Odonatological Abstract Service

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1997

12122. Fahrngruber, H.; Wenger, A. (1997): Nachweis von Gomphus flavipes (Charpentier, 1825) bei Krems / NÖ. Lanius, Krems 1996-1997: 73-75. (in German) [As a result of a road kill, Stylurus flavipes was found on 24-VII-1997 along the river Krems, near Senftenberg, Niederösterreich, Austria] Address: not stated

12123. Taylor, P.D. (1997): Empirical explorations of landscape connectivity. Proceeding of the sixth annual International Association for Landscape Ecology (UK Region) conference, 9th-11th September 1997. Eds: Cooper, A. and J. Power. IALE (UK): 11-18. (in English) ["Movement plays a fundamental role in the dynamics of populations, and is influenced by differences in the patterning of resources on the landscape. The interaction between the ability of an organism to move through different types of landscape and the relative size and positioning of resources in the landscape is termed landscape connectivity. Experimental manipulations have been made to measure landscape connectivity for two species of damselflies (Calopteryx maculata and C. aequabilis) in completely forested, completely open and mixed landscapes. Experimentally, individuals have been translocated between landscapes to measure aspects of how they move through the different types of landscapes. I present an overview of these experiments and results and then discuss their importance as methods for further exploring the important concept of connectivity." (Author)] Address: Taylor, P., Biology Department, Acadia University, Wolfville, Nova Scotia, Canada B4P 2R6. E-mail: ptaylor@resalliance.org

12124. Wenger, A. (1997): Die Libellenfauna eines Folienteiches. Lanius, Krems 1996-1997: 57-62. (in German) [In early 1996, a garden pond was created. The development of the colonisation by dragonflies in 1996 and 1997 is outlined. Anax imperator inspected the pond before it was filled with water.] Address: not stated

1999

12125. Hambrook, J.A.; Armitage, B.J.; Vis, M. (1999): Algal and macroinvertebrate assemblages of selected Ohio springs. Ohio Biological Survey Notes 2: 1-24. (in English) ["A qualitative study of the algal flora, macroinvertebrate fauna, and water quality of ten Ohio springs was conducted during July-September 1996. The springs were primarily in central and northern Ohio on a variety of surficial geology settings including karst, till, and exposed bedrock. Water quality varied with the groundwater source and local environment (agriculture, woodland). The algal community varied greatly in diversity among sites. One woodland site (Styx River) had only three taxa. In contrast, Cedar Bog (an open alkaline fen) had a great diversity of diatoms (246 taxa) with a total of 258 taxa. At most locations, between 15 and 56 taxa were reported. Like the algal community, the diversity of the macroinvertebrate fauna differed considerably among sites, ranging from 2 to 40 identified taxa. This variation may have been due to the sitespecific differences in water chemistry and/or habitat. Computation of Jaccard similarity coefficients for both the algal and macroinvertebrate data resulted in low similarity values among sites. The data collected provide a basis for proposed sampling methods (spring biotic survey protocols) that could be used for the range of spring/seep types found in Ohio." (Authors) The following taxa are listed: Anax junius, Cordulegaster sp., Libellula sp., Pachydiplax longipennis, Enallagma sp., Ischnura verticallis, Lestes rectangularis.] Address: Vis, M., Dept of Environmental & Plant Biology, Ohio Univ., Athens, OH 45701, USA

2001

12126. Goddard, S. (2001): The Scarce Chaser (Libellula fulva) on the River Stour. Trans. Suffolk Nat. Soc. 37: 81-82. (in English) [Recent records between 1997 and 2000 along the River Stour, UK are brought on record.] Address: Goddard, S., 47 Colchester Road, Ipswich IP4 3BT, UK

12127. Sugimura, M.; Futahashi, R. (2001): Second record of an interspecific hybrid between Sympetrum eroticum eroticum (Selys, 1883) and Sympetrum parvulum (Bartenef, 1912) (Libellulidae). Tombo 43: 51-54. (in Japanese, with English summary) [Japan; a supposed interspecific hybrid between the two taxa, is reported.] Address: Futahashi, R., Fujiwara Lab., Univ. Tokyo, Biosci. Bldg 501, Kashiwa, Chiba, 377-8562, Japan

2002

12128. Malavasi, D. (2002): Note sull'odonatofauna delle zone umide della Bassa Pianura modenese. Natu-

ra Modenese 6: 59-64. (in Italian, with English summary) [" Notes on dragonfly community of the Modena lowland wetlands: Notes on Odonata living in man-made wetlands, ponds and canals in Modena lowlands, are reported. The area is a typical intensive agriculture-based lowland,... The following list includes all the species observed: Sympecma fusca, Lestes barbarus, Platycnemis pennipes Ischnura elegans, Enallagma cyathigerum, Erythromma lindeni, Coenagrion puella, Erythromma najas, Aeshna cyanea, A. mixta, A. affinis, Anax imperator, Hemianax ephippiger, Gomphus vulgatissimus, Onychogomphus forcipatus, Libellula depressa, L. fulva, Orthetrum brunneum, O. albistylum, O. cancellatum, Crocothemis erythraea, Sympetrum striolatum, S. meridionale, S. sanguineum." (Author)] Address: Malavasi, D., Studio Associato GECO, Via San Faustino, 23, 41037 Mirandola, Italy. E-mail: davidemalavasi.eco@libero.it

12129. Matushkina, N.A.; Gorb, S.N. (2002): A checklist of substrates for endophytic oviposition of some European dragonflies (Insecta: Odonata). J. Kharkov Ent. Soc. 10: 108-118. (in Russian) ["Compiled from original and literature data, we have drawn up a list of endophytic oviposition substrates for some European dragonflies. This list can be used for ecological and faunistic studies in a variety of aquatic ecosystems. In some cases, the list can help predict the occurrence of a species in a given area." (Authors)] Address: Gorb, S.N., Functional Morphology and Biomechanics, Zoological Institute, Christian-Albrecht University of Kiel, 24098 Kiel, Germany. E-mail: sgorb@zoologie.uni-kiel.de

12130. Sherman, N. (2002): The discovery and observations of Small Red-eyed Damselfly (Erythromma viridulum) at a Suffolk site in 2001. Trans. Suffolk Nat. Soc. 38: 124-125, pl. (in English) [15-VIII-2001, without locality dates.] Address: Sherman, N., 98, Dover Road, Ipswich, Suffolk IP3 8JH

12131. Zhou, J.; Xie, J.-h.; Dai, Q.; Zeng, Y.-j.; Liu, J.-x.; Zhang, W.-g.; Zhang, S.-y. (2002): Feeding behavioral strategy of Rhinolophus pearsoni in summer. Zoological Research 2002(2): 120-128. (in Chinese, with English summary) [According to table 1, the diet of 32 specimens of R. pearsoni contained 912 specimens of Aeshnidae.] Address: Zhou, J., Institute of Zoology, the Chinese Academy of Sciences, Beijing 100080, China

2003

12132. Underwood, D.K. (2003): Occurrence of the Small Red-eyed damselfly Erythromma viridulum in west Suffolk during 2002. Trans. Suffolk Nat. Soc. 39 (2003): 60-62. (in English) [This paper reports on the first record of E. viridulum in Long Melford, UK on 4 August 2002. Several more specimens were seen later on until 1 September. The known data of E. viridulum in England are mapped.] Address: Underwood, D.K., 29 Cordell Road, Long Melford, Sudbury, Suffolk, CO10 9EH, UK: E-mail: darrenunderwood@clara.co.uk

2004

12133. Kelliher, E. (2004): Investigating fluctuating asymmetry of the larval damselfly, Calopteryx maculata (Odonata: Calopterigidae). Undergraduate Review 1(10). Available at: http://vc.bridgew.edu/undergradrev/vol1/iss1/10: 29-40. (in English) ["Fluctuating asymmetry (FA), or subtle random deviations from perfect bilateral symmetry, has recently become a useful tool in allowing researchers to understand more about an organism's health, fitness, developmental stability and environmental stressors. Ultimately, FA studies can be used as an indirect measurement of the quality of an aquatic system over time. We measured and examined the femur segments of the larval damselfly, C. maculata from sites on the Town, Hockomock, and Salisbury Plain Rivers, of Plymouth County, Massachusetts to determine FA levels. After accounting for measurement error, preliminary results show that variations in symmetry are not correlated to individual trait size. Also, the Hockomock River site showed FA levels thee times higher than the Salisbury Plain river, and twice that of the Town River. Finally, severe femur deformation of some individuals at all sites suggests that other, more serious developmental or environmental factors may be inhibiting normal development. Results from a simple two-way ANOVA of differences in right and left femur segments and a Kolmogorov Smirnov test for normality strongly suggest that the first femur of C. maculata is a useful trait for FA measurement." (Author)] Address: not stated

12134. Leeming, D.; Warrington, S. (2004): An aquatic invertebrate survey of Ickworth Park, Suffolk. Trans. Suffolk Nat. Soc. 40: 55-71. (in English) [At eight of the twelve studied ponds the following Odonata were recorded: Calopteryx splendens, Coenagrion puella, Enallagma cyathigerum, Pyrrhosoma nymphula, Ischnura elegans, Aeshna cyanea, A. grandis, Libellula depressa, Sympetrum striolatum, and S. sanguineum.] Address: Warrington, S., Regional Nature Conservation Advisor, East of England, The National Trust, The Dairy House, Ickworth, Bury St. Edmunds, IP29 5QE, UK. E-mail: stuart.warrington@nationaltrust.org.uk

2005

12135. Martinov, V.V.; Martinov, A.V. (2005): To the knowledge of dragonflies (Insecta: Odonata) of tne Nature Reserve 'Medobory' and surrounding areas. The Kharkov Entomological Society Gazette 2004 (2005) 12(1–2): 23-24. (in Russian, with English summary) [The Nature Reserve 'Medobory' is located in Gusiatinsky District of the Ternopol Region. Odonata of the reserve were collected during field studies in May and August, 2004. The total of twenty-five species represents 33.8 % of the Ukrainian Odonata fauna.] Address: Martynov V. V., Dept of Zoology, Biological Faculty, Donetsk National University, ul. Shchorsa 46, Donetsk, 83050, Ukraine. E-mail: martynov@dongu.donetsk.ua

12136. Mauersberger, R.; Buczyński, P. (2005): Materials to the knowledge of dragonflies (Odonata) of the Pomeranian Lakelands. Wiad. entomol. 24(4): 243-244. (in Polish) [Records of 26 Odonata species from 14 localities from northern Poland are documented.] Address: Buczyński, P., Dept of Zool., Maria Curie-Skłodowska University, Akademicka 19, PL-20-033 Lublin, Poland. E-mail: pawbucz@gmail.com

12137. Smith, J. (2005): Complementarity between two metrics which use invertebrates to assess riparian conditions of rivers. M. S. Thesis. University of KwaZulu-Natal, Pietermaritzburg: 98 pp + app. (in English) ["Conservation of streams involves an understanding of their physical , chemical and biological entities. SASS5 is a

biomonitoring method developed to monitor the habitat quality of a water body. It is based on differential scores attributed to various macroinvertebrate families with varying degrees of sensitivity to anthropogenic impact. This method, however, does not assess impacts on particular species. Odonata are good candidates for study at the species level as they are well researched and males are easily identified. As adults, they are known to be sensitive indicators of both riparian and river conditions. Yet Odonata cannot be an umbrella taxon for all other taxa. Therefore, the main aim of this study is to determine the complementarity of the two metrics (Odonata assemblages and SASS5), establishing whether Odonata assemblages offer additional information on, or insight into, riverine habitat quality as portrayed by SASS5. To accomplish this, certain objectives were addressed. 1) The variation of SASS5 scores and 2) Odonata assemblages between river systems, structural habitat types (open or closed canopies) and compositional habitat types (indigenous or alien vegetation). 3) Whether SASS5 scores vary to the same extent, and, 4) on the same spatial scale (river system and point localities) as Odonata abundance and species richness. The relationship between these two metrics was determined along three rivers in the Pietermaritzburg basin. Sampling units (SUs) with extremes in vegetation structure (sunlight and shaded SUs) and vegetation composition (alien or indigenous) were selected. Using this range of environmental conditions placed environmental extremes on the macroinvertebrate populations at point localities and having three different river systems added the dimension of variation over a broader scale, thus stretching the two metrics to investigate whether both responded similarly or in different ways. Results indicated that both metrics provide a similar portrait of overall river conditions. At the smaller spatial scale, the Odonata assemblage, unlike SASS, was highly sensitive to the riparian vegetation. Odonata species were less sensitive to vegetation composition but differentially sensitive to vegetation structure. However, landscape context is also important, with point localities being affected by the neighbouring dominant habitat type. Larval Odonata alone did not provide this information. Overall, aquatic macroinvertebrates and adult Odonata provide a highly complementary pair of metrics that together provide large spatial scale (river system) and small spatial scale (point localities) information on the level of impact of stressors such as riparian invasive alien trees." (Author)] Address: Smith, Jenny, School of Botany and Zoology, University of KwaZulu-Natal, P/Bag X01, Pietermaritzburg, South Africa

2006

12138. Morris, K. (2006): Suffolk dragonflies 2005. Trans. Suffolk Nat. Soc. 42: 68. (in English) ["Not a great year for migrants but a few interesting records along the coast. More importantly at least five of our Odonates continued their territorial expansion in Suffolk. Both Libellula fulva and Platycnemis pennipes pushed further up the River Stour with the former well into Sudbury and the latter just short although another small colony has recently appeared north of Sudbury in the Glemsford area. L. fulva wasn't found on this river until the 1990s but is now abundant either side of Bures. P. pennipes seemed to disappear from Suffolk in the 1960s but was rediscovered by Arthur Watchman at Stratford St Mary in 1988. Two other hawkers are making steady progress in establishing themselves in a wider area of our county. Aeshna isosceles can now be seen along the coast as far south as Aldeburgh with up to six hawking on the RSPB North Warren reserve – it was also reported as locally abundant further north and even found in central Lowestoft. Our earliest dragonfly – Brachytron pratense – only used to be found near the coast in Suffolk. Now it appears to be turning up almost anywhere. However it should be remembered that the hawkers normally take at least two years to go through their aquatic maturation process and therefore may not yet emerge every year in their new territories. Last but not least the new (1998) damselfly to England – Erythromma viridulum – can now be seen in most parts of the county where there is suitable habitat and certainly seems to have the ability to colonise faster than its larger relative E. najas." (Author)] Address: Morris, K., Arisaig, Back Lane, Monks Eleigh, Suffolk, IP7 7BA, UK. E-mail: dragons@arisaig.net

12139. Perez-Gelabert, D.E. (2006): Arthropods of Hispaniola (Dominican Republic and Haiti). A checklist and bibliography of species. Zootaxa 1831: 1-530. (in English, with Spanish summary) [Odonata are checklisted on pages 285-287.] Address: Perez-Gelabert, D.E., Integrated Taxonomic Information System (ITIS) and Dept of Entomology, U. S. National Museum of Natural History, Smithsonian Institution, P. O. Box 37012, Washington, DC 20013-7012, USA. E-mail: perezd@si.edu

2007

12140. Camousseight, A.; Vera, A. (2007): Estado del conocimiento de los Odonata (Insecta) de Chile. Boletín del Museo Nacional de Historia Natural, Chile 56: 119-132. (in Spanish, with English summary) ["A total of 47 species distributed in 23 genera and 9 families are recognized; the endemism reaches 29.8% of the species." (Authors)] Address: Camousseight, A., Museo Nacional de Historia Natural, Casilla 787, Santiago, Chile. Acamousseight@mnhn.cl

12141. Hagen, H. von (2007): Drachenfliegen und Wasserjunfgfern: Libellen. In: Naturschutzgruppe Witten - Biologische Station e.V. (Hrsg.): Natur zwischen Ruhr und Ardey. Erleben, verstehen und schützen. Comedia. Bochum: 77-83, 213. (in German) [This contribution on the regional natural history introduces into the dragonfly fauna. Appendix 2 lists the species known to occur near Witten, Nordrhein-Westfalen, Germany.] Address: von Hagen, H., Akazienweg 28, 58452 Witten, Germany. E-mail: h.vonhagen@web.de

12142. Ibrahimi, H.; Dauti, E.; Gashi, A.; Trozic-Borovac, S.; Skrijelj, R.; Grapci-Kotori, L. (2007): The impact of sewage effluents in water quality and benthic macroinvertebrate diversity of the Prishtina river (Kosova). Entomol. rom. 12: 227-231. (in English) ["From December 2004 until November 2005 macrozoobenthos specimens were collected every month with Surber net in six selected stations of the Prishtina River. The Hilsenhoff Family Biotic Index (FBI) and Shannon Weaver Index of Diversity on family level were used to indicate organic and nutrient pollution. In total 7 947 specimens belonging to 56 families of macrozoobenthos groups were found, mainly consisting of aquatic insects. The FBI results during the one-year period show that station P3 has the lowest value (4.6) and thus the best quality of water, while the highest value of this index was regis-

tered in station P5 (8.1) where the impact from sewage input is huge and obvious. The lowest value of Shannon Weaver Diversity Index was registered in station P5 (0.33) while the highest value was found in station P3 (4.04). These results show that biodiversity of aquatic insects (and macrozoobenthos in general) is seriously threatened in the last three stations of Prishtina river because of the direct discharge of sewage waters." (Authors) Taxa (including Odonata) are treated at family level.] Address: Ibrahimi, H., Faculty of Mathematical and Natural Sciences, University of Prishtina, Kosovo

12143. Rodrigues, R.C.; Teixeira, R.A.; Campos, L.A. (2007): Comunidade de insetos bentônicos em rio impactado por mineração de carvão em Treviso, Santa Catarina Community of benthic insects in a river impacted by coal mining in Treviso, Santa Catarina. Tecnologia e Ambiente 13: 14 pp-["The diversity of benthic insects under a pollution gradient by coal mining effluents was analyzed in the Mãe Luzia river, southern Santa Catarina (Brazil). Insects were collected biweekly from September 2004 to August 2005 at three sites presenting different contamination levels. Temperature, discharge, pH and conductivity were measured during field sampling. An entomological net (mesh of 1 mm) was used in transects of 20 m disturbing the substratum at each 1 m. The insects were identified to family level and for each site the diversity index of Shannon-Wiener and the equitability index of Pielou were calculated. Canonical Correspondence Analysis (CCA) was used to search for similarity patterns among the sites and the correlation between biotic and abiotic variables. A total of 14,025 specimens were registered belonging to 35 families of nine orders. Hydropsychidae (Trichoptera) was the most abundant family followed by Elmidae (Coleoptera) and Psephenidae (Coleoptera). Abundance and richness were inversely proportional to the pollution impact degree, whereas the highest values of diversity and equitability were found at the intermediary site. CCA indicated better correlation between the conductivity and the diversity of benthic insects. These analysis evidenced differences between the sample units of the two less disturbed sites, being useful to detect subtle variations in the lotic environment." (Authors) Taxa including Odonata are treated at family level.] Address: Rodrigues, R.C., Programa de Pós-Graduação em Ciências Ambientais, Universidade do Extremo Sul Catarinense, Av. Universitária 1105, Cx.P. 3167 CEP 88806-000 Criciúma, Santa Catarina, Brazil. E-mail: renatacrbio@yahoo.com.br

12144. Tamai, M.; Wang, Z.; Rajagopalan, G.; Hui, H.; He, G. (2007): Aerodynamic performance of a corrugated dragonfly airfoil compared with smooth airfoils at low Reynolds numbers. Proceedings of the 45th AIAA Aerospace Sciences Meeting and Exhibit, Reno, Nevada, 8-11 January 2007 (10.2514/6.2007-483): 12 pp. (in English) ["An experimental study was conducted to investigate the flow behaviour around a corrugated dragonfly airfoil compared with a traditional, streamlined airfoil and a flat plate. The experimental study was conducted at the chord Reynolds number of ReC =34,000, i.e., the regime where Micro-Air-Vehicles (MAV) usually operate, to explore the potential applications of such bio-inspired airfoils for MAV designs. The measurement results demonstrated clearly that the corrugated dragonfly airfoil has much better performance over the streamlined airfoil and the flat plate in preventing large-scale flow separation and airfoil stall at the test low Reynolds number level. The detailed PIV measurements near the noses of the airfoils elucidated underlying physics about why the corrugated dragonfly airfoil could suppress flow separation and airfoil stall at low Reynolds numbers: Instead of having laminar separation, the protruding corners of the corrugated dragonfly airfoil were found to be acting as “turbulators” to generate unsteady vortices to promote the transition of the boundary layer from laminar to turbulent rapidly. The unsteady vortex structures trapped in the valleys of the corrugated cross section could pump high-speed fluid from outside to near wall regions to provide sufficient energy for the boundary layer to overcome the adverse pressure gradient, thus, discourage flow separations and airfoil stall." (Authors)] Address: Zu, H., Dept of Aerospace Engineering, and AIAA Senior Member, USA. E-mail: huhui@iastate.edu

12145. Wang, Z.-g. (2007): Catalogue of Chinese dragonflies. Henan Science 25(2): 1-20. (in Chinese) [The paper lists 659 Odonata species/subspecies belonging to 154 genera and 19 families.] Address: Wang Zhi-guo, Henan Academy of Science, Zhengzhou, Henan, 450002 China

2008

12146. Calle, P.; Beekers, B.; Wijnhoven, H.; Schaffers, J. (2008): De Fauna van de Gelderse Poort. Een overzicht van de interessante ontwikkelingen in de periode 2004-2007. Stichting Flora- en Faunawerkgroep Gelderse Poort. Met financiële ondersteuning van de Provincie Gelderland, Staatsbosbeheer & ARK: 46 pp. (in Dutch) [Netherlands; 45 Odonata species have been recorded, 19 of them are mapped in detail.] Address: Calle, P., Begijnenstraat 36, 6511 WP Nijmegen, The Netherlands. E-mail: pepijncalle@yahoo.com

12147. Chaput-Bardy, A. (2008): Structure des populations sur un reseau hydrographique dendritique. These de doctorat. Université d’Angers: VII + 139 pp. (in French, with English summary) ["River networks are characterised by a hierarchical branching structure and spatio-temporal heterogeneity. Indeed, longitudinal (physico-chemical parameters, water flow), lateral (connectivity between the main course and secondary channels) and time dimensions (seasonal variations) influence habitat heterogeneity. These variations in environmental parameters are gradual along branches (physico-chemical gradients) or discrete between branches (habitat heterogeneity) of the river network. Then landscape structure influences distribution, dispersal and gene flow of freshwater organisms. This work aimed to test (i) the effect of river network geometry on dispersal and gene flow, and (ii) the effect of environmental variations on distribution and phenotypic traits related to dispersal. We used empirical and theoretical approaches by studying a damselfly species, Calopteryx splendens across the River Loire and fitting an individual based-model to simulate gene flow in synthetic river networks. Then we showed a discontinuous distribution of individuals along watercourses and a morphological cline across the Loire River. This cline was due to physico-chemical characteristics of water. Morphological variations did not influence dispersal abilities but affected survival. Survival and densities were the main factors influencing dispersal in C. splendens. Genetical analyses showed an isolation by distance pattern and a strong genetic structure, but no genetic groups were defined in the catchment. These results can be ex-

plained by overland gene flow between watercourses and a metapopulation structure at the catchment scale. This is the first study performed in a large river network in environmental conditions. Furthermore we realised the Gene-Net software to test the effects of the river network on population genetic structure of freshwater organisms." (Author)] Address: Chaput-Bardy, Audrey, Laboratoire Paysages et Biodiversité, UFR Sciences, 2 bd Lavoisier, 49045 ANGERS Cedex, France.

12148. Coles, J.O. (2008): An integrated assessment of heavy metal contamination of sediments in the Halls Mill Creek watershed in Mobile, Alabama. MSc. thesis, University of South Alabama: 93 pp. (in English) ["Halls Mill Creek and its tributaries, Milkhouse and Second Creeks, are part of the Dog River Watershed that drains most of metropolitan Mobile, AL. Suburban development in West Mobile has created a large non-point source of the metal contaminants of lead, copper, cadmium and chromium. As part of an integrated assessment of sediment quality in the Halls Mill Creek Watershed sediment physicochemical properties including metal concentrations, percent organic content, and particle size distributions were analyzed. A whole sediment contact toxicity bioassay with the freshwater amphipod Hyalella azteca (Hyalellidae; Amphipoda) was conducted and Progomphus obscuris larvae were examined as bioindicators of heavy metal contamination of sediments. Field collected sediments contained concentrations of lead, copper, cadmium and chromium below toxic effects threshold levels and did not result in reduced survival and growth in H. azteca. P. obscuris larvae accumulated metals to detectable levels however relationships between sediment and tissue concentrations were not seen."(Author) http://www.docin.com/p-226807678.html] Address: not stated

12149. Dyatlova, E.S. (2008): Zoogeographic analysis of dragonfly fauna (Insecta: Odonata) of south-western Ukraine. The Kharkov Entomological Society Gazette 2007 (2008) 15(1–2): 21-27. (in Russian, with English summary) ["An analysis of the dragonfly fauna of southwestern Ukraine was carried out, based on established odonatological zoogeographical classification. The odonate fauna of SW Ukraine was compared with other European countries. It was established that the fauna of the study area has the greatest similarity with certain Balkan countries (Serbia, Bulgaria, Bosnia and Herzegovina, Montenegro, Romania), south-eastern Ukraine and Hungary (82–75 %) and the least similarity with certain Baltic countries (Latvia, Sweden, Estonia and Finland) (58–49 %). As a result of zoogeographic analysis it was established that genera of the boreal faunistic complex dominate (72.4 %), genera of Sonore (42.6 %) and European-Siberian (21.3 %) groups predominating. Amongst the boreal species complex, 68.09 % belong to the European-Siberian group and 29.79 % to the Mediterranean group." (Author)] Address: Dyatlova, Elena, Inst. Zool., Fac. Biol., I.I. Mechnikov Univ. Odessa, Odessa, Ukraine. E-mail: lena.dyatlova@gmail.com

12150. Harter, N. (2008): Note sur la présence de l'Orthétrum à stylets blancs (Orthetrum albistylum) pour le département de la Marne (51). Naturale 2: 32-33. (in French) [17-VII-2007, Réserve Naturelle du Mesnil-sur-Oger, France] Address: Harter, N., 6 rue haute 08090 Fagnon, France. E-mail: harter.chiro@mail.com

12151. Martin, M.; Luig, J.; Ruusmaa, J.; Heidemaa, M. (2008): Distribution maps of Estonian insects. 3. Odonata. Maps 166-219. Eesti Loodusfoto. Tartu: 64 pp. (in Bilingual in Estonian and English) ["According to insect collections and publications, 54 species of Odonata are recorded from Estonia. For each species, a distribution map based on 10 x 1 0 km international UTM grid is provided. Records from before 1950 and 1950 onwards verified by the authors, as well as records from published or unpublished sources not verified by the authors are denoted with different symbols." (Authors)] Address: not stated

12152. Ternois, V.; Druart, D. (2008): Nouvelles observations d'Orthétrum à stylets blancs Orthetrum albistylum (Selys, 1848) dans le département de la Haute-Marne (Odonata, Anisoptera, Libellulidae). Bull. Soc. Sc. Nat. et Arch. de la Haute-Marne, 7 (nouvelle série): 14-17.[Seven new records from the 2007 season in northern France are presented as well as data on habitat and phenology of O. albistylum.] Address: Ternois, V., /c CPIE du Pays de Soulaines, Domaine de Saint-Victor, 10200 Soulaines-Dhuys, France. E-mail: cpie.vincent.ternois@wanadoo.fr

12153. Ternois, V.; Druart, D.; Brouillard, Y.; Lambert, J.-L. (2008): Première mention de Ceriagrion tenellum (De Villers, 1789) dans le département de la Haute-Marne et état des connaissances pour l'Aube (Odonata, Zygoptera, Coenagrionidae). Naturale 2: 26-31. (in French) [Bourbonne-les-Bains, France; 13-VI and 13-VII-2007; a graph with phenology and a distribution map of the species for the Champagne-Ardenne-region are presented in addition.] Address: Ternois, V., /c CPIE du Pays de Soulaines, Domaine de Saint-Victor, 10200 Soulaines-Dhuys, France. E-mail: cpie.vincent.ternois@wanadoo.fr

12154. Thaler, B. (2008): Die Wirbellosenfauna des Völser Weihers (Schlerngebiet, Südtirol). Gredleriana 8: 519-536. (in German, with English summary) ["In the frame of the "Habitat Schlem" project, the invertebrate assemblages of the Völser Weiher, meio- and macrozoobenthos as well as Zooplankton, were analyzed. Altogether 120 taxa were found, 33 of which not yet recorded for South Tyrol. Zoobenthos was composed of 99 crustacean and macroinvertebrate taxa, the majority of which found in the eulittoral. Tire richest group was the one of the Diptera with mainly Chironomidae taxa, followed by Oligochaeta and Crustacea. In terms of abundance the Crustacea clearly dominated in the eulittoral, mostly represented by Macroctjclops albidus and Alona njfinis. Among the macroinvertebrates the highest relative abundance was shown by the Oligochaeta with Sh/laria Incustris as the most frequent species, the Diptera (Dicrotcndipcs tritomus) and the Ephemeroptera (Caenis horaria). Tire zoobenthos of tire sublittoral zone was almost exclusively represented by Oligochaeta, Chironomidae and Crustacea. Tire Zooplankton was composed of 16 rotifer species, 10 cladoceran and 4 copepod species. Tire quantitatively most important species were Keratelh cochlearis among rotifers, Ceriodaphnia pulchella among dadocerans and Mesocyclops leuckarti among copepods. Tire Zooplankton community was characterized by a high percentage of rotifers. Tire ecological status of Völser Weiher, according to the European Water Framework Directive (2000/60/EC), was found to be good both evaluating it with Zooplankton and with eulittoral zoobenthos." (Authors) The list of taxa includes Coenagrion puella-group, Ischnura sp., Anax imperator, Cordulia aenea, Libellula depressa, and several early unidentified larval

stadia of different Odonata taxa.] Address: Thaler, Bertha, Biologisches Labor, Unterbergstr. 2, 39055 Leifers (BZ), Italy. E-mail: Bertha.Thaler@provinz.bz.it

2009

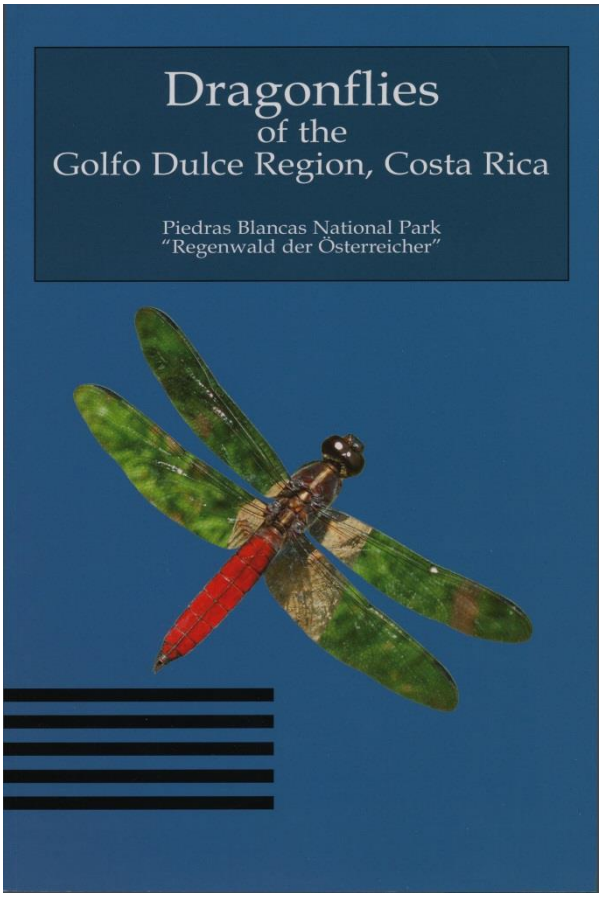
12155. Covey, S. (2009): Views and Reviews: The Dragonflies of Lesbos by John Bowers. Friends of Green Lesbos, Lesbos, Greece, 2009. 91 pp., 25 colour plates. Sbk. ISBN 978-960-930703-1. £15.00. Atropos 38: 58-59. (in English) [Extensive book review.] Address: not stated

12156. Dunkley, J. (2009): Red-veined Darter Sympetrum fonscolombii in Northamptonshire. Atropos 38: 64-65. (in English) ["A significant local find of six S. fonscolombii was made at Upton on 27 June 2009 by local stalwarts Nick Roberts and Mark Piper; these were hawking over a recently constructed pond serving as a stormwater balancing vessel for adjacent new roadworks, illustrating how Odonata may opportunistically make use of any available water offering favourable habitat. I visited the site the next day, but the sky had clouded over and despite searching there was no further sign that afternoon. I returned on 29 June at 08.00 hrs. It was already very warm, but it took another hour or more for the target to appear, by which time Bob Bullock had arrived and we were soon watching up to six S. fonscolombii, including an oviposting pair in tandem. Following Mark Tyrrell's prediction that confirmation of breeding should be looked for from mid-September onwards, visits by he and I on 19 and 22 September respectively produced not only tenerals but also exuviae. The species remained present into October with estimated numbers running into double figures, providing much pleasure to local Odonata enthusiasts. As a bonus Mark Tyrrell found a 'wandering' male of S. danae at the same site on 19 September, following a male in Northampton on 10 September (Doug Goddard), which I was also lucky to see. These constitute the first records for the County." (Author)] Address: Dunkley, J., 10 Stonelea Road, Syweil, Northampton, NN6 OAZ, UK

12157. Garzon Sanabria, C.; Realpe, E. (2009): Diversidad de Odonata (Insecta) en la reserva natural Cabildo-Verde (Sabana de Torres-Santander, Colombia), Una proximación hacia la conservatión (Dragonfly diversity (Insecta) in the natural reserve Cabildo-Verde (Sabana de torres-Santander, Colombia), an conservation approach). Caldasia 31(2): 459-470. (in Spanish, with English summary) ["We studied the diversity of Odonata in six sampling stations in the Sabana de Torres county, department of Santander, Colombia. Four stations were located within the Natural reserve Cabildo Verde, an area long the western hall slope of the Eastern cordillera, in the Magdalena's river mid valley. The remaining two ere located outside of this reserve. The species composition was analyzed using an euclydian distance analysis. We found 245 adult individuals belonging to seven families, 22 genera and 39 species in the Sabana de Torres; 33 species, most of them in the suborder Zygoptera were found in the Natural Reserve Cabildo verde. The Shannon-Weaver value for the natural reserve was of H`= 2,972 and outside of the reserve H`= 2,645, both relatively high in comparison to other studies. There was not significant differences in the number of species inside and outside of the reserve (Chi-squared, $X^2 = 1,51$, Gl=1, $p > 0.05$); however, the composition of dragonflies within the reserve was given mainly by estenotopics species, especially those in the families Protoneuridae and Perilestidae. Such species are abundant in the studied area, occurring in streams with high vegetal coverage in primary and secondary forests." (Authors)] Address: Garzon Sanabria, Carolina, Laboratorio de Zoología y Ecología Acuática (LAZOEA), Universidad de los Andes, Apartado 4976, Bogotá D.C., Colombia. lc.garzon88@uniandes.edu.co

12158. Glitz, D. (2009): Libellen: Das rheinland-pfälzische Naturerbe. Wir stellen Ihnen die Vielfalt der bedeutendsten Arten in Rheinland-Pfalz vor. Naturschutz in Rheinland-Pfalz 3/2009: 4-5. (in German) [The paper introduces Oxygastra curtisii, Ophiogomphus cecilia and an identification guide focussed on the regional Odonata species of Rheinland-Pfalz. In addition it reports on the conservation measures directed to Odonata.] Address: Glitz, D. c/o NABU Rheinland-Pfalz e.V., Frauenlobstr. 15-19, 55118 Mainz, Germany. E-mail: Kontakt@NABU-RLP.de

12159. Schneeweihs, S.; Albert, R.; Huber, W.; Weissenhofer, A. (2009): Dragonflies of the Golfo Dulce Region, Costa Rica: Piedras Blancas National Park "Regenwald der Österreicher". Verein zur Förderung der Tropenstation La Gamba, Vienna. 56 pp. (in English) [This booklet about the dragonflies of the Piedras Blancas National Park, Costa Rica, features the majority of the species of the region. Species descriptions and many colour photographs enable the reader to identify dragonflies. The booklet also includes an introduction to dragonflies and to the region's natural history." (Publisher) Address: Fakultätszentrum für Biodiversität der Universität Wien, Tropenstation La Gamba, Rennweg 14, A-1030 Wien, Austria. E-mail: tropenstation.botanik@univie.ac.at



12160. Weber, G.; Boomers, J.; Cölln, K.; Jakubzik, A.; Ricono, K. (2009): Die Rückbesiedlung der ehemaligen Deponie Eskesberg durch Tiere und Pflanzen nach Abschluss der Sanierung - Vorstellung des begleitenden Biomonitorings. Jahresbericht des Naturwissenschaftlichen Vereins Wuppertal 61: 145-158. (in German, with English summary) [Nordrhein-Westfalen, Germany; 16 Odonata species have been recorded within the recolonisation period of five years. Only Ischnura pumilio and Lestes sponsa are presented in greater details.] Address: Weber, G., C/o NVW, Soldnerstr. 22, 44801 Bochum, Germany. E-mail: nvwwuppertal@online.de

12161. Woodward, S. (2009): Mix up with a mixta. Leicestershire Entomological Society. Newsletter 41: 8. (in English) ["Dragonflies are generally reckoned to have good eyesight, but this male Sympetrum sanguineum is trying to couple with a male Aeshna mixta. The hawker was having none of it, so after about ten seconds of wingclattering and abdomen-waving, the darter was repelled. Egleton Reserve, Rutland Water, SK881075, 30 Aug 2009." (Author)] Address: Woodward, S., Highfield Rd, Groby, Leicester LE6 0GU, UK. E-mail: grobysteve @metronet.co.uk

2010

12162. Abbott, J.C. (2010): Dragonflies and Damselflies (Odonata) of Texas. Odonata Survey of Texas. Vol. 4. Austin, Texas: VI + 312 pp. (in English) [The book contains updated through 2009 references to the 234 species of odonates distributed throughout Texas, USA. Included in this volume are detailed species distribution and seasonality information arranged so that users can quickly and easily search by scientific name, county name, or flight season.] Address: Odonata Survey of Texas c/o John C. Abbott, Ph.D. Section of Integrative Biology1, University Station #L7000, The University of Texas at Austin, Austin, Texas 78712 USA. E-mail: jcabbott@mail.utexas.edu

12163. Bauer, S. (2010): Zielartenerfassung. Naturschutz im Landkreis Ravensburg 5: 367 pp. (in German) [Baden-Württemberg, Germany; the author presents basic data on the regional umbrella species including regional distribution, habitat requirements and threats. Odonata are represented by Coenagrion mercuriale, Orthetrum coerulescens, Cordulegaster bidentata, C. boltonii, Erythromma najas, Coenagrion pulchellum, Anax parthenope, Anaciaeschna isoceles, Epitheca bimaculata, Libellula fulva, Lestes barbarus, L. dryas, L. virens, Sympecma fusca, S. paedisca, Sympetrum flaveolum, Aeshna subarctica elisabethae, Somatochlora arctica, Leucorrhinia pectoralis, L. dubia, and L. rubicunda.] Address: Bauer, S., Im Tobel, 88353 Immenried, Germany. E-mail: Josef.Bauer@Landkreis-Ravensburg.de

12164. El Haissoufi, M.; Bennas, N.; El Mohdi, O.; Millan, A. (2010): Analyse preliminaire de la vulnerabilite des odonates (Odonata) du Rif occidental (nord du Maroc). Boletín de la S.E.A. 46(1): 345-354. (in French, with Spanish and English summaries) ["The Odonata fauna of the Western Rif is well-known for its richness and diversity. In fact, 49 species out of the 61 which live in Morocco occur in this region alone. The analysis of the level of vulnerability shown by the species that occur in this region has shed light on those species most vulnerable at the regional and national scale. Hemianax ephippiger, Calopteryx exul, Oxygastra curtisii, Zygonyx torridus, Aeshna mixta and Orthetrum brunneum are highly vulnerable at the regional scale and are therefore proposed for inclusion in the future red list of threatened species of the Western Rif. The degree of national vulnerability, studied here only for C. exul and Gomphus simillimus maroccanus, two Maghrebian and Moroccan endemics, respectively, revealed an average degree of vulnerability for both species. Protection measures should focus on these two species, especially because their natural habitats are being affected by different types and patterns of stress and disturbance." (Authors)] Address: El Haissoufi, M., Laboratoire Diversité & Conservation des Systèmes Biologiques. Département de Biologie, Université Abdelmalek Essaâdi, Tétouan, Maroc. E-mail: elhaissoufisym@yahoo.fr.

12165. Grand, D. (2010): Leucorrhinia pectoralis (Charpentier, 1825) dans la Dombes (département de l'Ain): éléments de biologie (Odonata, Anisoptera: Libellulidae). Martinia 26(3-4): 151-166. (in French, with English summary) ["The author first summarizes the biology, the ecology and the status of Leucorrhinia pectoralis in France and Europe. He brings then the results of a 3 years study of this species at the pond of Pizay, in the Dombes area, especially during emergence with attention to the metamorphosis substrates, exuviae location and sex-ratio. Some parameters influencing larval densities were examined as well as adults behaviours such maturation, territoriality, reproduction and displacements. The distribution of the species within Dombes area is finally considered together with its possible evolution regarding drought periods, agricultural practices and urban development." (Author)] Address: Grand, D., Impasse de la Voûte, F-69270 St. Romain-au-Mont d'or, France. E-mail: danielgrand@yahoo.fr

12166. Koch, L. (2010): Neu entstandene Kleingewässer entwickeln sich zu Libellen-Biotopen. Beiträge zur Heimatkunde der Stadt Schwelm und ihrer Umgebung N.F. 59: 19-38. (in German) [Nordrhein-Westfalen, Germany; 17, mostly widespread Odonata species are reported.] Address: Koch, L., Heinrich-Heine-Str. 5, 58256 Ennepetal, Germany. E-mail: L-Koch@t-online.de

12167. Lambret, P. (2010): Dynamique d'une population d'adultes de Lestes macrostigma (Eversmann, 1836) et implications pour son suivi: l'exemple de la Camargue (Odonata, Zygoptera: Lestidae). Martinia 26(1-2): 19-28. (in French, with English translation) ["The emergence curve, the flight period (phenology) and the number of adults which are detected along the day have been studied in L. macrostigma by the visual transect count method in a temporary pool of Camargue. Results are discussed in the light of other findings across the range of this threatened species. The consequences in term of survey and monitoring are highlighted." (Author)] Address: Lambret, P., Marais du Vigueirat, F-13104 Mas-Thibert, France. E-mail: philambret@hotmail.com

12168. Lambret, P. (2010): Un mâle de Lestes macrostigma (Eversmann, 1836) prisonnier de Juncus maritimus. Martinia 26(1/2): 49-51. (in French, with English summary) [1-VII-2009, Marais du Vigueirat, Camargue, France; a male of L. macrostigma that has been 'captured' by Juncus maritimus: its right forewing was pierced by a stem of the plant.] Address: Lambret, P., Amis des Marais du Vigueirat, F-13104 Mas Thibert, France. E-mail: philambret@hotmail.com

12169. Martire, D. (2010): Les Libellules et Ephemeres de la Reunion. BIOTOPE. Mèze: 72 pp. (in French) [The books covers 21 Odonata and 2 Ephemeroptera species found on the island of Reunion. These are attractively illustrated with colour photos. The book presents an identification key to Odonata, many colour photos and distribution maps of the species.] Address: Biotope, 22, boulvard Maréchal Foch, BO 58, 34140 Mèze, France

12170. Meyabeme Elono, A.L.; Liess, M.; Duquesne, S. (2010): Influence of competing and predatory invertebrate taxa on larval populations of mosquitoes in temporary ponds of wetland areas in Germany. Journal of Vector Ecology 35(2): 419-427. (in English) ["Abundances of mosquito larvae and associated invertebrate communities were assessed in 27 temporary ponds during the spring season in wetland areas of Germany. Four genera of mosquitoes were identified: Aedes, Anopheles, Culex, and Culiseta. We focused our analyses on Aedes spp. because this genus was the most abundant (92% of total abundance) and frequently encountered mosquito (present in 65% of investigated sites). The abundance of Aedes spp. was negatively associated with the abundance of competitors for food, and to a lesser extent with those of intraguild predators and strict predators. The influence of these natural antagonists on larvae of Aedes was stronger in ponds with higher levels of dissolved oxygen (53 ± 4%) than in ponds with lower levels (16 ± 1%). The overall abundance of antagonists explained 42% of the variation in abundance of Aedes spp. at sites with higher levels of dissolved oxygen. Of this explained variation, competitors accounted for 34.7%, whereas the abundance of intraguild predators and strict predators accounted for only 6.8 and 0.5%, respectively. Therefore, the promotion of competing species might be an appropriate ecological approach for the control of Aedes spp. in temporary ponds in these areas." (Authors) Samples including Odonata originate from Rosslau (Sachsen-Anhalt), Spreewald (Brandenburg) and Leipzig (Sachsen).] Address: Liess, M., UFZ – Helmholtz Centre for Environmental Research, Department of System Ecotoxicology, Permoserstr.15, 04318 Leipzig, Germany

12171. Molina, C.I.; Gibon, F.M.; Duprey J.L; Dominguez E.; Guimarães, J.R.; Roulet, M. (2010): Transfer of mercury and methylmercury along macroinvertebrate food chains in a floodplain lake of the Beni River, Bolivian Amazonia. Sci. Total. Environ. 408(16): 3382-3391. (in English) ["We have evaluated the mercury and methylmercury transfers to and within the macroinvertebrate communities (including Tramea sp.) of a floodplain lake of the Beni River basin, Bolivia, during three hydrological seasons and in two habitats (open water and vegetation belt). Using the stable isotopes ȡ(13)C and ȡ(15)N, six trophic chains were identified during a previous study. Four are based on only one source: seston, organic matter from the bottom sediment, periphyton and macrophytes. Two are based on mixed sources (seston and periphyton in one case, periphyton and macrophytes in the other). During sampling, we found only one taxon that had surface sediment organic matter as food source and very few taxa whose trophic source was constituted by macrophytes. The periphyton was the most important source during all seasons; it produced the longest chain, with three trophic positions. Whatever the season and trophic source, all collected macroinvertebrates contained methyl mercury and the latter was biomagnified in all trophic chains that we identified. The biomagnification of methylmercury through invertebrate trophic chains accurately reflected the existence and length of these chains. Biomagnification was virtually non-existent in the sediment-based chain, low and restricted to the dry season in the macrophyte-based chain. It was significant in the seston-based chain, but limited by the existence of only two trophic levels and restricted to the wet season. Finally, it was very effective in the periphyton-based chain, which offers the highest rate of contamination of the source but, above all, the largest number of trophic levels." (Authors)] Address: Molina, C.I., Instituto de Ecología, Unidad de Limnología, UMSA, Casilla postal #10077, La Paz, Bolivia. E-mail: camoar6088@gmail.com

12172. Specht, W. (2010): Zur Libellenfauna im Diabassteinbruch Wolfshagen, Landkreis Goslar (Niedersachsen) - ein Zwischenbericht (Odonata). Mitteilungen des Naturwissenschaftlichen Vereins Goslar 11: 81-164. (in German, with English summary) ["Dragonfly fauna of a quarry (Diabas-Steinbruch) near Wolfshagen, region Goslar (Lower Saxony, Germany) - an interim report (Odonata). During a number of studies in the quarry called "Diabas-Steinbruch" east of Wolfshagen in the time between 1992 and 2004, there was also carried out a survey of the occurrence of dragonflies within that quarry. On the basis of the results from those years, a total of 10 other species could be recorded in 2008 and 2009 raising the total number of species up to 33.18 out of these species are certainly indigenous to the place. This group includes the very rare Leucorrhinia albifrons and the Mediterranean species Sympetrum fonscolombii and Crocothemis erythraea. Ischnura pumilio, discovered in 2000 and 2004, was not found again. The rare dragonfly accounted to Aeshna viridis in 2004 could not be confirmed due to a mistake with identifying this specimen. The diversify and the large quantities of the dragonfly fauna in this protected biotope can possibly be explained with the presence of a micro-climate and a special water structure. The absence of fish and of human use are surely the most important reasons." (Author)] Address: Specht, W., Am Gemeindehof 6, 38690 Vienenburg, Germany. E-Mail: wolfgangspecht@web.de

12173. Thipaksorn, A.; Ruangsittichai, J. (2010): Diversity of rice Odonate insects in Lopburi Province, Thailand. New Entomol. 59(3,4): 37-42.["From 2005 to 2008 in-season rice cropping period, 16 odonate insects were collected from pre-germinated direct seeded rice fields in Lopburi Province, an important rice field area of Central plain, Thailand. Within all rice odonate species, three predominant species, Agriocnemis pygmaea, A. femina femina and Ischnura senegalensis, had the highest numbers of individuals. The percentage of 3 species was 56.19% of the total collected. The subdominant species were Diplacodes trivialis, I. aurora aurora, Crocothemis servilia servilia and Brachythemis contaminata. The highest mean zygopteran species catch was founded from tillering to flowering rice growth stages and will decreasing of their number in milk grain to mature grain stages. On the other hand, the highest mean anisopteran species catch was founded from tillering to milk grain stages and rapidly decreasing of their number in dough grain stage. The number of species and individuals of rice odonates are increasing correlated to specific rice growth stages." (Authors)] Address: Thipaksorn, A., Department of Zoology, Faculty

of Science, Kasetsart University, Chatuchak, Bangkok 10900 Thailand. E-mail: athipaksorn@yahoo.com

12174. Trevor, D.; Caston, M.; Zwelabo, S. (2010): An assessment of the effect of industrial and sewage effluent on aquatic Invertebrates: A case study of a southern urban stream, Zimbabwe. Journal of Sustainable Development 3(2): 210-214. (in English) ["The impact of industrial effluent discharged in Mazai stream was assessed through physical-chemical parameters and also by bio-monitoring of benthic macro-invertebrates. Samples were collected at three sites, one before the effluent discharge point into the stream (site 3) and two sites which were located downstream after the discharge points (sites 1 and 2). High levels of chemical pollutants were recorded at sites 1 and 2 (ZINWA red category) whereas site 3 (reference site) consisted of relatively clean water (ZINWA blue category). This was confirmed by the biological evaluation process. The SASS4 scores at sites 1 and 2 indicated a deterioration of water quality while site 3 there was good water quality with high species diversity. Detrended correspondence analysis (DCA) showed that pollution sensitive taxa such as Hemiptera, Trichoptera, Coleoptera and Odonata were dominant at site 3 whilst the other sites were dominated by pollution tolerant species such Chironomids. Continuous discharge of effluent could lead to extreme degradation of Mazai stream hence loss of biodiversity of macro-invertebrates." (Authors)] Address: Trevor, D., Dept Biol. Sci., Midlands State Univ., P. Bag 9055, Gweru, Zimbabwe. E-mail: tdube@msu.ac.zw

12175. van Swaay, C.A.M.; Groenendijk, D.; Termaat, T.; Plate, C.L. (2010): Vlinders en libellen geteld: jaarverslag 2009. Rapport VS2010.001, De Vlinderstichting, Wageningen: 36 pp. (in Dutch, with English summary) ["Butterflies and dragonflies are counted using a line-transect method. Butterfly transects are visited every week, dragonfly transects once every fortnight. The length of the transects is variable and depends on habitat quality and availability. In addition, single species transects are exclusively counted for a specific threatened butterfly or dragonfly. Indices were calculated using the computer program TRIM (Trends and Indices for Monitoring Schemes). This program was developed by CBS for the analysis of time series of counts with missing observations. The butterfly indices are calculated using a weighting procedure. The reference value of the year 2000 is set to 100. The dragonfly indices are not weighted yet and in most cases 2000 is used as the first year in the trend calculation and, therefore, set to a reference value of 100. Results of 2009: [...] Like in other years, in 2009 Odonata were counted every fortnight between May and September at 422 sites.The average number of dragonflies per transect was a little higher than in most previous years. Like in most other years Enallagma cyathigerum was the most common species (over 86,000 individuals). Ischnura elegans, with over 15,000 individuals, was the most widespread species. It was seen on about 81% of the plots. For most species indices are presented. As shown in previous years, an alarming decreasing trend was detected in 2009 again for Aeshna viridis and Coenagrion hastulatum. Other Red List species, like Sympecma fusca, Lestes virens, Leucorrhinia dubia and Libellula fulva, show a positive trend.(Authors)] Address: Termaat, T., De Vlinderstichting, Postbus 506, 6700 AM Wageningen, The Netherlands. E-mail: info@vlinderstichting.nl

12176. Woodward, S. (2010): Black Darter seen at Grace Dieu Wood. Leicestershire Entomological Society. Newsletter 43: 8. (in English) [Verbatim: The Black Darter Sympetrum danae is Britain's smallest dragonfly. As a heath and moorland species, it is very thinly scattered in the lowlands and there are less than ten records for Leicestershire (Ian Merrill). On a recording excursion to Grace Dieu Wood, Thringstone, on 15 August, … found one by some small pools that had formed in forestry machinery wheel ruts, SK433175. There was only one insect, a male, and it was not found on subsequent visits, however these pools have been productive for other dragonfly species this year and there are certainly many nymphs lurking in there...] Address: Woodward, S., Highfield Rd, Groby, Leicester LE6 0GU, UK. E-mail: grobysteve@metronet.co.uk

2011

12177. Bence, S.; Blanchon, Y.; Braud, Y.; Deliry, C.; Durand, E.; Lambret, P. (2011): Liste Rouge des Odonates de Provence-Alpes-Côte d'Azur. Martinia 27(2): 123-133. (in French, with English summary) [Basing on the results of a meeting of regional dragonfly experts on the 19th March, 2011 and applying the IUCN methods a regional Red List of endangered Odonata for Provence-Alpes-Côte d'Azur, France is published: "Sympecma paedisca is Regionally Extinct (RE). Lestes macrostigma, Coenagrion caerulescens, Cordulegaster bidentata, Somatochlora m. meridionalis, Sympetrum depressiusculum and S. v. vulgatum are Endangered (EN). Coenagrion pulchellum, S. m. metallica, S. flavomaculata, S. alpestris, S. arctica and Leucorrhinia dubia are Vulnerable (VU). Lestes barbarus, L. dryas, L. virens vestalis, C. mercuriale, Brachytron pratense, Anax ephippiger, Gomphus vulgatissimus, G. simillimus, Onychogomphus uncatus, Cordulia aenea, Oxygastra curtisii, S. pedemontanum and Trithemis annulata are Near Threatened (NT). Data are Defficient (DD) for Aeshna grandis, G. flavipes and C. b. boltonii. The IUCN methods were Not Applicable (NA) in the region for C. hastulatum, Erythromma najas and G. graslinii. Records of Calopteryx v. virgo, Macromia splendens, Ophiogomphus cecilia, Epitheca bimaculata, L. albifrons and Pantala flavescens are considered erroneous or unreliable. Other species which are present in the PACA region are classified Least Concern (LC). The main threats are habitat fragmentation and reduction of habitat quality. The current policies for biodiversity conservation should contribute to the reduction of the regional extinction risk. A new evaluation of this risk should be made in 2015." (Authors)] Address: Lambret, P., Coordinateur régional PACA du Plan d'Actions en faveur des Odonates, Amis des Marais du Vigueirat, F-13104 Mas Thibert, France. E-mail: p.lambret@espaces-naturels.fr

12178. Benken, T.; Komander, M. (2011): Die Senegal-Pechlibelle (Ischnura senegalensis) schlüpft in einem Aquarium bei Ulm. Mercuriale 11: 51-52. (in Geman, with English summary) ["We report on three specimens of I. senegalensis accidentally introduced to Germany in 2011. The odonates were encountered in the surroundings of Ulm (Baden-Württemberg) and we assumed the larvae were imported by exotic aquatic plants." (Authors)] Address: Benken, T., Nuitsstr. 19, D-76185 Karlsruhe, Germany. E-mail: Theodor@benken-online.net

12179. Benken, T.; Ehmann, H.; Miller, J.; Miller, E. (2011): Jäger als Gejagte - Libellenimagines als Nahrungsquelle. Mercuriale 11: 17-26. (in Geman) [Austria, France, Baden-Württemberg, Germany; Hornet attacks on Epitheca bimaculata and Aeshnidae as well as attacks of dragonflies, spiders and robberflies on Odonata are documented and discussed in detail.] Address: Benken, T., Nuitsstr. 19, D-76185 Karlsruhe, Germany. E-mail: Theodor@benken-online.net

12180. Chalar, G.; Arocena, R.; Pacheco, J.P.; Fabián, D. (2011): Trophic assessment of streams in Uruguay: A Trophic State Index for Benthic Invertebrates (TSI-BI). Ecological Indicators 11: 362-369. (in English) ["In this study we assessed the trophic status of 28 wadeable stream reaches of the Santa Lucía basin, an important economic region of Uruguay. We developed a Trophic State Index of Benthic Invertebrates (TSI-BI), the first of its kind for South American lotic systems. The methodological approach consisted of determining the ambient trophic gradient via canonical correspondence analysis based on the benthic invertebrate abundance matrix and an environmental variable matrix. The rescaled site scores served as environmental variables in the weighted averaging model (WA), to weight the benthic abundances and then find the optimum and tolerance of each of the sampled genus. These data were used to estimate the TSI-BI scores. These scores, in conjunction with the total phosphorus concentrations (TP), were used to group the study reaches when running a cluster analysis. The basic statistical parameters of the defined groups serve as an input to identify the threshold values of TP and TSI-BI corresponding with the different trophic states. The boundaries of TSI-BI and TP demarcating mesotrophic and eutrophic states were 8 and 71 g/l, respectively, and can be considered the limits between impaired and less altered reaches. The results also indicated that the trophic status of the reaches is related to land use intensity. A change in land use management seems to be critical for the preservation of one of the most important water supply systems in Uruguay." (Authors) 15 Odonata genera are integrated into the index.] Address: Guillermo Chalar, G., Section of Limnology, Department of Ecology, Faculty of Science, University of the Republic, Iguá 4225, Piso 9, Montevideo CP: 11400, Uruguay. E-mail: gchalar@fcien.edu.uy

12181. Contreras-Garduño, J.; Córdoba-Aguilar, A.; Azpilicueta-Amorín, M.; Cordero-Rivera, A. (2011): Juvenile hormone favors sexually-selected traits but impairs fat reserves and abdomen mass in males and females. Evolutionary Ecology 25(4): 845-856. (in English) ["The physiological mechanism underlying resource allocation in sexual selection studies has been little studied. One candidate is hormones as these favour resource allocation to reproductive traits but impair survival due to a resource over-expenditure directed to the former traits. We have investigated whether a juvenile hormone analog (JHa, methoprene) administrated topically is involved in the resource allocation to wing pigmentation (an ornamental trait), fat reserves and flight muscle mass in both sexes of Calopteryx haemorrhoidalis and C. virgo. We also investigated the possible negative effect of such implementation on abdomen mass (an indirect measure of egg production) and field-based survival in adult males of C. haemorrhoidalis and C. splendens. We found that males and females treated with JHa, against a control group, developed higher wing pigmentation and showed reduced fat reserves but had no change in muscle mass. In females, JHa decreased abdominal weight (an indicator of fecundity) and in males, survival was impaired only in C. splendens. These results support the idea that JH induces resource allocation to wing pigmentation, a sexually selected trait in both sexes. Thus, this study suggests that the action of JH could be a mechanistic link between ornaments and physiological condition in both males and females." (Authors)] Address: Cordoba-Aguilar, A., Centro de Investigaciones Biologicas, Universidad Autonoma del Estado de Hidalgo, Apdo. P. 69-1, Plaza Juarez, Pachuca, Hidalgo 42001, Mexico E-mail: acordoba@uaeh.reduaeh.mx

12182. Grand, D.; David, G.; Diebolt, L. (2011): Réapparition de Gomphus simillimus Selys, 1840 dans le Grand Lyon (Odonata, Anisoptera: Gomphidae). Martinia 27(1): 61. (in French, with English summary) [Saint-Priest (Rhône), France, 30-VI-2010] Address: Grand, D., Impasse de la Voûte, F-69270 Saint-Romain-au-Mont-d'Or, France. E-mail: danieljgrand@yahoo.fr

12183. Grand, D.; Pont, B.; Krieg-Jacquier, R.; Barlot, R.; Feuvrier, B.; Bazin, N.; Biot, C.; Deliry, C.; Gaget, V.; Michelot, J.-L.; Michelot, L. (2011): Gomphus flavipes (Charpentier, 1825) redécouvert dans le bassin hydrographique du Rhône (Odonata, Anisoptera: Gomphidae). Martinia 27(1): 9-26. (in French, with English summary) ["After a short statement about the larval habitats of Gomphus flavipes and its European and French conservation status, places where this species was recently discovered or rediscovered in the Rhône River basin are noted, among which two are described. The hypothesis of a coming back from the Loire and Rhine watersheds against the maintenance of overlooked local populations throughout the 20th century is discussed. The report ends with an assessment of the conservation status of G. flavipes populations in the Rhône River basin." (Authors)] Address: Grand, D., Impasse de la Voûte, F-69270 Saint-Romain-au-Mont-d'Or, France. E-mail: danieljgrand@yahoo.fr

12184. Grand, D.; Garnier, G. (2011): Rencontre avec Hemianax ephippiger (Burmeister, 1839) dans le bas Bugey (Ain) (Odonata, Anisoptera: Aeshnidae). Martinia 27(1): 31-32. (in French) [France, lacs de Conzieu, 22-VIII-2009] Address: Garnier, Géraldine, CREN Rhône-Alpes, Antenne de l'Ain, château Messimy, F-01800 Charnoz-sur-Ain, France

12185. Greven, H. (2011): Johann Leonhard Frisch (1666-1743) - ein wenig bekannter Pionier entomologischer Forschung. Entomologie heute 23: 145-206. (in German, with English summary) ["Johann Leonhard Frisch, pedagogue, linguist and entomologist, was born in 1666 in Sulzbach (Bavaria). He was a universal scholar of the Early Enlightenment. Among others he wrote aside from his job the "Description of various insects of Germany" („Beschreybung von allerley Insecten in Teutschland"), which was issued between 1721 and 1738 in 13 parts. Certainly, he was physico-theologically motivated, but this motivation is far less insistently expressed as by his contemporaries or subsequent "entomologists". The text often impresses with thorough descriptions of 300 "insects", in many cases including their developmental stages. Approximately 260 specimen are Hexapoda, from which many can be determined to the species level. The remaining "insects" belong to various "worms" such as arachnids, millipeds, molluscs, with careful observations of their living and

with ingenious and often amazing conclusions. In addition, he included 41 copper plates with 296 figures (tables; some with more than one figure) of different quality, which were engraved by his sons Philipp Jacob und Ferdinand Helfrich. Surely, meaningfulness of these plates (in combination with the text) is underestimated until now. Also noticeable are the short summaries, occasionally with critical annotations, of the entomological works of some famous naturalists of the Renaissance and the Early Enlightenment, among others Aldrovandi, Mofett, and Swammerdam. At the beginning of the 20th century Bodenheimer has thoroughly acknowledged Frisch, but later appreciations are either totally missing, are short, or focus on Frisch's main interest in parasites and store pests. Contrary to these approaches, I show exemplarily by some less spectacular details (e.g., striking legs of water scorpions, breathing of dragonfly-nymphs, parturition of aphids etc.), how precisely Frisch has observed his objects and how acutely he has commented his finding." (Author) The paper includes many figures and references to Odonata.] Address: Greven, H., Zoologie II, Heinrich-Heine-Universität, Universitätsstr. 1., 40225 Düsseldorf, Germany. E-mail: grevenh@uni-duesseldorf.de

12186. Hubregtse, V. (2011): Ovipositing Odonata: Dragonflies and damselflies at a flood-retarding basin. The Victorian Naturalist 128(4): 138-143. (in English) [A personal narrative is presented which explains the author's experience of watching the reproduction process of Odonata. The afternoon of 9 February 2011 was pleasantly warm, calm and sunny, so I decided to go for a walk around the flood-retarding basin in the north-east section of Monash University's Clayton campus, in suburban Melbourne. The basin, some 200m long and approximately 80m across at its widest point, is always interesting to visit, and this time I was about to see something special.] Address: unknown

12187. Klausnitzer, H. (2011): Bericht über die 11. Zentrale Tagung der Entomofaunistischen Gesellschaft und die 97. Tagung der Thüringer Entomologen. Entomologische Nachrichten und Berichte 55(1): 89-92. (in German) [The report on the meeting of the two German entomological societies includes pictures of Joachim Müller and Wolfgang Zimmermann, well known odonatologists. W. Zimmermann was rewarded for his great contributions to knowledge of Odonata and Ephemeroptera. The laudatio was held by J. Müller.] Address: Klausnitzer, Hertha, PF 202731, 01193 Dresden, Germany

12188. Middlemis-Maher, J.; Werner, E.E.; Denver, R.J. (2011): Stress hormones mediate predator-induced phenotypic plasticity in amphibian tadpoles. Front. Endocrinol. Conference Abstract: ISAREN 2011: 7th International Symposium on Amphibian and Reptilian Endocrinology and Neurobiology. doi: 10.3389/conf.fendo.2011.03.00031: (in English) ["Amphibian tadpoles mount behavioural, physiological and morphological responses to predation. Tadpoles rapidly reduce activity level when exposed to chemical cues of predation; with chronic exposure, tadpoles develop relatively smaller bodies and larger tails. The larger tail may serve as a lure to distract predator strikes from the more vulnerable body, or may confer enhanced burst locomotion for escape. In many vertebrates, exposure to predators also influences the activity of the hypothalamo-pituitary-adrenal (interrenal; HPI) axis. Here we investigated the effects of predator cues on activity of the tadpole HPI axis and the relation to predator-induced responses in tadpole behaviour and tail morphology. We exposed wood frog tadpoles (Rana sylvatica) to the nonlethal presence of a predator (dragonfly larvae fed conspecific tadpoles) in outdoor mesocosms, and measured whole body CORT content by radioimmunoassay. Exposure to predator cue reduced CORT by ~30% compared with controls at 4 hours, but increased CORT by ~2 fold after 4 or 8 days. In a laboratory experiment, exposure either to predator cue or to CORT for 3 days (130 nM added to the aquarium water), caused tadpoles to develop a larger tail relative to their body. Importantly, the effect of predator cue on tail morphology was blocked by treatment with the corticosteroid synthesis inhibitor metyrapone (110 ?M). Short term treatment with CORT (1-3 hours) increased tadpole activity, and lead to higher mortality than controls in the presence of an unrestrained predator. By contrast, chronic exposure to CORT (8 days) showed a trend towards increased survivorship of tadpoles with free predators. Our results support the hypothesis that tadpoles mount a dual physiological and phenotypic response to predation, suppressing behaviour and CORT in the short term, but increasing CORT with longer exposure which induces changes in tail and body morphology." (Authors)] Address: Denver, R.J., University of Michigan, Molecular, Cellular and Developmental Biology, Ann Arbor, USA. E-mail: Rdenver@umich.edu

12189. Naraoka, H. (2011): Reproductive behavior of Coenagrion terue (Asahina, 1949) (Zygoptera, Coenagrionidae), with special reference to repeated interruptions of the copulation and a long pre-ovipositional tandem linkage. Tombo 53: 101-109. (in Japanese, with English summary) ["The reproductive behaviour and prolonged pre-oviposition tandem in C. terue are described based on observations in northern Japan, in 2003-2007. The number of females was much smaller than that of males at the oviposition site. Tandem formation was observed at the roosting site in early morning and at the oviposition site in late morning, between 6:00-15:00h. However, males rarely succeeded in holding females, because most females avoided males by doing "face to face hovering". When a rejective female was seized by a male, she did a peculiar "abdominal oscillation", and consequently tandem was shortly dissolved. Copulation was observed from 6:10-14:30h. Oviposition started after 9:00h. When pairs were created early in the morning, they did not necessarily start to copulate soon, but did copulate at various time between 6:00-12:00h with a peak of 9:00-ll:00h. The duration of copulation, observed in field and cage, before 9:00h (mean 41.7 ± 22.3 min), was longer than that after that time (mean 33.0 ± 12.1 min), but the difference was not significant. Mean copulation duration was 38.1 ± 19 min (n=34). Copulation was divided into 3 stages; I: 35.4 ± 19.1 min, II: 77.8 ± 32.7 sec, and III: 110.7 ± 43.4 sec. In copulations continuing over 24 min, "breaks" of 1-3 times were observed. Tandem pairs created before 9:00 h rested at 0.5-3 hours in some points of pre, mid and post-copulation, the same after 9:00 h did rarely rest until copulation and oviposition. Pre-oviposition rest was negatively and significantly correlated with tandem formation time during the day. Long tandem duration before oviposition can be regarded as pre-oviposition guarding." (Author)] Address: Naraoka, H., Motoizumi 36-71, Fukunoda, Itayanagi, Kitatsugaru-gun, Aomori 038-3661, Japan. E-mail: sbnkq127@ybb.ne.jp

12190. Parr, A. (2011): Migrant Dragonflies in 2010. Including recent decisions and comments by the Odonata Records Committee. Atropos 42: 23-28. (in English) [Observation details are presented on Calopteryx splendens, Lestes barbarus, L. viridis, Coenagrion scitulum, Ischnura elegans, Erythromma viridulum, Aeshna affinis, A. grandis, A. mixta, Anax ephippiger, A. parthenope, Sympetrum danae, S. flaveolum, S. fonscolombii and S. striolatum. Ischnura senegalensis and Crocothemis servilia were recorded in Britain as obvious accidental introductions.] Address: Parr, A.J., 10 Orchard Way, Barrow, Bury St. Edmunds, Suffolk IP29 5BX, UK. E-mail: Adrian.parr@bbsrc.ac.uk

12191. Pfau, H.K. (2011): Functional morphology and evolution of the male secondary copulatory apparatus of the Anisoptera (Insecta: Odonata). Zoologica 156: 103 pp. (in English) ["In this study, the functions and mechanical interactions of different parts of the secondary copulatory apparatus of Anisoptera are reconstructed in detail and possible evolutionary pathways are described. Whereas in Zygoptera and Anisozygoptera the vesica spermalis of the third abdominal segment is a single segmented intermediate sperm-storage, this organ is subdivided into four segments in the Anisoptera. The evolutionary consequences of acquiring new functions as secondary (in reality tertiary) "penis" and sperm-syringe are one focus of this study. The secondary copulatory apparatus of male dragonflies (Odonata), located at the second and third abdominal segment, consists of a number of sequentially arranged devices. These serve (1) as support of the female ovipositor, (2) for carrying out preparatory actions for filling an intermediate sperm-storage, (3) for levering and inserting a secondary "penis" (in the primitive case the ligula) and (4) as transmitter of sperm to the female vagina. Each subtask affords a sequence of actions of the corresponding sclerites and muscles of this apparatus. An impressive variety of different solutions to perform and secure the filling of the sperm-reservoir of the vesica spermalis in the Anisoptera is described. In the primitive case a laborious and time-consuming procedure - which probably depends on interrelated functions of the ligula and female ovipositor - is carried out. Reduction of the ovipositor in different lines of the Anisoptera apparently initiated evolutionary modifications, which finally led to more sophisticated modes of preparing filling and protection. Another focus are the auxiliary devices and techniques in the Anisoptera for emptying the sperm-reservoir of the vesica spermalis. For instance, two different types of sperm-pumps are incorporated in its distal segment ("glans"). These pumps - which extend the function of a hydraulically working gland-structure, the erectile organ - show an opposite co-ordination of sperm-suction and –ejection in connection with compression and decompression movements. It was tried to reconstruct a transitional system to close a serious gap in the phylogenetic interpretation. A comparative investigation of different "glans" led to the discovery of different "ways" of combining the emptying-mechanism of the sperm-reservoir with an intensification of the sperm-jet and a "washing out" of sperm of the male predecessor (sperm displacement). The different stages of evolution of the glans, which reflect phylogenetic splittings, are outlined and discussed. This study is of great interest to biologists interested in the functional morphology of the Odonata. It does not merely rely on painstaking comparisons of morphological details, but integrates functional points of view to use the heuristic power of hypothetical approach." (Publisher)] Address: Pfau, H.K., Rathenaustr. 14, D-65326 Aarbergen, Germany. E-mail: clauspfau@web.de

12192. Pryswitt, K.-P. (2011): Die Asiatische Keiljungfer (Gomphus flavipes) in der Leine bei Neustadt am Rübenberge. Beiträge zur Naturkunde Niedersachsens 64(4): 96-98. (in German) [25./26-VII-2006, River Leine, Neustadt a. Rbge., Niedersachsen, Germany] Address: Pryswitt, K.-P., Lessingstr. 2, 31535 Neustadt a.Rbge., Germany

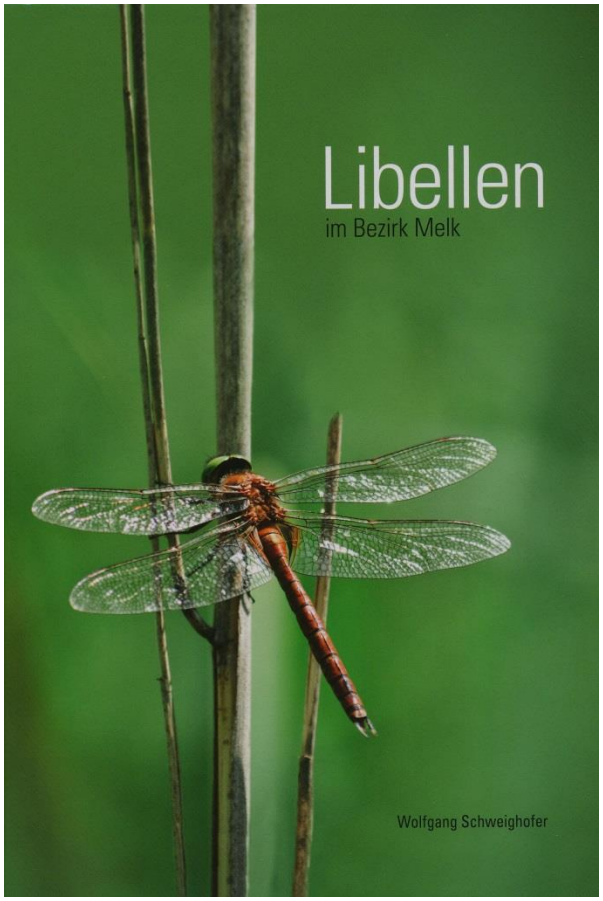
12193. Raescu, C.-S.; Dumbrava-Dodoaca, M.; Petrovici, M. (2011): Macrozoobenthic community structure and dynamics in Cerna River (western Romania). Aquaculture, Aquarium, Conservation & Legislation 4(1): 79-87. (in English, with Romanian and Hungarian summaries) ["In order to determine water quality in Cerna River, researchers carried out analyses into the structure and dynamics of benthic macroinvertebrates communities as well as into the physical-chemical factors. 12 Groups of macroinvertebrates were identified. Density, abundance and frequency values recorded for benthic communities varied according to the physical-chemical conditions specific to each sample collecting station. Researchers noticed a direct influence of Baile Herculane town and dam upon the community submitted to study, the maximum density and percentage numerical abundance being established for Oligochaeta and Diptera, benthic groups tolerant to changes in aquatic ecosystems qualitative parameters. The community of organisms including Ephemeroptera, Trichoptera, Plecoptera, Odonata and Coleoptera was characterized by a decrease in density and abundance values upstream - downstream as water quality is more and more degraded. This deterioration is also emphasized by the biotic index EPT/Ch values." (Authors)] Address: Dumbrava-Dodoaca, Malina, West Univ. of Timisoara, Faculty of Chemistry, Biology & Geography, Timisoara, Romania. E-mail: malinadumbrava@yahoo.com

12194. Ren, G.-d.; Ning, J. (2011): Differentiation and phylogeny of metathoracic pleural sclerites in selected pterygote insects. Entomotaxonomia 33: 81-93. (in Chinese, with English summary) ["Sixteen representative species of Pterygota are selected to analyse the development of morphological characteristics of metathoracic pleural sclerites in different taxa. A well-resolved cladogram of preliminary evolutionary relationships is produced with the topology: [Ephemeroptera + (Odonata + Neoptera)]+ [Plecoptera+(Megaloptera+Neuroptera+(Orthoptera+(Hemiptera+(Coleoptera+(Mecoptera+Lepidoptera+(Hymenoptera+Diptera))))))]. This analysis indicates that Palaeoptera and Neoptera are clearly separated. Ephemeroptera is more distantly related to Neoptera while Odonata has a closer relationship. The taxonomic status and evolutionary relationships of Neoptera are discussed and some arguments are made that are in conflict with the current classification system." (Authors)] Address: Ren, G.-d., College of Life Sciences, Hebei Univ., Baoding, Hebei 071002, China

12195. Runze, K.; Baier, H. (2011): Biotop- und Artenmonitoring in Mecklenburg-Vorpommern heute -auf einem schmalen Pfad zwischen Verpflichtungen und Ressourcen. Artenschutzreport 27: 26-40. (in German) [The paper outlines history and present status of monitoring acitivites in Mecklenburg-Vorpommern, Germany. Odonata are represented by Aeshna viridis, Leucorrhin-

ia albifrons, L. caudalis, L. pectoralis, Stylurus flavipes, and Sympecma paedisca. Records of these species are plotted in map 8.] Address: Runze, Katrin, Landesamt für Umwelt, Naturschutz und Geologie Mecklenburg-Vorpommern, Goldbergerstr. 12, 18273 Güstrow, Germany. E-mail: katrin.runze@lung.mv-regierung.de

12196. Schweighofer, W. (2011): Libellen im Bezirk Melk. Beiträge zur Bezirkskunde Melk 9. 207 pp. (in German) [Austria; detailed account on the regional dragonfly fauna including distribution maps] Herausgeber: Kuratorium zur Herausgabe einer Bezirkskunde für den Bezirk Melk, Abt Karl-Str. 25a, 3390 Melk, Austria. Address of author: Schweighofer, W., Ötscherblick 10, 3661 Arstetten, Austria. E-mail: wolfgang.schweighofer@schule.at



12197. Semwal, N.; Akolkar, P. (2011): Suitability of irrigation water quality of canals in NCR Delhi. International Journal of Basic and Applied Chemical Sciences 1(1): 60-69. (in English) ["Within the acceptable range of pH in water quality, deficiency and excess of various levels of critical pollutants such as, Total Dissolved Salts (TDS), Electrical Conductivity, Sodium Adsorption Ratio (SAR) and Boron determined the suitability of water for irrigation, in four major canals of Delhi. Canal waters were deficient in minimum SAR levels of 0.046 to 2.33. Average Boron levels of 0.639 to 0.807 mg/l were good enough for irrigation to sensitive group of crops, 0.639 mg/l to 0.807 mg/l levels were excellent for irrigation to semi tolerant group of crops and 1.22 to 1.966 mg/l of Boron levels were good for irrigation to tolerant group of crops. Excellent to good irrigation water was indicated by clean to slight pollution in biological water quality of Gang Canal and Western Yamuna Canal and medium to high salinity hazards supported moderate to heavy pollution in biological water quality of Agra Canal and Hindon Canal." (Authors) Odonata are treated at family level.] Address: Semwal, N., Central Pollution Control Board (Ministry of Environment & Forests, Govt of India), Parivesh Bhawan, East Arjun Nagar, Delhi 110 032, India. E-mail: nripsemwal@yahoo.co.in

12198. Ternois, V.; Lambret, J.-L. (coord.) (2011): Oxygastra curtisii (Dale, 1834) en Champagne-Ardenne: bilan du programme régional 2007-2009 (Odonata, Anisoptera: Corduliidae). Martinia 27(1): 45-60. (in French, with English summary) ["Little attention has been paid to O. curtisii in the Champagne-Ardenne region, France. Until the beginning of the years 2000, the species was considered rare and observations were spread all over the region. In 2005, many individuals were observed in gravel pits in the Aube department. This supposed this kind of habitat to be attractive for the species. In this context, the CPIE (Permanent Center for Environmental Initiatives) of the Pays of Soulaines and the Onema (National Office of Waters and Aquatic Habitats) led some investigations over several alluvial valleys in the region. The present paper gives both the results gathered from 2007 to 2009 and the regional status of O. curtisii. It provides also a new distribution map of the species for the Champagne-Ardenne region." (Authors)] Address: Ternois, V., CPIE du Pays de Soulaines, Domaine de Saint-Victor F-10200 Soulaines-Dhuys, France. E-mail: cpie.vincent.ternois@wanadoo.fr

12199. Ulmer, A. (2011): Sympetrum pedemontanum (Allioni, 1766) nouveau pour les départements de la Loire et de la Haute-Loire, et sites majeurs pour S. depressiusculum (Selys, 1841) dans ces deux départements. Martinia 27(2): 95-100. (in French, with English summary) ["This paper deals with the discovery of Sympetrum pedemontanum, which is new to the Loire and the Haute-Loire departments. Numbers of S. depressiusculum were also present. Some observations indicate that the breeding of both species is highly probable. The importance of these findings at a local scale is discussed." (Author)] Address: Ulmer, A., Le Colombier, F-42140 - Chazelles-sur-Lyon, France. E-mail: andre.ulmer@free.fr

12200. Vieira, V.; Teixeira, T.; Teixeira, M.; Oliveira, L. (2011): Novos Dados sobre Lepidópteros, Ondonatos e Himenópteros (Insecta) da Ilha de São Jorge, Açores. XV Expedição Científica do Departamento de Biologia - São Jorge 2011 - Rel. Com. Dep. Biol. 40: 107-116. (in Portuguese, with English summary) [São Jorge island (Azores, Portugal), July 25-31, 2011, Ischnura hastata, I. pumilio, Anax imperator, Sympetrum fonscolombii] Address: Vieira, V., Universidade dos Açores, Departamento de Biologia e Grupo de Biodiversidade dos Açores (CITA-A), Apartado 1422, PT-9501-801 Ponta Delgada, Açores, Portugal

2012

12201. Abraham, L. (2012): "On the other hand, what is this Eastern aeschnoides?" (Morton 1926) – an undescribed Palpares species from the Eastern Mediterranean (Neuroptera: Myrmeleontidae). Natura Somogyiensis 22: 65-102. (in English) ["This paper summarizes the history of Palpares libelloides (Linnaeus, 1764) and related taxa described from the Mediterranean in the neuropterological literature. Based on these

results Palpares assyriorum sp. n. from Syria, Jordan, Turkey and Israel is described. Libellula turcica Petiver & Empson, 1767 is a new homonym of Libellula Linnaeus 1758 (Odonata) (hom. n.) and a new synonym of Palpares libelloides (Linnaeus, 1764) (syn. n.). Palpares aeschnoides is a nomen nudum, only a collection name. Palpares chrysopterus Navás, 1910 is a valid taxon and Palpares turcicus Koçak, 1976 (syn. n.) is a new junior synonym of Palpares chrysopterus Navás, 1910." (Author)] Address: Ábrahám, L., Somogy County Museum, Natural History Department, H-7400 Kaposvár, P.O. Box 70, Hungary E-mail: labraham@smmi.hu

12202. Acatrini, C.-M.; Ghibusi, E.-A.; Petrovici, M.; Pirvu, M. (2012): Macrozoobenthic communities structure characteristic of certain tributaries of the Siret river from Harghita, Maramures and Vrancea Mountains and Moldovei Plateau. Annals of West University of Timisoara, ser. Biology 15: 141-148. (in Romanian, with English summary) [Romania; "35 qualitative macrozoobentonic samples were collected in 2011 from many Siret river tributaries coming from the Harghita Mountains (5 stations), Maramures Mountains (14 stations), Moldavian Plateau (4 stations) and Vrancea Mountains (12 stations). Laboratory analysis of samples revealed the existence of the following 15 groups of benthic invertebrates: Ephemeroptera, Plecoptera, Trichoptera, Oligochaeta, Diptera (Chironomidae, Simuliidae, Ceratopogonidae, Limoniidae), Gastropoda, Bivalva, Coleoptera, Acarina, Odonata, Hirudinea, Isopoda, Heteroptera, Turbellariata and Collembola). Groups that have the highest frequencies were mayflies and dipterans (each with a frequency of 97.1%), followed by caddisflies (80%), amphipods (68.6%), oligochaetes (57.1%) and stoneflies (54.3%). Presence of sensitive groups to water quality degradation (Ephemeroptera, Trichoptera and Plecoptera) with high frequency shows good quality water at most stations investigated." (Authors)] Address: Acatrini, Cristina-Mariana, West University of Timisoara, Faculty of Chemistry-Biology-Geography, Department of Biology and Chemistry, Pestalozzi, 16, 300115, Romania. E-mail: milcapetrovici@yahoo.com

12203. Andrew, R.J.; Thaokar, N.; Verma, P. (2012): Ectoparasitism of anisopteran dragonflies (Insecta: Odonata) by water mite larvae of Arrenurus spp. (Arachnida: Hydrachnida: Arrenuridae) in central India. Acarina 20(2): 194-198. (in English) ["There is no report on the frequency, species selection and site specificity of water mites' ectoparasitism within and among dragonfly species of India. Here, we present a field survey of the species selection and site specificity of ectoparasite larval arrenurid mites on anisopteran adults at Nagpur city of central India. Since the female odonates returns to water to oviposit, it would be of some advantage for the mite to show a female-biased parasitism in order to return to water easily and continue the remaining aquatic part of their life cycle. A total of 204 specimens of anisopteran odonates belonging to 11 species were examined for the presence of larval Arrenurus spp. as ectoparasites during the post-monsoon (August–September 2010) and summer (March–April 2011) months from a large pond in central India. Only 14 dragonfly specimens of six species (Acisoma panorpoides, Brachythemis contaminata, Crocothemis servilia, Diplacodes trivialis, Neurothemis t. tullia, and Trithemis pallidinervis) were found to be parasitized (overall prevalence of 6.86%). The prevalence for C. servilia was 28.6%, followed by T. pallidinervis and A. panorpoides at 21.4%. The total number of parasites recorded was 465 at an average of 33.26 per specimen. The parasite load per host species was the highest in T. pallidinervis (92.6) followed by C. servilia (24). In C. servilia, A. panorpoides and D. trivialis the mites were attached venterally to the thorax and were mostly arranged in a 'v' or triangular shape, while in B. contaminata and T. pallidinervis the mites were found all over the ventral abdomen. In one T. pallidinervis male and one C. servilia female, mites were found both on the thorax as well as the abdomen. The maximum number of mites found on an individual dragonfly was on the female abdomen of T. pallidinervis (114), while only one mite was found on the thorax of a male C. servilia. Mite infestation was sex-biased — 71.0% and 85.7% of infested odonates were females in August–September and March–April, respectively." (Authors)] Address: Andrew, R.J., Post Graduate Department of Zoology, Hislop College, Nagpur, 440 001, India. E-mail: rajuandrew@yahoo.com

12204. Aslan, B.; Karaca, I. (2012): Insect fauna of Kovada Lake National Park Basin (Isparta, Turkey). Türk. entomol. derg. 36(4): 473-489. (in English, with Turkish summary) ["The study was conducted to determine insect fauna of Kovada Lake National Park Basin in Isparta province of Turkey between April 2007 and October 2008. In the study, various collecting methods, including pitfall trap, sweeping, air-sweepnet, drop sheet and light trap were used in nine different habitats selected from the region. The insect specimens were collected by weekly samplings. A total of 240 insect species and subspecies belonging to 75 families and 11 orders were recorded from the national park basin." (Authors) The following Odonata species are listed: Aeshna mixta, Cercion lindeni lindeni, Coenagrion ornatum, C. puella puella, Onychogomphus forcipatus, Crocothemis erythraea, Orthetrum brunneum, O. cancellatum cancellatum, Libellula depressa.] Address: Aslan, B., Department of Medical and Aromatic Plants, Tefenni Vocational School of Higher Education, Mehmet Akif Ersoy University, 15600, Tefenni, Burdur, Turkey. E-mail: aslanb@mehmetakif.edu.tr

12205. Balter, M.; Zinman, A. (2012): The design, construction, and application of a 3D flying prey simulator to aid in the investigation of neuronal control in dragonflies. Proceedings of The National Conference, On Undergraduate Research (NCUR) 2012, Weber State University, Ogden Utah, March 29 – 31, 2012: 61-68. (in English) ["The goal of this interdisciplinary research project is to investigate the neuronal control of flying prey interception in dragonflies by designing, constructing, and programming an apparatus to simulate the complex motions of a flying insect. Our three-dimensional motion device is capable of mimicking a flying insect by moving a small glass bead accurately up to speeds of 1 m/s. Dragonflies are highly efficient aerial predators that have the remarkable capability of intercepting and capturing small insects in flight. This complex process generally occurs in less than 300 ms, with success rates as high as 97%1. Prey capture behaviour requires both rapid visual processing and information transmission, resulting in the evolution of large neurons in the control pathway. Eight pairs of large neurons, called Target-Selective Descending Neurons (TSDNs), are implicated in steering the interception flight. These neurons descend from the brain of the dragonfly to the wing motor regions of the thorax, transmitting visual information about prey movement. Our stimulus device will be used

to determine the way in which the TSDN's encode information about object movement in three dimensions. To date, visual neuron studies have been mostly restricted to two dimensions, the x-direction (left - right) and the y-direction (up - down), recording responses to images displayed on a flat projection screen. However, Dr. Olberg of the Biology Department at Union College hypothesized that the z-dimension (front - back) movement is vital to understanding the exact roles of these neurons in prey interception. An understanding of visually guided prey interception by dragonflies, could lead to the development of effective guidance mechanisms for military or civilian use. The device consists of 80/20 extruded aluminum parts, timing belts and pulleys, ball bearings, metal axles, and DC brushed motors with encoders. The device is computer controlled by Simulink and Real Time Windows Target, which are components of MATLAB." (Authors)] Address: Balter, M., Mechanical Engineering and Biology Departments, Union College, 807 Union Street, Schenectady, NY 12308 USA

12206. Balter, M. (2012): The design, construction, and application of a 3D flying prey simulator. Thesis. Rutgers University: (in English) ["The goal of this research project is to investigate the neuronal control of flying prey interception in dragonflies by designing, constructing, and programming an apparatus to simulate the complex motions of a flying insect. Our three-dimensional motion device is capable of mimicking a flying insect by moving a small bead accurately up to speeds of 1 m/s in any direction. Dragonflies are efficient aerial predators that can intercept and capture small insects in flight. Our stimulus device will be used to determine the way in which dragonfly neurons encode information about object movement in three dimensions. Sinusoidal position tracking experiments using multiple input frequencies were conducted using the apparatus. The results indicate that the machine operates smoothly with little variability between trials. Preliminary dragonfly testing with the apparatus showed favourable results, indicating proof of concept.... This machine is programmed to move an analogue of a small flying insect (bead) in front of a dragonfly causing the dragonfly to react as if it were prey. Assists the research of Dr. Robert Olberg. Work has been presented and published at the 2012 National Conference on Undergraduate Research, while lead to an invitation into the Union College Chapter of Sigma Xi. Has currently been submitted for publication to the 2012 ASME Dynamic Systems and Controls Conference." (Author)] Address: Balter, M., Mechanical Engineering & Biology Depts, Union College, 807 Union Str., Schenectady, NY 12308 USA

12207. Bechly, G. (2012): An interesting new fossil relict damselfly (Odonata: Zygoptera: Coenagrionoidea) from Eocene Baltic amber. Palaeodiversity 5: 51-55. (in English, with German summary) ["A new fossil genus and species of damselfly, Balticoagrion paulyi n. gen., n. sp. (Odonata: Zygoptera: Coenagrionoidea: Familia incertae sedis) is described from Eocene Baltic amber. This fossil taxon does not fit into any known fossil or Recent family-group taxon and is here tentatively considered as relict taxon and potential stem group representative of Coenagrionoidea. The same piece of amber also contains a piece of skin from a small reptile as syninclusion." (Author)] Address: Bechly, G., Staatliches Museum für Naturkunde, Abt. Paläontologie, Rosenstein 1, D-70191 Stuttgart, Germany. E-mail: guenter.bechly@smns-bw.de

12208. Benchalel, W.; Samraoui, B. (2012): Caractérisation écologique et biologique de l'odonatofaune de deux cours d'eau méditerranéens: l'oued El-Kébir et l'oued Bouaroug (Nord-Est de l'Algérie). Méditerranée 118: 19-27. (in French, with English summary) [Algeria; "A total of 13 species were identified in Oued El-Kebir, and 11 in Oued Bouarroug. Reproduction was proved for 5 species in Oued El-Kebir and 8 species in Oued Bouarroug. In both sites of study, the flight period of the species extends from the beginning of spring to the end of autumn. The follow-up of the larval development of some species has proved the univoltinism of Boyeria irene, Calopteryx haemorrhoidalis, Coenagrion puella, Lestes viridis, Orthetrum chrysostigma, Pseudagrion subdilatata. Other species such as Orthetrum anceps Onychogomphus costae Paragomphus genei are probably univoltine. But we lack data that confirms their univoltinism because of the sampling problem. As for Gomphus lucasi and Onychogomphus uncatus, these species are probably not univoltines. A morphometric characterization of the different larval stages (metric and numerical characters) has also been established for every species which the reproduction has been proved. Given the intense anthropic pressure in the sampled areas especially in Oued El-Kebir, the regression of the species' total number seems to be unfortunately irreversible. These hydrographical basins need to be immediately and effectively protected in order to keep this natural heritage." (Authors)] Address: Benchalel, W., Université Badji Mokhtar -Annaba, B.P. 12, 23000 Algeria. E-mail: wafachalel@yahoo.fr

12209. Benson, D. H.; Baird, I. R. C. (2012): Vegetation, fauna and groundwater interrelations in low nutrient temperate montane peat swamps in the upper Blue Mountains, New South Wales. Cunninghamia 12(4): 267-307. (in English) ["Newnes Plateau Shrub Swamps are a series of low nutrient temperate montane peat swamps around 1100 m elevation in the upper Blue Mountains, west of Sydney (lat 33° 23' S; long 150° 13'E). Transect-based vegetation studies show a closely related group of swamps with expanses of permanently moist, gently sloping peatlands. Vegetation patterns are related to surface hydrology and subsurface topography, which determine local peat depth. While there is evidence that a group of the highest elevation swamps on the western side of the Plateau are more dependent on rainwater, the majority of swamps, particularly those in the Carne Creek catchment, and east and south of it, may be considered primarily groundwater dependent with a permanently high watertable maintained by groundwater aquifers. An integral part of the swamps are a number of threatened groundwater dependent biota (plants-Boronia deanei subsp. deanei, Dillwynia stipulifera, dragonfly- Petalura gigantea, lizard- Eulamprus leuraensis), which are obligate swamp dwellers. This association of dependence leaves the entire swamp ecosystem highly susceptible to threats from any loss of groundwater, the current major one being the impact of damage to the confining aquicludes, aquitards, aquifers and peat substrates as a result of subsidence associated with longwall mining. Impacts on the swamps may also result from changes to hydrology through damming of creeks, mine waste water discharge, increased moisture competition from pine plantations, recreational motorbike and off-road vehicle tracks and climate change. If these groundwater dependent ecosystems do not receive protection from activities such as longwall mining subsidence, significant ecolog-

ical damage is unlikely to be avoided or able to be mitigated even where provisions of the Commonwealth Environment Protection and Biodiversity Conservation and NSW Threatened Species Conservation Acts apply to groundwater dependent swamps and biota. The importance of the highest elevation part of the Plateau for a number of restricted (some endemic) plant species is also discussed. This paper includes a synthesis of results of a study (by IRCB) of larval burrow morphology and groundwater dependence in P. gigantea" (Authors) Available from http://www.rbgsyd.nsw.gov.au/science/Scientificpublications/cunninghamia/contentsbyvolume/volume12#twelve four] Address: Baird, I., 3 Waimea St, Katoomba NSW 2780, Australia. E-mail: ianbaird@mountains.net.au

12210. Benzer, S.; Gül, A.; Yilma, M. (2012): Feeding properties of pike (Esox lucius L., 1758) living in Kapulukaya Dam Lake (Türkiye). GEFAD / GUJGEF 32(3): 697-714. (in Turkish, with English summary) [Among 328 pikes caught between November 2001 and October 2002, 58.82% had filled and 41.8% had empty digestive tracts. Odonata contributed significantly to the diet of pikes.] Address: Benzer, S., Gazi Universitesi, Gazi E.itim Fakultesi,.lko.retim Bolumu, Fen Bilgisi O.retmenli.i Anabilim Dal., Ankara, Turkey. E-mail: sbenzer@gazi.edu.tr

12211. Bland, L.M.; Collen, B.; Orme, C.D.L.; Bielby, J. (2012): Data uncertainty and the selectivity of extinction risk in freshwater invertebrates. Diversity and Distributions 18(12): 1211-1220. (in English) ["Aim: To investigate the impact of different treatments of the IUCN Data Deficient (DD) category on taxonomic and geographical patterns of extinction risk in crayfish, freshwater crabs and dragonflies. Location: Global. Methods: We used contingency tables to evaluate taxonomic and geographical selectivity of data deficiency and extinction risk for three invertebrate taxonomic groups (crayfish, Odonata, and freshwater crabs) based on their IUCN Red List status. We investigated differences in patterns of data deficiency and extinction risk among taxonomic families, geographical realms and taxonomic families within geographical realms for each of the three groups. At each level, we evaluated the impact of uncertainty conferred by the conservation status of DD species on extinction risk patterns exhibited by that group. We evaluated three scenarios: excluding DD species, treating all DD species as non-threatened and treating all DD species as threatened. Results: At the global scale, DD species were taxonomically non-randomly distributed in freshwater crabs and dragonflies, and geographically non-randomly distributed in all three taxonomic groups. Although the presence of under- or over-threatened families and biogeographical realms was generally unchanging across scenarios, the strength of taxonomic and geographical selectivity of extinction risk varied. There was little consistent evidence for taxonomic selectivity of extinction risk at sub-global scales in freshwater crabs and dragonflies, either among biogeographical realms or among scenarios. Main conclusions: Global patterns of taxonomic selectivity and geographical selectivity were generally consistent with one another and robust to different treatments of DD species. However, sub-global scale conservation prioritization from these types of data sets will require increased investment to make accurate decisions. Given the current levels of data uncertainty, the relative importance of biological characteristics and threatening processes in driving extinctions in freshwater invertebrates cannot be easily determined. We recommend that DD species should be given high research priority to determine their true status." (Authors)] Address: Bland, Lucie, Institute of Zoology, Zoological Society of London, Regent's Park, London, NW1 4RY, UK. E-mail: lucie.bland@ioz.ac.uk

12212. Blanke, A.; Greve, C.; Wipfler, B.; Beutel, R.; Holland, B.; Misof, B. (2012): The identification of concerted convergence in insect heads corroborates Palaeoptera. Systematic Biology 62(2): 250-263. (in English) ["The relationships of the three major clades of winged insects - Ephemeroptera, Odonata and Neoptera - are still unclear. Many morphologists favor a clade Metapterygota (Odonata+Neoptera), but Chiastomyaria (Ephemeroptera+Neoptera) or Palaeoptera (Ephemeroptera+Odonata) have also been supported in some older and more recent studies. A possible explanation for the difficulties in resolving these relationships is concerted convergence - the convergent evolution of entire character complexes under the same or similar selective pressures. In this study we analyse possible instances of this phenomenon in the context of head structures of Ephemeroptera, Odonata and Neoptera. We apply a recently introduced formal approach to detect the occurrence of concerted convergence. We found that characters of the tentorium and mandibles in particular, but also some other head structures, have apparently not evolved independently, and thus can cause artefacts in tree reconstruction. Our subsequent analyses, which exclude character sets that may be affected by concerted convergence, corroborate the Palaeoptera concept. We show that the analysis of homoplasy and its influence on tree inference can be formally improved with important consequences for the identification of incompatibilities between datasets. Our results suggest that modified weighting (or exclusion of characters) in cases of formally identified correlated cliques of characters may improve morphology based tree reconstruction." (Authors)] Address: Blanke, A., Zoologisches Forschungsmuseum Alexander Koenig, Zentrum für molekulare Biodiversität, Adenauerallee 160, 53113 Bonn, Germany

12213. Bo, T.; Fenoglio, S.; López-Rodríguez, M.J.; Tierno de Figueroa, J.M. (2012): Trophic behaviour of the dragonfly Cordulegaster boltoni (Insecta: Odonata) in small creeks in NW Italy. Entomologica Fennica 22: 255-261. (in English) ["C. boltonii is a widespread Odonata in Europe, which usually inhabits small lotic systems. In this study we analysed the gut contents of C. boltoni immature stages, collected in the Rocchetta Tanaro Natural Park (Italy, Piemonte). Two hundred and eleven individuals were collected, and their diet analyzed by dissection or clearing. Larvae appeared to be opportunistic predators, feeding on a variety of prey. Aquatic insects dominated their diet, while crustaceans, annelids, molluscs and terrestrial invertebrates were sporadically observed in the gut contents. An ontogenetic shift in the diet was detected, as small larvae consumed different prey than large ones. Our study suggests that C. boltonii is one of the dominant predators in the benthic communities of lowland small order streams of Piemonte, which, because of their environmental characteristics, are devoid of fish and stoneflies." (Authors)] Address: Fenoglio, S., University of Piemonte Orientale "Amedeo Avogadro", Via T. Michel, 11- 15121 - Alessandria - Italy. E-mail: fenoglio@unipmn.it

12214. Boscardin, J.; Corrêa Costa, E.; Garlet, J.; Cunha Bolzan, L.; Nascimento Machado, D.; Pedron, L. (2012): Índices faunísticos para a entomofauna coletada em plantios de Eucalyptus spp. VII Congreso de Medio Ambiente de la AUGM: 14 pp. (in Portuguese, with English summary) ["The genus Eucalyptus has become important for the economy of Brazil. However with the increase in areas with Eucalyptus sp. entomological problems tend to increase in the same proportions, as crops with this kind provide conditions for adaptation of pests, thereby requiring constant monitoring through surveys of insect populations. The objective of this study is the population survey of entomofaima by using light traps in Eucalyptus spp. The study was conducted in three Eucalyptus stands, belonging to the species: E. dunni, E. grandis and E. grandis x E. urophylla (clone hybrid), with three years of age. located on the Taquari farm, in Sào Francisco de Assis, Rio Grande do Sul To collect entomofauna light traps were used, one in every species tested, with samples taken monthly from August 2008 to July 2009. The insects collected were analyzed using indices of frequency, abundance, diversity and constancy. During the survey, we collected 3054 individuals in eight orders (Blatodea. Coleoptera. Dermaptera, Hemiptera, Hymenoptera, Lepidoptera. and Odonata [Libellulidae], Mantodea) and 34 families. The orders with the highest number of insects were collected: Coleoptera. Lepidoptera and Hemiptera with 61.18 and 12% of the total sample respectively. The orders Coleoptera and Lepidoptera. presented the families with the most significant indices, especially the families Elateridae, Ptilodactylidae and Staphylinidae, Scarabeidae order Coleoptera and Arctiidae and Noctuidae of the Lepidoptera order. Considering the results obtained in this survey, it is concluded that the area presents major groups, some with potential to become pests, and others considered as a tool in integrated pest management of insect pests in Eucalyptus. contributing to reduced use of chemicals in your control." (Authors)] Address: Boscardin, J., Univ. Federal de Santa Maria (UFSM), Centro de Ciencias Rurais, Campus Universitario, Bairro Camobi, Prédio 42, sala 3223, CEP 97105-900, Santa Maria, RS, Brasil. E-mail: boscardinj@gmail.com

12215. Brockhaus, T. (2012): Vorwort: Bibliografie der für Deutschland publizierten Libellenliteratur (Odonata). Libellula, Supplement 11: 3. (in German) [Introduction to the bibliographie of odonatological literature referring to Germany.] Address: Brockhaus, T., An der Morgensonne 5, 09387 Jahnsdorf, Germany. E-mail: T.Brockhaus @t-online.de

12216. Buczyński, P.; Tończyk, G.; Buczyńska, E. (2012): Materials to the knowledge of some aquatic insects (Plecoptera, Odonata, Heteroptera, Trichoptera, Coleoptera) of the Gorce Mountains. Teka Kom. Ochr. Kszt. Środ. Przyr. - OL PAN 9: 16-27. (in English, with Polish summary) [In spring 2006, Thecagaster bidentata was the only odonate species recorded in Gorce Mountains and the Gorczański National Park, Poland.] Address: Buczyński, P., Dept of Zool., Maria Curie-Skłodowska University, Akademicka 19, PL-20-033 Lublin, Poland. E-mail: pawbucz@gmail.com

12217. Buczyński, P.; Bielak-Bielecki, P. (2012): Crocothemis servilia (Drury, 1773) (Odonata: Libellulidae) introduced with aquarium plants to Lublin (Poland). Annales Universitatis Mariae-Curie Sklodowska Lubin - Polonia 67(2) (Sectio C): 21-26. (in English, with Polish summary) ["A larva of the Oriential dragonfly Crocothemis servilia was found in June 2012 in a pet shop in Lublin and brought up to the imago. This is the first record of this kind in Poland. There is evidence that the species was introduced with aquarium plants." (Authors)] Address: Buczyński, P., Dept of Zool., Maria Curie-Skłodowska University, Akademicka 19, PL-20-033 Lublin, Poland. E-mail: pawbucz@gmail.com

12218. Cano-Villegas, F.J.; (2012): Notas sobre la situacion de Cordulegaster bidentata Selys, 1843 (Odonata: Cordulegastridae) en el Pirineo de Lerida (noreste de Espana). Boletin de la Sociedad Entomologica Aragonesa (S.E.A.) 51: 337-339. (in Spanish, with English summary) [Data on the reproduction in the Iberian Peninsula of the European endemic species C. bidentata is presented for the first time. Additionally, information about the composition of one of its larval colonies in Lerida is provided, pointing out that it shares its habitat with C. boltonii. This could be a sign of the deterioration of its colonies in the area." (Authors)] Address: Cano Villegas, F.J., C/Montemayor, 4 1º-2; 14003-Córdoba, Spain. E-mail: fjcanovi2@hotmail.com

12219. Chae, J.S.; Park, M.K.; Kim, H.-C.; Jung, J.-Y.; Son, H.Y.; Ryu, S.-Y.; Shin, H.-J.; Sim, C.; Park, B.-K. (2012): Infection status of metacercaria in adult dragonflies from Republic of Korea. International Journal of Veterinary Science 1(2): 55-58. (in English) ["The dragonfly serves as a second intermediate host of some trematodes. Seven species of dragonflies, Sympetrum darwinianum, Orthetrum albistylum, Lyriothemis pachygastra, Sympetrum eroticum, Crocothemis servilia, Pantala flavescens and Sympetrum pedemontanum were surveyed. The most abundant species among these dragonflies were S. darwinianum, S. eroticum and C. servilia (2,118 and 620 and 334 individuals, respectively). And, the least abundant dragonflies were S. pedemontanum, L. pachygastra and O. albistylum (25, 57 and 62 individuals, respectively). Among these intermediate hosts, S. eroticum had the highest infestation rate of metacercaria per individual (11.71%). The infestation rates of two dragonflies, S. darwinianum and S. pedemontanum (8.58% and 4.56%, respectively) also were higher than those of the other four species. In artificial infection studies using animal hosts, we could identify the infections of adult P. muris and P. japonicus from only mouse, in which the infestation rates of P. muris and P. japonicus were 90% and 95% among 20-tested individuals, respectively. Interestingly, adult L. liberum was detected from only frog, R. nigromaculata and the rates of the infestation in frogs were 97.5% among 50-tested frogs. These results suggest that the population size of dragonfly is an important factor to carry high burden of metarcercaria. Moreover, we discussed their epidemiological implications for human and animal infections." (Authors)] Address: Sim, Cheolho, Department of Biology, Baylor University, Waco, Texas 76798, USA. E-mail: cheolhosim@baylor.edu

12220. Chandana, E.P.S.; Rajapaksha, A.C.D.; Samarasekara W.G.K.H. (2012): A survey of odonate assemblages associated with selected wetland localities in southern Sri Lanka. Asian Journal of Conservation Biology 1(2): 67-73. (in English) [28 Odonate species were recorded at five different study sites. Ceylon endemics or rare species are Pseudagrion rubiceps, Euphaea splendens, Onychothemis tonkinensis, Pseudagrion malabaricum and Indothemis limbata.] Address: Chandana E.P.S., Department of Zoology, Faculty of Sci-

ence, University of Ruhuna, Matara, Sri Lanka. E-mail: epschandana@zoo.ruh.ac.lk

12221. Chelmick, D. (2012): Views and Reviews: Fotogids Larvenhuidjes van Libellen [Photo Guide to Dragonfly Exuviae] by C. Brochard, D. Groenendijk, E van der Ploeg, & T. Termaat. KNNV Uitgeverij, 2012. 320 pp., colour images throughout, Sbk, 175x245mm. ISBN 9789050114097. €49.95. Atropos 47: 65-66. (in English) [book review.] Address: Chelmick, D.G., 31 High Beech Lane, Haywards Heath, West Sussex, RH16 1SQ, UK. E-mail: dgc@david.chelmick.com

12222. Choong, C.Y.; Ng, Y.F.; Dow, R.A. (2012): Odonata (Insecta) from three forests of central Terengganu, Malaysia. The Malayan Nature Journal 64(2): 95-104. (in English) ["Records of Odonata collected at sites in central Terengganu, Peninsular Malaysia, in August 2011 are presented. A total of 90 species from 13 families were collected. Of these, 49 named species are the first confirmed records for Terengganu and another three species to which no definite name can be assigned at this time are also new records for the state. The collection included a new species of Drepanosticta, yet to be named. Protosticta curiosa was recorded for the first time in Malaysia. These records are combined with existing records of Odonata from Terengganu in the literature to produce a full list of the Odonata known from the state. At present 107 species from 13 families are known from Terengganu." (Authors)] Address: Choong, C.Y., School of Environmental and Natural Resource Sciences, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, 43600 UKM Bangi, Selangor, Malaysia. E-mail: rocoto98@yahoo.com

12223. Chun-Ying Gao, C.-Y.; Meng, G.-X.; Li, X.; Wu, M.; Liu, Y.; Li, X.-Y.; Zhao, X.; Lee, I.; Feng, X. (2012): Wettability of dragonfly wings: the structure detection and theoretical modeling. Surface and Interface Analysis 45(2): 650-655. (in English) ["Hydrophobic surfaces have gained extensive attention in recent decades for their potential applications. The hydrophobic properties of dragonfly's (Pantala flavescens) wings were measured, and the water contact angles (WCAs) of the distal and basal part of a dragonfly's wing were 134.9° and 125.8°, respectively. Images obtained by optical microscopy and scanning electron microscopy showed the microstructures and nanostructures on the wing surface. Microstructures appeared as cell block patterns, and the size of the blocks decreased from the basal to distal part. However, no significant differences of chemical composition between the two parts were detected by X-ray photoelectron spectroscopy. To understand the correlation between the structures and WCA, a double roughness structure model was built theoretically with simplified lattice patterns, and the theoretical model was well fitted with empirical wettability of the dragonfly's wing." (Authors)] Address: Feng, X., State Key Laboratory of Medicinal Chemical Biology, College of Life Science, Nankai University, Tianjin, 300071, China. E-mail: xzfeng@nankai.edu.cn

12224. Dehghani, R.; Zarghi, I.; Aboutalebi, M.; Barzegari, Z.; Ghanbari, M. (2012): Fauna and habitat diversity of aquatic arthropods city of Kashan in 2010. Journal of North Khorasan University of Medical Sciences 4(4): 603-610. (in Farsi, with English summary) [Iran; 61 out of 1724 insect samples belong to Odonata, but the results are not detailed.] Address: Zarghi, I., School of Health, Mashhad, University of Medical Sciences, Mashhad, Iran. E-mail: i.zarghi@gmail.com

12225. Dow, R.A.; Orr, A.G. (2012): The type repository of Drepanosticta simuni spec. nov. (Zygoptera: Platystictidae). Odonatologica 41(4): 347-348. (in English) [To ensure that the name D. simuni, described (2012) in Odonatologica 41: 283-291, is available, the type repository, omitted from the original description, is stated along with a diagnosis of the species. The type is deposited in Naturalis Biodiversity Centre, Leiden (RMNH).] Address: Orr, A.G., Griffith School of the Environment, Griffith University, Nathan, Q 4111, Australia. E-mail: agorr@bigpond.com

12226. Endersby, I. (2012): The naming of Victoria's dragonflies (Insecta: Odonata). Proceedings of the Royal Society of Victoria 123(3): 155-178. (in English) ["The chronology of the naming of Victoria's 76 species of Odonata is given, with short biographical notes on the authors. From a study of the original descriptions, the etymology of the 76 species and 44 genera known from the State is elucidated or inferred." (Author)] Address: Endersby, I., 56 Looker Road, Montmorency, Vic. 3094, Australia. E-mail: endersby@mira.net

12227. Festi, A. (2012): Leucorrhinia pectoralis (Charpentier, 1825) (Odonata: Libellulidae) presso il Lago di Monticolo – importante segnalazione per l'Alto Adige e l'Italia. Gredleriana 12: 201-208. (in Italian, with English summary) [11.05.2012, Lago Grande di Monticolo (WGS 84 46,420652 11, 285273), Province of Bolzano (Italy). Information is given about habitat, distribution in Italy and the conservation status.] Address: Festi, A., Via Penegal 7, I-39100 Bolzano, Italy. E-mail: alex.festi@rolmail.net

12228. Foto, M.S.; Koji, E.; Ajeagah, G.; Bilong Bilong, C.; Njiné T. (2012): Impact of dam construction on the diversity of benthic macroinvertebrates community in a periurban stream in Cameroon. International Journal of Biosciences 2(11): 137-145. (in English) ["In the aim of evaluating the impact of a dam construction on the biodiversity of aquatic organisms, physicochemical variables coupled to benthic macroinvertebrates communities were analysed at the upstream and downstream of the Mefou stream dam from September 2009 to March 2010. Physicochemical results revealed a slightly acidic and well oxygenated water of the Mefou stream, being appropriated for the development of benthic macroinvertebrates organisms. Significant differences were observed for temperature and oxygen between the stations ($P < 0.05$). Of the 1801 individuals collected (4 phyla, 6 classes, 13 orders, and 47 families) arthropods (99.25%) dominated, while Annelids, Nemathelminths and Mollusca were less represented (2 %). The Correspondence Canonic analysis (CCA) distinguished two sections on the stream: a superior section at the upstream of the dam which is characterised by much oxygenation and abundance of Atyidea (excellent bioindicators of good quality water) ($r = 0.04$; $P < 0.05$); an inferior section at the downstream of the dam, dominated by rheophil organisms (odonates). The relative abundance of odonates correlated with the values of water flow rates of each station ($r = 0.94$; $P < 0.01$). The presence of polluo-tolerant organisms (Chironomidae and Haplotaxidae) at station 3 could reflect anthropic action at the downstream of the dam. Shannon and Weaver ($H = 4.1 \pm 0.5$ bits) and Pielou index ($J = 0.8 \pm 0.1$bits) revealed favourable conditions for the coexistence of

benthic macroinvertebrates. These results could provide viable information used in evaluating the water quality of lotic systems subjected to dam construction in Cameroon." (Authors)] Address: Foto, M.S., Dept of Animal Biology and Physiology, Faculty of Science, University of Douala, P.O Box 24157, Douala, Cameroon. E-mail: sfotomen@yahoo.fr

12229. Franzén, M.; Molander, M. (2012): Changes in the insect fauna in Padjelanta National Park. Entomologisk Tidskrift 132(2): 81-112. (in Swedish, with English summary) ["Arctic ecosystems and the trophic levels structuring them have recently been severely perturbed, although a relatively large proportion of the Arctic environment is protected. Temperatures have increased two to three times more rapidly in the Arctic compared to other regions, mammal populations have declined and the tree line has shifted to higher altitudes. However, knowledge of possible changes of the insect fauna in Arctic habitats is strikingly poor. In this study we compiled data from historical and recent surveys of six major insect taxa (Lepidoptera, Coleoptera, Hymenoptera (Aculeata), Odonata, Orthoptera and Diptera (Syrphidae) recorded in Padjelanta, the largest (1984 km²) National Park in Sweden. Padjelanta is situated in the Western part of the province Lule Lappmark and is dominated by alpine vegetation, with an average altitude of 800 m.a.s.l. (range: 550-1800 m.a.s.l.). Insects in Padjelanta have been studied occasionally since the beginning of the 1940s. We carried out a follow up study of the taxa listed above between 1998 and 2008 to study possible changes in the insect fauna. A total of 398 species belonging to the studied groups have been recorded in the park. Especially species rich groups are the bumblebees and butterflies, of which 16 and 26 species have been recorded. Red Listed species were represented by eight butterflies, but several other interesting and rare species were found, including the first records of the weevil Dorytomus tortrix and the chrysidid wasp Chrysis angustula in the province Lule lappmark. Only small changes in the fauna were detected; some species of Lepidoptera, Coleoptera and Aculeate wasps seem to have colonized the area over the last 65 years, but the overall rate of colonization has been low. We discuss changes in the alpine fauna, the Red List status of alpine insect species and threats to the environment. It is concluded that the alpine insect fauna warrants further attention and should be carefully monitored since environmental changes are expected to occur at an increased rate in the future." (Authors) Aeshna caerulea, Somatochlora alpestris and S. arctia are listed from the National Park.] Address: Franzén, M., UFZ Centre for Environmental Research, Dept of Community Ecology, Theodor-Lieser-Str. 4, 06120 Halle, Germany. E-post: markus.franzen@ufz.de

12230. Futahashi, R.; Yamamaka, T.; Uemura, Y.; Hisamatsu, M. (2012): Collection and photographic data on dragonflies and damselflies from Ibaraki prefecture. Bulletin of Ibaraki Nature Museum 15: 13-38. (in Japanese, with English summary) ["39 odonate species have so far been reported in Ibaraki Prefecture. Here we give a comprehensive list of Odonata collected from Ibaraki Prefecture based on the collections of Ibaraki Nature Museum and the authors' private collections, which consist of 87 species and one hybrid species. We also mention the following four species which are not included in these collections: Stylurus oculatus, Sympetrum uniforme, Libellula angelina, and Tholymis tillarga. The former three species may have become extinct in Ibaraki Prefecture, and the last species seems to be a species migrating from a southern area." (Authors)] Address: Futahashi, R., National Institute of Advanced Industrial Science and Technology, 1-1-1 Higashi, Tsukuba, Ibaraki 305-8566, Japan

12231. Gaffin-Cahn, E. (2012): Neural responses to looming objects in the dragonfly. Thesis, Bachelor of Science in Neuroscience, University of Rochester: (in English) ["Dragonflies have high visual acuity, which, when combined with a remarkably fast visual response, allows them to hunt small insects with a high success rate. Rather than aiming at the prey's current location, the dragonfly predicts the prey's future location and intercepts the insect mid-flight. Eight bilateral pairs of large Target-Selective Descending Neurons (TSDNs) of the dragonfly ventral nerve cord respond to small, contrasting objects, which presumably represent potential prey. These interneurons are part of the neuronal circuitry that triggers small changes in wing angle and position to control flight during prey interception. In flight, dragonflies extend their legs out to catch the prey about 20 ms before contact. The current research investigates the role of the TSDNs in prey contact. Spiking traces from the nerve cord were recorded during the presentation of expanding black circles projected on a screen, which simulate approaching prey. Several loom sizes and speeds were used to cover a range of realistic and unrealistic rates of expansion. I hypothesized that the interneurons predict the time to contact (Tc) of the simulated looming stimuli. Looming-sensitive TSDNs fired at a consistent time before Tc, supporting the hypothesis." (Author)] Address: Elon Gaffin-Cahn, E. E-mail: egaffinc @caoslab.rochester.edu

12232. Herrera-Grao, T.; Núria Bonada, N.; Blanco-Garrido, O.G. (2012): First record of Trithemis kirbyi Selys, 1891 in Catalonia (Odonata, Libellulidae). Boln. Asoc. esp. Ent. 36(3-4): 457-459.[Spain, Arnes (Tarragona), in early August 2012]

12233. Hobbelen, P.H.F.; Samuel, M.D.; Foote, D.; Tango, L.; LaPoint, D.A. (2012): Modeling the impacts of global warming on predation and biotic resistance: mosquitoes, damselflies and avian malaria in Hawaii. Theoretical Ecology 6(1): 31-44. (in English) [" Biotic resistance from native predators can play an important role in regulating or limiting exotic prey. We investigate how global warming potentially alters the strength and spatial extent of these predator–prey interactions in aquatic insect ecosystems. As a simple model system, we use rock pools in streams of rainforests of Hawaii, which contain Megalagrion calliphya as predator and the invasive southern house mosquito Culex quinquefasciatus as prey. This abundant mosquito is the major vector of avian malaria transmission to native forest birds. We use mathematical modelling to evaluate the potential impacts of damselfly predation and temperature on mosquito population dynamics. We model this predator–prey system along an elevational gradient (749-1952 m elevation) and assess the effect of 1°C and 2°C climate warming scenarios as well as the effects of El Niño and La Niña oscillations, on predator–prey dynamics. Our results indicate that the strength of biotic resistance of native predators on invasive prey may decrease with increasing temperature because demographic rates of predator and prey are differentially affected by temperature. Future warming could therefore increase the abundance of invasive species by re-

leasing them from predation pressure. If the invasive species is a disease vector, these shifts could increase the impact of disease on both humans and wildlife." (Authors)] Address: Hobbelen, P.H.F., Rothamsted Research, Harpenden AL5 2JQ, UK. E-mail: peter.hobbelen@rothamsted.ac.uk

12234. Hobson, K.A.; Anderson, R.C.; Soto, D.X.; Wassenaar, L.I. (2012): Isotopic evidence that dragonflies (Pantala flavescens) migrating through the Maldives come from the northern Indian subcontinent. PLoS ONE 7(12): e52594. doi:10.1371/journal.pone.0052594: 4 pp. (in English) ["Large numbers of P. flavescens appear in the Maldives every October–December. Since they cannot breed on these largely waterless islands, it has recently been suggested that they are “falling out” during a trans-oceanic flight from India to East Africa. In addition, it has been suggested that this trans-oceanic crossing is just one leg of a multi-generational migratory circuit covering about 14,000–18,000 km. The dragonflies are presumed to accomplish this remarkable feat by riding high-altitude winds associated with the Intertropical Convergence Zone (ITCZ). While there is considerable evidence for this migratory circuit, much of that evidence is circumstantial. Recent developments in the application of stable isotope analyses to track migratory dragonflies include the establishment of direct associations between dragonfly wing chitin ƍ2H values with those derived from long-term ƍ2H precipitation isoscapes. We applied this approach by measuring wing chitin ƍ2H values in 49 individual P. flavescens from the November–December migration through the Maldives. Using a previously established spatial calibration algorithm for dragonflies, the mean wing ƍ2H value of -117±16 ‰ corresponded to a predicted mean natal ambient water source of -81 ‰, which resulted in a probabilistic origin of northern India, and possibly further north and east. This strongly suggests that the migratory circuit of this species in this region is longer than previously suspected, and could possibly involve a remarkable trans-Himalayan high-altitude traverse." (Authors)] Address: Hobson, K.A., Environment Canada, Saskatoon, Saskatchewan, Canada. E-mail: Keith.Hobson@ec.gc.ca

12235. Hoffmann, J. (2013): Anmerkungen zur Beobachtung “Rotfußfalke auf nächtlicher Libellenjagd“ von Martin Löschau (in Otis 18: 115). Otis 19 (2011): 135-138 (in German, with English summary) ["Our knowledge on nocturnal activities both of dragonflies as well as falcons is very fragmentary. The observed dragonflies are probably Migrant Hawkers (Aeshna mixta). Presumably, the observed Red-footed Falcon (Falco vespertinus) has joined to the migrating dragonfly swarm, which also came from eastern direction, and used this for a longer time as a food resource. Small falcons hiking with dragonfly swarms are also known from other regions. Preconditions for such nocturnes antibioses are abiotic factors such as UV-visibility." (Author) Address: Hoffmann, J., alauda, Liebigstr. 2-20, 22113 Hamburg; E-Mail: hoffmann@alauda.de

12236. Holuša, O.; Holušova, K. (2012): The first findings of larvae of Cordulegaster insignis (Odonata: Cordulegastridae) in Macedonia. Acta Musei Beskidensis 4: 143-149. (in English, with Czech summary) ["Ten larvae of C. insignis were found on 6-VII-2012 at Novacani village near Veles town in central Macedonia. The finding of larvae of several instars shows the permanent occurrence of the species in Macedonia." (Authors)] Address: Holuša, O., Faculty of Forestry and Wood Technology, Mendel University in Brno, Zemeědělská 3, CZ-613 00 Brno, Czech Republic. E-mail: holusao@email.cz

12237. Holuša, O.; Krivan, V (2012): A population of Cordulegaster insignis (Schneider, 1845) in Macedonia (Odonata: Cordulegastridae). Acta Musei Moraviae, Scientiae biologicae (Brno) 97(2): 1-5. (in English) ["Males of the species were found at 23-V-2010 and 19-VI-2011 at Novaeani village near the town of Veles (41°45' N 21°4'56'E) in central Macedonia. The occurrence of a population and other Cordulegaster species in Macedonia is discussed." (Authors)] Address: Holuša, O., Faculty of Forestry and Wood Technology, Mendel University in Brno, Zemeědělská 3, CZ-613 00 Brno, Czech Republic. E-mail: holusao@email.cz

12238. Horne, J. (2012): Emergence, maturation time and oviposition in the Common Darter Sympetrum striolatum (Charpentier). J. Br. Dragonfly Society 28(2): 66-74. (in English) ["The most successful period of oviposition in 2005 occurred during the last half of September. However, 9% of the emergences in 2006 occurred from a pond exposed from mid-October through November 2005, indicating a second, smaller, peak of oviposition. Over the period 1990-2011 the average date for the first sighting of individuals was 17 June and the average date when first seen patrolling was 14 July. The mean time between emergence and patrolling was 28 days." (Author)] Address: Horne, J., 78 Spring Lane, Bishopstoke, Eastleigh, Hants, S050 6BB, UK

12239. Hull, R.; Katete, R.; Ntwasa, M. (2012): Therapeutic potential of antimicrobial peptides from insects. Biotechnology and Molecular Biology Review 7(2): 31-47. (in English) ["The first antimicrobial peptides were isolated from the cecropia moth Hyalophora cecropia in 1980. Since then a plethora of antimicrobial peptides have been isolated from other arthropods, invertebrates and chordates. With the emergence of antibiotic resistant bacterial pathogens and the promising activity of these peptides, attempts are being made to use these peptides as new antimicrobial agents. Other researchers are interested in using these peptides to improve the resistance of crops and livestock to infections, while another line of research is interested in using these peptides to control vector borne diseases. Despite the promising antibacterial, antiviral, anti-protozoan and anti-tumor activity of these peptides, relatively few peptides have made it to clinical trials. Problems associated with the development of these peptides into effective antimicrobial agents include their higher cost, proteolysis or decreased activity in physiological environments and mass production. This review (including a reference to Aeshna cyanea) will focus specifically on the development of insect antimicrobial peptides into useful chemotherapeutic agents." (Authors)] Address: Ntwasa, M., School of Molecular and Cell Biology, University of the Witwatersrand, Wits, 2050, South Africa. E-mail: monde@biology.wits.ac.za

12240. Jeziorski, P.; Holuša, O. (2012): An updated checklist of the dragonflies (Odonata) of the Czech Republic. Acta Musei Beskidensis 4: 143-149. (in English, with Czech summary) [26 genera of Odonata with 73 species have been recorded in the territory of the Czech Republic, 71 species from Bohemia and 69 species from Moravia.] Address: Jeziorski, P., Na Bělidle 1, CZ-735 64 Havířov-Suchá, Czech Republic. E-mail: jezirko@post.cz

12241. Jia, C.Y.; Wei, C.Y. (2012): Radio tracking of large Odonata species in forest fragments in Singapore. Project Report. Submitted to Nature Society (Singapore), Junior College Category, 2012; http://www.nss.org.sg/documents/LGD%202012%20%20Radio%20Tracking%20Odonata%20NUS%20High%20Hwa%20Chong%20Inst.pdf: 11 pp. (in English) ["Recent advances in technology allow radio tracking to be done for larger insects. Such studies have been done on Odonata, in the open fields of the UK. However, behaviour of larger Odonates in the tropical forests of the SE Asian region is not well known, especially when away from water bodies. Difficulty arises in following these large individuals through the dense forest undergrowth as the individuals fly or perch in the canopy foliage. This study thus aims to be a pilot study in the uses of radio tracking in collecting information on the spatial and temporal behaviour of large Singaporean Odonates, in particular the Macrogomphus quadratus. Radio tracking is done on foot and individuals are followed for as long as a signal is detected (an average of seven days). The M. quadratus is likely to be a percher in terms of its feeding behaviour as can be deduced from the signals received on the tracking receiver and also from visual observations of untagged individuals. As a pioneer work in the field of radio tracking in SE Asia, we hope that future work will be aided by our findings." (Authors)] Address: Jia, C.Y., NUS High School, Hwa Chong Inst., Little Green Dot Student Research Grant, 20 Clementi Avenue 1, Singapore 129957

12242. Joest, R.; Vierhaus, H.; Wrede, J. (2012): Erstnachweis des Kleinen Blaupfeils Orthetrum coerulescens im Arnsberger Wald. ABU info 33-35: 38-39. (in German) [Landkreis Soest, Nordrhein-Westfalen, Germany; records from 2010 and 2011 are documented.] Address: Joest, R., Hellweg 41, 59505 Bad Sassendorf-Lohne, Germany

12243. Kang, S.-R.; King, S.L. (2012): Influence of salinity and prey presence on the survival of aquatic macroinvertebrates of a freshwater marsh. Aquatic ecology 46(4): 411-420. (in English) ["Salinization of coastal freshwater environments is a global issue. Increased salinity from sea level rise, storm surges, or other mechanisms is common in coastal freshwater marshes of Louisiana, USA. The effects of salinity increases on aquatic macroinvertebrates in these systems have received little attention, despite the importance of aquatic macroinvertebrates for nutrient cycling, biodiversity, and as a food source for vertebrate species. We used microcosm experiments to evaluate the effects of salinity, duration of exposure, and prey availability on the relative survival of dominant aquatic macroinvertebrates (i.e., Procambarus clarkii, Cambarellus puer, Libellulidae, Dytiscidae cybister) in a freshwater marsh of southwestern Louisiana. We hypothesized that increased salinity, absence of prey, and increased duration of exposure would decrease survival of aquatic macroinvertebrates and that crustaceans would have higher survival than aquatic insect taxon. Our first hypothesis was only partially supported as only salinity increases combined with prolonged exposure duration affected aquatic macroinvertebrate survival. Furthermore, crustaceans had higher survival than aquatic insects. Salinity stress may cause mortality when acting together with other stressful conditions." (Authors)] Address: Kang, S.R., School of Renewable Natural Resources, Louisiana State Univ. AgCenter, Rm. 307, RNR Building, Baton Rouge, LA, 70803, USA. E-mail:

12244. Karube, H. (2012): Vietnamese Odonata collected in 1992-2003 surveys (3) Cordulegastridae, genus Anotogaster with note on its systematic grouping. Tombo 54: 55-69. (in English) ["Here I report the following five species of the genus Anotogaster from Vietnam with full descriptions; A. sakaii Zhou, 1988, A. chaoi Zhou, 1998, A. sapaensis sp. nov., A. gigantica Fraser, 1924 and A. klossi Fraser, 1919. Among them, A. sapaensis is new to science, and related for A nipalensis. A. sakaii, A. chaoi and A. gigantica are new records for Vietnam. The female of A. chaoi and the male of A. klossi are described for the first time. In northern Vietnam, I recorded 4 species from the same mountain, such a high species diversity is a unique characteristics of Indochina region. In addition, the key for grouping of this genus is discussed." (Author)] Address: Karube, H., Kanagawa Prefect. Mus. Nat. Hist., 499 Iryuda, Odawara, Kanagawa, 250, Japan. E-mail: paruki@nh-kanagawa-museum.jp

12245. Kim, M.; Yoo, J.-c. (2012): Diet of yellow bitterns (Ixobrychus sinensis) during the breeding season in South Korea. Journal of Ecology and Field Biology 35(1): 9-14. (in English) ["Yellow bitterns (Ixobrychus sinensis) are a small wetland bird common to Asian countries including South Korea, Japan, and China. The aim of this study is to describe diet of yellow bitterns during the breeding season in artificial wetland of northeastern South Korea between May to August 1999-2001. For the purposes of this paper, we observe the frequency of nest visiting by parents during the chick rearing period. A total of 98 boluses regurgitated by 52 chicks aged 1 day to 11 days after hatching form the sample and are shown to contain 323 food items. A bolus contained mean 3.8 items and weighs 0.2 g to 7.7 g. The most regularly occurring food items recorded are fish (63%) and insets (33%). In terms of fish, top mouth minnows (Pseudorasbora parva) and crucian carps (Carassius auratus) are frequently observed. In terms of insects, there are mosquitoes (Diptera), instars of dragonfly (Libellulidae), damselflies Coenagrionidae) and water bugs (Diplonychus japonicus). Yellow bitterns were also shown to feed on bull frogs (Rana catesbeiana), shrimp (Palaemonidae), and spiders (Araneae). The size of fish in a bolus ranged from 15.56 mm to 93.73 mm (mean, 37.08 mm). The amount of food can be observed to increase with the age of chicks ($r = 0.279$, $P = 0.025$, $N = 64$) but parents did not provide larger fish as chicks grew. Parent birds visited nests more frequently when they have a larger brood ($F_{1,21} = 14.529$, $P = 0.001$). Our results suggest that fish is the most important prey during the breeding season and that age of chicks is related to amount of diet in yellow bitterns." (Authors)] Address: Yoo, J.-c., Korean Institute of Ornithology and Dept of Biology, Kyung Hee Univ., Seoul 130-701, Korea. E-mail: jcyoo@khu.ac.kr

12246. Kipping, J.; Martens, A.; Suhling, F. (2012): Africa's smallest damselfly: a new Agriocnemis from Namibia (Odonata: Coenagrionidae). Organisms Diversity and Evolution 12(3): 301-306. (in English) [Agriocnemis bumhilli sp. n., a new damselfly from the Kwando River in northeastern Namibia is described. The new species is similar to Agriocnemis angolensis but characterized by unique male appendages, swollen abdominal segments 9 and 10, the complete absence of antehumeral stripes, and smaller size. The species is illustrated and

a photograph is provided. For comparison, an illustrated key to the other members of Agriocnemis within south-central Africa is provided." (Authors)] Address: Kipping, J., BioCart - Ökologische Gutachten & Studien, Albrecht-Dürer-Weg 8, D-04425 Taucha, Germany. E-mail: BioCartKipping@web.de

12247. Kipping, J. (2012): Zur aktuellen Verbreitung der in Fließgewässer siedelnden Libellenarten in der Umgebung von Altenburg mit besonderer Berücksichtigung von Pleiße und deren Nebengewässern (Insecta: Odonata). Mauritiana 23: 148-174. (in German, with English summary) ["The recent distribution of lotic dragonfly species in the surrounding of Altenburg with special account on the Pleiße River and its tributaries (Insecta: Odonata). Along the Pleiße River and its tributaries in the Altenburger Land district and adjacent areas all members of the Odonata families Gomphidae and Calopterygidae were not known to occur or extinct since the 1960th. Pollution with industrial and urban waste water was probably the main reason for decline and extinction of these species. With the regional collapse of water polluting industry in the river catchment and increasing efforts in water purification after 1990 the situation turned to the better and from this time onwards some of the species resettled formerly abandoned river stretches. The paper presented here gives an up to date overview about the recent distribution of Gomphus pulchellus, G. vulgatissimus, Ophiogomphus cecilia and Calopteryx splendens and C. virgo in the region. Some of the mentioned species are nowadays widely distributed and locally common. In Germany the lentic G. pulchellus has its easternmost occurrence near Altenburg." (Author)] Address: Kipping, J., BioCart - Ökologische Gutachten & Studien, Albrecht-Dürer-Weg 8, D-04425 Taucha, Germany. E-mail: BioCartKipping@web.de

12248. Klaus, D. (2012): Die Besiedlung künstlich geschaffener Kleingewässer in der Pleißeaue durch Wasserinsekten und Amphibien. Mauritiana 23: 54-77. (in German, with English summary) ["The colonisation of artificially created ponds in the Pleiße-Floodplain by aquatic insects and amphibians. The newly created small bodies of water on the meadows of the Pleiße between Windischleuba and Remsa in 2009 were examined for their colonization by dragonflies, water bugs, water beetles and amphibians. As a result 14 species of dragonflies, 8 taxa of water bugs and 27 representatives of aquatic beetles were detected. So far only three amphibian species were found in these ponds. The insects were predominantly eurytopic and widespread species in Thuringia. But with the Scarce Blue-tailed Damselfly (Ischnura pumilio) - Red List of TH 3 (= “Vulnerable"'), the diving beetle Laccophilus poecilus - RL TH: R (=”Rare”), and the green toad (Bufo viridis) - RL TH 1 (=”Critically endangered”), these bodies of water also presented a habitat to three species endangered in Thuringia." (Author)] Address: Klaus, D., Naturkundliches Museum Mauritianum Altenburg, Parkstr. 1, 04600 Altenburg, Germany. E-mail: klaus@mauritianum.de

12249. Koike, S. Morimoto, H.; Goto, Y.; Kozakai, C.; Yamazaki, K. (2012): Insectivory by five sympatric carnivores in cool-temperate deciduous forests. Mammal Study 37(2): 73-83. (in English) ["We studied insectivory by five carnivores—the Asiatic black bear (Ursus thibetanus), Japanese marten (Martes melampus), Japanese badger (Meles meles), red fox (Vulpes vulpes), and raccoon dog (Nyctereutes procyonoides)—in a cool-temperate deciduous forest in Japan. From May 2003 to April 2005, we assayed 373 fecal samples (91 from bear, 158 from marten, 43 from badger, 36 from fox, and 45 from raccoon dog) for insects. Each carnivore species consumed a variety of insect species, some preferentially. Bears preferred colonial insects like ants and wasps; martens ate a variety of forest insects, such as ground beetles and arboreal insects; badgers preferred forest ground beetles; foxes ate ground beetles and grassland insects; and raccoon dogs ate a variety of species. Dietary preferences may reflect the feeding strategy, behaviour, or habitat preference of each carnivore species. Based on the habitat preferences of the insects, we could assign carnivores to particular microhabitats: bears and martens used forest in three dimensions, badgers inhabited forest in two dimensions, foxes used grassland and forest in two dimensions, and raccoon dogs inhabited grassland and forest in three dimensions. Identification of insects in feces may provide information on the dietary and habitat preferences of these carnivores.... Foxes foraged only on Coleoptera, Hemiptera, Orthoptera, and Odonata. Only foxes ate Odonata (grassland insects)." (Authors)] Address: Koike, S., Tokyo University of Agriculture and Technology, 3-5-8 Saiwai, Fuchu, Tokyo 183–8509, Japan. E-mail: koikes@cc.tuat.ac.jp

12250. Koleček, J. (2012): A new record of the Yellow-spotted Whiteface (Leucorrhinia pectoralis, Odonata: Libellulidae) in the district Vsetín (Eastern Moravia, the Czech Republic). Acta Carpathica occidentalis 3: 117-18. (in Czech, with English summary) [3-4 mature males were observed at the abandoned gravel pit near the Choryně village on 15.vi.2012 at altitude 270 m a.s.l.] Address: Kolecek, J., Katedra zoologie, Přírodovědecká fakulta Univerzity Palackého, 17. listopadu 50, CZ-771 46 Olomouc, Czech Republic. E-mail: j.kolecek@email.cz

12251. Koren, T.; Trkov, D.; Vukotic, K.; Crne, M. (2012): New records of the rare dragonfly, Black Pennant – Selysiothemis nigra (Vander Linden, 1825) (Insecta: Odonata) in Bosnia and Herzegovina. Natura Sloveniae 14(2): 65-69. (in English, with Slovenien summary) [Records of the species in summer 2012 from two localities in Bosnia and Herzegovina and three in Croatia all located in the Neretva River alluvium are documented and discussed.] Address: Koren, T., University of Primorska, Science and Research Centre, Institute for Biodiversity Studies, SI-6310 Izola, Giordana Bruna 6, Slovenia. E-mail: koren.toni1@gmail.com

12252. Kosterin, O.E.; Chartier, G.; Holden, J.; Mey, F.S. (2012): New records of Odonata from Cambodia, based mostly on photographs. Cambodian Journal of Natural History 2012(2): 150-163. (in English, with Cambodian summary) ["Nine species of Odonata – Euphaea ochracea, Lestes nodalis, Gynacantha phaeomeria, Gynacantha demeter, Microgomphus chelifer, Amphithemis curvistyla, Orthetrum triangulare, Rhyothemis plutonia and Tetrathemis platyptera – are reported for the fi rst time for Cambodia, raising the number of named Odonata species recorded in this country to 135. All of the new records are based on photographs taken in nature apart from E. ochracea, which is supported by a voucher specimen. Also based on photographs, new distributional records for 93 Odonata species are provided for a number of localities in the Cardamom Mountains: the environs of Tatai Village in Koh Kong Province, and the environs of Ou Saom and Pramoui villages, including parts of Phnom Samkos

Wildlife Sanctuary, in Pursat Province. Ectoparasitic midges in the genus Forcipomyia (Pterobosca) were recorded on one species in the family Coenagrionidae and 11 species in the family Libellulidae." (Authors)] Address: Kosterin, O.E., Institute of Cytology and Genetics, Siberian Branch, Russian Academy of Sciences, Lavrentiev Ave 10, RUS-630090 Novosibirsk, Russia. E-mail: kosterin@bionet.nsc.ru

12253. Kulijer, D.; Baker, R.A.; Zawal, A. (2012): A preliminary report on parasitism of Odonata by water mites from Bosnia and Herzegovina. J. Br. Dragonfly Society 28(2): 92-10. (in English) ["The following Odonata, infested with mites, have been collected from a number of sites in Bosnia and Herzegovina - Aeshna isosceles, Sympetrum flaveolum, Coenagrion pulchellum, Coenagrion puella, Coenagrion scitulum, Enallagma cyathigerum, Erythromma najas, Ischnura elegans, Ischnura pumilio, Lestes dryas, Platycnemis pennipes, and Pyrrhosoma nymphula. The preferred site of mite attachment on the body is the posterior ventral surface of the thorax, behind the third pair of legs. In all but one of the species of zygopteran, mites were also found between the first and second pair and/or the second and third pair of legs and, in several species, on the abdomen. Mite loads varied for different species but preliminary results suggest that the larger anisopterans can carry more mites (in S. flaveolum mean 42, range 1-91) than the zygopterans, the highest recorded in the latter being in C. pulchellum (mean 37, range 1-68) and the lowest in L. dryas (mean 4, range 1-11). More mites were found on female damselflies than on males. Three distinct sizes of larval mite have been noted, indicating stages in their engorgement on the host." (Authors)] Address: Kulijer, D., National Museum of Bosnia and Herzegovina, Zmaja od Bosne 3, 71000 Sarajevo

12254. Kulijer, D.; Vinko, D.; Billquist, M.; Mekkes, J.J. (2012): Contribution to the knowledge of the Odonata fauna of Bosnia and Herzegovina – Results of the ECOO 2012. Natura Sloveniae 14(2): 23-38. (in English, with Slovenian summary) ["As a part of the 2nd European Congress on Odonatology (ECOO 2012), which was held in the beginning of July 2012 in Belgrade (Serbia), a post congress excursion to Bosnia and Herzegovina was organized. Between 6 and 12 August 2012, altogether 36 localities in three biogeographical regions throughout Bosnia and Herzegovina were surveyed, and 52 dragonfly species were found. This represents 83% of the hitherto recorded dragonfly species for the country. The most significant results are the second record and a new locality of Somatochlora metallica, second record of Coenagrion hastulatum, and first observation of the strong population of Lindenia tetraphylla for the country. New records of rare and/or threatened species, i.e. Coenagrion ornatum, Ceriagrion tenellum, Caliaeschna microstigma, Cordulegaster heros and Selysiothemis nigra, are also reported. The records of the most interesting species are briefly discussed from the aspects of biogeography and nature conservation." (Authors)] Address: Vinko, D., Slovenska 14, SI-1234 Mengeš, Slovenia; E-mail: damjan.vinko@gmail.com

12255. Laister, G. (2012): Ortstreue und Ortswechsel von Cordulia aenea an Fortpflanzungsgewässern (Odonata: Corduliidae). Libellula 31(3/4): 155-178. (in German, with English summary) ["In a five-year study, data on site fidelity and change of location in C. aenea during the pre-reproductive and reproductive period was collected using capture mark-recapture method. Five ponds, which were preferentially investigated in pairs in different years, were included in the study. Teneral individuals of C. aenea were marked at the pond that harboured the largest population. Immigration, unequal probability of individuals to gain a territory and mortality during pre-reproductive period presumably had the widest influence on the recapture rate of males marked as tenerals. Emigration was proved only to a lesser degree towards nearby ponds. In summary, it can be concluded that in spite of low recapture rates of teneral marked males we cannot assume that emigration plays a major part in the composition of a large population. In adult males site fidelity including an exchange of individuals between closely neighbouring ponds was found." (Author)] Address: Laister, G., Stadtgärten Linz, Abteilung Botanischer Garten und Naturkundliche Station, Roseggerstr. 20-22, A-4020 Linz, Austria. E-mail: Gerold.Laister@mag.linz.at

12256. Laister, G. (2012): Ortstreue und Gewässerwechsel von Cordulegaster boltonii (Odonata: Cordulegastridae). Libellula 31(3/4): 113-130. (in German, with English summary) ["Site fidelity and movement to other brooks in Cordulegaster boltonii (Odonata: Cordulegastridae) – In the year 2000, at three brooks in the area of Linz, Austria, site fidelity and movement to other brooks has been investigated. The brooks have been of different width and because of their characteristics of different suitability for Cordulegaster boltonii. It has been shown that site fidelity and movement to other brooks depends on how much a habitat meets the ecological needs of the species. Site fidelity was highest for males at the apparently favoured habitat. Ratio of males moving to other brooks was highest at brooks which represented less typical habitats. Some males have been found more frequently and for a longer time at the brook than other males." (Author)] Address: Laister, G., Stadtgärten Linz, Abteilung Botanischer Garten und Naturkundliche Station, Roseggerstr. 20-22, A-4020 Linz, Austria. E-mail: Gerold.Laister@mag.linz.at

12257. Lambert, J.L.; Neveu, G.; Millard, R.; Genin, C. (2012): Première preuve de l'indigénat d'Ophiogomphus cecilia (Fourcroy, 1785) dans le Jura Franc-Comtois (Odonata, Anisoptera : Gomphidae). Martinia 28(1): 41-48. (in French, with English summary) ["O. cecilia is reported from the Hérisson River, a major tributary of the Ain River, Jura mountains, eastern France, 2011. This is the first evidence of the reproduction in the Jura mountains, as previously only a dead imago was known from the mouth of the Loue River in the Doubs River." (Authors)] Address: Lambert, J.L., Onema, Service départemental de la Marne, F- 51520 La Veuve ; <jean-luc.lambert@onema.fr

12258. Lankika, M.D.H.; Karunaratne, M.M.S.C.; Conniff, K. (2012): Species composition of Odonate fauna in Meegahawatta, a wetland Aaea in Hanwella, Sri Lanka. Journal of Tropical Forestry and Environment 2(2): 37-42. (in English) ["Approximately 120 species of Odonata have been recorded in Sri Lanka to date. There are many gaps in our knowledge of Odonata taxonomy and distribution. The present study, therefore, was carried out to investigate adult Odonata species present in Meegahawatta area (1000m²) in Hanwella. The study was carried out using two fixed quadrats (20m x 10m) randomly established in two selected sites. Total number of individuals belonging to each species was counted fortnightly by using binoculars. A total of 27 species,

11 Zygoptera and 16 Anisoptera representing eight families were recorded. This comprised of three endemic Zygopteran species (Libellago adami, Pseudagrion rubiceps ceylonicum and Prodasineura sita) and three endemic anisopteran species (Epopthalmia vittata cyanocephala, Cyclogomphus gynostylus and Macrogomphus lankanensis). Among those identified was one recently discovered and yet un-described Archibasis species. Of the three endemic Anisopteran species recorded, C. gynostylus and M. lankanensis are listed as vulnerable species in the IUCN Redlist of 2010. Although the Zygopterans showed higher Diversity Index and Evenness Index (H'= 1.99, E= 0.83) than the Anisopterans (H'=1.96, E= 0.32), their Richness Index (R=1.67) was less than that of the Anisopterans (R= 2.49). The most common Zygopteran species recorded was Pseudagrion malabaricum whereas Neurothemis tulia tulia was the most common anisopteran species." (Authors)] Address: Lankika, M.D.H., Department of Zoology, University of Sri Jayewardenepura, Nugegoda, Sri Lanka. E-mail: harshi87@hotmail.com

12259. Maag, N.; Gehrer, L.; Woodhams, D.C. (2012): Sink or swim: a test of tadpole behavioral responses to predator cues and potential alarm pheromones from skin secretions. J. Comp. Physiol. A Neuroethol. Sens. Neural Behav. Physiol. 198(11): 841-846. (in English) ["Chemical signalling is a vital mode of communication for most organisms, including larval amphibians. However, few studies have determined the identity or source of chemical compounds signalling amphibian defensive behaviours, in particular, whether alarm pheromones can be actively secreted from tadpoles signalling danger to conspecifics. Here we exposed tadpoles of the common toad Bufo bufo and common frog Rana temporaria to known cues signalling predation risk and to potential alarm pheromones. In both species, an immediate reduction in swimming activity extending over an hour was caused by chemical cues from the predator Aeshna cyanea (dragonfly larvae) that had been feeding on conspecific tadpoles. However, B. bufo tadpoles did not detectably alter their behaviour upon exposure to potential alarm pheromones, neither to their own skin secretions, nor to the abundant predator-defence peptide bradykinin. Thus, chemicals signalling active predation had a stronger effect than general alarm secretions of other common toad tadpoles. This species may invest in a defensive strategy alternative to communication by alarm pheromones, given that Bufonidae are toxic to some predators and not known to produce defensive skin peptides. Comparative behavioural physiology of amphibian alarm responses may elucidate functional trade-offs in pheromone production and the evolution of chemical communication." (Authors)] Address: Maag, N., Institute of Evolutionary Biology & Environmental Studies, University of Zürich, Winterthurerstr. 190, 8057 Zürich, Switzerland. E-mail: nino.maag@gmx.ch

12260. Machado, A.B.M. (2012): A new species of Ischnura (Odonata: Coenagrionidae) from high altitude eastern Andes, of Colombia. Zoologia 29(6): 598-600. (in English) ["Ischnura mahechai sp. nov. is described and illustrated based on specimens collected at the Eastern Andean mountain range of Colômbia. The species is close to Ischnura cruzi De Marmels, 1987 but differs from it by the structure of male anal appendages and female hind prothoracic lobe. The specimens were collected on a small Andine lake at 3,600 m, the 4th altitudinal record for a resident odonate." (Author)] Address: Machado, A.B.M., Departamento de Zoologia, Instituto de Ciências Biológicas, Univ. Federal de Minas Gerais. Caixa Postal 486, 31270-901 Belo Horizonte, Minas Gerais, Brasil. E-mail: angelo@icb.ufmg.br

12261. Mäkinen, J. (2012): Eteläntytönkorento (Coenagrion puella) Suomessa [Coenagrion puella in Finland]. Crenata 5: 4-7. (in Finish) [In Finland C. puella was a very rare and local species for many decades. It was first recorded in 1958 in Vehkalahti, where a population was found in a small river. The next two populations were also discovered in small streams in southeastern Finland. C. puella was classified as endangered in the Finnish Red List between the years 1986 and 2001. In 2002 it began to expand its range rapidly. Within one decade it has become a common species in the Helsinki area. At present the northern border of the range (excluding the old population in Mäntyharju, still the northernmost in Finland) is 70-80 km north from the southern coast. The average speed of the expansion is estimated to have been 5-6 km per year during the past 11 years. (Asmus Schöter)] Address: makisenjussi@gmail

12262. Mäkinen, J., M. Friman, S. Karjalainen & J. (2012): Rahkonen (2012) Sudenkorentokatsaus 2011 [Report of dragonfly records made in Finland in 2011]. Crenata 5: 8-28. (in Finish) [This article presents the most interesting Odonata records from Finland in 2011. Two new additions to the Finnish fauna were found: Lestes virens and Sympetrum fonscolombii. L. virens was recorded in Vantaa (27-28 August, by Miikka Friman) and S. fonscolombii in Helsinki (9 October, by Timo Päivinen). Only one individual of both species was observed. During 2011 seven new provincial records were made. These include the second observation of Sympetrum pedemontanum in Finland (Liperi, 27 July, by Kari Manner). A total of 59 dragonfly species have been recorded in the country by the end of 2011. (Asmus Schöter)] Address: makisenjussi@gmail

12263. Marinov, M. (2012): Description of female Hemicordulia hilaris Lieftinck, 1975 (Anisoptera: Corduliidae) with brief notes on the biogeography of the genus. Rec. Auckland Mus. 48: 97-105. (in English) ["Three Hemicordulia specimens in the Auckland Museum, collected from the Cook Islands and Fiji, were compared with recently sampled material from Fiji, Tonga and New Caledonia. They were determined to be conspecific with H. hilaris, originally described from New Caledonia and confirmed for other parts of the Pacific – Fiji, Samoa and Tonga. The female of H. hilaris is described here for the first time and morphological features that separate the species from other congeners are discussed." (Author)] Address: Marinov, M., 7/160 Rossall Str., Merivale 8014, Christchurch, New Zealand. E-mail: milen.marinov@canterbury.ac.nz

12264. Martens, A.; Schiel, F.J. (2012): Erste Ansiedlung der Quagga-Muschel Dreissena rostriformis bugensis (Andrusov) an einem isolierten See in Mitteleuropa (Bivalvia: Dreissenidae). Lauterbornia 75: 109-111. (in German, with English summary) ["On 27-05-2012 a specimen of Dreissena rostriformis bugensis attached on a dragonfly exuviae was recorded at a gravel-pit lake near Dettenheim north of Karlsruhe, Germany. In autumn 2012, the mussel was recorded at the underside of angler's boats and on aquatic vegetation in big numbers. The lake had no water exchange with the

River Rhine, and was used for gravel dredging, swimming, fishing with boats and sailing. This is the first record of D. rostriformis bugensis from an isolated lake in Central Europe." (Authors)] Address: Martens, A., Pädagogische Hochschule Karlsruhe, Postfach 111062, D-76060 Karlsruhe, Germany. E-mail: andreas.martens@ph-karlsruhe.de

12265. Martens, A.; Zinecker, A. (2012): Springbrunnen – ein städtisches Extremhabitat als Entwicklungsgewässer von Sympetrum fonscolombii (Odonata: Libellulidae). Libellula 31(3/4): 211-221. (in German, with English summary) ["Waterspout fountains: an extreme urban habitat as breeding site of Sympetrum fonscolombii in Central Europe (Odonata: Libellulidae) – In September 2012, exuviae and fullgrown larvae of S. fonscolombii were found at fountains in the palace gardens of Karlsruhe, Bruchsal, Schwetzingen and Ludwigsburg, Baden-Württemberg, Germany. In Bruchsal the species emerged until 24-x-2012. Waterspout fountains are artificial urban habitats and form an extreme: They are filled with water between April and October and they are extremely poor in structures, microhabitats and species. So far, there were no reports of breeding odonates in that special type of urban waters. Having a rapid egg and larval development, S. fonscolombii prefers temporal ponds and is well-adapted to use these waters for successfully breeding; therefore, it profits from this urban habitat." (Authors)] Address: Martens, A., Pädagogische Hochschule Karlsruhe, Postfach 111062, 76060 Karlsruhe, Germany. E-mail: andreas.martens@ph-karlsruhe.de

12266. Martens, A. (2012): Lestes macrostigma (Eversmann, 1836) (Odonata, Zygoptera: Lestidae) en tant qu'hôte de Forcipomyia paludis (Macfie, 1936) (Diptera: Ceratopogonidae). Martinia 28(2): 107-108. (in French, with English summary) ["On 25 May 2010 in the National Natural Reserve of the Marais du Vigueirat (Camargue, Southern France), photographs of several prereproductive L. macrostigma were taken having ceratopogonids –or biting-midges– on their wings." (Author)] Address: Martens, A., Pädagogische Hochschule Karlsruhe, Postfach 111062, D-76060 Karlsruhe, Germany. E-mail: andreas.martens@ph-karlsruhe.de

12267. Masunaga, K. (2012): The dragonfly and damselfly faunas of Lake Biwa and their long-term changes. In Kawanabe, H., M Nishino & M. Maehata (eds.): Lake Biwa: Interactions Between Nature and People. Springer: 117-118. (in English) [The Odonata fauna in Lake Biwa is summarized. "Ninety-nine species were recorded in 2000 from Shiga Prefecture, which surrounds the lake. Five species are treated as endangered, six as vulnerable species, and five as near threatened species in the 2005 edition of the Red Data Book Shiga. Ongoing threats to these insects, particularly their aquatic young, include deteriorating water quality, loss of aquatic habitats, and predation by nonnative species of fish." (Author)] Address: Masunaga, K., Lake Biwa Museum, 1091 Oroshimo-cho. Kusatsu. Shiga 523-0001, Japan. E-mail: moai@lbm.go.ip

12268. Matushkina, N.A.; Buy, D.D.; Borysenko, N.N. (2012): Current status of the dragonfly (Insecta, Odonata) fauna of the Kanive Nature reserve and vicinities. Nature Reserves in Ukraine 18(1-2): 87-91. (in English, with Ukrainian and Russian summaries) ["Forty dragonfly species are recorded from the Kanev Natural Reserve and vicinities, three of which (Erythromma viridulum, Somatochlora flavomaculata, and Stylurus flavapes) were reported for the first time. Notes on biogeographic affinities, ecology and behaviour were added for these species. Current findings of some dragonfly species (Sympecma fusca, Aeshna affinis, Brachytron pratense, Somatochlora metallica, Crocothemis erythraea, and Orthetrum albistylum), rare or locally distributed in the Reserve, are added. Current status of the odonatofauna of the Reserve is discussed from the position of environment changes." (Authors)] Address: Matushkina, Natalia A., Department of Zoology, Biological Faculty, National Taras Shevchenko University of Kyiv, vul. Volodymirs'ka, 64, Kyiv UA-01033, Ukraine. E-mail: odonataly@gmail.com

12269. McTavish, E.J.; Smith, G.K.; Guerrero, R.F.; Gering, E.J. (2012): Flight morphology variation in a damselfly with female-limited polymorphism. Evolutionary Ecology Research 14: 325-341. (in English) ["Background: Female-limited colour polymorphisms occur in many species of Odonata. Often one female morph appears male-like in coloration (androchromes) whereas one or more others are distinct from males (gynochromes). These androchromes are hypothesized to be male-mimics, thereby avoiding the harassment of excessive male mating attempts. Organism: Ischnura ramburii, Rambur's forktail, is a widespread New World species with androchrome and gynochrome females. It was introduced to the Hawaiian Islands in the mid-1970s and females were thought to be exclusively gynochromatic there. Questions: How do males and females differ in their flight apparatus? Do females with different colour morphologies also differ in flight morphology? Hypothesis: Because male-like coloration is sometimes associated with male-like flight behaviours, androchrome females should have more male-like wings than gynochrome females. Methods: We caught individuals of I. ramburii in the field from seven populations on three of the Hawaiian Islands and three populations in Texas (part of its native range). Using digitized wing and body images, we compared body size, wing size, and wing shape between sexes, between female morphs, and among geographic regions. Results: Male I. ramburii are smaller than females and have smaller, more slender wings. Although androchromes are absent from the Big Island of Hawaii, both androchrome and gynochrome females are common on Oahu and Kauai. Androchrome females are indistinguishable from gynochrome females in all aspects of their flight apparatus except for forewing size, which is smaller than that of gynochromes and thus more-male like. Wing shape and size vary geographically. Body- and wing-size differences between males and females are consistent across regions, although the degree and direction of sexual dimorphism in wing shape are not." (Authors)] Address: Guerrero, R.F., Univ. of Texas at Austin, Section of Integrative Biology, One University Station, C0930, Austin, TX 78712, USA. E-mail: r.guerrero @utexas.edu

12270. Mezquita-Aranburu, I.; Ocharan, F.J. (2012): Odonates from Gipuzkoa. Munibe (Ciencias Naturales-Natur Zientziak) 60: 51-75. (in Spanish, with English and Euskarian summaries) ["We present data on 42 species of Odonata found in Gipuzkoa (Basque Country, Spain) during a study conducted between 2006 and 2011, and also we do a literature review. Overall, 43 species have been detected, 21 Zygoptera (9 of them first seen in Gipuzkoa) and 22 Anisoptera (13 of them

first seen in Gipuzkoa). Particularly interesting are Coenagrion mercuriale, C. scitulum, Oxygastra curtisii and Orthetrum albistylum." (Authors)] Address: Mezquita-Aranburu, I., Sociedad de Ciencias Aranzadi / Aranzadi Zientzia Elkartea, Departamento de Entomología / Entomologia Departamentua, Zorroagagaina 11 • 20014 Donostia / San Sebastián, Spain. E-mail: mezquitaaranburu@gmail.com

12271. Mielewczik, M.; Liebisch, F.; Walter, A.; Greven, H. (2012): Infrarot (NIR)-Reflexion bei Insekten — phänetische Untersuchungen an 181 Arten. Entomologie heute 24: 183-216. (in German, with English summary) ["We tested a camera system which allows to roughly estimate the amount of reflectance properties in the near infrared (NIR; ca. 700-1000 nm). The effectiveness of the system was studied by taking photos of 165 insect species including some subspecies from museum collections (105 Coleoptera, 11 Hemiptera (Pentatomidae), 12 Hymenoptera, 10 Lepidoptera, 9 Mantodea, 4 Odonata, 13 Orthoptera, 1 Phasmatodea) and 16 living insect species (1 Lepidoptera, 3 Mantodea, 4 Orthoptera, 8 Phasmatodea), from which four are exemplarily pictured herein. The system is based on a modified standard consumer DSLR camera (Canon Rebel XSi), which was altered for two-channel colour infrared photography. The camera is especially sensitive in the spectral range of 700-800 nm, which is well-suited to visualize small scale spectral differences in the steep of increase in reflectance in this range, as it could be seen in some species. Several of the investigated species show at least a partial infrared reflectance. NIR-reflectance is especially pronounced in specimens of an overall white, red, orange and yellow colouration, but was also found in numerous green insects (e.g. the leaf katydids Ancylecha fenestrata and Stipnochlora couloniana and the walking leaf Phyllium celebicum). In contrast, other green wings, as for example the metallic green wings of the butterfly Troides priamus or the metallic green elytra of several jewel beetles such as Chrysaspis aurovittata, do not reflect NIR-radiation.... 3.2.5. Odonata (museum specimen): In contrast to the yellow spots on the abdomen of a female Libellula depressa, the dark body parts of Odonata species did not show any NIR-reflectance. Whitish transparent exuviae of various unclassified species generally showed a high reflectance (data not shown)." (Authors)] Address: Mielewczik, M., ETH Zürich, Institute of Agricultural Sciences, Universitätstr. 2, CH-8092 Zürich, Switzerland. E-Mail: michaemi@ethz.ch

12272. Moenickes, S.; Frassl, M.; Schlief, J.; Kupisch, M.; Mutz, M.; Suhling, F.; Richter, O. (2012): Temporal patterns of populations in a warming world: a modelling framework. Marine Biology 159(11): 2605-2620. (in English) ["In this paper, we present an approach for describing the environmentally induced temporal pattern of structured populations by partial integro-differential equations. Populations are structured according to size or stage. Growth, energy allocation and stage transitions are affected by environmental conditions of which temperature, photoperiod, water depth and food supply were taken into account. The resulting modelling framework was applied to describe, analyse and predict alterations in populations with continuous development, populations with distinct state structures and interacting populations. Our exemplary applications consider populations of freshwater Amphipoda, Isopoda and Odonata. The model was capable of simulating life cycle alterations in dependence on temperature in interaction with other environmental factors: (1) population dynamics, (2) seasonal regulation, (3) water depth-dependent dispersal, (4) intraguild predation and (5) consumer-resource dynamics." (Authors)] Address: Suhling F., Inst. Geoökologie, TU Braunschweig, Langer Kamp 19c, D-38102 Braunschweig, Germany. E-mail: f.suhling@tu-bs.de

12273. Mohamed, Z. Y.A.; Osman, K.S.M.; Mohamed, I.E.E.; Bakry, S.M. (2012): Impact of water-ph values on the consumption capacity of certain aquatic insects preying on different medical snails. Journal of Evolutionary Biology Research 4(3): 39-51. (in English) ["The main aim of this work was to determine the consumption capacity of five aquatic insects (as predators) on four species of medical snails (as preys) tested under four values of pH at a constant and controlling temperature in the laboratory. The predators were represented by adults of two hemipterous species (Limnogeton fieberi Mayr, Sphaerodema urinator Duf.) and three larval odonatous species (Anax imperator, Crocothemis erythraea and Ischnura pumilio). Moreover, the four water-pH values were 5, 7, 9, and 11 at 30°C. On the other hand, the four prey of the medical snails were Bulinus truncates Audouin, Biomphalaria alexandrina Ehrenb, Cleopatra bulimoides Olivier and Melanoides tuberculata Muller. All of individual fauna were collected from the River Nile in Qena. The acidic media were adjusted as a mixture of three acids phosphoric acid acetic acid boric acid. In contrast, the alkalinic solution was prepared by sodium hydroxide. The results illustrate that, the maximum predation occurred under 7 pH and 9 pH at 30°C regardless of the laboratory conditions. It appeared that Bulinus truncates was highly preferable snail species to these predators. Biomphalaria alexandrina which is the intermediate host of Schistosoma mansoni Bilharz, may be the lastly preferable snail species to these predators. The belostomatids (Limnogeton fieberi and Sphaerodema urinator), and the odonats (A. imperator, C. erythraea and I. pumilio), could be the highest successful predators on the harmful snails (Bulinus truncates, Melanoides tuberculata, Biomphalaria alexandrina and Cleopatra bulimoides). Therefore, its use should be encouraged to be reared in large numbers and then released in the natural places of snails under 7 to 9 range values of water pH." (Authors)] Address: Mohamed, Z. Y., Zoology and Entomology Dept, Faculty of Science in Qena, South Valley University Egypt

12274. Moreno Pallares, M.I.; Guillot Monroy, G.H., (2012): Distribución espacial y temporal de náyades de odonatos en los humedales La Vaca y Santa María del Lago, Bogotá, Colombia. Acta biol. Colomb. 17(2): 281-294. (in Spanish, with English summary) ["We evaluated the spatial and temporal variation in communities of dragonfly's naiads and their association to the habitat rehabilitation status in LaVaca and Santa María del Lagowetlands. Four samplings were carried out in several sites of each during a year. Macroinvertebrates were collected at the entryande exit flow, and in open waters of the wetlands using standard techniques. We found a gradient in the distribution of the abundance of nymphs in both wetlands, where naiads community had the highest number of individuals in the places located farther from the dumping sites. Comparing the community s composition between wetlands La Vaca and Santa María del Lago through the beta diversity, heterogeneity was found in both ecosystems. The gradient in the

distribution of the abundance of naiads observed in both wetlands fits with to a response of the species in terms of tolerance to the environmental variables." (Authors)] Address: Moreno Pallares, Maria, Universidad Nacional de Colombia, Sede Bogotá, carrera 30 # 45-03, Bogotá-Colombia, Edificio 421, oficina 205, extensión 11319. E-mail: mimorenop@unal.edu.co

12275. Murashige, T. (2012): The record of an aberrant dark form of male Ischnura senegalensis (Rambur). Tombo 54: 70. (in Japanese, with English summary) ["An aberrant dark form of the male of Ischnura senegalensis was recorded from Kishiwada city, Osaka prefecture, Japan. This specimen has a uniformly black coloration on the whole head, synthorax, legs, basal abdomen and its dorsum, with only faintly bluish parts on the 8th and 9th segments. The green colour of typical specimens is totally absent and replaced by black." (Author)] Address: not stated

12276. Nilsson, V. (2012): Thermal adaptation along a latitudinal gradient in damselflies. Doctoral thesis. Umeå University, Faculty of Science and Technology, Department of Ecology and Environmental Sciences: XII + 35 pp. (in English) ["Understanding how temperature affects biological systems is a central question in ecology and evolutionary biology. Anthropogenic climate change adds urgency to this topic, as the demise or success of species under climate change is expected to depend on how temperature affects important aspects of organismal performance, such as growth, development, survival and reproduction. Rates of biological processes generally increase with increasing temperature up to some maximal temperature. Variation in the slope of the initial, rising phase has attracted considerable interest and forms the focus of this thesis. I explore variation in growth rate-temperature relationships over several levels of biological organization, both between and within species, over individuals' lifetime, depending on the ecological context and in relation to important life history characteristics such as generation length and winter dormancy. Specifically, I examine how a clade of temperate damselflies have adapted to their thermal environment along a 3,600 km long latitudinal transect spanning from southern Spain to northern Sweden. For each of six species, I sampled populations from close to the northern and southern range margin, as well from the centre of the latitudinal range. I reared larvae in the laboratory at several temperatures in order to measure individual growth rates. Very few studies of thermal adaptation have employed such an extensive sampling approach, and my finding reveal variation in temperature responses at several levels of organization." (Author)] Address: Nilsson, V., Dept of Ecology & Environ. Sci., Animal Ecology Group, Umeå Univ., 90187 Umea, Sweden. E-mail: viktor.nilsson@emg.umu.se

12277. Nishadh, K.A.; Das, K.S.A. (2012): Metazoan community composition in tree hole aquatic habitats of Silent Valley National Park and New Amarambalam Reserve Forest of the Western Ghats, India. Journal of Threatened Taxa 4(14): 3312-3318. (in English) ["In a study of the metazoan community composition in tree hole aquatic habitat of a tropical rainforest, Silent Valley National Park, and the adjacent moist deciduous forest, New Amarambalam Reserve Forest, of the Western Ghats, 28 different species were recorded from 150 tree hole aquatic habitats with an average of 3–5 species per tree hole. Most of the recorded organisms (96.8%) belong to Odonata (no details on more detailed taxonomic units), Heteroptera, Diptera, Coleoptera and Trichoptera. The study reports the first record of toe-winged beetle larvae (Ptilodactylidae) in a tree hole aquatic habitat. The most significant observation is the prolific occurrence of trichopteran larvae as the second most abundant taxa in tree holes of Silent Valley National Park, and this stands as the first comprehensive record of the entire order in the habitat studied. The study upholds the importance of less explored microhabitats in the Western Ghats region in terms of sustaining unique community composition in the most delicate and extreme habitat conditions. It also puts forward important ecological research questions on biodiversity ecosystem functionality which could impart important lessons for managing and conserving the diminishing tropical evergreen forests which are significant for these unique habitats." (Authors)] Address: Das, K.S.A., Centre for Conservation Ecology, Department of Zoology, M.E.S. Mampad College, Malappuram, Kerala 676542, India. E-mail: dasksa@gmail.com

12278. Nössing, T.B.; Festi, A.; Winkler, F.; Haller, R.; Lösch, B. (2012): Die Libellen (Odonata) der Etschtalsohle zwischen Meran und Salurn (Südtirol, Italien). Gredleriana 12: 185-200. (in German, with English summary) ["The dragonfly fauna of the Adige valley in a total of 41 locations between Merano and Salorno (South Tyrol, Italy) was analyzed in the period 2009 -2011. The current species composition was compared with historical data. 40 species in the area could be identified, 33 of which can be classified as certainly or probably autochthonous for the area. As expected the wetland complexes of the biotopes Kalterer See and Castelfeder are the most species-rich sites. On the other hand the channels and the small wet biotopes showed a relatively poor dragonfly community. Compared to the historical data, the typically riverine species and the species of periodically flooded habitats have disappeared or result very rare in the present dragonfly fauna. The decline of these species may be associated with changes in the landscape and the changing of farming methods in the Adige valley." (Authors)] Address: Nössing, Tanja, Nicolodistr. 47, I-39100 Bozen, Italy. E-mail: tanja.noessing@rolmail.net

12279. Norgret, J.-Y.; Vitzthum, S. (2012): Insectes remarquables de Lorraine & d'Alsace. Édition serpenoise: 247 pp. (in French) [The book briefly introduces into habitats and Odonata species of northeastern France] Address: Édition serpenoise, BP 70090, 57004 Metz Cedex I

12280. Novak, C.W.; Goater, T.M. (2012): Introduced bullfrogs and their parasites: Haematoloechus longiplexus (Trematoda) exploits diverse damselfly intermediate hosts on Vancouver Island. Journal of Parasitology 99(1): 59-63. (in English) ["The lung fluke, Haematoloechus longiplexus, is the most prevalent and abundant parasite of introduced bullfrogs on Vancouver Island, British Columbia, Canada. The ecological success of this trematode in invasive bullfrogs is related to the fluke's ability to utilize native intermediate hosts for transmission. The purpose of this study was to identify the odonate species involved in the transmission of H. longiplexus to the introduced bullfrog. The prevalences and mean intensities of 21 species of odonates (nymphs and adults) were examined for metacercariae infections. Haematoloechus longiplexus is a second intermediate host specialist, being found only in damselflies. Six damselfly species exhibiting the 'climber' ecological

habit were identified as second intermediate hosts of H. longiplexus. Enallagma carunculatum (prevalence = 75.0%, mean intensity = 17.2 ± 10.8), Ischnura cervula (65.2%, 8.9 ± 4.3), Ischnura perparva (45.5%, 15.4 ± 10.3), and Enallagma boreale (40.7%, 4.8 ± 7.8) were the most commonly infected damselfly species. Metacercariae were absent in damselflies collected from sites lacking bullfrogs. Haematoloechus longiplexus was likely introduced along with the bullfrog, and subsequently adapted to the physid snail and diverse damselfly intermediate hosts present in ponds on Vancouver Island." (Authors)] Address: Novak, C.W., Biology Dept, Vancouver Island University, Nanaimo, British Columbia, Canada V9R 5S5. E-mail: colin.novak@viu.ca

12281. Ogawa, H.; Nosaka, M.; Hashii, N.; Yokoyama, M.; Tsurusaki, N. (2012): Records of faunal survey of insects of Tottori Sand Dunes in 2011 with comments to the fauna of “Sakyu Oasis”. Natural History Research of San’in 7: 31-40. (in Japanese, with English summary) ["On the basis of faunal surveys of Tottori Sand Dunes in 2010, a total of 83 species of insects are recorded. The number includes 21 insect species that were previously unknown from the sand dune area. Some remarks are made for the aquatic communities and orthopteran fauna in and around a pool called “Oasis”, which is formed all year round except for the hottest season from mid July to September at the depression just below a ridge called “Umanose”." (Authors) Three Odonata species were recorded: Ischnura senegalensis, Pantala flavescens, Sympetrum risi.] Address: Tsurusaki, N., Laboratory of Biology, Faculty of Regional Sciences, Tottori University, Koyama-Minami 4-101, Tottori, 680-8551 Japan. E-mail: E-mail: ntsuru@rstu.jp

12282. Olberg, S.; Lønnve, O.J. (2012): Ischnura pumilio (Charpentier, 1825) (Odonoata, Coenagrionidae) in Norway. Norwegian Journal of Entomology 59: 229-233.["A male of I. pumilio was captured near a pond at the bottom of a sandpit at Bergsdalen in Nittedal, north of Oslo, on 30 May 2012. The following month, several imagines where spotted and nymphs where caught in the pond. The species is new to the Norwegian fauna." (Authors) The paper also provides a recent distribution map of the species covering Sweden and Norway.] Address: Olberg, S., BioFokus, Gaustadalléen 21, NO-0349 Oslo, Norway. E-mail: stefan@biofokus.no

12283. Olthoff, M.; Ikemeyer, D. (2012): Dragonflies of a peat bog in northwestern Turkey (Odonata: Anisoptera, Zygoptera). Zoology in the Middle East 57: 142-146. (in English) [37 Odonata species were recorded in 2011 in the peat bog around Yenicaga lake, province Bolu, northwest Turkey (40°47’N, 32° 1 ’E). Ischnura elegans, Coenagrion puella, Erythromma viridulum and Sympetrum sanguineum were the most abundant species. Leucorrhinia pectoralis, Cordulia aenea, Coenagrion pulchellum, C. scitulum, Pyrrhosoma nymphula, Lestes sponsa, L. dryas and Libellula quadrimaculata are remarkable due their regional rarity or arealgeographic position in Turkey.] Address: Olthoff, M., Biologische Station Zwillbrock e.V., Zwillbrock 10, 48691 Vreden, Germany. E-mail: matthias.olthoff@gmx.de

12284. Omopariola, C.A. (2012): Survey of Aquatic Insects of Ogun River Nigeria and Its Physico-Chemical Properties. Undergraduate These, Biological Sciences, Federal University of Agriculture, Abeokuta: (in English) [Nigeria; "This study was carried out to determine the abundance, composition, distribution of aquatic insects and physico - chemical factors of Ogun River. The aquatic insects were collected using sweep and pond net (0.5mm) from two study sites during February and middle April 2012. The water samples and insects were collected once in a week. Insects were sampled using standard entomological methods, while water samples was analysed using standard winkler s titrimetric and APHA methods to determine the chemical properties. Water analyses were conducted in the laboratory of Ogun State Water Corporation, Abeokuta, Ogun State. While insects identifications were done in the laboratory in the Department of Agricultural - Biology, University Of Ibadan. Results show that five orders and thirteen families were found with the highest number of aquatic insects from the order Odonata. The most abundant family were Coenagrionidae and Libellulidae respectively. Physico - chemical values, water temperature, pH, DO, Conductivity and Nutrient were measured. Only conductivity had the greater value among the water quality parameters. Bar chart were used to compare the physico - chemical parameters." (Author)] Address: not stated

12285. Ortega, A.J.J.; Ramos-Elorduy, J.; Pino Moreno, J.M. (2012): Insectos comestibles en algunas localidades en la región centro del Estado de México: técnicas de recolección, venta y preparación. Dugesiana 19(2): 123-133. (in Spanish, with English summary) ["Edible insects in some locations in Central Region of Mexico State: Collection, techniques, sale and preparation: The goal of this research is to know the actual condition of some edible insect species inside a framework in some municipalities of Toluca, Almoloya de Juárez, Temoaya and Lerma at Mexico State. For this study we utilize the ethnographic method, doing a tracking and gathering of species. Tianguis and markets were also visited. We found various Lepidoptera larvae as those of agave plant, those of “capulín” tree, the “sacamiches” of the grass and some Coleoptera larvae as those of different kind of trees alive and many of death trees, as well as nymphs of dragonflies. We also analyzed, different aspects related with their common and ethnic names, as well as the diverse ways to prepare them and how they are sold." (Authors)] Address: Ramos-Elorduy, Julieta, Instituto de Biología UNAM, Departamento de Zoología Laboratorio de Entomología. E-mail: relorduy@ibiologia.unam.mx

12286. Ott, J. (2012): Die Speer-Azurjungfer, ein seltener Bewohner von Moorgewässern. Heimatjahrbuch des Landkreises Kaiserslautern 2011: 91-93. (in German) [General account on Coenagrion hastulatum with focus on the Pälzerwald-region, Rhineland-Palatinate, Germany.] Address: Ott, J., Friedhofstr. 28, 67705 Trippstadt, Germany. E-mail: L.U.P.O.GmbH@t-online.de

12287. Ozono, A.; Kawashima, I.; Futahashi, R. (2012): Dragonflies of Japan. Bunichi-Sogo Syuppan., Co. Ltd. 532 pp (in Japanese, with English summary) [This fully illustrated field guide covers the total of the 203 Odonata species of Japan. Every species is generously illustrated with fully-coloured photographs, colour distribution maps, and detailed line drawings to aid species identification. Key features for identification, distribution, seasons of occurrence, habitats, similar species, and current taxonomic status based on molecular phylogeny is described for every species.]

12288. Paunović, M.; Janović, J.; Kovačević, S.; Zorić, K.; Žganec, K.; Simić, V.; Atanacković, A.; Marković, V.; Kračun, M.; Hudrina, S.; Lajtner, J.; Gosstein, S.; Lucić, A. (2012): Macroinvertebrates of the natural substrate of the Sava River – Preliminary results. Water Research and Management 2(4): 33-39. (in English) [Croatia; "The objective of this study is to present the comparable data on macroinvertebrate communities from the natural bottom substrate along the middle and lower stretch of the Sava River. The study was carried out in September 2011 at eight sites of the sector between Zagreb - Martinska Ves and Belgrade – at the confluence into the Danube. The data presented could be used as baseline information for any future management of the main course of the Sava River." (Authors) Odonata are represented by Calopteryx splendens, Erythromma lindenii, Coenagrion mercuriale [sic], Gomphus vulgatissimus, Pyrrhosoma nymphula, and Platycnemis pennipes.] Address: Paunovic, M., University of Belgrade, Institute for Biological Research “Sinisa Stankovic”, 142 Despota Stefana Boulevard, Belgrade, Serbia, E-mail: mpaunovi@ibiss.bg.ac.rs

12289. Perez Gutierrez, L.A. (2012): Archilestes chocoanus spec. nov., a new damselfly from Colombia (Odonata: Lestidae). Odonatologica 41(4): 349-354. (in English) ["The new species is described and illustrated from the adults of both sexes. Holotype (male: Colombia, Choco dept., Salero alt. 129 m a.s.l., 10-VIII-2005. A. chocoanus sp. n. shows the following character combination: cercus with well developed medial tooth in basal third, distal portion of cercus elongate, curved inward and sharply pointed, paraproct vestigial, and colour pattern of pterothorax close similar to A. neblina Garrison, except for metepisternum, metepimeron and metastemum largely yellow. The new species is closely related to A. guayaraca De Marmels, A. latialatus Donnelly and A. tuberalatus (Williamson)." (Author)] Address: Pérez Gutiérrez, L.A., Grupo de investigation en Biodiversidad del Caribe colombiano, Departamento de Biologia, Universidad del Atlantico, km 7 antigua via Puerto Colombia, Barranquilla, Colombia. E-mail: leonperez@mail.uniatlantico.edu.co

12290. Pickess, B.P. (2012): Mixed pairings: are male Emerald Damselfly Lestes sponsa short-sighted or desperate? Atropos 47: 76-77. (in English) [Mixed pairings are documented: (1) Male Lestes sponsa coupled with a female Pyrrhosoma nymphula. Arne, Dorset, UK 17 July 2012 and (2) Male Lestes sponsa coupled with a male Enallagma cyathigerum. Squirrel Cottage Lake, near East Holme, Dorset, UK 13 September 2012.] Address: Pickess, B.P., 8 Shaw Drive, Sandford, Wareham, Dorset, BH20 7BT, UK

12291. Plotnikova, S.I.; Svidersky, V.L.; Gorelkin, V. S. (2012): Peculiarities of structural-functional organization of the motor neuropil in the dragonfly thoracic ganglia. Journal of evolutionary biochemistry and physiology 48(5-6): 568-573.["The study considers structural-functional relations in motor neuropil of the thoracic ganglia in dragonflies-insects capable of performing very complex and fast maneuvering in flight. The motor neuropil in dragonflies was shown to be more differentiated than in less mobile insects, while its motor nuclei are more outlined and approached to each other. There were revealed dendrites of the leg muscle motoneurons (intermediate nucleus), running to the anterior and posterior nuclei that contain dendrites of the wing muscle motoneurons. A possible role of such a dendrite approaching is discussed for close functional cooperation of wing and leg muscles essential for dragonflies to catch a large prey in flight by using their legs. Peculiarities of structural organization of the wing muscle motoneurons in dragonflies and locusts are considered to suggest the greater functional capabilities of motoneurons in the dragonfly motor apparatus." (Authors)] Address: Svidersky, V.L., Sechenov Institute of Evolutionary Physiology and Biochemistry, Russian Academy of Sciences, St. Petersburg, Russia. E-mail: vlsvider@iephb.ru

12292. Postler, E.; Postler, W.; Schiel, F.-J.; Martens, A. (2012): Die Quagga-Muschel Dreissena rostriformis bugensis als neuer Aufsitzer von Libellenlarven (Bivalvia: Dreissenidae; Odonata: Gomphidae, Libellulidae). Libellula 31(3/4): 237-241. (in German, with English summary) ["The quagga mussel Dreissena rostriformis bugensis as a new epizoon of odonate larvae (Bivalvia: Dreissenidae; Odonata: Gomphidae, Libellulidae) – Individuals of Dreissena rostriformis bugensis, an invasive species rapidly spreading in navigable inland waters of Central Europe, were reported from two exuviae of Gomphus vulgatissimus collected at the Datteln-Hamm-Kanal near Bergkamen, Germany, on 03-v-2012 and from an exuvia of Orthetrum cancellatum collected at a gravel-pit lake on 27-v-2012 next to the Upper Rhine River near Dettenheim north of Karlsruhe, Germany. These seem to be the first records of D. r. bugensis epizoic on odonate larvae; so far all reports from North America and from Western and Central Europe deal with the zebra mussel Dreissena polymorpha. Further findings of D. rostriformis settling epizoically on odonate larvae are expected." (Authors)] Address: Postler, W., Hammer Str. 39, D-59174 Kamen, Germany. E-mail: w.postler@t-online.de

12293. Prpic, N.-M. (2012): Nomenclatural note on the identity of Agrion viridis Vander Linden, 1820: a plea for the selection of a neotype (Odonata: Zygoptera, Lestidae). Nachrichtenblatt der Bayerischen Entomologen 61(3/4): 76-79. (in German, with English summary) ["It has been recognized previously that the name for the Western Willow Spreadwing, Lestes viridis, in its original combination Agrion viridis Vander Linden, 1825, is a junior homonym of Agrion viridis Vander Linden, 1820, which is regarded as a junior synonym of Lestes barbara. The junior homonym normally must be replaced by its junior synonym Agrion leucopsallis De Charpentier, 1825, which would remove a well established and widely used name from the Odonata. Here I show that Agrion viridis Vander Linden, 1820, is no synonym of Lestes barbara, but has been based on a heterogenous type series that also contained several other Lestes species. Since no types are extant, it is suggested that a topotypic neotype should be selected to establish the identity of Agrion viridis Vander Linden, 1820, with the species currently called Lestes viridis. This action would conform to the regulations of the International Code of Zoological Nomenclature and preserve the usage of Lestes viridis." (Author)] Address: Pripic, N.-M., Georg-August-Universität Göttingen, Johann-Friedrich-Blurnenbach-Institut für Zoologie und Anthropologie, Abteilung für Entwicklungsbiologie, GZMB Emst-Caspari-Haus, Justus-von-Liebig-Weg 11, 37077 Göttingen, Germany. E-Mail: nprpic@uni-goettingen.de

12294. Pryswitt, K.-P. (2012): Ein Vorkommen von der Pokaljungfer (Erythromma lindenii) bei Neustadt - Poggenhagen. Mitteilungen der Arbeitsgemeinschaft Zoologische Heimatforschung Niedersachsen 17/18: 10-11. (in German) [6-VIII-2006, gravel pit near Wunstorf, Niedersachsen, Germany] Address: Pryswitt, K.-P., Lessingstr. 2, 31535 Neustadt a.Rbge., Germany

12295. Pugh, A.R. (2012): Effects of restoration on the waterways in the Styx River catchment. The Weta 44: 28-41. (in English) ["Riparian restoration of waterways is important in restoring, preserving, and enhancing their ecological and aesthetic values, particularly in lowland Canterbury where most waterways are severely degraded due to anthropogenic changes to the landscape. In order to assess the effects of riparian restoration in the Styx River catchment, aquatic macroinvertebrates were sampled at eight sites, seven within the Styx River catchment and a control site (there with Xanthocnemis). Comparisons were made between sites using the SQMCI biotic index, taxon richness and diversity, percentage EPT taxa, and by analysing macroinvertebrate community composition dissimilarity. The Styx River catchment is in relatively good condition compared to other lowland urban waterways in Canterbury; riparian restoration appears to be beneficial for the waterway macroinvertebrate communities, but currently unrestored sites require more than restoration of the riparian zone." (Author)] Address: Pugh, A.R., Dept of Ecology, Lincoln University, New Zealand. E-mail: Andrew.Pugh@lincolnuni.ac.nz

12296. Rebora, M.; Salerno, G.; Piersanti, S.; Dell'Otto, A.; Gaino, E. (2012): Olfaction in dragonflies: Electrophysiological evidence. Journal of Insect Physiology 58(2): 270-277. (in English) ["The problem of olfaction in Paleoptera (Odonata, Ephemeroptera) cannot be considered fully elucidated until now. These insects have been traditionally considered anosmic, because their brain lacks glomerular antennal lobes, typically involved in Neoptera odor perception. In order to understand if the presumed coeloconic olfactory receptors described on the antennal flagellum of adult Odonata are really functioning, we performed an electrophysiological investigation with electroantennogram (EAG) and single cell recordings (SCR), using Libellula depressa as a model species. Odors representing different chemical classes such as (Z)-3-hexenyl acetate (acetate ester), (E)-2-hexenal, octanal (aldehydes), (Z)-3-hexen-1-ol (alcohol), propionic acid, butyric acid (carboxylic acids), and 1,4-diaminobutane (amine) were tested. Most of the tested chemicals elicited depolarizing EAG responses in both male and female antennae; SCR show unambiguously for the first time the presence of olfactory neurons in the antennae of L. depressa and strongly support the olfactory function of the coeloconic sensilla located on the antennal flagellum of this species. Electrophysiological activity may not necessarily indicate behavioural activity, and the biological role of olfactory responses in Odonata must be determined in behavioural bioassays. This study represents a starting point for further behavioural, electrophysiological, neuroanatomical and molecular investigation on Odonata olfaction, a research field particularly interesting owing to the basal position of Paleoptera, also for tracing evolutionary trends in insect olfaction. Olfaction in Paleoptera (Odonata/Ephemeroptera) is still an open question. Libellula depressa bears presumed olfactory sensilla on its antennae. We performed an electrophysiological investigation (EAG, SCR) on these antennae. Depolarizing EAG and SCR responses to chemicals were recorded in males and females. This is the first clear identification of olfactory receptor neurons in Odonata." (Authors)] Address: Rebora, Manuela, Dipartimento di Biologia Cellulare e Ambientale, Via Elce di Sotto, 06123 Perugia, Italy. E-mail: rebora@unipg.it

12297. Rosario, K.; Dayaram, A.; Marinov, M.; Ware, J.; Kraberger, S.; Stainton, D.; Breitbart, M.; Varsani, A. (2012): Diverse circular single-stranded DNA viruses discovered in dragonflies (Odonata: Epiprocta). Journal of General Virology 93: 2668-2681. (in English) ["Viruses with circular single-stranded DNA (ssDNA) genomes that encode a replication initiator protein (Rep) are among the smallest viruses known to infect both eukaryotic and prokaryotic organisms. In the past few years an overwhelming diversity of novel circular Rep-encoding ssDNA (CRESS-DNA) viruses has been unearthed from various hosts and environmental sources. Since there is limited information regarding CRESS-DNA viruses in invertebrates, this study explored the diversity of CRESS-DNA viruses circulating among insect populations by targeting dragonflies (Epiprocta), top insect predators that accumulate viruses from their insect prey over space and time. Using degenerate PCR and rolling circle amplification coupled with restriction digestion, 17 CRESS-DNA viral genomes were recovered from eight different dragonfly species collected in tropical and temperate regions. Nine of the genomes are similar to cycloviruses and represent five species within this genus, suggesting that cycloviruses are commonly associated with insects. Three of the CRESS-DNA viruses share conserved genomic features with recently described viruses similar to the mycovirus Sclerotinia sclerotiorum hypovirulence-associated DNA virus 1, leading to the proposal of the Gemycircularvirus genus. The remaining viruses are divergent species representing four novel CRESS-DNA viral genera including a gokushovirus-like prokaryotic virus (microphage) and

three eukaryotic viruses with Reps similar to circoviruses. The novelty of CRESS-DNA viruses identified in dragonflies using simple molecular techniques indicates that there is an unprecedented diversity of ssDNA viruses among insect populations." (Authors)] Address: Ware, Jessica L., Rutgers, The State Univ. of New Jersey, Cook College, 93 Lipman Drive, New Brunswick, New Jersey 08901, USA. E-mail: jware@amnh.org

12298. Rosset, V.; Simaika, J.P.; Arthaud, F.; Bornette, G.; Samways, M.J.; Oertli, B.; Vallod, D. (2012): Comparative assessment of scoring methods of the conservation value of biodiversity in ponds and small lakes. Aquatic Conservation: Marine and Freshwater Ecosystems 23: 23-36. (in English) ["Fresh waters are among the most endangered ecosystems in the world. Practical tools to measure their biodiversity value are needed for their effective conservation. Besides species richness, other aspects of biodiversity, including the threat level of species also need to be considered. Currently, existing scoring methods for assessing the conservation value of freshwater fauna and flora assemblages are varied, and guidelines to select an appropriate method are lacking. In this paper, it is hypothesized that scores to assess the conservation value of assemblages can vary markedly according to the type of method used. To test this, four types of scoring methods were applied differing in the weight given to Red List categories and in the expression of the score, i.e. either using mean per species or the assemblage as a whole, on sets of dragonfly and macrophyte data collected from varied types of small lakes and ponds in three different countries (France, Switzerland and South Africa). The comparison of the different types of methods showed that the type of method used had a marked impact on the assessment of the conservation value of a water body: the expression per species or per assemblage as the weight given to Red List categories changed the value of a given water body. Overall, results also confirmed that the different types of methods could be applicable in different geographical areas and types of standing water bodies, independently of the original area where the method was developed. Results illustrated that, besides the species richness assessment commonly used, calculating conservation value as a mean per species is useful because it provides additional information. Overall, using methods expressed as a mean per species and coupling the Red List with other criteria gave the best performance." (Authors) The analysis includes Odonata identified at the order level.] Address: Rosset, Véronique, University of Applied Sciences Western Switzerland, hepia Geneva technology, architecture and landscape, 1254 Jussy-Geneva, Switzerland. E-mail: veronique@rosset.org

12299. Rudolph, R. (2012): Die Libellen der Germanengöttin Frigga. Odonatologica 41(3): 251-266. (in English) ["In 1919, the German author Hermann Löns published 'Wasserjungfern. Von Sommerboten und Sonnenkundern' (Voigtländer-Verlag, Leipzig), a collection of thirteen dragonfly stories written in a particular emotional style. Here Löns stated that in paganian Germanic times dragonflies had been consecrated to the goddess Frigga and that, therefore, early missionaries had damned dragonflies as diabolic, imposing on them the names 'Satansbolzen' and 'Teufelsnadel'. The 'Wasserjungfern' were reprinted many times up to today and these statements have become widespread popular belief in Germany. Their diction being close to Nazi-terminology, Löns's statements as to Frigga and the damnation of dragonflies were amended from the first edition following WW II but appeared again in all later editions. Here it is shown, by analyzing mythological and earliest clerical as well as ethnographic and old entomological literature, that dragonflies never have been consecrated to a Germanic goddess and that no clerical damnation ever took place." (Author)] Address: Rudolph, R., Kloosterweg 25, NL-5853 EE Siebengewald, The Netherlands

12300. Sabagh, L.T.; Carvalho-e-Silva, A.M.P.T.; Rocha, C.F.D. (2012): Biota Neotropica 12(4). Diet of the toad Rhinella icterica (Anura: Bufonidae) from Atlantic Forest highlands of southeastern Brazil: 258-262. (in English, with Portuguese summary) ["In this study, we present some information of the regarding throphic niche from the anuran toad R. icterica living in high altitudes above 2000 m a.s.l. from a habitat of the Atlantic Forest Biome – the Altitude Fields in the Itatiaia National Park. We found 150 prey items in toad stomachs, belonging to five prey types, as well as skin remains and some remains of plant material. The index of relative importance indicated that most important prey types were beetles and ants, these last composing 70% of the diet numerically and the trophic niche breadth (B) was 1.81. The relatively low diversity of prey types we recorded in the diet of R. icterica of Itatiaia and numerically dominated by ants suggests some preference for this item. We do not found significant relationship between the toad measurements with the preys' measurements. We concluded that R. icterica toads at the highlands of Itatiaia feeds on arthropods, mainly ants and coleopterans and that the high consumption of preys with relatively small and similar size as ants in the diet prevents an expected relationship among frog body or mouth size and prey volume and size." (Authors) Odonata contributed with 1.3% (n=2) to the diet of 17 toad specimens.] Address: Sabagh, L.T., Laboratório de Ecologia de Vertebrados, Depto de Ecologia, Univ. do Estado do Rio de Janeiro – UERJ, Rua São Francisco Xavier, 524, Maracanã, CEP 20550-019, Rio de Janeiro, RJ, Brasil. E-mail: leandro.sabagh@gmail.com

12301. Sánchez, A.B. (2012): Confirmación de la presencia actual de Lestes macrostigma (Eversmann, 1832) (Odonata: Lestidae) en la provincia de Cádiz (sudoeste de la Península Ibérica). Boletín de la S.E.A. 50(1): 565-566. (in Spanish, with English summary) ["Presence of populations of L. macrostigma in Cadiz province is confirmed, after more than 15 years without observations of this species, indicating the importance of these populations to guarantee the possible genetic flow between the populations of Doñana (Huelva and Seville) and the Natural Reservation Laguna de Fuente de Piedra (Malaga)." (Author)] Address: Sánchez, A.B., C/ Juan Ramón Jiménez 28. 11160 – Barbate (Cádiz, España) Arturo.libelula@gmail.com

12302. Santos Loureiro, N.; Pontes, L. (2012): The Trithemis nigra (Odonata: Libellulidae) of Príncipe Island, Gulf of Guinea. African Journal of Ecology 51: 180-183. (in English) ["Príncipe is a 114 km² volcanic island (1°36'N; 7°24'E) in the Gulf of Guinea, Africa. T. nigra was firstly described by Longfield (1936) as a subspecies of Trithemis donaldsoni (Calvert, 1899), after having examined two males collected by W.H.T. Tams in December 1932 and January 1933, at Príncipe Island, a former Portuguese colony in the Gulf of Guinea.... It seems that following the expedition of Tams, nobody re-

turned to Príncipe Island to add new field data concerning T. nigra... In this note, we present the results of a new survey carried out in March and August 2011. The occurrence of the species was confirmed and threats were evaluated. Fifteen localities were investigated in the August 2011 survey, and the species was found in five out of them... According to our observations, the habitat preference of T. nigra is for permanent lotic systems with abundant flowing freshwater and a mix of direct solar light and shades provided by the forest trees and shrubs. The 'Critically Endangered' category assigned in 1996 is maintained, the species was recognized as an endemism for Príncipe." (Authors)] Address: Santos Loureiro, N., Centre for Environmental Biology – ADC, Faculdade de Ciências da Universidade de Lisboa - Campo Grande Ed. C2, 1749-016 Lisboa, Portugal. E-mail: odonata@nsloureiro.pt

12303. Schneider, T.; Schneider, J. (2012): Sommerbeobachtungen von Libellen am unteren Nil in Ägypten (Odonata). Libellula 31(3/4): 257-266. (in German, with English summary) ["Summer observations of Odonata on the Lower Nile in Egypt – In June 2012, a total of 13 species was recorded on the River Nile south of Cairo. Of special interest was the first record of Acisoma panorpoides on the Nile in Egypt. This shows that the Nile can be used as a corridor by this species to reach the Mediterranean coast from tropical Africa. Mesocnemis robusta, a species which is classified as «critical relict» or «critically endangered» for North Africa, was found to be one of the most abundant dragonflies on the Nile. Some observations from the Nile Delta are added." (Authors)] Address: Schneider, T., Arnold-Knoblauch-Ring 76, 14109 Berlin/Wannsee, Germany. E-mail: thomas.rs@gmx.de

12304. Schorr, M.; Wolf, J. (2012): Bibliografie der für Deutschland publizierten Libellenliteratur (Odonata). Libellula, Supplement 11: 5-420. (in German, with English summary) ["This bibliography is a summary of over 6,400 titles about the Odonata of Germany. It starts with a quotation of 6,018 titles with relevance to Germany, including titles that originated in academic institutions. Besides individual studies, these were researched from about 1,000 periodicals from several countries. To ease the research on species, faunistic, biological, ecological, and geographical facts, all titles are tagged to approximately 1,000 words or phrases. Thanks to many parts also being in English, the contents of the quoted literature are also open to foreign users. The next chapter reviews around 400 quotations of unpublished titles about Odonata. Because of the nature of "grey literature" this chapter surely can only be a selection of an unknown amount of expertise and other unpublished literature." (Authors)] Address: Schorr, M., Schulstr. 7B, 54314 Zerf, Germany. E-mail: bierschorr@online.de

12305. Schröter, A.; Borisov, S.N. (2012): Coenagrion scitulum in Central Asia: a biogeographical analysis and rectification (Odonata: Coenagrionidae). Libellula 31(3/4): 267-283. (in English, with German summary) ["This study provides information on the occurrence of Coenagrion scitulum in Central Asia, in English for the first time. Based on critical evaluation of published and previously unpublished data, a schedule of records and an up-to-date distribution map is presented. With reference to occurrence of C. scitulum in Europe, specific chorological and ecological characteristics of Central Asian C. scitulum are discussed and by means of the example of a Kyrgyz population a regional habitat of C. scitulum is described. C. scitulum is among those dragonfly species being widely distributed in Europe and whose eastern limit of distribution runs through Central Asia. Due to language barriers and insufficient communication, a considerable lack of knowledge of the proper distribution range of such species amongst European odonatologists seems to persist. This article addresses the knowledge gap and aims to rectify erroneous statements and establish the correct eastern limit of distribution of C. scitulum in European non-Russian-language odonatological literature." (Authors)] Address: Schröter, A., Rasenweg 10, 37130 Gleichen, Germany. E-mail: AsmusTim@gmx.de

12306. Selva Kumar, C.; Nair, R.R.; Sivaramakrishnan, K.G.; Ganesh, D.; Janarthanan, S.; Arunachalam, M.; Sivaruban, T. (2012): Influence of certain forces on evolution of synonymous codon usage bias in certain species of three basal orders of aquatic insects. Mitochondrial DNA 23(6): 447-460. (in English) ["Forces that influence the evolution of synonymous codon usage bias are analyzed in six species of three basal orders of aquatic insects. The rationale behind choosing six species of aquatic insects (three from Ephemeroptera, one from Plecoptera, and two from Odonata) for the present analysis is based on phylogenetic position at the basal clades of the Order Insecta facilitating the understanding of the evolution of codon bias and of factors shaping codon usage patterns in primitive clades of insect lineages and their subtle differences in some of their ecological and environmental requirements in terms of habitat-microhabitat requirements, altitudinal preferences, temperature tolerance ranges, and consequent responses to climate change impacts. The present analysis focuses on open reading frames of the 13 protein-coding genes in the mitochondrial genome of six carefully chosen insect species to get a comprehensive picture of the evolutionary intricacies of codon bias. In all the six species, A and T contents are observed to be significantly higher than G and C, and are used roughly equally. Since transcription hypothesis on codon usage demands A richness and T poorness, it is quite likely that mutation pressure may be the key factor associated with synonymous codon usage (SCU) variations in these species because the mutation hypothesis predicts AT richness and GC poorness in the mitochondrial DNA. Thus, AT-biased mutation pressure seems to be an important factor in framing the SCU variation in all the selected species of aquatic insects, which in turn explains the predominance of A and T ending codons in these species. This study does not find any association between microhabitats and codon usage variations in the mitochondria of selected aquatic insects. However, this study has identified major forces, such as compositional constraints and mutation pressure, which shape patterns of codon usage in mitochondrial genes in the primitive clades of insect lineages." (Authors)] Address: Selva Kumar,C. Department of Zoology, University of Madras, Chennai 600 025, Tamil Nadu, India

12307. Sharma, R.K.; Agrawal, N. (2012): Faunal diversity of aquatic insects in Surha Tal of District - Ballia (U. P.), India. Journal of Applied and Natural Science 4(1): 60-6. (in English) [The regional diversity of aquatic insect fauna was studied during 2006-08. Twenty nine species of aquatic insect were collected including Mesogomphus lineatus, Potamarcha obscura, Ischnura aurora aurora, I. senegalensis and Agriocnemis pygmaea.] Address: Sharma, R.K., Department of Zoology,

University of Lucknow, Lucknow-226007, India. E-mail: rajnish.enviro.80@gmail.com

12308. Sheikh, E.M.; Douglas, M. (2012): Biodiversity, phenology, and thermoregulatory strategies of odonates at Pierce Cedar Creek Institute. Undergraduate Research Grants for the Environment Report, Grand Rapids Community College: 24 pp. (in English) ["Forty-three species of dragonflies from five families and sixteen species of damselflies from three families were identified at Pierce Cedar Creek Institute in Hastings, Michigan (latitude 42.6459 and longitude -85.2908) between May 7 and August 10, 2012. Our study showed that Pierce Cedar Creek Institute provides habitat to a greater number and variety of odonates than expected. The diurnal phenology of the odonates varied by species, with smaller and medium dragonflies generally out earlier in the day and active into the afternoon, and large dragonflies are more active near dusk. We found that dragonflies and damselflies use a variety of active and passive thermoregulatory strategies. We found that the mean Ä T (the difference between ambient and thoracic temperature) as well as the heating / cooling curves and preferred flight temperatures, are positively correlated with increasing thoracic size of the odonate. In addition, we found that the flow of haemolymph from the wings to the thorax does not function to significantly regulate thoracic temperature." (Authors)] Address: Sheikh, Elaine M.

12309. St. Clair, C. (2012): Effects of atrazine exposure on immune function and cannibalistic behavior of dragonfly larvae. M.S. thesis, Murray State University: 74 pp. (in English) ["Chapter 1: Agricultural runoff containing herbicide is known to have adverse effects on freshwater organisms. Aquatic insects are particularly susceptible, and herbicide runoff has the potential to affect immunity in this group. I examined the effect of atrazine, an herbicide commonly used in the United States, on immune function in larvae of Plathemis lydia during a long-term exposure at ecologically relevant concentrations. Larvae were exposed to concentrations of 0, 1, 5 and 10 ppb atrazine for three or six weeks. Haemocyte counts, haemolymph phenyloxidase (PO) activity, cuticular and gut PO, encapsulation ability and post-encapsulation PO were measured at the end of each trial period as indicators of immune system strength. Atrazine concentration had a significant effect on haemocyte counts after controlling for the effect of larva size. There was a significant interaction between time and concentration for haemolymph PO, cuticular PO, and a marginal interaction for gut PO. Therefore, atrazine affects both haemocyte numbers and phenyloxidase activity over time in P. lydia. The exact impact of the changes is unclear. However, the changed immune function demonstrated in this study is likely to modify susceptibility to pathogens, alter wound healing and may decrease available energy for growth and metamorphosis. Chapter 2: Agricultural runoff containing herbicide is known to have adverse effects on freshwater organisms. Aquatic insects are particularly susceptible, and herbicide runoff has the potential to affect behaviour in this group. Here I examine the effects of short-term exposure to the herbicide atrazine on cannibalistic behaviour in larvae of Libellula luctuosa. Large focal larvae (> 12 mm length) were exposed to 0, 1, 10, or 100 ppb atrazine for 96 hours. A smaller (< 8 mm) conspecific was then placed with the focal larva, and its behaviour observed for 30 minutes. Time until initiation of stalking and time until strike were noted. After the initial 30 minutes, each pair was checked at 2, 4, 6, 24 and 48 hours. Time of consumption and amount consumed were noted. The number of larvae that engaged in cannibalistic activity within the initial 30-minute observation period was significantly higher for controls compared to all experimental treatments. When stalking, striking and consumption times were examined together (a measure of overall response time) concentration had a significant effect, with the 10 ppb group taking significantly longer to cannibalize than the control group." (Author)] Address: not stated

12310. Stavenga, D.G.; Leertouwer, H.L.; Hariyama, T.; De Raedt, H.A.; Wilts, B.D. (2012): Sexual dichromatism of the damselfly Calopteryx japonica caused by a melanin-chitin multilayer in the male wing veins. PLoS ONE 7(11): e49743. doi:10.1371/journal.pone.0049743: 7 pp. (in English) ["Mature male C. japonica damselflies have dark-blue wings, due to darkly coloured wing membranes and blue reflecting veins. The membranes contain a high melanin concentration and the veins have a multilayer of melanin and chitin. Female and immature C. japonica damselflies have brown wings. We have determined the refractive index of melanin by comparing the differently pigmented wing membranes and applying Jamin-Lebedeff interference microscopy. Together with the previously measured refractive index of chitin the blue, structural colour of the male wing veins could be quantitatively explained by an optical multilayer model. The obtained melanin refractive index data will be useful in optical studies on melanized tissues, especially where melanin is concentrated in layers, thus causing iridescence." (Authors)] Address: Stavenga, D.G., Computational Physics, Zernike Institute for Advanced Materials, University of Groningen, Groningen, The Netherlands, E-mail: D.G.Stavenga@rug.nl

12311. Stewart, S.S. (2012): Variation in fluctuating asymmetry among nine damselfly species. M.S. thesis. Dept. of Biology. Baylor University: (in English) ["Fluctuating asymmetry (FA), measured as random deviations from bilateral symmetry, likely results from developmental disturbances by internal or environmental stresses. However, comparisons of FA in single damselfly species from stresssed environments have often been inconclusive. We measured levels of FA among multiple species of damselflies from the same environment to determine the relative roles of environmental stress and species specific developmental instability. Damselflies of nine species were collected from a central Texas wetland. Calculations of their FA were based on cell counts of four venation patterns in fore and hind wings. Significant FA of venation occurred in both sexes, both wing positions, and in each of four venation patterns of all nine species. Levels of FA were not significantly different between sexes or between wing positions for any of the nine species. However, FA varied significantly among the four venation patterns. Patterns with lowest mean cell counts had significantly higher FA than the other patterns, despite scaling to remove size bias. More broadly, a three-fold difference in overall FA occurred among the nine species and was not correlated with species mean weight or abdomen length. The wide range of FA levels among multiple species in the same environment casts doubt on the effective use of FA of a single species to indicate of environmental stress. Future research must examine the relative roles of species-specific predispositions for FA from internal genetic

stresses as well as external stressors." (Author) For a published version of the thesis see: Stewart, S.S.; Vodopich, D.S. (2013): Variation in fluctuating asymmetry among nine damselfly species. International Journal of Odonatology 16(1): 67-77.] Address: Stewart, Sherry, Department of Biology, Baylor University, Waco, TX, 76798-7388, USA

12312. Stobbe, H. (2012): Besondere Libellenfunde auf Kreta im Oktober 2011 (Odonata). Libellula 31(3/4): 251-256. (in German, with English summary) ["18 Odonata species were spotted in the Greek island of Crete during October 2011. A visual observation of a female Calopteryx virgo festiva on the Megalou Potamos documented the first re-sighting of this species after more than 150 years. Several males of Trithemis arteriosa flew on a reservoir near Skourvoula. This species is not only new for Crete but for the whole European continent. It is argued that both spp. most probably originated from the east, and came via southwestern Turkey and the Dodecanese Islands. Sightings of Boyeria cretensis in October confirm a long flying season until autumn. The check-list of Crete comprises 35 Odonata species so far." (Author)] Address: Stobbe, H., Wulksfelder Weg 9A, D-22889 Tangstedt, Germany. E-mail: Hartwig.Stobbe@t-online.de

12313. Suhonen, J.; Suutari, E.; Kaunisto, K.M.; Krams, I. (2012): Patch area of macrophyte Stratiotes aloides as a critical resource for declining dragonfly Aeshna viridis. Journal of Insect Conservation 17(2): 393-398. (in English) ["Currently, many rare and endangered species occur in fragmented habitats. Habitat patch size is often used as an easily measured surrogate of habitat quality and local population size. We investigated whether habitat patch size affects the presence and density of larvae of the endangered dragonfly Aeshna viridis, which for a large part of their life history depend on the macrophyte Stratiotes aloides rosette. The study was performed in four populations, two from Finland and two from Latvia. Our main result was that density of A. viridis and patch occupation increased with area of S. aloides patch. The results may be due to larvae actively avoiding enemies (higher survival) and/or to the possibility that females laid higher number of eggs in the large S. aloides patches. Our results indicate that local abundance and persistence of A. viridis population may depend on the few, large S. aloides patches rather than several small patches of equal total area." (Authors)] Address: Suhonen, J., Section of Ecology, Dept of Biology, University of Turku, 20014 Turku, Finland. E-mail: juksuh@utu.fi

12314. Taylor, D.J.; Titus-Mcquillan, J.; Bauer, A.M. (2012): Diet of Chalcides ocellatus (Squamata: Scincidae) from southern Egypt. Bulletin of the Peabody Museum of Natural History 53(2): 383-388. (in English) ["We studied the diet of the skink C. ocellatus (Forskål, 1775) from southern Egypt using stomach contents from a large series of specimens collected during the Yale University Prehistoric Expedition to Nubia. Only 2.5% of specimens contained identifiable prey items. Insect larvae, coleopterans and orthopterans were the most important prey items. The first two of these prey categories are typically among the most important in the diet of this species in other areas of its broad distribution. Males and females differed somewhat in their diets and had a dietary overlap of 0.607. Males had relatively larger head widths than females, but this is likely to be related to sexual selection rather than dietary segregation." (Authors) One female had preyed on an Odonata specimen.] Address: Taylor, D.J., Department of Biology, Villanova University, 800 Lancaster Avenue, Villanova PA 19085 USA. E-mail: dylan.taylor@villanova.edu

12315. Termaat, T.; Kalkman, V.J. (2012): De nieuwe Rode Lijst Libellen. Vlinders 2 2012: 4-7. (in Dutch, with English summary) ["The new Red List for dragonflies: Red Lists have to be updated every ten years, and as the previous Red List for dragonflies of the Netherlands was written in 1997, a new one was finally made in 2011. As the current method for evaluating species differs, the 1997 data had to be re-evaluated to make comparison of the lists possible. During the last fourteen years, the status of Dutch dragonflies has improved. Three nationally extinct species reappeared. Eight species have increased, now considered to be of least concern. Six more species have become less threatened. The downside is that two species which used to be of least concern are now vulnerable and one other species shifted from endangered to critically endangered. Environmental and nature conservation measures have mediated the positive picture for most dragonflies, but the improvements are not large enough for some of the most critical species. Climate change also plays a positive role for many species, but might be a risk for others. Dragonfly data collected by voluntary observers are crucial to be able to make Red Lists, now and in the future." (Authors)] Address: Termaat, T., Rijnsteeg 8-10a, 6708 PP Wageningen,The Netherlands. E-mail: tim.termaat@vlinderstichting.nl

12316. Theischinger, G.; Richards, S.J. (2012): Gynacantha heros spec. nov., a large crepuscular species from Papua New Guinea (Anisoptera: Aeshnidae). Odonatologica 41(4): 355-359. (in English) ["The new species is described. Holotype male: Papua New Guinea, Sepik Basin, 31-V-2010, at light; deposited in the Museum & Art Gallery of the Northern Territory (NTM), Darwin, Australia. It is the 6th and the largest member of the genus recorded from the island of New Guinea. Characters of the adult male are illustrated and the affinities of the new species are discussed." (Authors)"] Address: Theischinger G., 2A Hammerley Road, Grays Point, NSW 2232, Australia. E-mail: Gunther.Theischinger@environment.nsw.gov.au

12317. Theischinger, G.; Richards, S.J. (2012): Akrothemis, a new libellulid genus from Papua New Guinea (Anisoptera: Libellulidae). Odonatologica 41(4): 337-345. (in English) ["The new genus is established for Oda risi Campion, 1915. Photos of the holotype of O. risi are presented, and the supposed female of this species is described for the first time. A second species, Akrothemis bimaculata sp. n., from Papua New Guinea is described as new. Holotype female: Papua New Guinea, Kaugumi Camp, E Sepik Prov., alt 60 m a.s.l., 4-X-2010 (NTM 1008589). Akrothemis appears to belong in Tetrathemistinae and may be most closely related to a group of genera around Tetrathemis Brauer, 1868." (Authors)] Address: Theischinger G., 2A Hammerley Road, Grays Point, NSW 2232, Australia. E-mail: Gunther.Theischinger@environment.nsw.gov.au

12318. Thipaksorn, A.; Apiwathnasorn, C.; Ruangsittichai, J. (2012): Modified molecular techniques for detecting rice odonate insects in Thailand. Munis Entomology & Zoology7(2): 852-856. (in English) ["Rice odonates are beneficial predators that can help control insect pests in rice, so playing a valuable role in the rice eco-

system. Morphological classification is not reliable at the taxonomic level for some species. Thus, molecular techniques may be used to resolve species more accurately. Normally, genetic DNA sequence amplification is used in molecular identification. This study modified and developed one stage of the DNA extraction process to permit DNA extraction from a single insect leg. After cytochrome oxidase subunit 1 (COI) amplification, nucleotide banding was conducted to determine the efficiency of the extracted DNA. The results showed that this modification to DNA extraction could yield sufficient DNA to amplify the COI gene, and thus be a practical tool for detecting odonates using molecular techniques." (Authors) Agriocnemis pygmaea, Ischnura a. aurora, Ischnura senegalensis, Brachythemis contaminata, Diplacodes trivialis] Address: Apiwathnasorn, C., Dept of Medical Entomology, Faculty of Tropical Medicine, Mahidol Univ., Ratchawithi Road, Ratchathewi, Bangkok 10400, Thailand. E-mail: tmjrs@mahidol.ac.th

12319. Tiple, A.D. (2012): Odonata fauna with their status of Achanakmar-Amarkantak Biosphere Reserve, Madhya Pradesh and Chhattisgarh. International Journal of Biotechnology and Bio Sciences 2(1): 97-101. (in English) ["The paper reports detailed entomological survey on the Odonata diversity in Achanakmar-Amarkantak Biosphere Reserve. During the course of study 70 species of Odonata belonging to 12 families is provided. The highest number of Odonate were recorded belonging to the Libellulidae (31 species), followed by Coenagrionidae (15), Gomphidae, (5), Protoneuridae (3) and Lestidae (3), Aeshnidae (4 species), Platycnemididae (2 species), Calopterygidae and Chlorocyphidae (2 species) and Euphaeidae, Corduliidae and Macromiidae (one species). Of the total 67 species 23 were very common, 21 were common, 18 rare and 5 very rarely in occurrence. The observations support the high value of this Achanakmar-Amarkantak Biosphere Reserve for conservation of Odonata and research on their biology." (Authors)] Address: Tiple A. D., Department of Zoology, Vidyabharti College Seloo, Wardha, Maharastra, India and Forest Entomology Division, Tropical Forest Research Institute, Jabalpur 482021, India. E-mail: ashishdtiple@yahoo.co.in

12320. Tyrrell, M. (2012): The impact of spring temperature on emergence patterns in five 'spring' species. J. Br. Dragonfly Society 28(2): 102-107. (in English) ["The first emergence dates for five 'spring' species were monitored at a single site over a seven season period. During this time, average spring temperature was also monitored and the two related to determine the impact of average air temperature on the first emergence of each species. It was noted that during warm springs, for example 2007 and 2011, the five species emerged significantly earlier than in an average spring, for example 2010. During a cold spring, for example 2012, first emergence coincided with the dates for average springs. This implies that, for these species, spring air temperature is only a critical factor determining emergence if it is high, in which case day length is not a trigger but sun intensity may be. Cooler temperatures in spring have little or no impact on first emergence compared to an average spring, in which case day length may then be the critical factor determining emergence." (Author)] Address: Tyrrell, M., 8 Warwick Close, Raunds, Northants, NN9 6JH, UK

12321. van der Poorten, N.; Conniff, K. (2012): The taxonomy and conservation status of the dragonfly fauna (Insecta: Odonata) of Sri Lanka. In: The National Red List 2012 of Sri Lanka; Conservation Status of the Fauna and Flora. Weerakoon, D.K. & S. Wijesundara Eds., Ministry of Environment, Colombo, Sri Lanka: 1-10. (in English) ["The current list for Sri Lanka includes 118 species in 12 families with a high degree of endemism: there are 47 endemic species and an additional 8 endemic subspecies. Three new endemic species are in the process of description. Since the last IUCN Red List publication (2007), five new endemic species have been described: Drepanosticta bine, D. anamia, D. mojca (Bedjanic, M., 2010), Lyriothemis defonsekai (van der Poorten, 2009a) and Libellago corbeti (van der Poorten, 2009b)." (Authors)] Address: Conniff, Karen, C\O ICIMOD, Khumaltar, Lalitpur, G.P.O Box 3226, Kathmandu, Nepal

12322. Vercken, E.; Wellenreuther, M.; Svensson, E. I.; Mauroy, B. (2012): When asymmetrical fitness costs select for suboptimal traits: the cliff-edge hypothesis revisited. PLoS ONE 7(4): e34889. doi:10.1371/journal.pone.0034889: 9 pp. (in English) ["The cliff-edge hypothesis introduces the counterintuitive idea that the trait value associated with the maximum of an asymmetrical fitness function is not necessarily the value that is selected for if the trait shows variability in its phenotypic expression. We develop a model of population dynamics to show that, in such a system, the evolutionary stable strategy depends on both the shape of the fitness function around its maximum and the amount of phenotypic variance. The model provides quantitative predictions of the expected trait value distribution and provides an alternative quantity that should be maximized (''genotype fitness'') instead of the classical fitness function (''phenotype fitness''). We test the model's predictions on three examples: (1) litter size in guinea pigs, (2) sexual selection in damselflies, and (3) the geometry of the human lung. In all three cases, the model's predictions give a closer match to empirical data than traditional optimization theory models. Our model can be extended to most ecological situations, and the evolutionary conditions for its application are expected to be common in nature.... Our second example deals with a secondary sexual trait in Calopteryx splendens, using survival and mate choice data obtained in the field ([30], M. Wellenreuther, E. Vercken and E. Svensson, unpublished data)." (Authors)] Address: Vercken, Elodie, Institut Sophia Agrobiotech, UMR 1355 ISA, Institut National de la Recherche Agronomique, Sophia-Antipolis, France. E-mail: elodie.vercken@sophia.inra.fr

12323. Villanueva, R.J.T.; Cahilog, H. (2012): Notes on a small Odonata collection from Tawi-Tawi, Sanga-Sanga and Jolo islands, Philippines. International Dragonfly Fund - Report 55: 1-32. (in English) ["Sulu region is among the least explored faunal region in the Philippine archipelago. Odonatologically, this region is poorly studied until recently. Presently a survey conducted in July 1 – 14, 2011 revealed ten new records in Tawi-Tawi raising the total number of Odonata to 54. Three new species records were made for Sanga-Sanga raising the known number in that island to 34. Three species were recorded for the first time in Jolo raising the total number to 18. One new species of damselfly was found and several questionable and possible new species of dragonflies were documented." (Authors)] Address: Villanueva, R.J.T., D3C Gahol Apartment, Lopez Jaena St., PH-8000 Davao, Philippines. E-mail: rjtvillanueva@gmail.com

12324. Waldhauser, M. (2012): Dragonflies from the Western High Atlas, Morocco, with the first records of Pyrrhosoma nymphula in the High Atlas (Odonata: Coenagrionidae). Libellula 31(3/4): 243-250. (in English, with German summary) ["Fifteen species of Odonata were recorded during a short trip to the central part of the Moroccan Western High Atlas in May/June 2012. Pyrrhosoma nymphula was recorded in the High Atlas for the first time. Cordulegaster princeps was found in series of localities, west of pass Tizi-n-Test for the first time." (Author)] Address: Waldhauser, M., Petrovice 136, Jablonné v Podještìdí, CZ-471 25, Czech Republic. E-mail: martinw@seznam.cz

12325. Walter, S. (2012): Wiederfund der Zwerglibelle Nehalennia speciosa (Charpentier , 1840) in Sachsen (Odonata). Entomologische Nachrichten und Berichte 56(3-4): 252. (in German) [Sachsen, Germany, Muskauer Heide, 9-VI-2012] Address: Walter, Sabine, c/o Landschaftsplanung Dr. Böhnert & Dr. Reichhoff GmbH Freital, Dresdner Str. 77, 01705 Freital, Germany

12326. Wildermuth, H. (2012): Extensiv genutztes Grünland als Reifungs-, Jagd- und Paarungshabitat von Coenagrion puella und Enallagma cyathigerum (Odonata: Coenagrionidae). Libellula 31(3/4): 223-235. (in German, with English summary) ["Extensively used meadows as habitat for maturation, forage and copulation of C. puella and E. cyathigerum (Odonata: Coenagrionidae) – The heterogeneously structured environment of an isolated pond in the Swiss Central Alps at 1,475 m a.s.l. was surveyed for maturing, foraging and copulating imagines of C. puella and E. cyathigerum. The individuals were distributed patchily and concentrated on extensively used grassland, grassy rock vegetation and shrubbery up to 780 m distant from the pond (max. abundance 30 individuals/10 m² 100-200 m distant from pond) while intensively exploited rich meadows that had been cut shortly before the start of the study were largely avoided (max. abundance 0.06 individuals/10 m² 100-200 m distant from pond). The extensively used grassland that was neither cut nor grazed during the survey not only served for maturation and foraging, but also as rendezvous and copulation site in 68 documented cases during a three days' study. The importance of extensively used grassland as terrestrial habitat in the life history of the two Zygoptera species is discussed." (Author)] Address: Wildermuth, H., Haltbergstr. 43, 8630 Rüti, Switzerland. E-mail: hansruedi@wildermuth.ch

12327. Yakovlev, V.A.; Yakovleva, A.V.; Ilyasova, A.R. (2012): Insects in the invertebrate communities of the upper reaches of the Kuybyshev Reservoir, Russia. Proceedings of the University of Kazan 154(4): 188-198. (in Russian, with English summary) ["Based on the study of zoobenthos in the upper reaches (Volga, Kama, Volga-Kama, and Tetyushi) of the Kuybyshev Reservoir carried out in 1999–2008, about 150 taxons of insects of different ranks were revealed including 119 taxons with rank below genus. Insects made up from 41.5% (shallow shores) up to 55.0% (deep water areas) of the total taxon composition of benthal invertebrates. From the six orders (Ephemeroptera, Odonata, Hemiptera, Coleoptera, Trichoptera, Diptera), dipterans (67.2% of all insects) were characterized by the greatest diversity, basically due to chironomid larvae. Generally, the contribution of insects to the total abundance and biomass of zoobenthos is not significant; they considerably concede to homotopic invertebrates, especially molluscs, consisting mostly of invaders that have widely settled the Reservoir in the last two decades." (Authors) The following taxa are listed: Coenagrion armatum, C. puella, C. pulchellum, Coenagrion sp., Ischnura elegans, I. pumilio, Anax parthenope, Gomphus vulgatissimus and Orthetrum sp.] Address: not stated

12328. Yang, G.; Xu., J.; Yang, Z.; Mao, B. (2012): A summary of resource of Odonata in Yunnan province. Journal of Dali University 11(10): 59-65. (in Chinese, with English summary) [China; 210 Odonata species are checklisted.] Address: Yang, G., College of Agriculture and Biology Science, Dali University, Dali, Yunnan 671003, China

12329. Zabłocki, P.; Wolny, M. (2012): The first locality of the Northern Emerald Somatochlora arctica (Zetterstedt, 1840) (Odonata: Corduliidae) in the Opole region (Southwest Poland) with commentary to the list of dragonflies of Opole voivodeship. Parki nar. Rez. Przyr. 31: 87-96. (in Polish, with English summary) [Kamieniec Nature Reserve, Opole vovodship, Upper Silesia, Poland, 8-IX-2012] Address: Wolny, M., Dział Przyrody Muzeum Śląska Opolskiego, ul. Leśnicka 28, 47-154 Góra Św. Anny, Poland. E-mail: m.wolny@poczta.onet.pl

12330. Zabłocki, P.; Wolny, M. (2012): Materials to the knowledge of some protected, rare and interesting species of dragonflies (Insecta: Odonata) of Silesia (southwest Poland). Opolski rocznik muzealny 14: 9-48. (in Polish, with English summary) [Records of 31 Odonata species from Silesia are documented. A total of 314 specimens was collected from 101 localities located in 46 different UTM grid squares dating from years 2002, 2007-2012. 80% of the examined sites are located in the Opole voivodeship, 15% in the Lower Silesian voivodeship, and 5% in the Silesian voivodeship. All specimens are deposited in the collection of Nature Department of Opole Silesia Museum. The most significant findings for the Opole voivodeship are: Sympetrum fonscolombii, S. pedemontanum, S. depressiusculum, Epitheca bimaculata and Leucorrhinia caudalis.] Address: Wolny, M., Dział Przyrody Muzeum Śląska Opolskiego, ul. Leśnicka 28, 47-154 Góra Św. Anny, Poland. E-mail: m.wolny@poczta.onet.pl

12331. Zawal, A.; Szlauer-Łukaszewska, A. (2012): Water mite parasites (Hydrachnidia) of odonates from the Nature Reserve "Jezioro Szare", northwestern Poland. Odonatologica 41(3): 267-275. (in English) ["The relationships between larvae of Arrenurus s. str. and their Odonata hosts from Lake Szare are described. A total of 173 water mite larvae of Arrenurus afftnis/neumanilvietsi, A. bicuspidator, A. cuspidator, A. cuspidifer, A. tricuspidator, A. robustus and Piona longipalpiswas collected. Of these, 151 were found on adult Odonata, 9 on odonate larvae and 13 on exuviae. Parasitic mite larvae were found on odonate adults but only phoretic mite larvae were found on the larvae and exuviae. The occurrence of parasites was most frequently and most numerously recorded on the thoracic segments of their hosts." (Authors)] Address: Zawal, A., Department of Invertebrate Zoology and Limnology, University of Szczecin, Wąska 13, PL-71-415 Szczecin, Poland

12332. Zhuravchak, R.O.; Shidlovsky, L.V. (2012): The fauna of the projected Novelsky National Park. Nature Reserves in Ukraine 18(1-2): 42-50. (in Ukrainian, with English and Russian summaries) [Enallagma cyathigerum, Sympetrum danae, S. sanguineum and S. vul-

gatum are the only Odonata species so far known from the territory of the proposed National Park.] Address: not stated

12333. Zimmermann, F. (2012): Vielfalt gesichert? Ein Überblick zur aktuellen Gefährdungssituation von Arten und Lebensräumen in Brandenburg. Naturschutz und Landschaftspflege in Brandenburg 21(3): 96-110. (in German) [Populations of Mediterranean species and species of running waters have developed positively, while that of bogs decreased.] Address: Zimmermann, F., Landesamt für Umwelt, Gesundheit und Verbraucherschutz des Landes Brandenburg, Seeburger Chaussee 2, 14476 Potsdam, Germany

2013

12334. Abbasi, F.; (2013): Comparative analyses of the diet of the Spirlin (Alburnoides eichwaldii) in the Tilabad, Shirabad and Kaboodval Streams Golestan Province, Iran. World Journal of Fish and Marine Sciences 5(1): 79-83. (in English) [Odonata are preyed more accidentally and not at all studied localities.] Address: Abbasi, Fatemeh, Dept Fisheries, Gorgan University of Agriculture and Natural Resources, Gorgan, Iran

12335. Aden, C.; Kastner, F.; Loesbrock, J.; Krohn-Grimberghe, S. (2013): Neue Ansätze digitaler Artenerfassung für den ehrenamtlichen Naturschutz Ergebnisse der Entwicklung mobiler Lösungen in Niedersachsen. Naturschutz und Landschaftsplanung 45(4): 101-107. (in German, with English summary) ["The collection of data on flora and fauna by honorary nature conservation has been subject of changes in terms of techniques in the field and the flow of data. During the last years web portals have been established supported by open source software including free usable maps and forms for the recording of the observations as well as identification keys, species profiles and internet platforms. The portals are hosted by NGOs and public authorities. The method of Citizen Science seems to be very effective for data collection in a broad geographical range. Voluntary data collection has been additionally facilitated by the use of mobile devices such as smartphones, simplifying data flow from the field to the NGOs or nature conservation authorities. The paper summarises the current developments of voluntary data collection. It illustrates software developments such as the DragonflyApp (LibellenApp) and the web-based GIS portal eMapper. As an additional example the paper explains the standardized digital flow of data from the field up to the Lower Saxony Water Management, Coastal Defense and Nature Conservation Agency (NLWKN) which has also been implemented within the joint research project ARDINI. The apps have been developed to run on both operating systems (iOS/ Android). The application of modern techniques of the IT sector may encourage young people to participate in honorary nature conservation." (Authors)] Address: Kastner, Friederike, Carl von Ossietzky Universität Oldenburg, Institut für Biologie und Umweltwissenschaften, Ammerländer Heerstr. 114-118, 26129 Oldenburg, Germany. E-Mail: friederike.kastner@uni-oldenburg.de;

12336. Anderson, C.N.; Grether, G.F. (2013): Characterization of novel microsatellite loci for Hetaerina americana damselflies, and cross-amplification in other species. Conservation Genetics Resources 5(1): 149-151. (in English) ["Hetaerina damselflies are distributed throughout the Neotropics. We developed eleven microsatellite loci for the damselfly Hetaerina americana. Microsatellites were tested for polymorphism on a panel of 24 individuals. The number of alleles ranged from 2 to 6, observed heterozygosity from 0.080 to 0.701, and the fixation index from -0.266 to 1.000. Cross-amplification was tested in 7 different species in the genus Hetaerina from the United States and Mexico. These microsatellite loci will be useful for studies of population structure and gene flow in H. americana." (Authors)] Address: Grether, G.F., Dept of Ecology and Evolutionary Biology, University of California, 621 Charles E Young Drive South, Los Angeles, CA, 90095. USA. E-mail: ggrether@obee.ucla.edu

12337. Andrew, R.J. (2013): Andromorphic female of the dragonfly Neurothemis tullia tullia (Drury) (Odonata: Libellulidae), central India. Journal of Threatened Taxa 5(1): 3571-3573. (in English) ["On 02 November 2010, we were observing the dragonflies of Telenkhedi Pond (west end) when we noticed a typical “male” of Neurothemis t. tullia behaving in an unusual manner. It was hovering above the shallow shore and flying low at regular intervals so as to dip the terminal abdominal segment in water, which is a typical female ovipositing behaviour of this species." (Authors)] Address: Andrew, R.J., Post Graduate Department of Zoology, Hislop College, Nagpur, Maharashtra 440001, India. E-mail: rajuandrew@yahoo.com

12338. Arle, J.; Wagner, F. (2013): Effects of anthropogenic salinisation on the ecological status of macroinvertebrate assemblages in the Werra River (Thuringia, Germany). Hydrobiologia 701: 129-148. (in English) ["For more than 100 years, the Werra River has been severely affected by intensive salinisation caused by potash fertilizer industries. We show considerable differences in macroinvertebrate assemblages between reaches without salinisation impact and downstream reaches with intense anthropogenic salinisation in the Werra. This is true for almost all biological metrics relevant for ecological status classification under the EU-Water Framework Directive (EU-WFD) (European Community, Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, No. L 327/1, of 22 December 2000) and diversity measures (taxon richness, evenness). Macroinvertebrate assemblages at salinisation sites were completely dominated by three halophile neobiotic macroinvertebrate species (Gammarus tigrinus, Corophium lacustre and Potamopyrgus antipodarum). We compared anthropogenically salinised sites from the Werra with disturbed but non-salinised sites from the Werra and other German rivers. We used biological metrics developed for classifying the ecological status according to the EU-WFD. This comparison indicated a severe degradation at salinisation sites on the Werra and these fell into the worst ecological status class ‘bad’ according to the EU-WFD. Multivariate statistical analyses revealed anthropogenic salinisation as a key factor causing the differences in composition of macroinvertebrate assemblages in the Werra between salinisation and reference sites. Analyses of the long-term presence–absence data of macroinvertebrate assemblages indicated no marked improvement in the ecological status in the past 20 years." (Authors) The assessment also includes the Odonata-EPTCBO (Eph., Ple., Tri., Col., Bivalv., Odo.)) index.] Address: Wagner, F.,

Institut für Gewässerökologie und Fischereibiologie Jena (IGF), Sandweg 3, 07745 Jena, Germany. E-mail: falko.wagner@igf-jena.de

12339. Arnold, A. (2013): Kleb-Labkraut als Falle für eine Prachtlibelle. Mitteilungen Sächsischer Entomologen 32: 12. (in German) [Altscherbitzer Park, north of Leipzig, Sachsen, Germany. A male Calopteryx splendens was caught by catchweed (Galium aparine). G. aparine is a scrambler, whose epidermis is barbed.] Address: Arnold, A., Zur schönen Aussicht 25, 04435 Schkeuditz, Germany

12340. Babu, R.; Subramanian, K.A.; Andrew, R.J. (2013): Obituary: Tridib Ran Jan Mitra. Odonatologica 42(1): 67-72. (in English) ["A brief biography and appreciation of the work of Dr T.R. Mitra (19 Feb. 1942-3 July 2012), the doyen of Indian odonatology, are followed by his odonatological bibliography (1967-2013). He described six new taxa from India and his works on the Indian odonate fauna will remain important references for a long time to come." (Authors)] Address: Subramanian, K.A., Zoological Survey of India, M-Block, New Alipore, Kolkata, West Bengal 700053, India. E-mail: subbuka.zsi@gmail.com

12341. Baird, R.C. (2013): Larval habitat and behaviour of Phenes raptor (Odonata: Petaluridae): a review of current knowledge, with new observations. International Journal of Odonatology 16(1): 79-91. (in English) ["Phenes raptor is one of only two petalurid dragonflies with a documented non-fossorial larval lifestyle. There have been few reported observations of larvae and their habitat, and the behaviour and ecology of this unique South American species remain largely unknown. This paper provides a review of previously published and unpublished information, and new observations on the habitat and behaviour of larvae and imagines. Larval habitat ranges from fens or seepages to moist terrestrial forest floor litter habitats. Better understanding the ecology and behaviour of the species will require observation of mating locations, additional observations of larvae in habitat and of oviposition and emergence sites across the species' broad geographic and bioclimatic range." (Author)] Address: Baird , I.R.C., 3 Waimea St, Katoomba NSW 2780, Australia

12342. Baker, K.S.; McIntyre, N.E. (2013): Associations between size and fitness of adult females in the model odonate: Enallagma civile (Odonata: Coenagrionidae). The Southwestern Naturalist 58(1): 91-96. (in English, with Spanish summary) ["During June 2009–June 2010, we collected 561 actively mating female familiar bluets Enallagma civile. Although only ca. 25% of these subsequently laid eggs in the laboratory, size of clutch averaged 250 eggs (range, 1–1,047). Overall, there was a high average rate of hatching success (75.8%). Size of females, in terms of width of head capsule, a non-labile trait in adults, was not significantly associated with metrics of fitness. Hatching success was associated positively with length of eggs (indicating that size of eggs may be an indicator of quality of eggs) and negatively related to duration of hatching." (Authors)] Address: McIntyre, Nancy, Dept of Biological Sciences, Texas Tech University, Lubbock, TX 79409-3131, USA. E-mail: nancy.mcintyre@ttu.edu

12343. Beatty, S.J.; Morgan, D.L.; Keleher, J.; Allen, M.G.; Sarre, G.A. (2013): The tropical South American cichlid, Geophagus brasiliensis in Mediterranean climatic south-western Australia. Aquatic Invasions 8: 21-36. (in English) ["The highly endemic (82%) freshwater fishes of south-western Australia are imperiled due to severe habitat and water quality declines and impacts of introduced species. As a case study of the recent tropical aquarium fish introductions, the biology and ecology of the pearl cichlid Geophagus brasiliensis was determined in the Swan River catchment south-western Australia. Unlike endemic freshwater fish species of this Mediterranean climatic region, Geophagus brasiliensis underwent a protracted spawning period during the warmer period from December to May. It appeared that recruitment only occurred in lentic habitats; however the species also persists in downstream lotic habitats. Growth rate and maximum size (245 mm TL) of the species exceed all but one of the region's native freshwater fishes. Whilst minimum water temperature may help limit its establishment in many aquatic ecosystems, its salinity tolerance and omnivorous diet would facilitate its colonisation in this region, including freshwaters and estuaries. Past and future habitat and climatic change is predicted to continue to favour species from sub-tropical and tropical regions." (Author) Odonata larvae are preyed upon.] Address: Beatty, S.J., Freshwater Fish Group and Fish Health Unit, Murdoch University, South St, Murdoch, Western Australia, Australia 6150 E-mail: s.beatty@murdoch.edu.au

12344. Bechly, G.; Kin, A. (2013): First record of the fossil dragonfly family Eumorbaeschnidae from the Upper Jurassic of Poland. Acta Palaeontologica Polonica 58(1): 121-124. (in English) ["Eumorbaeschna adriankini sp. nov. is decribed as first fossil insect from the Upper Jurassic of Central Poland (Owadów-Brzezinki quarry, Tomaszów Mazowiecki area), and as first record of the family Eumorbaeschnidae (Odonata: Anisoptera: Aeshnoptera) outside the Solnhofen lithographic limestone." (Authors)] Address: Bechly, G., Staatliches Museum für Naturkunde, Abt. Paläontologie, Rosenstein 1, D-70191 Stuttgart, Germany. E-mail: guenter.bechly@smns-bw.de

12345. Bedjanic, M. (2013): Paragomphus campestris spec. nov., a new endemic dragonfly from Sri Lanka (Anisoptera: Gomphidae). Odonatologica 42(1): 45-53. (in English) ["The new species is described and illustrated. Holotype male: Mawanella, Hingula Oya; Kegalle distr., Sabaragamuwa prov.; 22-IV-1976; deposited in State Collection of Zoology, Munich. The currently known information on its distribution, phenology and ecology is provided and discussed." (Author)] Address: Bedjanic, M., Rakovlje 42/A, SI-3314 Braslovce, Slovenia. E-mail: matjazbedjanic@yahoo.com

12346. Bernard, R., Buczyński, P.; Tończyk, G. (2013): A distribution atlas of dragonflies (Odonata) in Poland – correction. Odonatrix 9(1): 31-32. (in Polish, with English summary) ["Due to an error in the database an incorrect UTM-square has been included and/ or a correct UTM-square has been lacking on the distribution maps for nine species in the "Atlas". For three further species, this error has resulted in incorrect colour of the circle, which reflects a period of data collecting, in one or two squares. The corrections for particular species both on maps and in the numbers of occupied squares recorded in the historical period are presented in the table." (Authors)] Address: Bernard, R., 1 Zakład Zoologii Ogólnej, Uniwersytet im. Adama Mickiewicza, ul. Umultowska 89, 61-614 Poznań, Poland. E-mail: rbernard@amu.edu.pl

12347. Bertoluci, J.; da Rocha, P.L.B.; Trefaut, R.M. (2013): Field evidence of coupled cycles of arthropod predator-tadpole prey abundance in six aquatic systems of an Atlantic Rainforest site in Brazil. The Herpetological Journal 23(1): 63-66 (in English) ["We evaluated the patterns of abundance association between tadpoles and their aquatic arthropod predators (including Anax amazili, Aeshna punctata, Libellula herculea) in natural communities of Atlantic Forest in south-eastern Brazil. We distributed 10 traps in each one of six aquatic systems and counted the numbers of tadpoles and of predators captured monthly for 13 months. For each system, we quantified the temporal association between tadpoles and predator abundances and measured its strength (using Spearman's rho coefficient) for timelags ranging from -6 to +6 months, followed by testing the hypothesis that the strength of the association differs among time-lag values. The associations were always stronger in streams than in ponds, and strongest (r^2>0.42) and always significant (p<0.016) when time-lag was zero months, resulting in significant differences of mean values of r^2 across time-lags (p<0.001). A time-lag shorter than one month agrees with predictions from the model of predator-prey coupled cycles. The results also suggest that the importance of secondary factors driving abundance values in streams is stronger than in ponds, where conditions tend to be more unstable. To our knowledge, this is the first evidence of coupled cycles of predator-prey abundance with delayed dependence demonstrated with tadpoles and insects in aquatic forest systems." (Authors)] Address: Bertoluci, J, Endereço profissional Universidade de São Paulo, Escola Superior de Agricultura Luiz de Queiroz. Av. Pádua Dias, 11 Pavilhão da Horticultura 2 andar sala 18, Vila Independência 13418-900 – Piracicaba, SP - Brasil - Caixa-Postal: 9. E-mail: jaime.bertoluci@usp.br

12348. Bhandarkar, S.V.; Bhandarkar, W.R. (2013): A study on species diversity of benthic macro invertebrates in freshwater lotic ecosystems in Gadchiroli district Maharashtra. Int. J. of Life Sciences 1(1): 22-31. (in English) ["A study was conducted to evaluate the potential of benthic macro-invertebrates community assemblages in predicting the water quality status. Three sampling stations with various environmental quality gradients were selected at the Wainganga, Gadhavi and Khobragadhi River in Gadchiroli district in order to determine differences or changes in the benthos community associated with variability in water quality. The diversity indices like Shannon-Wiener index, Evenness or Shannon equitability index and Margalef's index were calculated. According to Shannon-Wiener index of species diversity, all the selected sampling sites fall under moderate pollution. The Shannon equitability index values showed a greater equitability in the apportionment of individuals among the species in all the sites while Margalef's index of species richness reveals that the site-I had more healthy body and have higher species diversity among all sampling sites. The species diversity of site-II is greater than site-III. The site-III had poorer in species diversity and nutrient material." (Authors) The taxa list includes "Aphylla nymph (Aeshnidae)", Gomphidae and Libellulidae.] Address: Bhandarkar, S.V., Department of Zoology, M. B. Patel College, Deori. Dist. Gondia. 441 901. MS. India. E-mail: sudhirsense@rediffmail.com

12349. Bin, L.; Mao, S. (2013): Aerodynamic interactions between wing and body of a model insect in forward flight and maneuvers. Journal of Bionic Engineering 10(1): 19-27. (in English) ["The aerodynamic interactions between the body and the wings of a model insect in forward flight and maneuvers are studied using the method of numerically solving the Navier-Stokes equations over moving overset grids. Three cases are considered, including a complete insect, wing pair only and body only. By comparing the results of these cases, the interaction effect between the body and the wing pair can be identified. The changes in the force and moment coefficients of the wing pair due to the presence of the body are less than 4.5% of the mean vertical force coefficient of the model insect; the changes in the aerodynamic force coefficients of the body due to the presence of the wings are less than 5.0% of the mean vertical force coefficient of the model insect. The results of this paper indicate that in studying the aerodynamics and flight dynamics of a flapping insect in forward flight or manoeuvre, separately computing (or measuring) the aerodynamic forces and moments on the wing pair and on the body could be a good approximation." (Authors) The paper includes a reference to dragonflies.] Address: Bin, L., Ministry-of-Education Key Laboratory of Fluid Mechanics, Beihang University, Beijing 100191, P. R. China

12350. Bischof, M.M.; Hanson, M.A.; Fulton, M.R.; Kolka, R.K.; Sebestyen, S.D.; Butler, M.G. (2013): Invertebrate community patterns in seasonal ponds in Minnesota, USA: Response to hydrologic and environmental variability. Wetlands 33(2): 245-256. (in English) ["Seasonal ponds are common throughout forested regions of the north central United States. These wetlands typically flood due to snow-melt and spring precipitation, then dry by mid-summer. Periodic drying produces unique fishless habitats with robust populations of aquatic invertebrates. A basin's physical/chemical features, the absence of vertebrate predation, and especially the duration of seasonal flooding, have long been viewed as the major structuring influences on these communities, but previous studies have shown only limited effects of environmental variables on pond invertebrates. Applying ordination methods to data from weekly collections of invertebrates during 2008–2009, we tested influences of site-level environmental gradients on the presence and relative abundance of aquatic invertebrate communities in 16 seasonal ponds in a forested region of north central Minnesota, USA. We assessed invertebrate (including Odonata) community patterns in relation to pond size and depth, soil nutrients, canopy closure, hydroperiod, and predominant groundwater function (recharge, discharge, or flow-through). Patterns in pond invertebrate community composition were consistently related to pond depth, overhead canopy closure, and hydroperiod. Site-level hydrologic function showed weak relationships to seasonal patterns of invertebrate abundance. Although physical features of ponds had only modest influence on presence and abundance of invertebrates, weekly sampling improved models relating environmental variables to pond invertebrates." (Authors) Address: Hanson, M.A., Minnesota Department of Natural Resources, Wetland Wildlife Populations and Research Group, Bemidji, MN, 56601, USA. E-mail: mark.alan.hanson@ state.mn.us

12351. Blanke, A.; Beckmann, F.; Misof, B. (2013): The head anatomy of Epiophlebia superstes (Odonata: Epiophlebiidae). Organisms Diversity & Evolution 13(1): 55-66. (in English) ["The relic dragonfly family Epiophlebi-

idae is recovered as sistergroup of Anisoptera (= Epiprocta) by most molecular and morphological analyses. However, in a recent study it was placed within Anisoptera as sister group of Cordulegastridae. In another study, several affinities to Zygoptera in the morphology of the ovipositor and the egg-laying behaviour were pointed out. Here, we present a detailed study of the outer, as well as the inner, head morphology of Epiophlebia superstes. Compared with the last detailed literature account, three additional mandibular muscles were discovered, as well as additional buccal and pharyngeal muscles. The results are compared with the anatomic features of Zygoptera and Anisoptera. A formal character evaluation focused on head characters confirms the sistergroup relationship of Epiophlebiidae and Anisoptera." (Authors)] Address: Blanke, A., Zentrum für molekulare Biodiversität, Zoologisches Forschungsmuseum Alexander Koenig, Adenauerallee 160, 53113, Bonn, Germany. E-mail: blanke@uni-bonn.de

12352. Bochumer Botanischer Verein (2013): GEO-Tag der Artenvielfalt am 16. und 17. Juni 2012 auf der Halde Hoheward in Herten. Jahrbuch des Bochumer Botanischen Vereins 4: 117-134. (in German) [Herten, Nordrhein-Westfalen, Germany; 11 Odonata species including Erythromma najas were recorded.] Address: Goertzen, Diana, Dornröschenweg 27, D-44339 Dortmund, Germany. E-mail: diana.goertzen@rub.de

12353. Bomfleur, B.; Decombeix, A.-L.; Escapa, I.H.; Schwendemann, A.B.; Axsmith, B. (2013): Whole-plant concept and environment reconstruction of a Telemachus conifer (Voltziales) from the Triassic of Antarctica. International Journal of Plant Sciences 174(3): 425-444. (in English) ["We present a whole-plant concept for a genus of voltzialean conifers on the basis of compression/impression and permineralized material from the Triassic of Antarctica. The reconstruction of the individual organs is based on a combination of organic connections, structural correspondences, similarities in cuticles and epidermal morphologies, co-occurrence data, and ex situ palynology. The affiliated genera of organs include trunks, branches, and roots (Notophytum); strap-shaped leaves with parallel venation (Heidiphyllum compressions and permineralized Notophytum leaves); seed cones (Telemachus and Parasciadopitys); pollen cones (Switzianthus); and bisaccate pollen of Alisporites type. Structural similarities lead us to suggest that Parasciadopitys is the permineralized state of a Telemachus cone and should be treated as a junior synonym. Biotic interactions involving the reconstructed conifer genus include plant-insect interactions (oviposition by Odonata) and not less than five different types of plant-fungal interactions, including two distinct endomycorrhizal associations, two probable seed parasites, and epiphyllous fungi. A representative whole plant is reconstructed as a 10–15-m-tall, seasonally deciduous forest tree with a vertical, narrow-conical crown shape. We interpret these Telemachus trees as the dominant components of peat-forming conifer swamps, forest bogs, and immature bottomland vegetation in the Triassic high-latitude river basins of southern Gondwana. In architecture, growth habit, and many ecological characteristics, the Telemachus conifers appear to be comparable to extant larch (Larix). Owing to the large amount and often exquisite preservation of the material, this conceptual whole-plant genus represents one of the most completely reconstructed ancient conifer taxa to date." (Authors)] Address: Bomfleur, B., Dept of Ecology & Evolutionary Biology, University of Kansas, Lawrence, Kansas 66045, U.S.A., and Natural History Museum and Biodiversity Institute, University of Kansas, Lawrence, Kansas 66045, USA

12354. Bose, A.P.H.; Robinson, B.W. (2013): Invertebrate predation predicts variation in an autotomy-related trait in larval damselfly. Evolutionary Ecology 27(1): 27-38. (in English) ["Autotomy, the discarding of a prey appendage grasped by a predator, may evolve when the benefits of immediate survival outweigh the costs of appendage loss. In larval damselflies, joints connecting lamellae to the abdomen vary in size and shape within and among taxa suggesting that they may evolve under selection by invertebrate predators, such as dragonfly larvae. Assuming that joint width is proportional to the force required for autotomy, we tested if invertebrate predation favours smaller lamellar joints for autotomy or larger joints for structural support of lamellae for swimming. We compared the maximum joint widths of larval Lestes and Enallagma among ponds that varied in risk of invertebrate predation. Relative predation risk estimated as the frequency of regenerated lamellae within ponds was weakly and positively related to the relative abundance of larval dragonflies. The allometry of lamellar joint size decreased with increasing risk of invertebrate predation across ponds after controlling for variation in body size in Lestes congener but not in Enallagma species. Both species of Lestes had larger joint sizes than the five species of Enallagma, suggesting that the ancestral divergence of lamellar joints between these genera may influence contemporary responses to invertebrate predation." (Authors)] Address: Bose, Aneesh, Department of Integrative Biology, University of Guelph, 50 Stone Road East, Guelph, ON, N1G-2W1, Canada. E-mail: abose@uoguelph.ca

12355. Brandon, A. (2013): Odonata news and events from across the vice counties of Anglesey, Merionethshire, Caernarvonshire, Denbighshire and Flintshire. Y Fursen - North Wales Dragonfly Newsletter 70: 3 pp. (in English) [The author reports from the British Dragonfly Society Recorders Conference at CEH, Wallingford, UK in March 2013, and presents a brief report on the recent trends in UK species ranges: "The records show that since 1970 they are doing much better as a group than, say, butterflies. There are more species actually increasing their range than those in decline - 14% are increasing and 5% decreasing. The winners, i.e. those species that have expanded their ranges or are colonising new sites are: Aeshna mixta, A. cyanea, Anax imperator, Brachytron pratense, Calopteryx splendens, Erythromma viridulum, Libellula fulva, L. quadrimaculata, Orthetrum cancellatum, Platycnemis pennipes, Sympetrum sanguineum. Distinct losers are: Aeshna grandis, Coenagrion puella, C. pulchellum, Enallagma cyathigerum, Ischnura elegans – this includes three of our most common damselflies!" Details on the current distribution of C. pulchellum in North Wales, UK are presented. The journal also advises to Odonata larva videos.] Address: Brandon, A., North Wales Dragonfly Recorder, Bryn Heilyn, Rowen, Conwy LL32 8YT., UK. E-mail: allanrowenconwy@antispam sky.com

12356. Büsse, S.; Genet, C.; Hörnschemeyer, T. (2013): Homologization of the flight musculature of Zygoptera (Insecta: Odonata) and Neoptera (Insecta). PLoS ONE 8(2): e55787. doi:10.1371/journal.pone. 0055787: 16 pp, suppl. (in English) ["Among the winged insects (Pterygota) the Dragonflies and Damselflies (Odonata) are

unique for several reasons. Behaviourally they are aerial predators that hunt and catch their prey in flight, only. Morphologically the flight apparatus of Odonata is significantly different from what is found in the remaining Pterygota. However, to understand the phylogenetic relationships of winged insects and the origin and evolution of insect flight in general, it is essential to know how the elements of the odonatan flight apparatus relate to those of the other Pterygota. Here we present a comprehensive, comparative morphological investigation of the thoracic flight musculature of damselflies (Zygoptera). Based on our new data we propose a homologization scheme for the thoracic musculature throughout Pterygota. The new homology hypotheses will allow for future comparative work and especially for phylogenetic analyses using characters of the thoracic musculature throughout all winged insects. This will contribute to understand the early evolution of pterygote insects and their basal phylogenetic relationship." (Authors)] Address: Büsse, S., Georg-August-Universität Göttingen, Johann-Friedrich-Blumenbach-Institut für Zoologie & Anthropologie, Abteilung Morphologie, Systematik & Evolutionsbiologie mit Zoologischem Museum, Berliner Str. 28, 37073 Göttingen, Germany. E-Mail: sebastian.buesse@biologie.uni-goettingen.de

12357. Bußmann, M. (2013): Nachweise der Gestreiften Ouelljungfer Cordulegaster bidentata Selys, 1843 (Odonata: Cordulegastridae) in Ouellbächen des Unteren Lennetales (Märkischer Kreis, NRW). Natur und Heimat 73(1): 1-10. (in German) [Märkischer Kreis, Nordrhein-Westfalen, Germany; C. bidentata was recorded in the crenal of ten from 33 studied running water bodies.] Address: Bußmann, M., Märkischer Kreis, Untere Landschaftsbehörde, Heedfelder Str. 45, 58509 Lüdenscheid, Germany

12358. Butcher, G. (coord.) (2013): The Mysterious Migratory Dragonfly. Flylines Spring 2013: 7-8. (in English) [Verbatim: For centuries, people around the world have reported seeing large swarms of dragonflies, migrating mostly in early fall. In the United States, up to 16 different species have been spotted in these autumnal flights. In spite of these numerous sightings and the fascination with dragonflies, these flights still remain a mystery. The US Forest Service and its partners, however, are working to increase our knowledge of this remarkable phenomenon. They are working together to delve deeper into the mystery of dragonfly migration, their biology and their breeding patterns. One partner organization, the Xerces Society, has convened a group of experts to form the Migratory Dragonfly Partnership. One of the first products of the partnership is a scientific review paper by Michael L. May: “A critical overview of progress in studies of migration of dragonflies (Odonata: Anisoptera), with emphasis on North America,” in the Journal of Insect Conservation (www.migratorydragonflypartnership.org). In his review, the author discusses the task of greatly increasing our understanding of this phenomenon. Citizen science is another way in which we are gaining more than a glimpse into the world of dragonflies. Celeste Mazzacano, dragonfly partnership coordinator, is organizing a project, Pond Watch (www.migratorydragonflypartnership.org), which encourages the public to visit local dragonfly ponds often to determine which species are present and at which life-cycle stage. The project focuses on five major migratory species: Anax junius, Tramea lacerata, Pantala flavescens, P. hymenaea, and Sympetrum corruptum; however, the study’s techniques can be used on any dragonfly species of interest. Another project, Migration Monitoring Project (www.migratorydragonflypartnership.org) encourages people to report sightings during fall migration. Many observations of their flight have occurred at well-known sites for observing raptor migration, so it may be possible to combine efforts to monitor hawks, eagles, kites, and dragonflies from the same sites. Migratory Dragonfly Partnership researchers are taking the lead on a third major project that uses latitudinal differences in stable isotopes to determine the geographic origin of adult dragonflies. The scientists study emerging adults and exuviae (the “skin” that the emerging adults discard) to create an isotopic map of North America. Then they can compare the isotopes of migrating adults to determine their geographic origin. If all of this makes you want to get involved, be sure to visit the web site and start contributing your data. In addition, visit the web site to see if there will be a Migratory Dragonfly Short Course taught in your area. These short courses are a great way to learn how to participate firsthand.] Address: For more information on the Wings Across the Americas, visit http://www.fs.fed.us/global/wings

12359. Carlson, B.E.; Langkilde, T. (2013): A common marking technique affects tadpole behavior and risk of predation. Ethology 119(2): 167-177. (in English) ["In many studies, it is necessary for researchers to mark individual animals for later identification. It is often assumed in the interpretation of these studies that marks have no effects on the biology of the animals. This assumption is insufficiently tested, and, when it is, coarse assessments of negative effects are often used, such as survival and growth under simplified laboratory conditions. We examined the consequences of a common larval amphibian marking technique (staining with methylene blue) for wood frog tadpole behaviour and survival in an ecologically realistic scenario (predation). We measured a number of tadpole behavioural variables, under baseline conditions and in the presence of olfactory cues of a predator, for marked and unmarked tadpoles. We then exposed pairs of tadpoles (one marked and one unmarked) to one of two predators and tested for the effects of marking on the susceptibility of tadpoles to predation. We found that marking suppressed the increase in movement rate that typically occurred in (unmarked) tadpoles in the presence of predator cues. Marked tadpoles were significantly more likely to be captured by predators, an effect that could not be attributed to this difference in movement rate. These results raise concern about the use of this staining method and highlight the need for studies involving marked animals to thoroughly address any relevant effects the marks may have on the biology of the subjects." (Authors) Dragonfly predators were predominantly larvae of Anax junius.] Address: Carlson, B.E., Dept of Biology, The Pennsylvania State University, 208 Mueller Laboratory, University Park, PA 16802, USA. E-mail: bec169@psu.edu

12360. Chambers, D.L.; Wojdak, J.M.; Du, P.; Belden, L.K. (2013): Pond acidification may explain differences in corticosterone among salamander populations. Physiological and Biochemical Zoology 86(2): 224-232. (in English) ["Physiological tolerances play a key role in determining species distributions and abundance across a landscape, and understanding these tolerances can therefore be useful in predicting future changes in species distributions that might occur. Vertebrates possess

several highly conserved physiological mechanisms for coping with environmental stressors, including the hormonal stress response that involves an endocrine cascade resulting in the increased production of glucocorticoids. We examined the function of this endocrine axis by assessing both baseline and acute stress–induced concentrations of corticosterone in larvae from eight natural breeding populations of Jefferson's salamander Ambystoma jeffersonianum. We surveyed individuals from each pond and also examined a variety of environmental pond parameters. We found that baseline and stress-induced corticosterone concentrations differed significantly among ponds. Population-level baseline corticosterone concentrations were negatively related to pH and positively related to nitrate, and stress-induced concentrations were again negatively related to pH, positively related to nitrate, and positively related to temperature. We followed the field survey with an outdoor mesocosm experiment in which we manipulated pH and again examined baseline and acute stress–induced corticosterone in A. jeffersonianum larvae. As in the field survey, we observed an increase in the baseline corticosterone concentration of individuals exposed to the lowest pH treatment (pH 5–5.8). Examining physiological indices using a combined approach of field surveys and experiments can be a powerful tool for trying to unravel the complexities of environmental impacts on species distributions. [...] After 24 h, tadpoles from high-latitude populations, compared with those from low-latitude populations, had increased baseline corticosterone levels when reared with a nonlethal dragonfly predator, but this difference disappeared after 15 d of cohousing with a predator." (Authors)] Address: Belden, Lisa, 4092C Derring Hall, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061-0406, USA. E-mail: belden@vt.edu

12361. Chen, Y.H.; Skote, M.; Zhao, Y.; Huang, W.M. (2013): Stiffness evaluation of the leading edge of the dragonfly wing via laservibrometer. Materials Letters 97: 166-168. (in English) ["The material property of the leading edge vein (LEV) of the dragonfly wing is investigated. A new vibration method is developed using a laser vibrometer and mini-shaker. The natural frequency of a cantilevered LEV is determined via lateral oscillation. As a result, the elastic modulus of a LEV sample from a dragonfly wing is found to be in the range of the elastic hydrocarbon polymer, while a dead dragonfly is similar to low density polyethylene. The loss of water contents in the veins increases the stiffness of the LEV by approximately 20times. Highlights: *Material property of the costa of the dragonfly hindwing is investigated. *New vibration method is developed to obtain the elastic modulus of the costa. *Elastic modulus is 20 times lower for a fresh costa than a dead sample. *Material for an artificial model should be an elastic hydrocarbon polymer." (Authors)] Address: Skote, M., School of Mechanical and Aerospace Engineering, Nanyang Technological University, 50 Nanyang Avenue, Singapore 639798. E-mail: mskote@ntu.edu.sg

12362. Choong, C.Y.; Cheah, D.S.L. (2013): Odonata of Ayer Hitam Forest Reserve, Johor, Peninsular Malaysia. Faunistic Studies in South-East Asian and Pacific Island Odonata 2: 1-11. (in English, with Malay summary) ["Odonata records from Ayer Hitam Forest Reserve and the surrounding area in Johor, Peninsular Malaysia are presented. A total of 44 Odonata species from eight families were collected in the area in October 2012. All of these records are new to Ayer Hitam Forest Reserve. Indothemis carnitica is a new record for Malaysia." (Authors)] Address: Choong, C.Y., School of Environ. & Natural Resource Sciences, Fac. of Sci. & Tech., Univ.i Kebangsaan Malaysia, 43600 UKM Bangi, Selangor, Malaysia. E-mail: rocoto98@yahoo.com

12363. Chowdhary, S.; Sharma, K.K. (2013): Evaluation of macrobenthic invertebrates in the longitudinal profile of a river (Tawi), originating from Shivalik hills. Journal of Global Biosciences 2(1): 31-39. (in English) [Identification of Nearctic(!) Odonata taxa was done at the genus level.] Address: Chowdhary, Samita, Dept of Zoology, Univ. of Jammu-180006, Jammu and Kashmir, India

12364. Daraż, B. (2013): Some dragonflies (Odonata) of Chingombe, Zambia, and some other localities in Zambia and Botswana. Odonatrix 9(1): 13-20. (in English, with Polish summary) ["During occasional observations at ten southern African localities in 2011, mainly in Zambia and additionally in Botswana, 24 dragonfly species were recorded. Sixteen species were recorded in Chingombe, central Zambia." (Author)] Address: Daraż, B., Kościelna Str. 41, 35-505 Rzeszów, Poland. E-mail: bdaraz@poczta.onet.pl

12365. Das, A.; Gupta, S.K. (2013): An initial survey on insect associated mites of South Bengal. IOSR Journal of Pharmacy and Biological Sciences (IOSR-JPBS) 5(1): 7-8. (in English) ["A preliminary study related to mites associated in the insects is given in this article. Ten species of mites under nine families collected from six orders of insects from South Bengal are reported here giving collection data and biological information." (Authors) Arrenurus sp. is listed from an Odonata sampled at the Science City area.] Address: Das, A.., PG Department of Zoology, Vidyasagar College, Kolkata, India

12366. De Block, M.; Pauwels, K.; Van Den Broeck, M.; De Meester, L.; Stoks, R. (2013): Local genetic adaptation generates latitude-specific effects of warming on predator–prey interactions. Global Change Biology 19(3): 689-696. (in English) ["Temperature effects on predator–prey interactions are fundamental to better understand the effects of global warming. Previous studies never considered local adaptation of both predators and prey at different latitudes, and ignored the novel population combinations of the same predator–prey species system that may arise because of northward dispersal. We set up a common garden warming experiment to study predator–prey interactions between Ischnura elegans damselfly predators and Daphnia magna zooplankton prey from three source latitudes spanning >1500 km. Damselfly foraging rates showed thermal plasticity and strong latitudinal differences consistent with adaptation to local time constraints. Relative survival was higher at 24 °C than at 20 °C in southern Daphnia and higher at 20 °C than at 24 °C, in northern Daphnia indicating local thermal adaptation of the Daphnia prey. Yet, this thermal advantage disappeared when they were confronted with the damselfly predators of the same latitude, reflecting also a signal of local thermal adaptation in the damselfly predators. Our results further suggest the invasion success of northward moving predators as well as prey to be latitude-specific. We advocate the novel common garden experimental approach using predators and prey obtained from natural temperature gradients spanning the predicted temperature increase in the northern popula-

tions as a powerful approach to gain mechanistic insights into how community modules will be affected by global warming. It can be used as a space-for-time substitution to inform how predator–prey interaction may gradually evolve to long-term warming." (Authors)] Address: Stoks, R., Laboratorium voor Aquatische Ecologie, K.U.Leuven, De Beriotstraat 32, B-3000 Leuven, Belgium. E-mail: robby.stoks@bio.kuleuven.ac.be

12367. De Knijf, G.; Vanappelghem, C.; Demolder, H. (2013): Odonata from Montenegro, with notes on taxonomy, regional diversity and conservation. Odonatologica 42(1): 1-29. (in English) ["The Odonata fauna of Montenegro was investigated during 2 field trips in 2009 and in 2011. In all, 105 localities were visited resulting in 50 observed species (52 taxa). Important populations of Lindenia tetraphylla and Selysiothemis nigra were found, that of the former is probably the most important one in Europe. The presence of Lestes parvidens, Caliaeschna microstigma, Cordulegaster heros and C. bidentata is confirmed. C. heros individuals show clear variation from the nominal type and are of an intermediate form with the ssp. pelionensis. Several populations of Gomphus schneiderii, which differ in thoracic and abdominal markings from typical schneiderii, were detected and criteria are given for the differentiation with G. vulgatissimus. Epitheca bimaculata is a new species for Montenegro and represents the southernmost observation in its European range. The first populations of Trithemis annulata were discovered. A major emphasis was on the survey and diversity of the Mediterranean region. This region has a greater diversity than the Alpine region and several species of the Balkans are confined to it. Skadar lake has the greatest diversity of dragonflies and is home to several threatened and European protected species. Many populations of rare species in the coastal area are threatened by an increasing demand for water consumption by tourists and for agriculture use." (Authors)] Address: Knijf, G. de, Instituut voor Natuurbehoud, Kliniekstraat 25, B-1070 Brussel, Belgium. E-mail: geert.deknijf@inbo.be

12368. Degefu, F.; Lakew, A.; Tigabu, Y.; Teshome, K. (2013): The water quality degradation of upper Awash River, Ethiopia. Ethiopian Journal of Environmental Studies and Management 6(1): 58-66. (in English) ["Benthic macroinvertebrate based assessment of water quality in the upper Awash River, along the river course of about 500 kms was conducted on quarterly bases between September 2009 and August 2010. This paper reports the complete identification of macroinvertebrates together with measurements of physico-chemical parameters and heavy metal concentrations which were considered as a tool for assessing the water quality status of upper Awash river, Ethiopia. Benthic animals and water samples were collected from three different sampling sites located in the upper Awash River, and analyzed to evaluate stressor sources and the general stream water quality. The percentage abundance of families of various macroinvertebrates taxonomic groups was identified from all sites. Accordingly, Koka bridge site of the upper Awash River had low water quality status which is likely to be due to poor farming, untreated effluents from factories and poor provision of sanitation facilities to the riparian communities. Apparently, the concentrations of the selected nutrients and heavy metals did not differ significantly among the sampling sites (ANOVA, $P > 0.05$), presumably due to pollution of the whole stream reach by the catchment nutrient sources. Ten orders of benthic macroinvertebrates consisting of 36 families were identified. The highest family richness was observed in Ginchi, slightly impacted site (1) whilst the least faunal diversity was observed in Koka Bridge (7 families) indicating the effect of water quality class differences among the sampling sites." (Authors) Taxa include Odonata and are treated at family level.] Address: Degefu, F., EIAR-National Fisheries and Aquaculture Research Center, P.O.Box 64, Sebeta, Ethiopia. E-mail: fasildeg2000@yahoo.com

12369. Demayo, C.G.; Rico, M.J.; Torres, M.A.J. (2013): Relative warp analysis of variations in the fore- and hindwings of selected populations of male Neurothemis terminata terminata (Ris, 1911). Sci. Int. (Lahore) 25(2): 277-284. (in English) ["Relative warp analysis of variations in the shape of the fore- and hind wings of male N. terminata was done on selected populations. To illustrate variations in wing shape, landmark data was subjected to relative warp analysis and the resulting scores were subjected to Multivariate Analysis of Variance (MANOVA) and Canonical Variate Analysis (CVA). The results display significant variations between populations on the wings of the male N. terminata. The results suggest that each population represents discrete panmictic units which could be due to the territorial behaviour of male dragonflies." (Authors)] Address: Demayo, C.G., Dept of Biological Sciences. College of Science and Mathematics, MSU-Iligan Institute of Technology, Iligan City, Philippines. E-mail: cgdemayo@gmail.com

12370. Domisch, S.; Araújo, M.B.; Bonada, N.; Pauls, S.U.; Jähnig, S.J.; Haase, P. (2013): Modelling distribution in European stream macroinvertebrates under future climates. Global Change Biology 19(3): 752-762. (in English) ["Climate change is predicted to have profound effects on freshwater organisms due to rising temperatures and altered precipitation regimes. Using an ensemble of bioclimatic envelope models (BEMs), we modelled the climatic suitability of 191 stream macroinvertebrate species from 12 orders across Europe under two climate change scenarios for 2080 on a spatial resolution of 5 arc minutes. Analyses included assessments of relative changes in species' climatically suitable areas as well as their potential shifts in latitude and longitude with respect to species' thermal preferences. Climate-change effects were also analysed regarding species' ecological and biological groupings, namely (1) endemicity and (2) rarity within European ecoregions, (3) life cycle, (4) stream zonation preference and (5) current preference. The BEMs projected that suitable climate conditions would persist in Europe in the year 2080 for nearly 99% of the modelled species regardless of the climate scenario. Nevertheless, a decrease in the amount of climatically suitable areas was projected for 57–59% of the species. Depending on the scenario, losses could be of 38–44% on average. The suitable areas for species were projected to shift, on average, 4.7–6.6° north and 3.9–5.4° east. Cold-adapted species were projected to lose climatically suitable areas, while gains were expected for warm-adapted species. When projections were analysed for different species groupings, only endemics stood out as a particular group. That is, endemics were projected to lose significantly larger amounts of suitable climatic areas than nonendemic species. Despite the uncertainties involved in modelling exercises such as this, the extent of projected distributional changes reveals further the vulnerability of freshwater organisms to climate change and implies a need

to understand the consequences for ecological function and biodiversity conservation." (Authors) The analysis includes Calopteryx haemorrhoidalis, C. splendens, Gomphus pulchellus and Onychogomphus uncatus.] Address: Domisch, S., Senckenberg Research Institute and Natural History Museum Frankfurt, Department of River Ecology and Conservation, Gelnhausen, Germany. E-mail: sami.domisch@senckenberg.de

12371. Dow, R.A.; Reels, G.T. (2013): Previously unpublished Odonata records from Sarawak, Borneo. Part I. Kuching Division excluding Kubah National Park, and Samarahan Division. Faunistic Studies in South-East Asian and Pacific Island Odonata 3: 1-25. (in English) ["Records of Odonata from Kuching and Samarahan, the western administrative divisions of Sarawak in Malaysian Borneo, are presented. Forty-two species are listed from Bako National Park, and eighty-nine species are listed from various other locations. Notable records, not yet published in detail elsewhere, include Aciagrion ?fasiculare, Bornargiolestes species, Pericnemis species cf triangularis, Coeliccia new species and Tetrathemis flavescens." (Authors)] Address: Dow, R.A., 6 Bramley Avenue, Coulsdon, Surrey, CR5 2DP, UK. E-mail: rory.dow@virgin.net

12372. El-Hawagry, M.S.; Khalil, M.W.; Sharaf, M.R.; Fadl, H.H.; Aldawood, A.S. (2013): A preliminary study on the insect fauna of Al-Baha Province, Saudi Arabia, with descriptions of two new species. ZooKeys 274: 1-88. (in English) [A total of 582 species and subspecies (few identified only to genus level) belonging to 129 families and representing 17 orders, have been recorded from Al-Baha Province. The list of taxa includes two Odonata species: Anax parthenope and Trithemis arteriosa.] Address: El-Hawagry, M.S., Basic Sciences Department, Community College, Al-Baha University, Al-Baha, Saudi Arabia, PO Box 1598, Project: Survey and Classification of Agricultural and Medical Insects in Al-Baha Province, Kingdom of Saudi Arabia. E-mail: elhawagry@gmail.com

12373. Engel, M.S.; Kristensen, N.P. (2013): A history of entomological classification. Annual Review of Entomology 58: 585-607. (in English) ["The classification of insects has attempted to most effectively communicate information about this hyperdiverse lineage of life and, not surprisingly, has had a considerably rich historical development. This history can be coarsely segregated into four periods: the Pre-Linnean era, the first century spanning Linnaeus's Systema Naturae to Darwin's On the Origin of Species, the Darwinian era up to the Cladistic Revolution, and the Hennigian era leading to today. The major events of each of these episodes are briefly summarized and some of the more notable researchers highlighted, along with their influence on our current understanding of insect relationships and how this is reflected in the current classification of the Hexapoda." (Authors) The paper contains many references to Odonata.] Address: Engel, M.S., Division of Entomology, Natural History Museum, and Dept of Ecology & Evolutionary Biology, University of Kansas, Lawrence, Kansas 66045, USA. E-mail: msengel@ku.edu

12374. Favretto, M.A.; Bortolon dos Santos, E.; Geuster, C.J. (2013): Entomofauna do Oeste do Estado de Santa Catarina, Sul do Brasil. EntomoBrasilis 6(1): 42-63. (in Portuguese, with English summary) ["In this study is presented a list of 1328 insect species observed in west of Santa Catarina State, Brazil, in the last eight decades. The species richness founds corresponds 1.47 % of the total of species registered in Brazil. The data set was compiled from collection records performed by F. Plaumann, in addition to the records from literature and personal observations. Here, we recorded a total of 17 orders of insects." (Authors) 58 Odonata taxa, mostly identified at the genus level, are listed.] Address: Favretto, M.A., Prefeitura Municipal de Campos Novos, Secretaria Municipal de Saude, Brazil. E-mail: marioarthur.favretto@hotmail.com

12375. Ferreira, G.A.; Nakano-Oliveira, E.; Genaro, G.; Lacerda-Chaves, A.K. (2013): Diet of the coati Nasua nasua (Carnivora: Procyonidae) in an area of woodland inserted in an urban environment in Brazil. Revista Chilena de Historia Natural 86: 95-102. (in English, with Spanish summary) ["Coatis are omnivores whose diet consists of small vertebrates, invertebrates, and fruit. In urban areas, they may ingest food waste that has been discarded in deposits near their habitat, or they may consume food offered by humans. The present work investigates the diet of coatis through analysis of 56 fecal samples collected from Morro Imperador, a fragment of woodland inserted into an urban center in the municipality of Juiz de Fora, State of Minas Gerais, Brazil. The results point to a diet with niche breadth of 0.4 in which the percentage of occurrence of insects (34.9 %) and fruit (19.9 %) comprise the main dietary items. The presence of food due to human action (direct or indirect) is also constant throughout the year (14.1 %), thereby demonstrating the ability of these animals to adapt to modified environments." (Authors) Frequency of occurrence and percentage of occurrence in Odonata: Aeshnidae FO:1.8, PO: 0.4.] Address: Ferreira, G.A., Programa de Pós Graduação em Biologia e Comportamento Animal, Universidade Federal de Juiz de Fora, Campus Universitário/sn, Juiz de Fora, MG, 36036-900, Brasil. E-mail: ferreira.g.a@hotmail.com

12376. Ferry, E.E.; Hopkins, G.R.; Stokes, A.N.; Mohammadi, S.; Brodie, E.D.; Gall, B.G. (2013): Do all portable cases constructed by caddisfly larvae function in defense? Journal of Insect Science: Vol. 13 | Article 5: 9 pp. (in English) ["The portable cases constructed by caddisfly larvae have been assumed to act as a mechanical defense against predatory attacks. However, previous studies have compared the survival of caddisflies with different cases, thereby precluding an analysis of the survival benefits of "weaker" case materials. The level of protection offered by caddisfly cases constructed with rock, stick, or leaf material, as well as a no-case control, was investigated against predatory nymphs of Anax junius. A valid supposition is that the cases made of stronger material are more effective at deterring predators. Yet, observations revealed that there was no difference in survival between the case types. All caddisflies with a case experienced high survival in comparison to caddisflies removed from their case. In addition, larvae with stick-cases experienced fewer attacks and captures by dragonflies. These results showed that the presence of a case, regardless of the material used in its construction, offers survival benefits when faced with predatory dragonfly nymphs." (Authors)] Address: Ferry, Emily, Dept of Biology, Utah State Univ., 5305 Old Main HL, Logan UT 84322, USA.

12377. Fleck, G.; El Adouzi, M. (2013): The larva of the genus Palaeosynthemis Förster, 1903 (Odonata: Anisoptera: Synthemistidae) and a generic key to the larvae of non-New Caledonian Synthemistidae. Zootaxa 3619

(5): 589-594. (in English) ["The larva of Palaeosynthemis Förster, 1903, based on P. cyrene (Lieftinck, 1953), is described and illustrated for the first time. A diagnosis of the genus is given. A larval generic key to all known non-New Caledonian genera of Synthemistidae is provided." (Author)] Address: Fleck, G., CBGP (Centre de Biologie et de Gestion des Populations), Campus international de Baillarguet, CS 30016, 34988 Monferrier-sur-Lez cedex, France. E-mail: fleckgunther@gmail.com

12378. Friebe, J.G. (2013): Libellen am Wassergarten im Dornbirner Stadtpark (Vorarlberg / Österreich) (Insecta: Odonata). inatura - Forschung online, Nr. 3: 8 pp. (in German, with English summary) ["During the years 2010 to 2012 a total of 23 dragonfly and damselfly species (Odonata) have been observed in the vicinity of the «water garden» near the natural history museum «inatura» in Dornbirn (Vorarlberg / Austria). 22 species have been documented at species level. Solely some rare Demoiselle specimens (Calopteryx sp.) eluded photographic documentation thus inhibiting exact determination. Common species are typically ubiquitous without special demands regarding their habitat. Despite strong anthropogenic influence and «care» of the water garden they reproduce successfully. Remarkable, however, is the occurrence of some rare species (Sympetrum depressiusculum, Sympecma paedisca) well within the settlement area of Dornbirn. The documentation of Odonata will be continued. All observational data are documented in the biodiversity database (BioOffice 2.0) of the museum. They are also available online via the Biodiversity Portal GBIF (http://www.gbif.at/)." (Author)] Address: Friebe, G., Jahngasse 9, A-6850 Dornbirn, Austria. E-Mail: georg.friebe@inatura.at

12379. Frye, M.A. (2013): Visual attention: A cell that focuses on one object at a time. Current Biology 23(2): R61-R63. (in English) ["A new study has identified a remarkable neuron in the dragonfly brain that chooses and faithfully follows one and only one prey-like visual target, completely ignoring another, thereby demonstrating a form of competitive selection required for visual attention." (Author)] Address: Frye, M.A., Howard Hughes Medical Institute, Department of Integrative Biology and Physiology, Univ. of California, Los Angeles, CA 90095, USA. Electronic address: frye@ucla.edu.

12380. Fuller, C.A.; Gilmore, A.F. (2013): The combined effects of Atrazine and predation on the larval dragonfly Ladona deplanata. Kentucky Water Resources, Annual Symposium, March 18, 2013, Marriott's Griffin Gate Resort, Lexington, Kentucky: 57-58. (in English) [Verbatim: Agricultural pesticide contamination is ubiquitous in freshwater habitats and predicting the fate of these chemicals in natural communities is an important goal for ecologists. Atrazine is a common herbicide found in freshwater habitats worldwide with numerous negative effects on aquatic wildlife. Typical concentrations are relatively low (~100 ppb), yet have the ability to impair wildlife behaviour, physiology, and fitness traits. Recent research indicates that these effects are often magnified in the context of other community interactions. Because invertebrates are a keystone species in aquatic habitats we sought to determine how sublethal concentrations of atrazine (80 ppb) and predator cues (Anax junius) affect larval dragonflies (Ladona deplanata) throughout development. We used a split-plot experimental design with aquatic mesocosms to test the interaction of these stressors over a six-week period. We examined the effects of both stressors on immune parameters, growth, and fat storage, phenotypically plastic traits that have fitness implications for adult dragonflies. Preliminary analyses using two-way ANOVAs indicate that both treatment effects on larvae were evident after two weeks of exposure with predator cues affecting growth and immune parameters over the entire six weeks. After two weeks of exposure, there was a significant treatment interaction on immune parameters, however by the end of the six-week period, treatment effects depended on the specific immune response measured. The effect of predator presence on hemocyte numbers persisted throughout the experiment, as did the effect of atrazine on phenoloxidase (PO) activity. The results of our study indicate that sublethal atrazine exposure affects immune function in larval dragonflies with implications for parasite resistance and the potential for tradeoffs between growth and immune investment. In the context of a natural community, sublethal herbicide exposure may be intensifying the effects of predators with implications for survival to metamorphosis and adult fitness. This study highlights the importance of conducting long-term exposure experiments of multiple stressors, in detecting differences in the sublethal effects of contaminants on aquatic invertebrates.] Address: Fuller, Claire, A., Department of Biology, Murray State University, Murray, KY 42071, USA. E-mail: claire.fuller@murraystate.edu

12381. Genoud, D. (2013): Présence de Lestes virens vestalis (Rambur, 1845) et Lestes barbarus (Fabricius, 1798) en Plaine de l'Ain (départementde l'Ain) à proximité du Rhône. Discussion sur leur statut. Sympetrum 16: 22-23. (in French) [Records of the regionally rare L. virens vestalis and L. barbarus between 1995-1997 are documented. Gain and loss in the 2000th of the local populations are presented.] Address: Genoud, D., 2 domaine de Bellevue - 11290 Arzens, France

12382. Genoud, D. (2013): Présence de Platycnemis acutipennis (Selys, 1841) en Plaine de l'Ain (département de l'Ain) à proximité du Rhône. Sympetrum 16: 18-20. (in French) [France; records of P. acutipennis from 29.VII-1995, 29-VII-1996 as well as 6 and 23-VIII-2007 are presented.] Address: Genoud, D., 2 domaine de Bellevue - 11290 Arzens, France

12383. Genoud, D. (2013): Observation de Boyeria irene (Fonscolombe, 1838) en Plaine de l'Ain (département de l'Ain) à proximité du Rhône. Sympetrum 16: 24-25. (in French) [23-VIII-1997, Saint-Maurice-de-Reymen, France.] Address: Genoud, D., 2 domaine de Bellevue - 11290 Arzens, France

12384. Goertzen, D.; Suhling, F. (2013): Promoting dragonfly diversity in cities: major determinants and implications for urban pond design. Journal of Insect Conservation 17(2): 399-409. (in English) ["Urbanisation is increasing and it is essential to integrate biodiversity into the spatial planning of urban areas. This requires deeper understanding of biodiversity patterns in cities. We investigated which habitat variables are major determinants of dragonfly diversity and species assemblage structure in the municipal area of Dortmund (Germany). We sampled dragonfly larvae in 33 ponds situated in city parks, commercial, residential and agricultural areas. We recorded 30 autochthonous dragonfly species with species richness ranging from zero to 17. Additionally, we surveyed a set of environmental variables including habitat size, water level, pond structures

and vegetation as well as surrounding landscape and potential disturbances like waterfowl and fish. Multivariate methods were used to identify the major determinants of dragonfly diversity, abundance and assemblage structure. Analysis indicated that diversity of aquatic and terrestrial vegetation affected dragonfly diversity positively. City park ponds had low diversity, but Ischnura elegans was obviously promoted by the specific park pond conditions, including high waterfowl density. We found five assemblages mostly determined by generalistic species which were related to different pond types. Moderately disturbed ruderal and pioneer ponds in residential and agricultural areas also containned increased numbers of rare species. Our results indicate that urban ponds may have a great value for maintaining biodiversity, but various disturbances have negative impact. To promote urban biodiversity we suggest a natural design of well-vegetated ponds as well as a high diversity of different pond types and particularly a more-natural redesign of city park ponds." (Authors)] Address: Suhling F., Inst. Geoökologie, TU Braunschweig, Langer Kamp 19c, 38102 Braunschweig, Germany. E-mail: f.suhling@tu-bs.de

12385. Gonzalez-Bellido, P.T.; Peng, H.; Yang, J.; Georgopoulos, A.P.; Olberg, R.M. (2013): Eight pairs of descending visual neurons in the dragonfly give wing motor centers accurate population vector of prey direction. Proceedings of the National Academy of Sciences 110(2): 696-701. (in English) ["Intercepting a moving object requires prediction of its future location. This complex task has been solved by dragonflies, who intercept their prey in midair with a 95% success rate. In this study, we show that a group of 16 neurons, called target-selective descending neurons (TSDNs), code a population vector that reflects the direction of the target with high accuracy and reliability across 360°. The TSDN spatial (receptive field) and temporal (latency) properties matched the area of the retina where the prey is focused and the reaction time, respectively, during predatory flights. The directional tuning curves and morphological traits (3D tracings) for each TSDN type were consistent among animals, but spike rates were not. Our results emphasize that a successful neural circuit for target tracking and interception can be achieved with few neurons and that in dragonflies this information is relayed from the brain to the wing motor centers in population vector form." (Author) Libellula luctuosa was studied; additional results were obtained by using specimens of L. lydia and L. pulchella.] Address: Gonzalez-Bellido, Paloma, Allen Institute for Brain Science, Seattle, WA 98103, USA. E-mail: paloma@mbl.edu.

12386. Harabiš, F.; Tichanek, F.; Tropek, R. (2013): Dragonflies of freshwater pools in lignite spoil heaps: Restoration management, habitat structure and conservation value. Ecological Engineering 55: 51-61. (in English) ["Although numerous studies of several terrestrial groups have revealed high conservation potential of post-industrial sites, freshwater habitats in post-mining sites still remain little explored. Here we present a study of Odonata colonizing 61 freshwater pools newly established at 9 lignite spoil heaps in the north-western Czech Republic, Central Europe. We aimed mainly on effects of the three prevailing pool restoration methods (spontaneously inundated depressions at non-reclaimed sites, at reclaimed sites; and novel technically constructed ponds) along with several factors of the local habitat and surrounding landscape on species richness, conservation values, and species composition of the dragonfly communities. By recording of 32 species of lentic dragonflies (including 8 threatened ones) and 2 additional threatened lotic species, we documented the conservation value of post-industrial habitats also for aquatic arthropods. None of the three restoration methods supported dragonfly communities of distinctly higher conservation value then did the two others, each method generated habitats for different threatened species. Similar patterns were revealed also for vegetation heterogeneity, bottom substrate, water shading, and surrounding terrestrial habitats. We thus conclude that a mosaic-like combination of the restoration methods and creating of heterogeneous water pools will be most effective for restoring of freshwater biodiversity in highly degraded sites." (Authors)] Address: Harabiš, F., Dept of Ecology, Faculty of Environmental Sciences, Czech University of Life Sciences Prague, CZ-165 21 Prague 6, Czech Republic. E-mail: harabis.f@gmail.com

12387. Heino, J. (2013): Environmental heterogeneity, dispersal mode, and co-occurrence in stream macroinvertebrates. Ecology and Evolution: 12 pp. (in English) ["Both environmental heterogeneity and mode of dispersal may affect species co-occurrence in metacommunities. Aquatic invertebrates (including Odonata; all taxa are treated at order level) were sampled in 20–30 streams in each of three drainage basins, differing considerably in environmental heterogeneity. Each drainage basin was further divided into two equally sized sets of sites, again differing profoundly in environmental heterogeneity. Benthic invertebrate data were divided into three groups of taxa based on overland dispersal modes: passive dispersers with aquatic adults, passive dispersers with terrestrial winged adults, and active dispersers with terrestrial winged adults. The co-occurrence of taxa in each dispersal mode group, drainage basin, and heterogeneity site subset was measured using the C-score and its standardized effect size. The probability of finding high levels of species segregation tended to increase with environmental heterogeneity across the drainage basins. These patterns were, however, contingent on both dispersal mode and drainage basin. It thus appears that environmental heterogeneity and dispersal mode interact in affecting co-occurrence in metacommunities, with passive dispersers with aquatic adults showing random patterns irrespective of environmental heterogeneity, and active dispersers with terrestrial winged adults showing increasing segregation with increasing environmental heterogeneity." (Author)] Address: Heino, J., Finnish Environment Institute, Natural Environment Centre, Ecosystem Change Unit, P.O. Box 413, FI-90014, Oulu, Finland. E-mail: jani.heino @environment.fi

12388. Hunt, P. (2013): Favourite days: A summer holiday provided Peter Hunt with one of his favourite days spotting some of the dragonfly species of a Greek island. Dragonfly News 63: 20-21 (in English) [Thassos, Greece; records are documented with focus on Sympetrum fonscolombii and Crocothemis erythraea.] Address: not stated

12389. Ishaq, F.; Khan, A. (2013): Aquatic biodiversity as an ecological indicators for water quality criteria of River Yamuna in Doon Valley, Uttarakhand, India. World Journal of Fish and Marine Sciences 5(3): 322-334. (in English) [The taxa list includes Agrion and Matrona.] Address: Khan, A., Department of Biotechnology and Biochemistry, Division of Life Science, Sardar Bhagwan

Singh Post Graduate Institute of Biomedical Sciences and Research, Balawala, 248161, Dehradun, UK, India

12390. Jancowski, K.; Orchard, S.A. (2013): Stomach contents from invasive American bullfrogs Rana catesbeiana (= Lithobates catesbeianus) on southern Vancouver Island, British Columbia, Canada. NeoBiota 16: 17-37. (in English) ["Invasive alien American bullfrog populations are commonly identified as a pernicious influence on the survival of native species due to their adaptability, proliferation and consequent ecological impacts through competition and predation. However, it has been difficult to determine conclusively their destructive influence due to the fragmentary and geographically dispersed nature of the historical database. An expanding meta-population of invasive American bullfrogs, became established on southern Vancouver Island, in the mid- to late 1980s. An on-going bullfrog control program begun in 2006 offered a unique opportunity to examine the stomach contents removed from 5,075 adult and juvenile bullfrogs collected from 60 sites throughout the active season (April to October). Of 15 classes of organisms identified in the diet, insects were numerically dominant, particularly social wasps and odonates. Seasonality and site-specific habitat characteristics influenced prey occurrence and abundance. Native vertebrates in the diet included fish, frogs, salamanders, snakes, lizards, turtles, birds, and mammals, including some of conservation concern. Certain predators of bullfrog tadpoles and juveniles are commonly preyed upon by adult bullfrogs, thereby suppressing their effectiveness as biological checks to bullfrog population growth. Prey species with antipredator defences, such as wasps and sticklebacks, were sometimes eaten in abundance. Many prey species have some type of anti-predator defence, such as wasp stingers or stickleback spines, but there was no indication of conditioned avoidance to any of these. Results from this study reinforce the conclusion that, as an invasive alien, the American bullfrog is an opportunistic and seemingly unspecialized predator that has a uniquely large and complex ecological footprint both above and below the water surface." (Authors)] Address: Jancowski, K., BullfrogControl.com Inc., 69A Burnside Road West, Victoria, British Columbia, Canada, V9A 1B6. E-mail: bullfrogcontrol@shaw.ca

12391. Janssens, L.; Stoks, R. (2013): Exposure to a widespread non-pathogenic bacterium magnifies sublethal pesticide effects in the damselfly Enallagma cyathigerum: From the suborganismal level to fitness-related traits. Environmental Pollution 177: 143-149. (in English) ["While there is increasing concern that pesticide stress can interact with stress imposed by antagonistic species including pathogens, it is unknown whether this also holds for non-pathogenic bacteria. We exposed Enallagma cyathigerum damselfly larvae to the pesticide chlorpyrifos and a non-pathogenic Escherichia coli strain. Both exposure to chlorpyrifos and E. coli reduced growth rate and fat storage, probably due to the observed energetically costly increases in physiological defence (glutathione-S-transferase and Hsp70) and, for E. coli, immune defence (phenoloxidase). Moreover, these stressors interacted for both fitness-related traits. Most importantly, another fitness-related trait, bacterial load, increased drastically with chlorpyrifos concentration. A possible explanation is that the upregulation of phenoloxidase in the presence of E. coli changed into a downregulation when combined with chlorpyrifos. We argue that the observed interactive, partly synergistic effects between pesticides and widespread non-pathogenic bacteria may be common and deserves further attention to improve ecological risk assessment of pesticides. Highlights: *Non-pathogens such as the bacterium E. coli are ignored in ecotoxicology. *Both E. coli and chlorpyrifos impaired fitness-related traits in damselfly larvae. *E. coli modulated and magnified effects of chlorpyrifos on physiology and fitness. *Bacterial load was magnified >10× in the presence of chlorpyrifos. *Risk assessment of pesticides should consider synergisms with non-pathogens." (Authors)] Address: Janssens, Lizanne, Laboratory of Aquatic Ecology, Evolution and Conservation, University of Leuven, Charles Deberiotstraat 32, B-3000 Leuven, Belgium. E-mail: lizanne.janssens@bio.kuleuven.be

12392. Janssens, L.; Stoks, R. (2013): Synergistic effects between pesticide stress and predator cues: conflicting results from life history and physiology in the damselfly Enallagma cyathigerum. Aquatic Toxicology 132–133: 92-99. (in English) ["There is increasing awareness that the negative effects of anthropogenic stressors may be magnified in the presence of natural stressors. Very few of these studies have included physiology, yet including physiological studies may help learning about the mechanistic base of such synergisms at the life history level and identify synergistic interactions not translated in life history traits. We studied in Enallagma cyathigerum damselfly larvae potential synergistic effects between exposure to the pesticide glyphosate and predator cues on a key life history trait, growth rate, its associated behavioral trait, food intake, and three types of physiological traits known to be affected by both stressors in isolation: the stress protein Hsp70, energy storage and variables related to oxidative stress and damage. The pesticide and predator cues reduced growth rate in an additive way. Food intake increased under pesticide exposure and was not affected by the predator cues, indicating physiological mediation of the growth reduction. One potential physiological mechanism was that both stressors additively increased Hsp70 levels, this may also have contributed to the reduced levels of total carbohydrates when exposed to predator cues. Chronic exposure to predator cues reduced oxygen consumption, possibly to avoid too high costs of an increased metabolic rate. This reduction did not occur in the presence of the pesticide, reflecting the need for energetically expensive defence mechanisms (such as Hsp70 upregulation). When both stressors were combined, there was a reduction of the antioxidant enzyme superoxide dismutase activity (SOD) and an associated increase of oxidative damage in lipids. While synergistic interactions were not present for growth rate and food intake, they were identified for antioxidant defence and oxidative damage. This novel type of “hidden” synergistic interaction may have profound fitness implications, and when ignored will lead to underestimations of the impact of pollutants in natural populations where predators are omnipresent. Highlights: *Interactions between natural stressors and pesticides remain poorly understood. *Predation risk and glyphosate additively affected life history and behaviour. *We showed a novel type of synergistic interaction in terms of oxidative damage. *This hidden synergism can have severe fitness consequences and may be widespread." (Authors)] Address: Janssens, Lizanne, Laboratory of Aquatic Ecology, Evolution and Conservation, University of Leuven, Charles

Deberiotstr. 32, B-3000 Leuven, Belgium. E-mail: lizanne.janssens@bio.kuleuven.be

12393. Jinguji, H.; Quoc Thuyet, D.; Uéda, T.; Watanabe, H. (2013): Effect of imidacloprid and fipronil pesticide application on Sympetrum infuscatum (Libellulidae: Odonata) larvae and adults. Paddy and Water Environment 11: 277-284. (in English) ["The effect of imidacloprid and fipronil on S. infuscatum larvae and adults during the rice cultivation period was monitored using an experimental micro-paddy lysimeter (MPL) system. Twenty-two hatched larvae were laid on the soil surface of each MPL. MPLs were treated with imidacloprid, fipronil, and the control MPL was left untreated. The pesticide concentration, S. infuscatum larval and adult populations, and larval emergence time were monitored in each MPL. The maximum imidacloprid and fipronil concentration in paddy water was 52.8 µg/l at 1 day, and 1.3 µg/l at 6 h, respectively, after the pesticide application. Both pesticides dissipated quickly in paddy water, with half-lives of 8.8 and 5.4 days for imidacloprid and fipronil, respectively. The absence of S. infuscatum larvae and exuviae in the fipronil-treated MPL was remarkable. The larval survival decreased to 63.6 ± 18.2, 15.2 ± 2.6, and 0% in the control, imidacloprid-treated, and fipronil-treated MPLs, respectively, by 9 days after pesticide application. Emergence in the imidacloprid-treated MPL was also significantly lower than that in the control MPL. The observed decrease in the abundances of S. infuscatum larvae and adults in MPLs seems to be both directly and indirectly associated with nursery-box application of fipronil and imidacloprid." (Authors)] Address: Jinguji, H., School of Food, Agricultural and Environmental Sciences, Miyagi University, 2-2-1 Hatatate, Taihaku-ku, Sendai, Miyagi, 982-0215, Japan. E-mail: jinguji@myu.ac.jp

12394. Johansson, F.; Nilsson-Örtman, V. (2013): Predation and the relative importance of larval colour polymorphisms and colour polyphenism in a damselfly. Evolutionary Ecology 27(3): 579-591. (in English) ["Intraspecific body colour variation is common in many animal species. Predation could be a key selective agent giving rise to variation in body colour, and such variation could be due to genetics (polymorphisms) or phenotypic plasticity (polyphenisms). In this study we examined the degree of colour polymorphism and polyphenism in background colour matching in larvae of Coenagrion armatum. In addition, we tested if predation risk is reduced when larvae are exposed to a matching compared to a non-matching background. By raising families of larvae at three different background colours we showed that polymorphism explained about 20 % of the total variation and polyphenism about 35 %. In a predation experiment with fish, we showed that larvae with a body colour matching the background had a higher survival success compared to larvae with a non-matching background colour. We suggest that the background matching is adaptive in terms of survival from predation and that colour diversity is maintained because of spatial and temporal variation in the background experienced by damselfly larvae under field conditions." (Authors)] Address: Johansson, F., Department of Ecology and Genetics, Uppsala University, Uppsala, Sweden. E-mail: frank.johansson@ebc.uu.se

12395. Johnson, L.; Mantle, B.L.; Gardner, J.L.; Backwell, P.R.Y. (2013): Morphometric measurements of dragonfly wings: the accuracy of pinned, scanned and detached measurement methods. ZooKeys 276: 77-84. (in English) ["Large-scale digitization of museum specimens, particularly of insect collections, is becoming commonplace. Imaging increases the accessibility of collections and decreases the need to handle individual, often fragile, specimens. Another potential advantage of digitization is to make it easier to conduct morphometric analyses, but the accuracy of such methods needs to be tested. Here we compare morphometric measurements of scanned images of dragonfly wings to those obtained using other, more traditional, methods. We assume that the destructive method of removing and slide-mounting wings provides the most accurate method of measurement because it eliminates error due to wing curvature. We show that, for dragonfly wings, hand measurements of pinned specimens and digital measurements of scanned images are equally accurate relative to slide-mounted hand measurements. Since destructive slide-mounting is unsuitable for museum collections, and there is a risk of damage when hand measuring fragile pinned specimens, we suggest that the use of scanned images may also be an appropriate method to collect morphometric data from other collected insect species." (Authors)] Address: Backwell, Patricia, Research School of Biology, The Australian National University, 116 Daley Road, Canberra, ACT 0200, Australia. E-mail: pat.backwell@anu.edu.au

12396. Jones, G. (2013): Sensory biology: Listening in the dark for echoes from silent and stationary prey. Current Biology 23(6): R249-R251. (in English) ["New research shows how bats use echolocation unexpectedly to detect silent and stationary prey in darkness. Bats may use acoustic search images to identify potential prey when prey-generated noises, visual and olfactory cues are absent.... Perhaps the bats possess an acoustic image of a dragonfly, and base their decision of whether or not to attack according to how close the acoustic image they receive is to their neural template of a prey item — in this case a dragonfly...." (Authors)] Address: Jones, G.; School of Biological Sciences, University of Bristol, Woodland Road, Bristol BS8 1UG, UK. E-mail: Gareth.Jones@bristol.ac.uk

12397. Joshi, S. (2013): Response to “Talmale, S.S. & A.D. Tiple (2013). New records of damselfly Lestes thoracicus Laidlaw, 1920 (Odonata: Zygoptera: Lestidae) from Maharashtra and Madhya Pradesh states, central India” with a note on identification of Lestes concinnus Hagen in Selys, 1862 and L. umbrinus (Selys, 1891). Journal of Threatened Taxa 5(7): 4125-4126. (in English) [The author discusses the taxonomic status of L. thoraticus in detail and concludes that the specimens collected by Talmale & Tiple (2013) are of L. concinnus.] Address: Joshi, S., Department of Zoology, St. Xaviers College- Autonomous, Mumbai, Maharashtra 400001, India. E-mail: shantanuvanellus@gmail.com

12398. Kabouche, B. (2013): Note sur les odonates de la région d’Oran (Algérie), compte-rendu de prospections (septembre 2011). Poiretia 5: 1-5. (in French, with English summary) ["A series of surveys carried out in September 2011 in the vicinity of Oran and Tlemcen permit to observe nine species of Odonata in six different locations. The presence of a Saharan species, Trithemis kirbyi, and a rare species in the Oran area, Orthetrum trinacria, is highlighted." (Author)] Address: Kabouche, B. LPO PACA (Ligue de Protection des Oiseaux, région Provence Alpes Côte d’Azur): 6,avenue Jean Jaurès, 83400 Hyères-les-Palmiers (France). E-mail: benjamin.kabouche@lpo.fr

12399. Karjalainen, S.; Hämäläinen, M. (2013): Demoiselle damselflies. Winged jewels of silvery streams. Publisher: Caloptera, www.caloptera.com. ISBN 978-952-93-1045-6. 224 pp (bilingual in Finnish and English) ["The demoiselle damselflies are among the most beautiful of all insects. They typically inhabit clear pristine streams, where they cavort jewel-like in the sun over the waters. The superb photographs in this book and an informative text introduce us to their fascinating world. Besides the familiar European species, the book also includes representatives of all Demoiselle genera from around the world, as well as their nearest relatives. This book is the product of a fruitful collaboration between an exceptionally gifted nature photographer and a well known scientific authority on these insects.] (Publisher) You can order the book from the publisher (Caloptera Publishing, Neidonpuistontie 6 D 8, FI-02400 Kirkkonummi, Finland) and pay with Paypal. Price of €36 includes worldwide economy postage. Economy shipping to most of the countries takes 8 to 15 business days. Email address for ordering: info@caloptera.com.

12400. Kaunisto, K.M.; Suhonen, J. (2013): Parasite burden and the insect immune response: interpopulation comparison. Parasitology 140(1): 87-94. (in English) ["The immune response affects host's survival and reproductive success. Insurmountable immune function has not evolved because it is costly and there is a trade-off between other life-history traits. In previous studies several factors such as diet and temperature have been proposed to cause interpopulation differences in immune response. Moreover, the insect immune system may be functionally more protective upon secondary exposure, thus infection history may associate with the immune response. Here we measured how geographical location and Parasite burden is related to variation in immune response between populations. We included 13 populations of Coenagrion hastulatum in Finland over a latitudinal range of 880 km to this study. We found that water mites associated strongly with the immune response at interpopulation level: the more the mites, the higher the immune response. Also, in an alternative model based on AIC, latitude and individual size associated with the immune response. In turn, endoparasitic gregarines did not affect the immune response. To conclude, a positive interpopulation association between the immune response and the rate of water mite infection may indicate (i) local adaptation to chronic Parasite stress, (ii) effective 'induced' immune response against Parasites, or (iii) a combined effect of both of these." (Authors)] Address: Suhonen, J., Department of Biology, Section of Ecology, University of Turku, FI-20014 Turku, Finland. E-mail: juksuh@utu.fi

12401. Keränen, I.; Kahilainen, A.; Knott, E.; Kotiaho, J.S.; Kuitunen, K. (2013): High maternal species density mediates unidirectional heterospecific matings in Calopteryx damselflies. Biological Journal of the Linnean Society 108(3): 534-545. (in English) ["Hybridization is a well-known phenomenon, but there are still relatively few studies addressing the question of reproductive isolation between related sympatric animal species with largely overlapping ranges. Population density, relative abundance, and operational sex ratio (OSR) are among the factors known to have an influence on the frequency of heterospecific matings in sympatric populations. Here we had two aims. First, we used microsatellite markers and field observations to study the frequency of hybrids, and backcrosses, and the rate of heterospecific matings between two sympatric damselfly species Calopteryx splendens and C. virgo. Second, we investigated the role of population densities, relative abundances, and OSRs on conspecific and heterospecific mating rates. Altogether we genotyped 2104 individuals from both species and found four hybrids (0.19%), one of which was a backcross. Of all the 272 matings observed, 17 (6%) were between heterospecifics, and all of these were between a C. splendens male and a C. virgo female. In addition, all of the hybrids contained mitochondrial DNA (mtDNA) of C. virgo. We show that the population density of C. virgo, which was the maternal species of all the heterospecific matings and hybrid individuals, was the only significant factor covarying with the rate of the heterospecific matings. The OSRs did not correlate with the rate of con- or heterospecific matings. Studies on interspecific interactions in sympatric species can give information about the maintenance of reproductive isolation, and thus speciation." (Authors)] Address: Keränen, I., Department of Biological and Environmental Science, University of Jyväskylä, Jyväskylä, Finland. E-mail: inka.m.keranen@jyu.fi

12402. Khadijah, A.R.; Azidah, A.A.; Meor, S.R. (2013): Diversity and abundance of insect species at Kota Damansara Community Forest Reserve, Selangor. Scientific Research and Essays 8(9): 359-374. (in English) ["A study was conducted on the diversity and abundance of insect species at Kota Damansara Community Forest Reserve in order to determine the richness of the forest insect fauna. A total of 774 insects from 13 Orders and 79 Families were recorded. This study shows that Coleoptera (42.63%), Hymenoptera (17.96%), Diptera (10.08%) and Orthoptera (10.85%) were the most dominant Orders in the Forest Reserve. The highest insect diversity was observed in Diptera (Shannon's, H' = 2.67), while Dermaptera, Isoptera, Mantodea and Phasmatodea (Shannon's, H' = 0.00) were the lowest. However, the highest insect evenness was observed in Blattodea (Evenness, E = 0.36). This study also found that

the abundance of insects in Kembit zone was the highest (Margalef index, = 8.51) compared to other zone sites." (Authors) Odonata are poorly represented within the samples.] Address: Azidah, A.A., Institute of Biological Sciences, Fac. of Science, Univ. of Malaya, 50603 Kuala Lumpur, Malaysia. E-mail: azie@um.edu.my. T

12403. Khairiyah, M.H.S.; Izzati, M.R.N.; Faezah, P. (2013): Species richness and temporal variation in the dragonfly and damselfly fauna at National Botanical Garden Shah Alam. Humanities, Science and Engineering (CHUSER), 2012 IEEE Colloquium on 3-4 Dec. 2012: 442-447. (in English) ["A study on the species richness and temporal variation of insect under order Odonata was conducted at National Botanical Garden Shah Alam (NBGSA), Selangor. Samplings were conducted for three months from January 2012 to March 2012 using sweep net. Two trails were chosen at two different lakes and two different sessions which were morning session and evening session. Trail one was located at the innermost part of the forest that far human activities while trail two was located at middle of the forest with open area and near to human activities. A total of 420 odonates were successfully collected consist of four families and 23 morphospecies. The families identified were Lestidae, Libellulidae, Coenagrionidae and Gomphidae. The most abundant family was the Libellulidae with 341 individuals followed by Lestidae, Coenagrionidae and Gomphidae with 54, 16, and 9 individuals respectively. Trail one recorded the highest number of individuals collected with 250 individuals while trail two with 170 individuals had the lowest number of individual collected. Morning session was identified as the most active time for Odonata with 236 individuals collected rather than evening session with only 184 individuals. From the data analysis, Shannon-Weiner Diversity Index showed that there was no significant different ($p > 0.05$) between both trails and sessions. Overall study had shown area with high vegetation and located far away from human activities had the highest diversity of Odonata." (Authors)] Address: Khairiyah, M.H.S., Faculty of Applied Sciences, Universiti Teknologi MARA, 40450, Shah Alam, Selangor, Malaysia

12404. Kim, Y.H.; Lee, S.H. (2013): Which acetylcholinesterase functions as the main catalytic enzyme in the class Insecta? Insect Biochemistry and Molecular Biology 43(1): 47-53. (in Englsih) ["Most insects possess two different acetylcholinesterases (AChEs) (i.e., AChE1 and AChE2; encoded by ace1 and ace2 genes, respectively). Among the two AChEs, AChE1 has been proposed as a major catalytic enzyme based on its higher expression level and frequently observed point mutations associated with insecticide resistance. To investigate the evolutionary distribution of AChE1 and AChE2, we determined which AChE had a central catalytic function in several insect species across 18 orders. The main catalytic activity in heads was determined by native polyacrylamide gel electrophoresis in conjunction with Western blotting using AChE1- and AChE2-specific antibodies. Of the 100 insect species examined, 67 species showed higher AChE1 activity; thus, AChE1 was considered as the main catalytic enzyme. In the remaining 33 species, ranging from Palaeoptera to Hymenoptera, however, AChE2 was predominantly expressed as the main catalytic enzyme. These findings challenge the common notion that AChE1 is the only main catalytic enzyme in insects with the exception of Cyclorrhapha, and further demonstrate that the specialization of AChE2 as the main enzyme or the replacement of AChE1 function with AChE2 were rather common events, having multiple independent origins during insect evolution. It was hypothesized that the generation of multiple AChE2 isoforms by alternative splicing allowed the loss of ace1 during the process of functional replacement of AChE1 with AChE2 in Cyclorrhapha. However, the presence of AChE2 as the main catalytic enzyme in higher social Hymenoptera provides a case for the functional replacement of AChE1 with AChE2 without the loss of ace1. The current study will provide valuable insights into the evolution of AChE: which AChE has been specialized as the main catalytic enzyme and to become the main target for insecticides in different insect species." (Authors) The study includes Calopteryx atrata and Sympetrum pedemontanum.] Address: Lee, S.H., Dept of Agricultural Biotechnology, Seoul National Univ., 599 Gwanakno, Gwanakgu, Seoul 151-742, Republic of Korea. E-mail: shlee22@snu.ac.kr

12405. Kin, A.; Gruszczyński, M.; Martill, D.; Marshall, J.D.; Błażejowski, B. (2013): Palaeoenvironment and taphonomy of a Late Jurassic (Late Tithonian) Lagerstätte from central Poland. Lethaia 46(1): 71-81. (in English) ["A rich assemblage of exceptionally preserved marine and terrestrial fossils occurs in finegrained limestones in the upper part of the Late Tithonian (Middle Volgian) shallowing upward carbonate sequence in Central Poland. The richest horizon, a deposit known locally as the Corbulomima horizon, is named after the shallow burrowing suspension feeding bivalve Corbulomima obscura, moulds of which occur in densities of up to 500 per square metre on some bedding planes. The fauna in this bed also includes organic and phosphatic remains of a wide range of other creatures including the exuviae of limulids and decapods, disarticulated fish skeletons and rare isolated pterosaur bones and teeth. There are also perfectly preserved dragonfly wings and beetle exoskeletons. The average stable carbon and oxygen isotope values for ostracod shells and fine-grained sediment from this horizon suggest precipitation of the calcium carbonate from warm seawater of normal marine salinity. The carbonate sediments overlying the fossiliferous horizon have been interpreted as nearshore to shoreface facies. These pass abruptly into coarse reworked intraclastic sediments interpreted as possible tsunami or storm surge over-wash deposits. The clasts in this deposit have more positive oxygen isotope values than those in the underlying limestone, which may indicate that they were lithified in a slightly more evaporative, perhaps intertidal, setting. The succession terminates with silicified fine-grained limestones likely to have formed in extremely shallow lagoonal environments. In contrast with the Solnhofen limestones of Lower Tithonian age in south-central Germany the Corbulomima horizon is interpreted as a transitional deposit formed in a shallow marine setting by rapid burial with elements of both Konservat- and Konzentrat-Lagerstätte preservation." (Authors) For the odonatological details see: Bechly, G.; Kin, A. (2013): First record of the fossil dragonfly family Eumorbaeschnidae from the Upper Jurassic of Poland. Acta Palaeontologica Polonica 58(1): 121-124.] Address: Martill, D., School of Earth & Environmental Sciences, University of Portsmouth, Burnaby Building, Burnaby Road, Portsmouth, PO1 3QL Portsmouth, UK. E-mail: david.martill@port.ac.uk

12406. Koshelev, V.N.; Kolobov, V.Yu. (2013): Feeding of juvenile Kaluga and Amur sturgeon in the Amur ricer estuary. Bulletin of Astrakhan State Technical University. Series: Fishing Industry 2013(1): 20-28. (in Russian, with English summary) ["Data on feeding of juvenile kaluga and Amur sturgeon in the Amur river estuary are presented for the first time. It is established that kaluga main food consists of fishes (98.4 %), as mollusks are dominant in Amur sturgeon food compositon (63.0 %). Kaluga main food components are fishes of Cyprinidae (43.1 %), Bagridae (24.5 %) and Osmeridae (19.1 %), Amur sturgeon dominant prey are mollusks of Amuropaludina chloantha (39.6 %) and Corbicula sp. (17.4 %). Dynamics of food composition in the period from May to October is described [including data on Odonata at the order level]. It is defined that there is no competitive activity between juvenile kaluga and Amur sturgeon in the Amur river estuary part." (Authors)] Address: Kolobov, V.Yu., Khabarovsk branch of the Pacific Research Fisheries Center; Junior Scientific Researcher of the Amur River Bioresources Laboratory, Russia. E-mail: kolobovv78@mail.ru

12407. Kulijer, D.; Boudot, J.-P. (2013): First evidence of the occurence of Cordulegaster insignis Schneider, 1845 in Serbia. Odonatologica 42(1): 55-62. (in English) ["Two C. insignis specimens from Serbia were found in the collection of the National Museum of Bosnia and Herzegovina. These constitute both the first record of the species in Serbia and its north-westemmost record worldwide. The distribution of the species in Europe and the taxonomic characters of the specimens are presented and discussed."(Authors)] Address: Kulijer, D., National Museum of Bosnia and Herzegovina, Zraaja od Bosne 3, BA-71000 Sarajevo, Bosnia and Herzegovina. E-mail: dejan.kulijer@gmail.com

12408. Kulkarni, A.S.; Subramanian, K.A. (2013): Habitat and seasonal distribution of Odonata (Insecta) of Mula and Mutha river basins, Maharashtra, India. Journal of Threatened Taxa 5(7): 4084-4095. (in English, with Marathian summary) ["Catchment landscape degradation and habitat modifications of freshwater ecosystems are a primary cause of biodiversity loss in riverine ecosystems all over the world. Many elements of the flora and fauna of freshwater ecosystems are sensitive to the changes in catchment land use and habitat modification. These sensitive taxa are also reliable indicators of freshwater ecosystem health. In the current study we investigate the seasonal and habitat distribution of Odonata across riparian land use types in Mula and Mutha river basins, northern Western Ghats, Maharashtra. There was a difference in the species composition across land use types and across seasons with highest diversity and abundance during the post monsoon period. The highest Odonata diversity was observed in urban areas followed by forest and agriculture fields. There was a loss of 31% of the odonate fauna in the study area over 50 years which could be due to rapid industrialization and urbanization of the region and consequent degradation of freshwater ecosystems. The significance of catchment land use on Odonata diversity and its value in landscape monitoring is discussed." (Authors)] Address: Kulkarni, A.S., Agharkar Research Institute, Gopal Ganesh Agarkar Road, Pune, Maharashtra 411004, India. E-mail: aboli.kulkarni5@gmail.com

12409. Li, Y.; Béthoux, O.; Pang, H.; Ren, D. (2013): Early Pennsylvanian Odonatoptera from the Xiaheyan locality (Ningxia, China): new material, taxa, and perspectives. Fossil Record 16(1): 117-139. (in English) ["Data on Odonatoptera species from the Xiaheyan locality (Ningxia, China; Early Pennsylvanian) described so far are complemented based on abundant new material. Several taxonomic and nomenclatural adjustments are proposed. The species Tupus readi Carpenter, 1933 is transferred to the genus Shenzhousia Zhang & Hong, 2006 in Zhang et al. (2006), and therefore should be referred to as Shenzhousia readi (Carpenter, 1933) n. comb. The monotypic genus Sinomeganeura Ren et al., 2008 is synonymized with Oligotypus Carpenter, 1931. As a consequence the type species of the former must be referred to as Oligotypus huangheensis (Ren et al., 2008) n. comb. The monotypic genus Paragilsonia Zhang, Hong & Su, 2012 in Su et al. (2012) is synonymized with Tupus Sellards, 1906. As a consequence the type-species of the former is to be referred to as Tupus orientalis (Zhang, Hong & Su, 2012 in Su et al. (2012)) n. comb. The monotypic genus Sinierasiptera Zhang, Hong & Su, 2012 in Su et al. (2012) is synonymized with Erasipterella Brauckmann, 1983. As a consequence the type-species of the former is to be referred to as Erasipterella jini (Zhang, Hong & Su, 2012 in Su et al. (2012)) n. comb. In addition Aseripterella sinensis n. gen. et sp. and Sylphalula laliquei n. gen. et sp. are described. The 'strong oblique distal' cross-vein, located in the area between RA and RP is found to occur more extensively than previously expected. It is believed to be a structure distinct from the subnodal cross-vein, and therefore deserves to be referred to by a distinct name (viz. 'postsubnodal cross-vein'). Odonatoptera from the Xiaheyan locality cover a broad range of sizes. Factors that could have promoted the evolution of large-sized Odonatoptera are briefly reviewed. The permissive conditions prevailing during the Pennsylvanian, and the existence of an elaborated food web, are emphasized as putative positive factors. The new taxonomic treatment suggests that genera documented in the Lower Permian, such as Shenzhousia and Oligotypus, stem from the early Pennsylvanian, and implies a high resilience of these taxa when facing the Pennsylvanian–Permian environmental perturbations." (Authors)] Address: Li, Y., College of Life Science, Capital Normal University, 105 Xisanhuanbeilu, Haidian District, Beijing 100048, China. E-mail: liyongjunsysu@126.com

12410. Li, Y.; Nel, A.; Shih, C.; Ren, D.; Pang, H. (2013): The first euthemistid damsel-dragonfly from the Middle Jurassic of China (Odonata, Epiproctophora, Isophlebioptera). ZooKeys 261: 41-50. (in English) ["Sinoeuthemis daohugouensis gen. et sp. n. is the first record of the isophlebiopteran family Euthemistidae from Middle Jurassic of northeast China, while previously this family was restricted to the early Late Jurassic Kazakhstan. This new finding allows us to emend the family diagnosis with hindwing characters. This new species shows a mixture of characters alternatively present in different genera of the two families Euthemistidae and Sphenophlebiidae." (Authors)] Address: Ren, D., State Key Laboratory of Biocontrol and Institute of Entomology / Key Laboratory of Biodiversity Dynamics and Conservation of Guangdong Higher Education Institutes Sun Yat-Sen University, Guangzhou, China. E-mail: rendong@mail.cnu.edu.cn

12411. Locke, S.A.; Bulté, G.; Forbes, M.R.; Marcogliese, D.J. (2013): Estimating diet in individual pumpkinseed sunfish Lepomis gibbosus using stomach contents, stable isotopes and parasites. Journal of Fish Bi-

ology 82(2): 522-537. (in English) ["The diets (including Odonata) of 99 pumpkinseed sunfish Lepomis gibbosus from a pair of small, adjacent lakes in Ontario, Canada, were estimated from their stomach contents, trophically transmitted parasites and stable isotopes of carbon and nitrogen in fish tissue. The three methods provided virtually unrelated information. There was no significant correlation in the importance of any prey item across all three methods. Fish with similar diets according to one method of estimating diet showed no tendency to be similar according to other methods. Although there was limited variation in fish size and the spatial scale of the study was small, both fish size and spatial origin showed comparatively strong associations with diet data obtained with all three methods. These results suggest that a multidisciplinary approach that accounts for fish size and spatial origins is necessary to accurately characterize diets of individual fish." (Authors)] Address: Forbes, M.R., Dept of Biology, Carleton University, 587 Tory Building, 1125 Colonel By Drive, Ottawa, ON K1S 5B6, Canada. E-mail: mforbes@ccs.carleton.ca

12412. Lopes Junior, R.S.; Peixoto, P.E.C. (2013): Males of the dragonfly Diastatops obscura fight according to predictions from game theory models. Animal Behaviour 85(3): 663-669. (in English) ["Agonistic interactions between males for the ownership of mating territories are common among animal species. There are at least three theoretical models aimed to clarify the rules used by rivals to decide the contest winner: war of attrition model (WOA), sequential assessment model (SAM) and cumulative assessment model (CAM). However, few empirical investigations have simultaneously tested predictions from these three models, reducing our ability to infer each model's explanatory power. In this study, we used males of D. obscura to identify traits that affect individual fighting ability (resource-holding potential, RHP) and to test predictions derived from WOA, SAM and CAM models. For this, we identified morphological and physiological male traits related to chances of victory, timed contests between males and evaluated the relationship between male traits, contest duration and performance of costly behaviours. Individual body mass represented the main trait affecting RHP. Contest duration decreased with increasing winner body mass and increased with increasing loser body mass, rejecting the WOA model. The probability of physical contact increased with decreasing mass differences between rivals. Additionally, when considering pairs of rivals that showed similar mass differences, contest duration was unrelated to loser body mass. Since fights can lead to physical contact, body mass may affect the capacity to inflict costs on the rivals. Also, the relationships between contest duration and RHP and between the probability of physical contact and RHP difference between rivals indicate that males perform mutual assessment of fighting ability, as presumed by SAM. Highlights: *We identified male traits in Diastatops obscura that determine fighting ability. *We tested predictions from three game theory models regarding rules used by rivals. *Males previously present in territories were more likely to win. *Greater body mass was related to greater chances of victory in contests. *Males seem to perform mutual evaluation of fighting ability during the contest." (Authors)] Address: Peixoto, P.E.C., Departamento de Ciências Biológicas, Universidade Estadual de Feira de Santana, Feira de Santana CEP 44031-460, Bahia, Brazil. E-mail: pauloenrique@gmail.com

12413. Lou, M. (2013): Improving specimen identification: Informative DNA using a statistical Bayesian method. Open Access Dissertations and Theses. Paper 7637. http://digitalcommons.mcmaster.ca/opendissertations/7637: XI + 99 pp. (in English) ["This work investigates the assignment of unknown sequences to their species of origin. In particular, I examine four questions: Is existing (GenBank) data reliable for accurate species identification? Does a segregating sites algorithm make accurate species identifications and how does it compare to another Bayesian method? Does broad sampling of reference species improve the information content of reference data? And does an extended model (of the theory of segregating sites) describe the genetic variation in a set of sequences (of a species or population) better? Though we did not find unusually similar between-species sequences in GenBank, there was evidence of unusually divergent within-species sequences, suggesting that caution and a firm understanding of GenBank species should be exercised before utilizing GenBank data. To address challenging identifications resulting from an overlap between within- and between species variation, we introduced a Bayesian treeless statistical assignment method that makes use of segregating sites. Assignments with simulated and Drosophila (fruit fly) sequences show that this method can provide fast, high probability assignments for recently diverged species. To address reference sequences with low information content, the addition of even one broadly sampled reference sequence can increase the number of correct assignments. Finally, an extended theory of segregating sites generates more realistic probability estimates of the genetic variability of a set of sequences. Species are dynamic entities and this work will highlight ideas and methods to address dynamic genetic patterns in species." (Author) The paper includes a few references to Odonata.] Address: Lou, Melanie, McMaster University, 1280 Main St W Hamilton, ON L8S 4L8, Canada. E-mail: melanie.jj.lou@gmail.com

12414. Lozano, F. (2013): Description of three females of the genus Acanthagrion (Odonata: Coenagrionidae) with a key to the females of Argentina. Zootaxa 3646 (1): 23-38. (in English, with Spanish summary) ["The neotropical genus Acanthagrion Selys is composed of 44 species, of which the females of 31 species are currently known. In this contribution the females of A. aepiolum and A. minutum are described and that of A. ascendens is redescribed. Distribution maps and new records are provided for all three species. Finally, a key to females of the genus Acanthagrion from Argentina is provided.] Address: Lozano, F., Centro Regional de Estudios Genómicos (UNLP) Av. Calchaquí km 23.4, 1888, Florencio Varela, Buenos Aires, Argentina. E-mail: federicolozano82@ gmail.com

12415. Lupi, D.; Rocco, A.; Rossaro, B. (2013): Benthic macroinvertebrates in Italian rice fields. J. Limnol. 72(1): 184-200. (in English) ["Rice fields can be considered man-managed temporary wetlands. Five rice fields handled with different management strategies, their adjacent channels, and a spring were analysed by their benthic macroinvertebrate community to i) evaluate the role of rice agroecosystem in biodiversity conservation; ii) find indicator species which can be used to compare the ecological status of natural wetlands with rice agroecosystems; and iii) find the influence of environmental variables on biodiversity. Different methods of data analysis with increasing degree of complexity – from diver-

sity index up to sophisticated multivariate analysis – were used. The investigation provided a picture of benthic macroinvertebrates inhabiting rice agroecosystems where 173 taxa were identified, 89 of which detected in rice paddies. Among them, 4 phyla (Mollusca, Annelida, Nematomorpha, and Arthropoda), 8 classes (Bivalvia, Gastropoda, Oligochaeta, Hirudinea, Gordioida, Insecta, Branchiopoda, and Malacostraca), 24 orders, 68 families, 127 genera and 159 species have been found. Ten threatened and 3 invasive species were detected in the habitats examined. The information obtained by the different methods of data analysis allowed a more comprehensive view on the value of the components of rice agroecosystems. Data analyses highlighted significant differences between habitats (feeding channel and rice field), with higher diversity observed in channels, and emphasised the role of the water chemical-physical parameters. The period of water permanence in rice fields resulted to be only one of the factors influencing the community of benthic macroinvertebrates. The presence of rare/endangered species allowed characterising some stations, but it was less informative about management strategies in rice paddies because most of these species were absent in rice fields." (Authors) The list of taxa includes 15 Odonata species.] Address: Lupi, Daniela, Univ. of Milan, Dept of Food, Environmental and Nutritional Sciences (DeFENS), Via Celoria 2, 20133 Milano, Italy. E-mail: daniela.lupi@unimi.it

12416. MacNeil, C.; Beots, P.; Lock, K.; Goethals, P.L.M. (2013): Potential effects of the invasive 'killer shrimp' (Dikerogammarus villosus) on macroinvertebrate assemblages and biomonitoring indices. Freshwater Biology 58(1): 171-182. (in English) ["(1.) Water quality monitoring data from 10 watercourses and laboratory mesocosm studies were used to assess the potential impacts of the crustacean amphipod invader D. villosus on resident macroinvertebrate assemblage structure in Central European fresh waters. (2.) The presence of D. villosus was associated with a decline in the prevalence of many native species, pollution sensitive as well as pollution tolerant, and changes in biotic indices, despite the trends of improved water quality coinciding with the invasion period. A general increase in the prevalence of other invaders was also noted. The potential impacts of D. villosus were substratum dependent, differing between stone, concrete and sand-dominated sites. (3.) Mean Multimetric Macroinvertebrate Index Flanders (MMIF) values were marginally lower when D. villosus was present ($P < 0.06$), as opposed to when other amphipod species or no amphipods were present, despite the improved water quality. Mesocosm studies showed that several macroinvertebrate taxa were completely eliminated in treatments with D. villosus, oligochaete worms, Caenidae mayfly, chironomids and tipulids being particularly vulnerable to D. villosus predation. Biological Monitoring Working Party (BMWP) scores were lower in mesocosms with D. villosus as opposed to the native Gammarus pulex or no amphipods at all. (4.) We predict that resident macroinvertebrate assemblages in both Central Europe and Britain will come under increasing pressure as D. villosus invasions progress. Consequently, macroinvertebrate biotic indices, such as the MMIF or BMWP, may need to be revised to account for changes in taxa sensitivities to water quality as well as increased predation and competition." (Authors) Larvae of Ischnura elegans were used for the experiments. They were preyed less frequently by D. villosus and only very rarely by G. pulex, opposite to worms, chironomids and tipulids which were predated in all amphipod replicates. In field samples based on the samples from 1990 to 2009, Platycnemididae were effected negatively by invasive D. villosus especially in rivers with concrete substratum or stone substratum.] Address: MacNeil, C., Department of Environment, Food and Agriculture, The Isle of Man Government, Thie Slieau Whallian, Foxdale Road, St. Johns IM4 3AS, Isle of Man. E-mail: calummanx@hotmail.com

12417. Majumder, J.; Das, R.K.; Majumder, P.; Ghosh, D.; Agarwala, B.K. (2013): Aquatic insect fauna and diversity in urban fresh water lakes of Tripura, Northeast India. Middle-East Journal of Scientific Research 13(1): 25-32. (in English) ["Freshwater lakes are integral part of urban ecosystem and provide numerous benefits to human beings directly or indirectly. An inventory was carried out to study the aquatic entomofauna, their diversity and distribution in three urban freshwater lakes of Tripura, northeast India during January to May, 2012. A total of 2159 individuals representing 31 species belonging to 23 genera, 15 families and 4 orders were recorded. Maximum of 30 species and 1191 individuals of aquatic insects were recorded in vegetation rich Maharaja Bir Bikram College Lake and minimum of 11 species and 215 individuals were recorded in vegetation poor Laxminarayan Bari Lake. Insects belonging to the orders Hemiptera (32.26%) and Odonata (32.25%) showed higher species richness followed by those belonging to Coleoptera (25.81%) and Diptera (9.68%), respectively. Maximum diversity (Hs = 3.03) and least dominance (Ds = 0.06) and minimum diversity (Hs = 1.50) and maximum dominance (Ds = 0.06) of aquatic insects was recorded in Maharaja Bir Bikram College Lake and Laxminarayan Bari Lake, respectively. Richness estimators Chao 1 and Chao 2 provided the best predicted value of species richness. Three species are reported here for the first time from the state. Dominance of hemipteran and coleopteran insects suggested that urban lakes of Tripura are relatively less polluted." (Authors)] Address: Agarwala, B.K., Department of Zoology, Ecology and Biodiversity Laboratories, Tripura University, Suryamaninagar, Tripura 799 022, India

12418. Marinov, M.; Donnelly, N. (2013): Teinobasis fatakula sp. nov. (Zygoptera: Coenagrionidae), found on 'Eua Island, Kingdom of Tonga. Zootaxa 3609(6): 589-592. (in English) ["A recent study of the 'Eua Island in the Kingdom of Tonga has yielded a small Odonata fauna including the new species Teinobasis fatakula (Holotype male: Kingdom of Tonga, 'Eua Island, 21.3781° S, 174.9346° W, elevation 175 m; 14 July 2012, M. Marinov leg.). Because 'Eua has aquatic habitats unique within the Kingdom of Tonga, the new species is very likely endemic to that island and represents an extension of the verified range of the genus of at least 2800 km." (Authors)] Address: Marinov, M., 7/160 Rossall Str., Merivale 8014, Christchurch, New Zealand. E-mail: milen.marinov@canterbury.ac.nz

12419. May, M.L. (2013): A critical overview of progress in studies of migration of dragonflies (Odonata: Anisoptera), with emphasis on North America. J. Insect Conserv. 17(1): 1-15. (in English) ["Migration by Odonata has been recorded sporadically for several centuries, but only recently have new technologies and a new wave of interest in these ancient insects sparked a concerted effort to understand the extent, behavioural mechanisms, adaptive significance, and ecological consequences of this phenomenon. Here I review our cur-

rent knowledge of these sometimes spectacular flights, focusing on the few species in North America that are known to migrate more or less annually. One of these, Anax junius, has been shown to traverse hundreds to thousands of kilometers from north to south during fall migration. Pantala flavescens is plausibly inferred to make an overseas flight from India to East Africa with the Northeast Monsoon, although its migrations in North America are less well understood. Large scale movements of these and other species raises questions about population connectivity, ecosystem impacts, the nature and evolution of cues that initiate migration, and effects of climate change on these phenomena." (Author)] Address: May, M.L., Dept Entom., New Jersey Agricultural Experiment Station, Cook College, Rutgers Univ., New Brunswick, NJ 08901-8524, USA. E-mail: may@aesop.rutgers.edu

12420. Mchenga, I.S.S.; Ali, A.I. (2013): Macro-fauna communities in a tropical mangrove forest of Zanzibar Island, Tanzania. Global Journal of Bio-Science and Biotechnology 2(1): 260-266. (in English) [Odonata are treated at family level.] Address: Mchenga, I.S.S., Society for Environmental Research and Conservation, P.O. Box 2477, Zanzibar, Tanzania. E-mail: islamsalum@yahoo.co.uk

12421. Meyer-Rochow, B. (2013): Ethno-entomological observations from North Korea (officially known as the "Democratic People's Republic of Korea"). Journal of Ethnobiology and Ethnomedicine 2013, 9:7 doi:10.1186/1746-4269-9-7: 12 pp. (in English) ["In terms of scientific activities generally and ethnobiological pursuits in particular, North Korea, officially known as the Democratic People's Republic of Korea, is an almost blank entity on the quilt of global research. During a sabbatical semester at Pyongyang University of Science and Technology the author used this opportunity to gather some information on the uses of insect and other terrestrial arthropods as human food and components of traditional healing methods in that country. Despite the widely publicised shortcomings in the supply of food stuffs to the population of North Korea, insects are not generally seen as a source of food worthy of exploitation. However, the therapeutic use of insects, centipedes and scorpions to treat illnesses as diverse as the common cold, skin rashes, constipation, dysentery, nervous prostration, whooping cough, osteomyelitis, tetanus, and various forms of cancer is apparently still popular. The arthropods used therapeutically are credited with antiinflammatory, immunological and other health-promoting effects, because they are said to contain hormones, steroids, lipids and plant-derived alkaloids, all of which capable of exerting their effects on the human body." (Author) "Aeshnidae, Libellulidae, Crocothemis servilia" are used both as food and for therapeutic reasons. Regrettably no details are presented.] Address: Meyer-Rochow, B., School of Engineering and Science, Jacobs University Bremen, Research II (Rm.37), Bremen D-28759, Germany. E-mail: dence: b.meyer-rochow@jacobs-university.de

12422. Mitra, T.R.; Babu, R.; Subramanian, K.A. (2013): Anax panybeus Hagen, 1867: an addition to the Odonata (Aeshnidae) of India. Journal of Threatened Taxa 5(2): 3682-3683. (in English) ["Materials examined: 4868/H13, 1♂, 01.viii.1984, 27km on NS Road, Swarup Nullah, Great Nicobar Island; 4869/H13, 1♂, 01.viii.1984, 35km on NS Road, Shashtri Nagar, Great Nicobar Island, coll. S.S. Saha. The Specimens were deposited in National Zoological Collection, Zoological Survey of India, Kolkata." (Authors)] Address: Subramanian, K.A., Zoological Survey of India, M-Block, New Alipore, Kolkata, West Bengal 700053, India. E-mail: subbuka.zsi@gmail.com

12423. Moon, D.C.; Silva, D. (2013): Environmental heterogeneity mediates a cross-ecosystem trophic cascade. Ecological Entomology 38: 23-30. (in English) ["(1.) The flow of energy and nutrients across ecosystem boundaries can have significant community-wide effects, but the role of productivity of the recipient habitat in mediating these effects remains unclear. This is especially true when organisms moving across ecosystem boundaries serve simultaneously as predators and prey. (2.) In this study, the effects of odonates, primarily Enallagma civile, on a salt marsh system were examined. Cages were used to exclude odonate predators, but not other arthropods, from experimental plots of the sea oxeye daisy, Borrichia frutescens (L.) in high and low productivity areas. The effects were assessed on the in situ arthropod community and the host plant. (3.) There were strong direct effects of predation on the herbivores Pissonotus quadripustulatus Van Duzee and Asphondylia borrichiae Rossi and Strong, with higher densities where damselflies were excluded. Damselflies also served as prey for web-building spiders. This resulted in lower spider densities inside cages, and a positive indirect effect on grasshopper densities. (4.) Direct and indirect effects of odonates were greater in the high productivity area, resulting in a trophic cascade, with greater damage and reduced flowering and density of the host plant inside cages. (5.) The results of this study support the subsidy hypothesis and show that theoretical models of trophic dynamics, which were developed to explain exchanges within ecosystems, may have predictive and explanatory value for exchanges across ecosystems as well." (Authors)] Address: Moon, D.C., Dept of Biology, University of North Florida, Jacksonville, Florida, USA. E-mail: dmoon@unf.edu

12424. Murphy, J.F.; Davy-Bowker, J.; McFarland, B.; Ormerod, S.J. (2013): A diagnostic biotic index for assessing acidity in sensitive streams in Britain. Ecological Indicators 24(1): 562-572. (in English) ["Despite the history of freshwater biomonitoring, there is still a dearth of proven indices that allow accurate status assessment while simultaneously diagnosing the cause of impairment, particularly when stressors are multiple. Here, we present an approach to developing diagnostic indices where the sensitivity of biota (including Cordulegaster boltonii) is quantified using multivariate ordination. We applied the approach to the development of an index to detect acidity in British streams. Using a 197-site calibration dataset, we quantified variation in macroinvertebrate assemblages and determined which environmental variables best described the pattern. We then ranked taxa along an acid–base gradient, having first considered the merits of factoring out confounding variation from natural environmental factors. The response of the new species-level Acid Water Indicator Community (AWICsp) index to variation in base-flow and storm-flow pH and acid neutralising capacity (ANC) was quantified using independent data. Performance was also compared with existing family-level and species-level indices. AWICsp was consistently the species-level diagnostic index most clearly related to base-flow pH, storm-flow pH and ANC, accounting for 38–56% of the variation in acid conditions among the 76

test sites. Given the need to develop bio-diagnostic indicators, these data illustrate how organisms can indicate causes of stream impairment using robust and objective procedures, and when applied to strong environmental gradients such as acid–base status. We suggest that given the necessary calibration data, this approach could be applied successfully to other widespread stressors with equally strong biological effects such as organic pollution and fine sediment deposition, particularly if used in combination with RIVPACS-type predictive bioassessment models." (Authors)] Address: Murphy, J.F., River Communities Group, School of Biological and Chemical Sciences, Queen Mary University of London, c/o FBA River Laboratory, East Stoke, Wareham, Dorset BH20 6BB, UK.

12425. Nautiyal, P.; Shivam Mishra, A. (2013): Variations in benthic macroinvertebratefauna as indicator of land use in the Ken River, central India. Journal of Threatened Taxa 5(7): 4096-4105. (in English, with Marathian summary) [" Examination of benthic macroinvertebrates in semi-natural, urban and agricultural land use along the highland Ken River in central India reveals a significantly higher density in semi-natural compared with other two landuse. Insects dominate the fauna at seminatural (90%) and urban locations (93%) compared to agriculture sites (48%) where annelid share increases to 32%. The seminatural location characterized by rocky substrate support high relative abundance of Caenidae and Neoephemeridae. Their abundance decreases at urban locations. Brachycentridae, Chironomidae, Glossocolecidae, Nephthydae, Thiaridae and Corbiculidae increased at urban and agriculture locations characterized by small-sized sediments, suggesting important role for substrate also. Ordination shows that the Caenidae and Heptageniidae are characteristic at semi-natural location, Leptophlebiidae, Hydropsychidae, Glossosomatidae at urban while Thiaridae and Chironomidae at agricultural locations. Functionally, the collectors dominate the fauna, as all three landuse, especially large tracts of agriculture, are a continuous source of particulate organic matter (POM) in the river." (Authors) The study includes Gomphidae.] Address: Shivam Mishra, A. Aquatic Biodiversity Unit, Department of Zoology & Biotechnology, H. N. B. Garhwal (Central) University, Srinagar, Garhwal, Uttarakhand 246174, India. E-mail: shivama2000@yahoo.co.in

12426. Nixon, M.R.; Orr, A.G.; Vukusic, P. (2013): Subtle design changes control the difference in colour reflection from the dorsal and ventral wing-membrane surfaces of the damselfly Matronoides cyaneipennis. Optics Express 21(2): 1479-1488. (in English) ["The hind wings of males of M. cyaneipennis exhibit iridescence that is blue dorsally and green ventrally. These structures are used semiotically in agonistic and courtship display. Transmission electron microscopy reveals these colours are due to two near-identical 5-layer distributed Bragg reflectors, one placed either side of the wing membrane. Interestingly the thicknesses of corresponding layers in each distributed Bragg reflector are very similar for all but the second layer from each outer surface. This one key difference creates the significant disparity between the reflected spectra from the distributed Bragg reflectors and the observed colours of either side of the wing. Modelling indicates that modifications to the thickness of this layer alone create a greater change in the peak reflected wavelength than is observed for similar modifications to the thickness of any other layer. This results in an optimised and highly effective pair of semiotic reflector systems, based on extremely comparable design parameters, with relatively low material and biomechanical costs." (Authors)] Address: Nixon, M.R., School of Physics, University of Exeter, EX4 4QL, UK. E-mail: M.R.Nixon@exeter.ac.uk

12427. Nomura, F.; De Marco, P.; Carvalho, A.F.A.; Rossa-Feres, D.C. (2013): Does background colouration affect the behaviour of tadpoles? An experimental approach with an odonate predator. Ethology Ecology & Evolution 25(2): 185-198. (in English) ["Predation is a primary driver of tadpole assemblages, and the activity rate is a good predictor of the tadpoles' tolerance for predation risk. The conflicting demands between activity and exposure to predation can generate suboptimal behaviours. Because morphological components, such as body colouration, may affect the activity of tadpoles, we predict that environmental features that enhance or match the tadpole colouration should affect their survival or activity rate in the presence of a predator. We tested this prediction experimentally by assessing the mortality rate of tadpoles of Rhinella schneideri and Eupemphix nattereri and the active time on two artificial background types: one bright-coloured and one black-coloured. We found no difference in tadpole mortality due to the background type. However, R. schneideri tadpoles were more active than E. nattereri tadpoles, and the activity of R. schneideri was reduced less in the presence of the predator than that of E. nattereri. Although the background colouration did not affect the tadpole mortality rate, it was a stimulus that elicited behavioural responses in the tadpoles, leading them to adjust their activity rate to the type of background colour." (Authors)] Address: Nomura, F., Departamento de Ecologia, ICB, Universidade Federal de Goiás (UFG), CP 131, CEP 74001-970, Goiânia, Goiás, Brazi

12428. Novello-Gutierrez, R.; Che Salmah, M.R. (2013): Two interesting larvae of Onychogomphus from Malaysia (Anisoptera: Gomphidae). Odonatologica 42(1): 31-38. (in English) ["The larvae of O. thienemanni and Onychogomphus sp. are described and illustrated. Both species are clearly separated from each other principally by the shape of post-clypeus, pronotum, size of ligula, and dorsal protuberance on abdominal segment 2. The most distinctive feature of these 2 larvae is the shape and position of the 3|J antennomere in a manner of a protecting shield in front of the head." (Authors)] Address: Che Salmah, M.R., Universiti Sains Malaysia, School of Biological Sciences, 11800 Pulau Pinang, Malaysia. E-mail: csalmah@usm.my

12429. Nunes, A.L.; Richter-Boix, A.; Laurila, A.; Rebelo, R. (2013): Do anuran larvae respond behaviourally to chemical cues from an invasive crayfish predator? A community-wide study. Oecologia 171(1): 115-127. (in English) ["Antipredator behaviour is an important fitness component in most animals. A co-evolutionary history between predator and prey is important for prey to respond adaptively to predation threats. When non-native predator species invade new areas, native prey may not recognise them or may lack effective antipredator defences. However, responses to novel predators can be facilitated by chemical cues from the predators' diet. The red swamp crayfish Procambarus clarkii is a widespread invasive predator in the Southwest of the Iberian Peninsula, where it preys upon native anuran tadpoles. In a laboratory experiment we studied behavioural antipredator defences (alterations in activity level and spa-

tial avoidance of predator) of nine anurans in response to P. clarkii chemical cues, and compared them with the defences towards a native predator, the larval dragonfly Aeshna sp. To investigate how chemical cues from consumed conspecifics shape the responses, we raised tadpoles with either a tadpole-fed or starved crayfish, or dragonfly larva, or in the absence of a predator. Five species significantly altered their behaviour in the presence of crayfish, and this was largely mediated by chemical cues from consumed conspecifics. In the presence of dragonflies, most species exhibited behavioural defences and often these did not require the presence of cues from predation events. Responding to cues from consumed conspecifics seems to be a critical factor in facilitating certain behavioural responses to novel exotic predators. This finding can be useful for predicting antipredator responses to invasive predators and help directing conservation efforts to the species at highest risk." (Authors)] Address: Nunes, Ana, Departamento de Biologia Animal, Centro de Biologia Ambiental, Faculdade de Ciências da Universidade de Lisboa, Bloco C2, Piso 5, Campo Grande, 1749-016, Lisbon, Portugal. E-mail: alnunes@fc.ul.pt

12430. Obasi, K.O.; Ijere, N.D.;Okechukwu, R.I. (2013): Species diversity and equitability indices of some fresh water species in Aba River and Azumini Blue River, Abia state Nigeria. International Journal of Science and Technology 2(3): 238-241. (in English) [The taxa list includes larvae of Aeshnidae.)] Address: Obasi, K.O., Department of Biological Science, School of Science; Fed. Univ. of Tech. Owerri, Imo State, Nigeria

12431. Oliveira Junior, J.M.B.; Ramos Cabette, H.S.; Silva Pinto, N.; Juen, L. (2013): As variações na comunidade de Odonata (Insecta) em córregos podem ser explicadas pelo Paradoxo do Plâncton? Explicando a riqueza de espécies pela variabilidade ambiental. EntomoBrasilis 6(1): 1-8. (in Portuguese, with English summary) ["Variations in Odonata (Insecta) community in streams may be predicted by the plankton paradox? Explaining species richness by environmental variability: The theory of Plankton Paradox postulates that environments that exhibit regular temporal fluctuations would present a high diversity of species, since such fluctuations would prevent the occurrence of competitive exclusion. This work aimed evaluate variations in adult Odonata community in catchment of River Suiá-Miçú, testing the hypothesis that sites with environmental variables with the largest amplitude of variation would present the highest species richness. Were sampled 11 water bodies in an area of transition Cerrado-Amazon Forest in east-central Mato Grosso state, Brazil. Environmental variables evaluated were: environmental integrity (HII) and range of variation of pH, conductivity, air temperature, water temperature, dissolved oxygen, ammonia, phosphorus and Mg+. Were collected 2.144 specimens, distributed in eight families, 41 genera and 78 species. Our hypothesis was not confirmed, since the multiple regression analysis performed between the estimated kind of richness Anisoptera and Zygoptera with range of variation of physical-chemical was not significant for any of the eight variables, as well as for HII. Our results suggest that variations in the community of Odonata in streams cannot be explained by Plankton Paradox. We believe that this result may have occurred due mainly to the low variations in environmental conditions discussed, action of other local processes such as competition and predation or differences ecophysiological result of body size variation and capacity of thermoregulation in the order of the adults studied." (Authors)] Address: Juen, L. Universidade Federal do Para, Brasil. E-mail: leandrojuen@ufpa.br

12432. Ott, J. (2013): Eine europaweit geschützte Libelle: die Große Moosjungfer hat sich im Raum Kaiserslautern angesiedelt. Heimatjahrbuch Kaiserslautern 2013: 90-92. (in German) [Rheinland-Pfalz, Germany. The authors outlines biology and habitat requirements of Leucorrhinia pectoralis in the district of Kaiserslautern and discusses the possible origin of the recently established local populations.] Address: Ott, J., Friedhofstr. 28, 67705 Trippstadt, Germany. E-mail: L.U.P.O.GmbH@t-online.de

12433. Parr, A.J. (2013): The Large White-faced Darter Leucorrhinia pectoralis (Charp.) in Britain during 2012. J. Br. Dragonfly Society 29(1): 40-45. (in English) ["L. pectoralis was noted in England on two occasions in 2012, these constituting only the second- and third-ever confirmed UK records of the species. This is discussed in the light of the migratory capabilities of Leucorrhinia species and the possibility that some earlier unexpected sightings from eastern England originally ascribed to White-faced Darter L. dubia may have been either L. pectoralis or L. rubicunda.] Address: Parr, A.J., 10 Orchard Way, Barrow, Bury St. Edmunds, Suffolk IP29 5BX, UK. E-mail: Adrian.parr@bbsrc.ac.uk

12434. Petrulevicius, J.F.; Nel, A. (2013): A new Frenguelliidae (Insecta: Odonata) from the early Eocene of Laguna del Hunco, Patagonia, Argentina. Zootaxa 3616 (6): 597-600. (in English) ["The discovery of a new specimen of Frenguelliidae, attributed to the new species Frenguellia iglesiasi, in Patagonia, Argentina, is noteworthy for the knowledge of the diversity within this little-known family." (Authors)] Address: Petrulevicius, J.F., Museo de La Plata - UNLP - CONICET, División Paleozoología Invertebrados, Paseo del Bosque s/n, 1900 La Plata, Argentina. E-mail: levicius@museo.fcnym.unlp.edu.ar

12435. Pinguey, D. (2013): On the trail of the Orange-spotted Emerald. Dragonfly News 63: 22-24 (in English) [northern Portugal without locality dates, Oxygastra curtisii, Macromia splendens, Gomphus graslinii.] Address: not stated

12436. Ramírez, A.; Gutiérrez-Fonseca, P.E. (2013): The larvae of Heteragrion majus Selys and H. atrolineatum Donnelly, with a key to known species from Costa Rica (Odonata: Megapodagrionidae). Zootaxa 3609(1): 96-100. (in English, with Spanish summary) ["The final larval stadium of Heteragrion majus Selys, 1886 and H. atrolineatum Donnelly, 1992 are described and illustrated for the first time, using reared material from Costa Rica, and compared with other species of the genus known from the country. All species were very similar as larvae, but they can be separated by the presence and distribution of antennal setae, spines on the posterior margin of the abdominal segments, and size. A key to separate all five species known for Costa Rica is provided." (Authors)] Address: Ramírez, A., Department of Environmental Sciences, University of Puerto Rico, P.O. Box 190341, San Juan, Puerto Rico 00919. E-mail: araamirez@ramirezlab.net

12437. Ramirez-Gonzalez, R.; Yu, D.W.; Bruce, C.; Heavens, D.; Caccamo, M.; Emerson, B.C. (2013): PyroClean: Denoising pyrosequences from protein-coding

amplicons for the recovery of interspecific and intraspecific genetic variation. PLoS ONE 8(3): e57615. doi:10.1371/journal.pone.0057615: 11 pp. (in English) ["High-throughput parallel sequencing is a powerful tool for the quantification of microbial diversity through the amplification of nuclear ribosomal gene regions. Recent work has extended this approach to the quantification of diversity within otherwise difficult-to-study metazoan groups. However, nuclear ribosomal genes present both analytical challenges and practical limitations that are a consequence of the mutational properties of nuclear ribosomal genes. Here we exploit useful properties of protein-coding genes for cross-species amplification and denoising of 454 flowgrams. We first use experimental mixtures of species from the class Collembola to amplify and pyrosequence the 5' region of the COI barcode, and we implement a new algorithm called PyroClean for the denoising of Roche GS FLX pyrosequences. Using parameter values from the analysis of experimental mixtures, we then analyse two communities sampled from field sites on the island of Tenerife. Cross-species amplification success of target mitochondrial sequences in experimental species mixtures is high; however, there is little relationship between template DNA concentrations and pyrosequencing read abundance. Homopolymer error correction and filtering against a consensus reference sequence reduced the volume of unique sequences to approximately 5% of the original unique raw reads. Filtering of remaining non-target sequences attributed to PCR error, sequencing error, or numts further reduced unique sequence volume to 0.8% of the original raw reads. PyroClean reduces or eliminates the need for an additional, time-consuming step to cluster reads into Operational Taxonomic Units, which facilitates the detection of intraspecific DNA sequence variation. PyroCleaned sequence data from field sites in Tenerife demonstrate the utility of our approach for quantifying evolutionary diversity and its spatial structure. Comparison of our sequence data to public databases reveals that we are able to successfully recover both interspecific and intraspecific sequence diversity." (Author) The study includes Odonata ("Ophiogomphus"), a taxon not known from Teneriffa.] Address: Emerson, B.C., Island Ecology and Evolution Research Group, Instituto de Productos Naturales y Agrobiología (Consejo Superior de Investigaciones Cientificas), La Laguna, Tenerife, Canary Islands, Spain. E-mail: bemerson@ipna.csic.es

12438. Rathod, P.P.; Manwar, N.A.; Pawar, S.S.; Raja, I.A. (2013): Diversity and abundance of dragonflies and damselflies (Order - Odonata) in agro ecosystems around the Amravati City (M.S.), India in monsoon season. International Journal of Agriculture Innovations and Research 1.5: 174-182. (in English) [Between July 2012 and October 2012, 31 Odonata species were reported The authors calculated the Species diversity (H) and Evenness (E) as 3.012 and 0.877 respectively.] Address: Raja, I.A., Dept of Zoology, Shri Shivaji College of Arts, Commerce and Science, Akola - 444001. India. E-mail: medrraja@gmail.com

12439. Ren, H.; Wang, X.; Li, X.; Chen, Y. (2013): Effects of dragonfly wing structure on the dynamic performances. Journal of Bionic Engineering 10(1): 28-38. (in English) ["The configurations of dragonfly wings, including the corrugations of the chordwise cross-section, the microstructure of the longitudinal veins and membrane, were comprehensively investigated using the Environmental Scanning Electron Microscopy (ESEM). Based on the experimental results reported previously, the multi-scale and multi-dimensional models with different structural features of dragonfly wing were created, and the biological dynamic behaviours of wing models were discussed through the Finite Element Method (FEM). The results demonstrate that the effects of different structural features on dynamic behaviours of dragonfly wing such as natural frequency/modal, bending/torsional deformation, reaction force/torque are very significant. The corrugations of dragonfly wing along the chordwise can observably improve the flapping frequency because of the greater structural stiffness of wings. In updated model, the novel sandwich microstructure of the longitudinal veins remarkably improves the torsional deformation of dragonfly wing while it has a little effect on the flapping frequency and bending deformation. These integrated structural features can adjust the deformation of wing oneself, therefore the flow field around the wings can be controlled adaptively. The fact is that the flights of dragonfly wing with sandwich microstructure of longitudinal veins are more efficient and intelligent." (Authors)] Address: Wang, X., Dept of Engineering Mechanics, AML, Tsinghua Univ., Beijing 100084, P. R. China. E-mail: xshwang@tsinghua.edu. cn

12440. Ren, L.-q.; Li, X.-j. (2013): Functional characteristics of dragonfly wings and its bionic investigation progress. Science China Technological Sciences 56(4): 884-897. (in English) ["Dragonfly is one of the most excellent nature flyers, and its wings exhibit excellent functional characteristics through the coupling and synergy of morphology, configuration, structure and material. The functional characteristics presented by dragonfly wings provide a biological inspiration for the investigation and development of aerospace vehicles and bionics flapping aerocraft flapping-wing micro air vehicles. In resent years, some progresses have been achieved in the researches on the wings' geometric structure, material characteristics, flying mechanism and the controlling mode. In this paper, the functional characteristics of the dragonfly wings including flying, self-cleaning, anti-fatigue, vibration elimination and noise reduction are introduced and the effects of their morphology, configuration, structure and material on the functional characteristics are described. Moreover, the current state of the bionic study on the functional characteristics of dragonfly wings is analyzed and its application prospect is depicted." (Authors)] Address: Ren, L.-q., Key Laboratory of Bionic Engineering (Ministry of Education, China), Jilin University, Changchun, 130025, China. E-mail: lqren@jlu.edu.cn

12441. Renner, S.; Périco, E.; Sahlén, G. (2013): Dragonflies (Odonata) in Subtropical Atlantic Forest fragments in Rio Grande do Sul, Brazil: seasonal diversity and composition. Scientia Plena 9(1): 1-8. (in English, with Portuguese summary) ["One of the most endangered ecosystems in America is the Atlantic Forest, which demands emergency actions to protect its remnants as well its biodiversity. In this situation the species inventory can develop a management role for the future, determining specific areas that should be preserved as well the species composition and richness can be used as an indicator of a healthy ecosystem. The use of dragonfly species composition has proven its potential indication of quality habitats. The Odonata species actually still poorly known in the Neotropical region and has never been used as a tool to analyze the

actual conditions of aquatic environments particularly in the Subtropical Atlantic Forest, which occurs in south of Brazil. A systematic survey was carried out in aquatic systems located at remnants of forest from March 2011 to February 2012. A total of 565 specimens belonging to 34 species, distributed in 5 families were sampled. Libellulidae was dominant, with 14 species, followed by Coenagrionidae, Gomphidae, Lestidae and Aeshnidae. Through inventory survey we deepen the Odonata composition knowledge and performed a statistic analysis." (Authors)] Address: Ecologia e Sensoriamento Remoto, Centro Universitário Univates, 95900-000, Lajeado-RS, Brasil. E-mail: samuelrenner@hotmail.com

12442. Rizo-Patron, F.; Kumar, A.; McCoy Colton, M.B.; Springer, M.; Trama, F.A. (2013): Macroinvertebrate communities as bioindicators of water quality in conventional and organic irrigated rice fields in Guanacaste, Costa Rica. Ecological Indicators 29: 68-78. (in English) ["The purpose of this study was to compare how aquatic macroinvertebrates are affected by certain management practices and agrochemicals in organic and conventional rice cultivations (treatments) in northwestern of Costa Rica. We sampled macroinvertebrates in both treatments, at the water entrances (irrigation) and exits (drainage) during two cycles (8 months total) of rice field cultivation. We employed a water quality index using macroinvertebrates (BMWP/CR) as bioindicators in both management treatments. Insect family mean (P = 0.0019) and species mean richness (P = 0.0340) were greater in the organic vs. the conventional treatments as well as at the entrances rather than their exits. Both macroinvertebrates mean abundance (P = 0.0281) and insects mean abundances (P = 0.0065) were greater at the organic vs. the conventional treatments. The water quality index (BMWP/CR) was greater in the organic treatment at the entrance (124) comparing with the exit (72), and also at the conventional entrance (92) vs. the exit (66), thus showing that the management practices affected the macroinvertebrate community. The organic treatment showed the settlement of a greater number of families and species of macroinvertebrates both in general and in those considered sensitive to pollution than in the conventional treatment. This sensitive group of macroinvertebrates (Baetis sp., Fallceon sp., Leptohyphes sp., Tricorythodes sp., Farrodes sp., Phyllogomphoides sp., Hydroptila sp., Mayatrichia sp., Neotrichia sp., Oxyethira sp., Nectopsyche sp.1, Nectopsyche sp.2, Oecetis sp.) can be used as a bioindicators of water quality in these agroecosystems. On the contrary, more macroinvertebrates resistant to pollution were found in the conventional compared to the organic treatment, showing that aquatic macroinvertebrates respond to the type of management/products that are applied to the rice field." (Authors)] Address: Rizo-Patrón, F., Organization for Tropical Studies, Palo Verde Biological Station, Guanacaste, Costa Rica. E-mail: frizopatron@ibcperu.org

12443. Rosario, K.; Padilla-Rodriguez, M.; Kraberger, S.; Stainton, D.; Martin, D.P.; Breitbart, M.; Varsani, A. (2013): Discovery of a novel mastrevirus and alphasatellite-like circular DNA in dragonflies (Epiprocta) from Puerto Rico. Virus Research 171: 231-237. (in English) ["Geminiviruses have emerged as serious agricultural pathogens. Despite all the species that have been already catalogued, new molecular techniques continue to expand the diversity and geographical ranges of these single-stranded DNA viruses and their associated satellite molecules. Since all geminiviruses are insect-transmitted, examination of insect vector populations through vector-enabled metagenomics (VEM) has been recently used to investigate the diversity of geminiviruses transmitted by a specific vector in a given region. Here we used a more comprehensive adaptation of the VEM approach by surveying small circular DNA viruses found within top insect predators, specifically dragonflies (Epiprocta). This 'predator-enabled' approach is not limited to viral groups transmitted by specific vectors since dragonflies can accumulate the wide range of viruses transmitted by their diverse insect prey. Analysis of six dragonflies collected from an agricultural field in Puerto Rico culminated in the discovery of the first mastrevirus (Dragonfly-associated mastrevirus; DfasMV) and alphasatellite molecule (Dragonflyassociated alphasatellite; Dfas-alphasatellite) from the Caribbean. Since DfasMV and Dfas-alphasatellite are divergent from the limited number of sequences that have been reported from the Americas, this study unequivocally demonstrates that there have been at least two independent past introductions of both mastreviruses and alphasatellites to the New World. Overall, the use of predacious insects as sampling tools can profoundly alter our views of natural plant virus diversity and biogeography by allowing the discovery of novel geminiviruses and associated satellite molecules without a priori knowledge of the types of viruses or insect vectors in a given area." (Authors)] Address: Varsani, A., School Biol. Sci., Univ. Canterbury, Private Bag 4800, Christchurch 8140, New Zealand. E-mail: arvind.varsani@canterbury.ac.nz

12444. Ruhi, A.; Boix, D.; Gascon, S.; Sala, J.; Quintana, X.D. (2013): Nestedness and successional trajectories of macroinvertebrate assemblages in man-made wetlands. Oecologia 171(2): 545-556 (in English) ["Current successional models, primarily those based on floral succession, propose several distinct trajectories based on the integration of two key hypotheses from succession theory: convergence versus divergence in species composition among successional sites, and progression towards versus deviation from a desired reference state. We applied this framework to faunal succession, including differential colonization between active and passive dispersers, and the nested patterns generated as a consequence of this peculiarity. Nine man-made wetlands located in three different areas, from 0–3 years from wetland creation, were assessed. In addition, 91 wetlands distributed throughout the region were used as references for natural macroinvertebrate communities. We predicted the following: (1) highly nested structures in pioneering assemblages will decrease to lower mid-term values due to a shift from active pioneering taxa to passive disperser ones; (2) passive idiosyncratic taxa will elicit divergent successional trajectories among areas; (3) the divergent trajectories will provoke lower local and higher regional diversity values in the mid-term assemblages than in pioneer assemblages. Our results were largely congruent with hypotheses (1) and (2), diverging from the anticipated patterns only in the case of the temporary wetlands area. However, overall diversity trends based on hypothesis (3) did not follow the expected pattern. The divergent successional trajectories did not compensate for regional biodiversity losses that occurred as a consequence of pioneering colonizer decline over time. Consequently, we suggest reconsidering wetland construction for mitigation purposes within mid-term time frames

(B3 years). Wetlands may not offset, within this temporal scenario, regional biodiversity loss because the ecosystem may not support idiosyncratic taxa from natural wetlands." (Authors) Supplementary data provide information at the species level, while the main paper analyses the taxa (including Odonata) at family level.] Address: Ruhí. A., Catalan Institute for Water Research (ICRA), Scientific and Technological Park of the University of Girona, H2O Building, Emili Grahit 101, 17003 Girona, Catalonia, Spain. E-mail: aruhi@icra.cat

12445. Rychła, A. (2013): New sites of the Golden-ringed Dragonfly Cordulegaster boltonii (Donovan, 1807) (Odonata: Cordulegastridae) in the mid-western Poland. Odonatrix 9(1): 21-28. (in Polish, with English summary) ["C. boltonii has been known from 133 sites in Poland so far. Currently, the largest metapopulations are present in the Pomarenian's Lake Disrtict, Lubusz Land, Upper Silesia and Lesser Poland. However, the knowledge about the distribution of C. boltonii is still incomplete and any information is required since it has been vulnerable and consequently protected species in Poland. Therefore, new records of C. boltonii from mid-western Poland (southern Lubusz Land) are presented in this paper. The investigated area is situated on territories of communes Brody, Gubin, Lubsko and Tuplice in the Lubuskie District. In brief, it is lowland locally with varied relief structure of numerous morainic hills (altitudes to 120 a.s.l) and depressions (altitudes to 50 a.s.l.), particularly covered by pine cultures with small participation of leaf forests. The main running waters like Pstrąg, Tymnica, Golec and Wełnica represent the type of lowland rivers dominated by sandy channel substrates and receive flows from numerous small tributaries in the area. The investigation was carried out from April to October 2011 in selected sections (length of 100–500 m) of all running waters. The occurrence of larvae, exuviae and imagines, as well as the general hydromorphological features of each habitat were noted. For larvae, 15 to 20 samples were taken with a hydrobiological scoop at each site. As result, C. boltonii was observed at 16 sites in 11 running waters (small rivers and streams). Larvae were found at 12 sites localized in 7 running waters, providing a breeding success of C. boltonii in these habitats. The highest number of larvae was found in small forest streams at sites 6 and 9, with 21 and 22 larvae respectively. The habitats of C. boltonii are small-mid lowland streams, rivers, and rarely ditches with the width range of 0,5–3,5 m and depth range of 10–100 cm; with swift current, sandy and sand-gravelled bottom partially covered with fine and grob detritus deposits. The flowing water is clear, but at the most sites brown coloured probably as a result of large iron content. Currently, the surface waters in the investigated are only under slight anthropogenic pressure, manifesting in low risk of dispersed nutrients inflows from the drainage basin and in temporary changing hydrological regime and water quality by fish ponds. Locally, the hydrological regime of some running waters is changed by beaver's dam constructions, which slow down the current. In fact, only imagines could be found at some sites downstream from the fish ponds (No. 2 and 7), suggesting that the larvae might avoid habitats localized directly beyond fish ponds. (sites No. However, with increasing distance from ponds, larvae could be observed again (sites No. 4a, 4b, 4c). Additionally, the significant hydromophological changes occurred only locally (sites No. 3, 4a, 8 and 10) as a result of beaver's activity (several meters above the dams). The larvae of C. boltonii weren't observed only the still water bodies. It indicates, that the beavers might have a negative influence only on short sections of habitats used by C. boltonii in this area. To conclude, the data indicate that the southern part of Lubusz Land is currently an important area for the development and protection of an intact population of C. boltonii in Poland." (Author)] Address: Rychła, Anna, ul. Osiedlowa 12, Płoty, 66-016 Czerwieńsk, Poland. E-mail: rychlan@op.pl

12446. Sacchi, R.; Hardersen, S. (2013): Wing length allometry in Odonata: differences between families in relation to migratory behaviour. Zoomorphology 132(1): 23-32. (in English) ["In insects, wing shape and body size are correlated with several aspects of behaviour, and the optimal morphology of wings is a trade-off between a number of functional demands in relation to behaviour (e.g. foraging, migration and sexual display). Dragonflies are spectacularly skilful flyers and present a range of different wing shapes, but to date, no detailed studies have been conducted in this group on wing length allometry in relation to body size. In this paper, we use published data on body length and wing length in all European and North American dragonflies to investigate differences in wing length allometries among Odonata taxa (suborders and families) and to relate these to behavioural patterns. We found different wing allometries between Zygoptera and Anisoptera, which are probably related to the flight mode and wing form of the two suborders. Among the Anisoptera, the Libellulidae showed a distinct wing length allometry from all other anisopteran families and migrants differed from non-migrant species. The first dichotomy is likely to reflect the adaptation of wing morphology of Libellulidae to sit-and-wait behaviour and to brief foraging flights (most species of this family are perchers) with respect to all other families, members of which are typically flyers. The second dichotomy reflects the trend of migrating species to have relatively longer wings than non-migrating members of the same family. Finally, wing length allometry differed among all the zygopteran families analysed, and this pattern suggested that each family evolved a particular wing morphology in response to peculiarities in behaviour, habitat and flight mode." (Authors)] Address: Hardersen, S., Centro Nazionale per lo Studio e la Conservazione della Biodiversità Forestale, Corpo Forestale dello Stato, Strada Mantova, 29, 46045 Marmirolo (MN), Italy. E-mail: s.hardersen@gmail. com

12447. Sánchez-Guillén, R.A.; Martínez-Zamilpa, S.M.J.; Jiménez-Cortés, J.G.; Forbes, M.R.L.; Córdoba-Aguilar, A. (2013): Maintenance of polymorphic females: do parasites play a role? Oecologia 171(1): 105-113. (in English) ["The role of parasites in explaining maintenance of polymorphism is an unexplored research avenue. In odonates, female-limited colour polymorphism (one female morph mimicking the conspecific male and one or more gynochromatic morphs) is widespread. Here we investigated whether parasitism contributes to colour polymorphism maintenance by studying six species of female dimorphic damselflies using large databases of field-collected animals. We predicted that androchrome females (male mimics) would be more intensively parasitized than gynochrome females which is, according to previous studies, counterbalanced by the advantages of the former when evading male harassment compared to gynochrome females. Here we show that in Ischnura denticollis and Enallagma no-

vahispaniae, androchrome females suffer from a higher degree of parasitism than gynochromatic females, and contrary to prediction, than males. Thus, our study has detected a correlation between colour polymorphism and parasitic burden in odonates. This leads us to hypothesize that natural selection, via parasite pressure, can explain in part how androchrome and gynochrome female colour morphs can be maintained. Both morphs may cope with parasites in a different way: given that androchrome females are more heavily parasitized, they may pay a higher fecundity costs, in comparison to gynochrome females." (Authors)] Address: Sánchez-Guillén, Rosa, Departamento de Ecología Evolutiva, Instituto de Ecología, Universidad Nacional Autónoma de México, Ciudad, Universitaria, Apdo. Postal 70-275, México. E-mail: rguillen@uvigo.es

12448. Savard, M. (2013): Inventaire automnal des odonates au Saguenay–Lac-Saint-Jean: découverte d'une population du sympétrum tardif. Le Naturaliste Canadien 137(1): 25-32. (in French) [Between 18-IX.and 12-X-2011, Sympetrum vicinum was found inhabiting the beaver ponds north of Lac Saint-Jean in the National Park Pointe-Taillon, Québec, Canada. This is the northmost of the known distribution boundary of S. vicinum.] Address: Savard, M.; E-mail: michel.savard@ssss. gouv. qc.ca

12449. Sciberras, A.; Sammut, M. (2013): The occurrence of the Copper Emerald Calopteryx haemorrhoidalis (Vander Linden, 1825), records of rare species, changing population trends of some hitherto common species and recent colonisers in the Maltese Islands. J. Br. Dragonfly Society 28(1): 1-9. (in English) ["The first record of C. haemorrhoidalis from the Maltese Islands is reported. Historical and modern records for the Maltese Islands of the rare species, C. virgo, Aeshna mixta and Selysiothemis nigra, are discussed; also the changing population trends of hitherto common species such as Orthetrum coerulescens anceps, Sympetrum fonscolombii and Sympetrum striolatum." (Authors)] Address: Sciberras, A., 1133 'Arnest', Arcade Str, Paola, Malta. E-mail: bioislets@gmail.com

12450. Sesterhenn, T.M.; Reardon, E.E.; Chapman, L.J. (2013): Hypoxia and lost gills: respiratory ecology of a temperate larval damselfly. Journal of Insect Physiology 59(1): 19-25. (in English) ["Damselfly larvae, important predators and prey in many freshwater communities, may be particularly sensitive to hypoxia because their caudal lamellae (external gills) are frequently lost. In this study, we address how lost lamellae interact with low oxygen to affect respiration and behaviour of the widespread North American damselfly Ischnura posita. Results showed no effect of lost lamellae on resting metabolic rate or critical oxygen tension. Ventilation behaviours increased only when dissolved oxygen (DO) was at or below 25% saturation, and these behaviours were not affected by the number of lamellae. Use of the oxygen-rich surface layer occurred almost exclusively at the lowest dissolved oxygen level tested (10% saturation, 2.0 kPa). Damselflies that were missing lamellae spent more time at the surface than individuals with intact lamellae. The negative relationship between body size and time at the surface, and the negative relationship between body mass and critical oxygen tension suggest that larger I. posita may be more hypoxia tolerant than smaller individuals. Overall, I. posita was minimally affected by missing lamellae and seems well adapted to low DO habitats. Average critical oxygen tension was very low (0.48 kPa, 2.4% saturation), suggesting that individuals can maintain their metabolic rate across a broad range of DO, and behaviours changed only at DO levels below the hypoxia tolerance thresholds of many other aquatic organisms." (Authors)] Address: Sesterhenn, T.M., Dept of Biology, Univ. of Kentucky, 101 Morgan Building, Lexington, KY 40506-0225, USA. E-mail: tsesterh@purdue.edu

12451. Siepielski, A.M.; McPeek, M.A. (2013): Niche versus neutrality in structuring the beta diversity of damselfly assemblages. Freshwater Biology 58(4): 758-768. (in English) [" (1.) Differences among communities in taxonomic composition – beta diversity – are frequently expected to result from taxon-specific responses to spatial variation in ecological conditions, through niche partitioning. Such process-derived patterns are in sharp contrast to arguments from neutral theory, where taxa are ecologically equivalent and beta diversity results primarily from dispersal limitation. (2.) Here, we compared beta diversity among assemblages of Zygoptera, for which previous experiments have shown that niche differences maintain genera within a community, but patterns of relative abundance for species within each genus are shaped primarily by neutral dynamics. (3.) Using null-model and ordination-based methods, we find that both genera and (in contrast to neutral theory) species assemblage composition vary across the landscape in a deterministic fashion, shaped by environmental and spatial factors. (4.) While the observed patterns in species composition conflict with theory, we suggest that this a result of weak ecological filters acting to produce spatial variation in assemblages of ecologically similar species undergoing ecological drift within communities. Such patterns are especially likely in systems of relatively weak dispersers like damselflies." (Authors) The study includes the following taxa: Enallagma divagans, E. ebrium/hageni, E. exulans, E. geminatum, E. minusculum, E. pictum, E. signatum, E. traveatum, E. vernale, E. vesperum, Argia, Ischnura, Lestes, and Nehalennia.] Address: Siepielski, A.M., Department of Biology, University of San Diego, San Diego, CA 92110, USA. E-mail: adamsiepielski@sandiego.edu

12452. Sim, L.L.; Davis, J.A.; Strehlow, K.; McGuire, M.; Trayler, K.M.; Wild, S.; Papas, P.J.; O'Connor, J. (2013): The influence of changing hydroregime on the invertebrate communities of temporary seasonal wetlands. Freshwater Science 32(1): 328-342. (in English) ["Community dynamics in temporary waters are constrained by the hydroregime (depth, timing, duration, frequency, and predictability of water in an aquatic habitat), which in turn is influenced by climatic patterns and anthropogenic use of water in the landscape. Declining rainfall in regions with a Mediterranean climate, such as southwestern Australia, has decreased the depth and duration of water in temporary wetlands, potentially altering the composition of invertebrate communities. We used a long-term data set (6–25 y) to examine temporal changes in hydroregimes and aquatic invertebrate diversity (based on species presence/absence) at 9 seasonal wetlands. The study wetlands maintained distinctly seasonal hydroregimes, despite declining rainfall and the contraction of wetland hydroperiods. Distance-based redundancy analysis (dbRDA) indicated that conductivity, NO3-+NO2-, and turbidity were the most important factors explaining the changes in invertebrate community composition over time. Allocation of species into 4 trait-based groups based on their resilience to or

resistance of drought and their mode of recolonization of a water body upon rewetting revealed that the fauna is dominated by active dispersers. This result suggests that the proximity of source wetlands from which mobile invertebrate species and vertebrate vectors, such as waterbirds, can recolonize seasonal wetlands is an important factor influencing the invertebrate community response to rewetting. Despite the decline in water availability, we found little evidence of a shift to a more arid-adapted fauna. We suggest that the maintenance of a mosaic of wetlands of varying hydroregimes at the whole-landscape scale will be critical to the future persistence of aquatic invertebrate communities in Mediterranean regions where the frequency and intensity of droughts is predicted to increase... Group-3 taxa (colonists that do not need water for egg laying) were relatively rare. Those recorded included damselflies (Lestidae), mosquitoes (Culicidae), and dragonflies (Libellulidae)." (Authors)] Address: Davis, Jenny, Australian Centre for Biodiversity, School of Biological Sciences, Monash University, Wellington Road, Clayton, Victoria 3800, Australia. E-mail: jenny.davis@monash.edu

12453. Simaika, J.P.; Samways, M.J.; Kipping, J.; Suhling, F.; Dijkstra, K.-D.B.; Clausnitzer, V.; Boudot, J.-P.; Domisch, S. (2013): Continental-scale conservation prioritization of African dragonflies. Biological Conservation 157: 245-254. (in English) ["Indicators on the state of global biodiversity illustrate continued decline, while pressure on biodiversity keeps rising. This necessitates revisiting site prioritization and species protection for conservation. Patterns of richness and threat of four well-studied aquatic taxa, the fishes, crabs, molluscs and dragonflies largely coincide at the continental scale, at least in Africa. For this study, we focus on dragonflies, for which there is a point locality database, as a surrogate taxon, modelling the species at the fine-scale, using species distribution modelling. With this approach, we built a protected areas network using spatial planning software. Priority areas for dragonfly conservation largely coincided with analyses of global biodiversity hotspots. The Zambian swamps and woodlands, as well as the rainforests of the Lower Guinea and Congo Basin are emphasized as hotspots of dragonfly diversity. Among globally threatened species, 72% were recorded at least once in a protected area. Although the current reserve network covers 10.7% of the landscape, the proportional representation of species geographic distributions in reserves is only 1.2%. The reserve network is therefore inefficient concerning freshwater species, and many areas of conservation priority that are not formally protected remain. The advantage of operating at the fine scale, while covering a large geographic area is that it shifts the focus from the large-scale hotspots to smaller priority areas within and beyond hotspots. Also, by operating at the fine-scale for a large geographical area, the potential exists for local conservation managers to consider campaigning for the inclusion of the priority areas that are not formally protected, while adjacent to the existing reserve networks. Where this is not possible, we recommend monitoring these areas to detect future threats to the habitats that these might face." (Authors)] Address: Simaika, J.P., Dept of Conservation Ecology and Entomology, Stellenbosch University, P Bag X1, Matieland 7602, South Africa. E-mail: john.simaika@senckenberg.de

12454. Simon, S.; Narechania, A.; DeSalle, R.; Hadrys, H. (2013): Insect phylogenomics: Exploring the source of incongruence using new transcriptomic data. Genome Biol Evol. 4(12): 1295-1309. (in English) ["The evolution of the diverse insect lineages is one of the most fascinating issues in evolutionary biology. Despite extensive research in this area, the resolution of insect phylogeny especially of inter-ordinal relationships has turned out to be still a great challenge. One of the challenges for insect systematics is the radiation of the polyneopteran lineages with several contradictory and/or unresolved relationships. Here, we provide the first transcriptomic data for three enigmatic polyneopteran orders (Dermaptera, Plecoptera and Zoraptera) to clarify on of the most debated issues among higher insect systematics. We applied different approaches to generate three data sets comprising 78 species and 1,579 clusters of orthologous genes. Using these three matrices we explored several key mechanistic problems of phylogenetic reconstruction including missing data, matrix selection, gene and taxa number/choice and the biological function of the genes. Based on the first phylogenomic approach including these three ambiguous polyneopteran orders we provide here conclusive support for monophyletic Polyneoptera, contesting the hypothesis of Zoraptera+Paraneoptera and Plecoptera+ remaining Neoptera. In addition, we employ various approaches to evaluate data quality and highlight problematic nodes within the Insect Tree that still exist despite our phylogenomic approach. We further show how the support for these nodes or alternative hypotheses might depend on the taxon- and/or gene-sampling." (Authors) The analysis includes Ischnura elegans.] Address: Simon, Sabrina, ITZ, Ecology & Evolution, Stiftung Tierärztliche Hochschule Hannover, 30559 Hannover, Germany. E-mail: ssimon@amnh.org

12455. Smith, M.S. (2013): Another mixed damselfly pairing. Atropos 48: 85-86 (in English) [Mixed pairing of Lestes barbarus and L. sponsa. Winterton, Norfolk, 8 – IX-2012] Address: Smith, M.S., 15 St Edmund's Road, Lingwood, Norfolk, NR13 4LU, UK

12456. Smith, E.L.; Coté, D.; Colbo, M.H. (2013): An impoverished benthic community shows regional distinctions. Northeastern Naturalist 20(1): 91-102 (in English) ["Monitoring programs using benthic macroinvertebrates are well-used and expanding to areas where communities are species-poor. The sensitivity of these depauperate communities to environmental conditions, however, is not well known. In this study, impoverished benthic invertebrate communities were compared from three climatically and geologically distinct regions of Newfoundland. Differences in community structure were evident among regions at both the genus and family level. These results indicate that widely dispersing and depauperate macroinvertebrate communities can be sufficiently diverse to respond to regional variation in environmental conditions and therefore remain promising for detecting anthropogenic-induced changes... For example, species of Ephemeroptera number 35 in Newfoundland (106,000 km²) versus 160 species in Maine (91,650 km²) while Odonata number 38 species in Newfoundland and 128 species in the Canadian ..." (Authors)] Address: Smith, Erica, Box One, Portage la Prairie, MB, Canada R1N 3P1. E-mail: SmithEricaL@gmail.com

12457. Stewart, S.S.; Vodopich, D.S. (2013): Variation in fluctuating asymmetry among nine damselfly species. International Journal of Odonatology 16(1): 67-77. (in English) ["Fluctuating asymmetry (FA), measured as

random deviations from bilateral symmetry, likely results from developmental disturbances by internal or environmental stresses. However, comparisons of FA in single damselfly species (Odonata: suborder Zygoptera) from stressed environments have often been inconclusive. We measured levels of FA among multiple species of damselflies from the same environment to determine the relative roles of environmental stress and species-specific developmental instability. Damselflies of nine species (Argia sedulum, A. nahuana, A. immundum, Ischnura ramburii, I. hastata, I. posita, Enallagma civile, E. basidens, Telebasis salva) were collected from a central Texas wetland. Calculations of their FA were based on cell counts of four clearly defined areas (venation patterns) in fore and hind wings. Significant FA of venation occurred in both sexes, both wing positions, and in each of four venation patterns of all nine species. Levels of FA were not significantly different between sexes or between wing positions for any of the nine species. However, FA varied significantly among the four venation patterns. Patterns with lowest mean cell counts had significantly higher FA than the other patterns, despite scaling to remove size bias. More broadly, a three-fold difference in overall FA occurred among the nine species and was not correlated with species mean weight or abdomen length. The wide range of FA levels among multiple species in the same environment calls for caution in designing studies that select a single species expected to be sensitive to environmental stress. Future research must examine the relative roles of species-specific predispositions for FA from internal genetic stresses as well as external stressors." (Authors)] Address: Stewart, Sherry, Department of Biology, Baylor University, Waco, TX, 76798-7388, USA

12458. Suhling, I.; Suhling, F. (2013): Thermal adaptation affects interactions between a range-expanding and a native odonate species. Freshwater Biology 58(4): 705-714. (in English) ["(1.) Increasing temperature and invading species may interact in their effects on communities. In this study, we investigated how rising temperatures alter larval interactions between a naturally range-expanding dragonfly, Crocothemis erythraea, and a native northern European species, Leucorrhinia dubia. Initial studies revealed that C. erythraea grow up to 3.5 times faster than L. dubia at temperatures above 16 C. As a result, we hypothesised that divergent temperature responses would lead to rapid size differences between coexisting larvae and, consequently, to asymmetric intraguild predation at higher ambient temperatures. (2.) Mortality and growth rates were measured in interaction treatments (with both species present) and non-interaction controls (one species present) at four different temperature regimes: at an ambient temperature representative of central Germany, where both species overlap in distribution, and at temperatures increased by 2, 4 and 6 C. (3.) The mortality of C. erythraea did not differ between treatment and control. In contrast, mortality of L. dubia remained similar over all temperatures in the controls, but increased with temperature in the presence of the other species and was significantly higher there than in the controls. We concluded that L. dubia suffered asymmetric intraguild predation, particularly at increased temperature. Reduced growth rate of L. dubia in the interaction treatment at higher temperatures also suggested asymmetric competition for prey in the first phase of the experiment. (4.) The results imply that the range expansion of C. erythraea may cause reduction in population size of syntopic L. dubia when temperature rises by more than 2°C. The consequences for future range patterns, as well as other factors that may influence the interaction in nature, are discussed." (Authors)] Address: Suhling F., Inst. Geoökologie, TU Braunschweig, Langer Kamp 19c, D-38102 Braunschweig, Germany. E-mail: f.suhling@tu-bs.de

12459. Sundermann, A.; Gerhardt, M.; Kappes, H.; Haase, P. (2013): Stressor prioritisation in riverine ecosystems: Which environmental factors shape benthic invertebrate assemblage metrics? Ecological Indicators 27: 83-96. (in English) ["Aquatic ecosystems are amongst the most heavily altered ecosystems and exhibit a disproportional loss of biodiversity. Numerous stressors, such as nutrient enrichment, contaminant pollution, sedimentation and alterations in stream hydrology and habitat structure, account for these losses. Understanding these forces is of utmost importance to prevent riverine ecosystems from further deterioration and to provide helpful insights for restoration practices. In the present study, we analyse the response of biological indicators to a large number of environmental factors. For this, benthic invertebrate assemblages (including Odonata at the order level) from 83 sites in Germany were described based on 25 metrics from four different metric types. The condition of the sites was described using 27 environmental factors: 13 for water quality, 4 for land use in the catchment and 10 for local scale habitat structure. The relative importance of single environmental predictors or predictor combinations for benthic invertebrate assemblages was analysed with single and multiple linear regression models. The results for the latter models were statistically supported via a bootstrap approach. The models revealed the importance of water quality and catchment-scale land use in explaining benthic invertebrate assemblages; in particular, chloride, oxygen, total organic carbon and the amounts of artificial surfaces and arable land were the most important predictors. Models including solely structural variables such as plan form, bank structures and substrate diversity had lower goodness of fit values than those for other variables. Regarding the four different assemblage metric types, functional metrics had on average lower goodness of fit values than composition/abundance, richness/diversity and sensitivity/tolerance metrics. Among the richness/diversity metrics, however, the model results for the Shannon–Wiener and Simpson diversity indices and evenness were poor. Our results show that catchment-related factors and water quality were of overriding importance in shaping biodiversity patterns and causing species loss. In contrast, structural degradation at a local scale was not the most significant stressor. This finding might explain why structural restoration at a reach scale often yields a low benefit–cost ratio and may be considered to represent inappropriate investment prioritisation." (Authors)] Address: Sundermann, Andrea, Senckenberg Research Institute and Natural History Museum Frankfurt, Department of River Ecology and Conservation, Clamecystr. 12, 63571 Gelnhausen, Germany. E-mail: Andrea.Sundermann@senckenberg.de

12460. Takahara, T.; Doi, H.; Kohmatsu, Y.; Yamaoka, R. (2013): Different chemical cues originating from a shared predator induce common defense responses in two prey species. Animal Cognition 16(1): 147-153. (in English) ["In freshwater ecosystems, inducible defenses that involve behavioural or morphological changes in

response to chemical cue detection are key phenomena in prey–predator interactions. Many species with different phylogenetic and ecological traits (e.g., general activity patterns and microhabitats) use chemical cues to avoid predators. We hypothesized that prey species with a shared predator, but having different ecological traits, would be adapted to detect different chemical cues from the predator. However, the proximate mechanisms by which prey use chemical cues to avoid predation remain little known. Here, we tested our hypothesis by using fractionated chemical components from predatory dragonfly nymphs (Anax parthenope julius) to trigger anti-predator behavioural responses in two anuran tadpoles, the wrinkled frog Glandirana (Rana) rugosa and the Japanese tree frog Hyla japonica. Glandiranarugosa detected chemical cues that had either high or low hydrophobic properties, but H. japonica responded only to chemical cues with hydrophilic properties. During the normal behaviours of these tadpole species, G. rugosa remains immobile in benthic habitats, whereas H. japonica exhibits active swimming at the surface or in the middle of the water column. As we had hypothesized, these tadpole species, which have different general activity levels and microhabitats, detected different chemical cues that were exuded by their shared predator and responded by changing their activities to avoid predation. The specific chemical cues detected by each tadpole species are likely to have characteristics that optimize effective predator detection and encounter avoidance of the shared dragonfly predator." (Authors)] Address: Takahara, T., Graduate School of Science and Technology, Kyoto Institute of Technology, Sakyo-ku, Kyoto, 606-8585, Japan. E-mail: takahara@hiroshima-u.ac.jp

12461. Takahashi, Y.; Watanabe, M. (2013): Time constraints related to sexual maturation and prolonged copulation in the female-dimorphic damselfly Ischnura senegalensis. Entomological Science 16(1): 34-39. (in English) ["Time constraints are critical for reproductive success. To understand the spatiotemporal dynamics of morph frequency in the female-dimorphic damselfly Ischnura senegalensis, we compared two different morphs for two important time constraints on female reproductive output, i.e. post-emergence sexual maturation and prolonged copulation. The females of both morphs achieved sexual maturation 4–5 days after emergence, suggesting that the rate of sexual mutation does not result in morph-specific fitness. The copulation durations declined with the time of onset of copulation in both morphs. Consequently, all copulations terminated at approximately 12:00 hours. Because females show foraging and oviposition activity only after copulation, the copulation duration does not result in morph-specific time constraints. These two important time constraints do not account for morph-specific reproductive success and do not affect the evolutionary equilibrium of morph frequency in I. senegalensis." (Author)] Address: Takahashi, Y., Graduate School of Life Sciences, Tohoku University, 6-3, Aoba, Aramaki, Aoba, Sendai, Miyagi 980-8578, Japan. Email: takahashi.yum@gmail.com

12462. Talmale, S.S.; Tiple, A.D. (2013): New records of damselfly Lestes thoracicus Laidlaw, 1920 (Odonata: Zygoptera: Lestidae) from Maharashtra and Madhya Pradesh states, central India. Journal of Threatened Taxa 5(1): 3552-3555. (in English) ["05.xii.2010, two males and one female from Sukad River, Singhori Wildlife Sanctuary, District Raisen, Madhya Pradesh (23°14.68'N & 78°11.01'E) (ZSI,CZRC A/16755); 09.xii.2010, one male and one female from Bhagdehi, Singhori Wildlife Sanctuary, District Raisen, Madhya Pradesh (23°06.59'N & 78°15.22'E) (ZSI,CZRC A/16756); 20.vii.2011, one male from Danital Lake, Rani Durgavati Wildlife Sanctuary, District Damoh, Madhya Pradesh (23°32.86'N & 79°43.70'E) (ZSI,CZRC, A/16757); 03.vii.2010, one male and one female were collected from Futala Lake Nagpur, Maharashtra (20°9'N & 79°9'E) (ZSI, CZRC, A/16987)." (Authors)] Address: Talmale, S.S., Zoological Survey of India, Central Zone Regional Centre, Jabalpur, Madhya Pradesh 482002, India. E-mail: stalmale@yahoo.co.in

12463. Taylor, P. (2013): A change in status of the Willow Emerald Damselfly Lestes viridis (Vander Linden) in the United Kingdom. J. Br. Dragonfly Society 29(1): 65-68 (in English) ["The revised list of Odonata in the United Kingdom produced by Taylor et at. (2009) contained 42 species in Category A, a further 12 species in Category B and three species in Category C (former breeding species not recorded since 1970). This list was subsequently revised again (Taylor & Smallshire, 2010) following the discovery of Coenagrion scitulum in Kent during June and July 2010 - this discovery necessitating a move for the species from Category C to Category B (vagrant species). The sustained colonisation of Lestes viridis since 2009 now requires this species be moved from Category B to Category A (resident and/or migrant species recorded since 1970)." (Author)] Address: Taylor, Pam, Decoy Farm, Decoy Rd, Potter Heigham, Norfolk, NR29 5LX, UK

12464. Theischinger, G.; Tang, C. (2013): Diagnostic characters of the larvae of Austropetalia Tillyard (Anisoptera Austropetaliidae), including some mainly pictorial history. Agrion 17(1): 4-7. (in English) ["The two Australian species of Austropetaliidae, Austropetalia patricia (Waterfall Redspot) and Austropetalia tonyana (Alpine Redspot), were hitherto generally identified by their geographic distribution. Recently planned listing as VULNERABLE species necessitated a closer look at the larvae. As a result, it became possible to identify the available larval material of the two species on the basis of size and direction of the lateral abdominal lobes on segments 5-8 and to present diagnostic photos in the present article (Figs 1-10)." (Authors)] Address: Tang, Cheryl, Water Science, Office of Environment & Heritage, Department of Premier & Cabinet, PO Box 29, Lidcombe NSW 1825, Australia

12465. Theischinger, G.; Richards, S.J. (2013): Palaeosynthemis elegans spec. nov., a new dragonfly from Papua New Guinea (Anisoptera: Synthemistidae). Odonatologica 42(1): 63-66. (in English) ["The new species is described from the upper Sepik Basin in northern Papua New Guinea. Holotype ♂: PNG, West Sepic prov., Temporary Camp in upper Sepic Basin, alt. 290 m asl, during Feb. 2010; deposited in Mus. & Art Gallery, Darwin, Australia. Characters of the adult male are illustrated and the affinities of the new species are discussed." (Authors)] Address: Theischinger, G., NSW Dept of Premier & Cabinet, Office of Environment & Heritage, PO Box 29, Lidcombe, NSW 1825, Australia. E-mail: gunther.theischinger@environment.nsw.gov.au

12466. Thomas, J.A.; Trueman, J.W.H.; Rambaut A.; Welch, J.J. (2013): Relaxed phylogenetics and the palaeoptera problem: Resolving deep ancestral splits in the insect phylogeny. Systematic Biology 62(2): 285 - 297. (in English) ["The order in which the three groups

of winged insects (the Pterygota) diverged from their common ancestor has important implications for understanding the origin of insect flight. But despite this importance, the split between the Odonata (dragonflies and damselflies), Ephemeroptera (mayflies) and Neoptera (the other winged orders) remains very much unresolved. Indeed, previous studies have obtained strong apparent support for each of the three possible branching patterns. Here, we present a systematic reinvestigation of the basal pterygote split. Our results suggest that outgroup choice and limited taxon sampling have been major sources of systematic error, even for datasets with a large number of characters (e.g., in phylogenomic datasets). In particular, a dataset of 113 taxa provides consistent support for the Palaeoptera hypothesis (the grouping of Odonata with Ephemeroptera), while results from datasets with fewer taxa give inconsistent results, and are highly sensitive to minor changes in data and methods. We also focus on recent methods that exploit temporal information using fossil calibrations, combined with additional assumptions about the evolutionary process, and so reduce the influence of outgroup choice. These methods are shown to provide more consistent results, for example, supporting Palaeoptera, even for datasets that previously supported other hypotheses. Together, these results have implications for understanding insect origins and for resolving other problematic splits in the tree of life." (Authors)] Address: Thomas, Jessica, Dept of Biology, Univ. of York, York, YO10 5DD, UK. E-mail: jessicaathomas@gmail.com

12467. Tiitsaar, A.; Kaasik, A.; Teder, T. (2013): The effects of seasonally variable dragonfly predation on butterfly assemblages. Ecology 94(1): 200-207. (in English) ["Where predation is seasonally variable, the potential impact of a predator on individual prey species will critically depend on phenological synchrony of the predator with the prey. Here we explored the effects of seasonally variable predation in multispecies assemblages of short-lived prey. The study was conducted in a landscape in which we had previously demonstrated generally high, but spatially and seasonally variable dragonfly-induced mortality in adult butterflies. In this system, we show that patterns of patch occupancy in butterfly species flying during periods of peak dragonfly (in >90% Orthetrum cancellatum) abundance are more strongly associated with spatial variation in dragonfly abundance than patch occupancy of species flying when dragonfly density was low. We provide evidence indicating that this differential sensitivity of different butterfly species to between-habitat differences in dragonfly abundance is causally tied to seasonal variation in the intensity of dragonfly predation. The effect of dragonfly predation could also be measured at the level of whole local butterfly assemblages. With dragonfly density increasing, butterfly species richness decreased, and butterfly species composition tended to show a shift towards a greater proportion of species flying during periods of off-peak dragonfly abundance." (Authors)] Address: Tiitsaar, A., Dept of Zoology, Institute of Ecology and Earth Sciences, University of Tartu, Vanemuise 46, 51014 Tartu, Estonia. E-mail: anu.tiitsaar@ut.ee

12468. Tiple, A.; Chandra, K. (2013): Dragonflies and damselflies (Insecta, Odonata) of Madhya Pradesh and Chhattisgarh states, Central India. Journal Care4Nature 1(1): 3-11. (in English) [106 Odonata species from Madhya Pradesh and Chhattisgarh are listed and briefly discussed.] Address: Tiple, A., Forest Entomology Division, Tropical Forest Research Institute, Jabalpur-482021, Madhya Pradesh, India. E-mail: ashishdtiple@yahoo.co.in

12469. Touchon, J.C.; McCoy, M.W.; Vonesh, J.R.; Warkentin, K.M. (2013): Effects of plastic hatching timing carry over through metamorphosis in red-eyed treefrogs. Ecology 94: 850-860. (in English) ["Environmentally cued plasticity in hatching timing is widespread in animals. As with later life-history switch points, plasticity in hatching timing may have carryover effects that affect subsequent interactions with predators and competitors. Moreover, the strength of such effects of hatching plasticity may be context dependent. We used red-eyed treefrogs, Agalychnis callidryas, to test for lasting effects of hatching timing (four or six days post-oviposition) under factorial combinations of resource levels (high or low) and predation risk (none, caged, or lethal Pantala flavescens dragonfly naiads). Tadpoles were raised in 400-L mesocosms in Gamboa, Panama, from hatching until all animals had metamorphosed or died, allowing assessment of effects across a nearly six-month period of metamorphosis. Hatching early reduced survival to metamorphosis, increased larval growth, and had context-dependent effects on metamorph phenotypes. Early during the period of metamorph emergence, early-hatched animals were larger than late-hatched ones, but this effect attenuated over time. Early-hatched animals also left the water with relatively longer tails. Lethal predators dramatically reduced survival to metamorphosis, with most mortality occurring early in the larval period. Predator effects on the timing of metamorphosis and metamorph size and tail length depended upon resources. For example, lethal predators reduced larval periods, and this effect was stronger with low resources. Predators affected metamorph size early in the period of metamorphosis, whereas resource levels were a stronger determinant of phenotype for animals that metamorphosed later. Effects of hatching timing were detectable on top of strong effects of larval predators and resources, across two subsequent life stages, and some were as strong as or stronger than effects of resources. Plasticity in hatching timing is ecologically important and currently underappreciated. Effects on metamorph numbers and phenotypes may impact subsequent interactions with predators, competitors, and mates, with potentially cascading effects on recruitment and fitness." (Authors)] Address: Touchon, J.C., Smithsonian Tropical Research Institute, Apartado Postal 0843-03092, Balboa, República de Panamá. E-mail: TouchonJC@si.edu

12470. Tweedy, B.; Drenner, R.W.; Murray Chumchal, M.; Kennedy, J.H. (2013): Effects of fish on emergent insect-mediated flux of methyl mercury across a gradient of contamination. Environ. Sci. Technol. 47: 1614-1619. (in English) [Texas, USA; "We examined the effects of fish predation on emergent insect-mediated methyl mercury (MeHg) flux across a gradient of MeHg contamination in experimental ponds. Emergent insects were collected from ponds with (n=5) and without fish (n=5) over a six-week period using floating emergence traps. We found that the potential for MeHg flux increased with Hg contamination levels of the ponds, but that the realized MeHg flux of individual insect taxa was determined by fish presence. Fish acted as size-selective predators and reduced MeHg flux by suppressing emergence of large insect taxa (Odonata) but not small insect taxa (chironomids and micro-caddis-

flies). MeHg flux by small insect taxa was correlated with concentrations of MeHg in terrestrial spiders along the shorelines of the study ponds, demonstrating for the first time the cross-system transport of MeHg by emergent insects to a terrestrial spider." (Authors)] Address: Tweedy, B., Dept of Biology, Texas Christian University, Winton Scott Room 401, 2800 South University Drive, Fort Worth, Texas 76129, USA

12471. van Strien, A.J.; Termaat, T.; Kalkman, V.; Prins, M.; De Knijf, G.; Gourmand, A.-L.; Xavier Houard, X.; Nelson, B.; Plate, C.; Prentice, S.; Regan, E.; Smallshire, D.; Vanappelghem, C.; Vanreusel, W. (2013): Occupancy modelling as a new approach to assess supranational trends using opportunistic data: a pilot study for the damselfly Calopteryx splendens. Biodivers. Conserv. 22(3): 673-686. (in English) ["There is limited information available on changes in biodiversity at the European scale, because there is a lack of data from standardised monitoring for most species groups. However, a great number of observations made without a standardised field protocol is available in many countries for many species. Such opportunistic data offer an alternative source of information, but unfortunately such data suffer from non-standardised observation effort and geographical bias. Here we describe a new approach to compiling supranational trends using opportunistic data which adjusts for these two major imperfections. The non-standardised observation effort is dealt with by occupancy modelling, and the unequal geographical distribution of sites by a weighting procedure. C. splendens was chosen as our test species. The data were collected from five countries (Ireland, Great Britain, the Netherlands, Belgium and France), covering the period 1990–2008. We used occupancy models to estimate the annual number of occupied 1 x 1 km sites per country. Occupancy models use presence-absence data, account for imperfect detection of species, and thereby correct for between-year variability in observation effort. The occupancy models were run per country in a Bayesian mode of inference using JAGS. The occupancy estimates per country were then aggregated to assess the supranational trend in the number of occupied 1 x 1 km². To adjust for the unequal geographical distribution of surveyed sites, we weighted the countries according to the number of sites surveyed and the range of the species per country. The distribution of C. splendens has increased significantly in the combined five countries. Our trial demonstrated that a supranational trend in distribution can be derived from opportunistic data, while adjusting for observation effort and geographical bias. This opens new perspectives for international monitoring of biodiversity." (Authors)] Address: van Strien, A.J., Statistics Netherlands, P.O. Box 24500, 2490 HA The Hague, The Netherlands. E-mail: asin@cbs.nl

12472. van Swaay, C.; Veling, K.; Termaat, T.; Huskens, K., Plate, C. (2013): Vlinders en libellen geteld. Jaarverslag 2012. Rapport VS2013.003, De Vlinderstichting, Wageningen: 37 pp. (in Dutch, with English summary) ["The number of dragonfly transects has stabilized around 330 sites. About 40% of these transects are counted for one target species only. In 2012, 21 transects had more than 20 species. The most speciose transects had 27 species (2 transects, both in eastern Overijssel). The number of counted dragonflies per transect was below the long-term average, but a little higher than the previous two years. Like previous years, Coenagrion puella was the most abundant species, Ischnura elegans was the most widespread species. Population indices are presented fort most species in chapter 8. 22 species show a significant increase, 6 species are stable and 18 others are declining. For the first time significant trends are presented for three very rare species: Coenagrion armatum, Leucorrhinia albifrons and L. caudalis (all declining). L. albifrons was not observed in 2012. The coming field season will indicate if this species still exists in the Netherlands or not." (Authors)] Address: De Vlinderstichting, Mennonietenweg 10, Postbus 506 , 6700 AM Wageningen, The Netherlands

12473. Vargas Salgado, L.G.; Carvalho, A.; Pinto A.P. (2013): Larval taxonomy of Macrothemis Hagen, 1868 (Odonata: Libellulidae), with descriptions of four larvae and a key to the fourteen known species. Zootaxa 3599 (3): 229-245. (in English) ["The ultimate larval stadia of Macrothemis declivata, M. hemichlora, M. imitans imitans and M. tenuis are described and illustrated for the first time, based on material from Brazil. Six of the most used keys to larvae of libellulid genera of the New World are evaluated with respect to the correct identification of the 27 known larvae of Macrothemis, Brechmorhoga, Gynothemis and Scapanea. Macrothemis species were wrongly identified in more than 50% of the trials, being keyed as Brechmorhoga, Gynothemis and even Dythemis. The genus Macrothemis and its relatives need to be revaluated and adequately diagnosed based on larvae. A key to the 14 known larvae of species currently included in Macrothemis is presented." (Authors)] Address: Pinto A.P., Depto de Entomologia, Museu Nacional, Univ. Federal do Rio de Janeiro (UFRJ); Caixa Postal 68044, 21944-970, Cidade Universitária, Rio de Janeiro, RJ, Brazil.E-mail: odonata-angelo@hotmail.com

12474. Villanueva, R.J.T.; Cahilog, H. (2013): Small Odonata collection from Talaingod, Davao del Norte, Mindanao Island, Philippines. International Dragonfly Fund - Report 59: 1-26. (in English) ["Odonata survey was conducted in Talaingod, Davao del Norte, Mindanao Island. Four major sites were explored in Barangay Santo Niño from December 26 - 30, 2012. Thirty five species under eleven families including one new species were found re-presenting the first odonatological record in the province of Davao del Norte. Three species need further study while Orthetrum glaucum represents a new record for the island of Mindanao. Coeliccia exoleta population, a vulnerable species in the IUCN Red List of Threatened Species, was found." (Authors)] Address: Villanueva, R.J.T., D3C Gahol Apartment, Lopez Jaena St., PH-8000 Davao, Philippines. E-mail: rjtvillanueva@gmail.com

12475. Villanueva, R.J.T.; Medina, M.N.D.; Jumawan, K.M. (2013): Pericnemis melansoni sp. nov., a new damselfly (Odonata: Coenagrionidae) from Compostela Valley Province, Mindanao Island, Philippines. Journal of Threatened Taxa 5(7): 4110-4112. (in English) ["During a short biodiversity survey in Cabalian Creek, Nabunturan, Compostela Valley Province conducted by the second and third authors, specimens of Pericnemis were collected. Voucher specimens were given to the first author who confirmed they represented a species new to science. Due to the urgency of establishing the known habitat of the present species as a protected area, it is described here in advance of a complete treatment of the Philippine Pericnemis. Holotype: Male, ACN-2012-hol-1, 22.xi.2012, Cabalian Creek, Nabunturan, Com-

postela Valley Province, Mindanao Island, Philippines, K. Jumawan leg." (Authors)] Address: Villanueva, R., D3C Gahol Apartment, Lopez Jaena St., PH-8000 Davao, Philippines. E-mail: rjtvillanueva@ gmail.com

12476. Wang, C.; Zhou, H.; Zhang, Z.; Zhao, Y.; Cong, D.; Menga, C.; Zhang, P.; Ren, L.b (2013): Mechanical property of a low carbon steel with biomimetic units in different shapes. Optics & Laser Technology 47: 114-120. (in English) ["Inspired by the superior biomechanical properties of some biological compositions, an attempt to improve the mechanical property of low carbon steel with biomimetic units was made by using a laser remelting process. Three kinds of shapes including 'striation', 'spot' and 'gridding', were chosen for forming the biomimetic units. Microstructure and microhardness examinations demonstrated that desirable microstructural changes and regular hardness distribution were acquired in the units. The results of tensile tests indicated that the biomimetic specimens had an improvement in the strength and ductility simultaneously. The beneficial influence of laser processed biomimetic units on tensile behaviour can be attributed to the combined effects of the microstructural characteristics within the unit zone and the stress redistribution derived from the efficient stress transfer. By investigating the variation of plastic deformation in different regions of the specimens, the effect of unit shapes on tensile property was also compared and discussed. Highlights: *Low carbon steel with biomimetic units in different shapes was processed by laser. *Good combination of strength and ductility was obtained in biomimetic samples. *Mechanical property improvement was analyzed on basis of microstructural changes and stress transfer. *Effect of unit shapes on tensile property was compared and discussed.... Typical structural shapes of constriction units in biological compositions: (a) striation-shaped units in the tree leaf; (b) spot-shaped units in the elytrum of ground beetle; (c) gridding-shaped units in the dragonfly wing; (d) gridding-shaped units in the scale of butterfly wing." (Authors)] Address: Wang, C., The Key Lab of Automobile Materials, The Ministry of Education, Jilin University, No. 5988 Renmin Street, Changchun, Jilin 130025, PR China

12477. Wang, Y.; Engel, M.S.; Rafael, J.A.; Dang, K.; Wu, H.; Wang, Y.; Xie, Q.; Bu, W. (2013): A unique box in 28S rRNA is shared by the enigmatic insect order Zoraptera and Dictyoptera.. PLoS ONE 8(1): e53679. doi:10.1371/journal.pone.0053679: 13 pp. (in English) ["The position of the Zoraptera remains one of the most challenging and uncertain concerns in ordinal-level phylogenies of the insects. Zoraptera have been viewed as having a close relationship with five different groups of Polyneoptera, or as being allied to the Paraneoptera or even Holometabola. Although rDNAs have been widely used in phylogenetic studies of insects, the application of the complete 28S rDNA are still scattered in only a few orders. In this study, a secondary structure model of the complete 28S rRNAs of insects was reconstructed based on all orders of Insecta. It was found that one length-variable region, D3-4, is particularly distinctive. The length and/or sequence of D3-4 is conservative within each order of Polyneoptera, but it can be divided into two types between the different orders of the supercohort, of which the enigmatic order Zoraptera and Dictyoptera share one type, while the remaining orders of Polyneoptera share the other. Additionally, independent evidence from phylogenetic results support the clade (Zoraptera+Dictyoptera) as well. Thus, the similarity of D3-4 between Zoraptera and Dictyoptera can serve as potentially valuable autapomorphy or synapomorphy in phylogeny reconstruction. The clades of (Plecoptera+Dermaptera) and ((Grylloblattodea+Mantophasmatodea)+(Embiodea+Phasmatodea))were also recovered in the phylogenetic study. In addition, considering the other studies based on rDNAs, this study reached the highest congruence with previous phylogenetic studies of Holometabola based on nuclear protein coding genes or morphology characters. Future comparative studies of secondary structures across deep divergences and additional taxa are likely to reveal conserved patterns, structures and motifs that can provide support for major phylogenetic lineages." (Authors)] Address: Xie, Q., Institute of Entomology, College of Life Sciences, Nankai University, Tianjin, China. E-mail: qiangxie@nankai.edu.cn (QX)

12478. Watanabe, K.; Yamazaki, S.; Shoji, K.; Nagashima, Y.; Sato, K. (2013): Dragonfly fauna in Dainohara Forest Park. Bulletin of Sendai Science Museum 22: 82-83. (in Japanese) [17 species of dragonflies found in the Dainohara forest park (Miyagi Prefecture, Japan) from 2011 to 2012 are listed together with collection data.] Address: not transliterated

12479. Wellenreuther, M.; Sánchez-Guillén, R.A.; Cordero-Rivera, A.; Svensson, E.I.; Hansson, B. (2013): Male-biased recombination in odonates: insights from a linkage map of the damselfly Ischnura elegans. Journal of Genetics 92(1): 5 pp. (in English) ["Results: The two-point analyses detected that 13 of the 19 markers were linked to at least one other in our I. elegans mapping data set. These markers built up four linkage groups with two to five markers (figure 1). No markers were linked to more than one linkage group, and thus no conflicting assignments occurred. The parsimonious sex-average autosomal linkage map spanned 211.5 cM. A moderate degree of heterochiasmy was found, with a female map of 179.2 cM and a male map of 331.7 cM (paired t-test on log10 map distances at the four linkage groups: t = 3.295, df = 3, P = 0.046). The female-to-male map ratio was 0.54, i.e. -0.27 on a log10-scale. To compare the pattern of recombination in insects, we compiled data of sex-specific recombination, either from linkage mapping studies or recombination nodule counts, for 30 insect species (including I. elegans) (figure 2; details and references are given in table 2 in electronic supplementary material). Comparison of recombination rates within the class of Insecta showed that most species have higher recombination in females, contrasting the pattern found for I. elegans, and that achiasmatic recombination is widespread across multiple orders." (Authors)] Address: Wellenreuther, Maren, Section for Animal Ecology, Ecology Building, Lund University, Sölvegatan 37, SE-223 62 Lund, Sweden. E-mail: maren.wellenreurther@zooekol.lu.se

12480. Wheat, C.W.; Wahlberg, N. (2013): Explosion, the colonization of land and the evolution of flight in arthropoda. Systematic Biology 62(1): 93-109. (in English) ["The timing of the origin of arthropods in relation to the Cambrian explosion is still controversial, as are the timing of other arthropod macroevolutionary events such as the colonization of land and the evolution of flight. Here we assess the power of a phylogenomic approach to shed light on these major events in the evolutionary history of life on earth. Analyzing a large phylogenomic dataset (122 taxa, 62 genes) with a

Bayesian-relaxed molecular clock, we simultaneously reconstructed the phylogenetic relationships and the absolute times of divergences among the arthropods. Simulations were used to test whether our analysis could distinguish between alternative Cambrian explosion scenarios with increasing levels of autocorrelated rate variation. Our analyses support previous phylogenomic hypotheses and simulations indicate a Precambrian origin of the arthropods. Our results provide insights into the 3 independent colonizations of land by arthropods and suggest that evolution of insect wings happened much earlier than the fossil record indicates, with flight evolving during a period of increasing oxygen levels and impressively large forests. These and other findings provide a foundation for macroevolutionary and comparative genomic study of Arthropoda." (Authors) The paper includes references to dragonflies.] Address: Wheat, C.W., Dept of Biosciences, PL 65, Viikinkaari 1, 00014 University of Helsinki, Finland. E-mail: chris@christopherwheat.net

12481. Wildermuth, H. (2013): Libellengewässer, die kommen und gehen. Mskr. 8 pp. (in German, with English summary) ["Rise and fall of small dragonfly ponds (Odonata): The dragonfly fauna of two freshly created shallow ponds in open meadows country in the Swiss Plateau was monitored during summer 2012. Altogether 24 and 28 species were recorded, respectively, 17 and 15 of them certainly or most probably indigenous. The water bodies proved to be suitable for pioneer and regionally rare species such as Ischnura pumilio, Orthetrum albistylum, O. brunneum, Sympetrum depressiusculum und S. fonscolombii. The importance of shallow ponds as breeding habitats for dragonflies, the problems of rapid overgrowth and the possible maintenance measures for conservation of an optimal succession state are discussed." (Author)] Address: Wildermuth, H., Haltbergstr. 43, CH-8630 Rüti, Switzerland. E-mail: hansruedi@wildermuth.ch

12482. Wildermuth, H. (2013): Die Libelle auf der Wäscheleine. Mercuriale 12(2012): 53-56. (in German, with English summary) ["An adult female Sympetrum vulgatum was observed in a garden using a washing line as perch from where it started irregularly to feeding flights for nearly seven hours during a warm and sunny day. The body was mostly held horizontally and probably cooled by a slight wind. Obelisk posture was only adopted at windless moments. On the same day at the same locality only a few metres apart a female S. fonscolombii used the tip of a slender inflorescence of Lythrum salicaria as starting point for hunting flights. The results are discussed relating to the percher mode for feeding and thermoregulation in Sympetrum spp." (Author)] Address: Wildermuth, H., Haltbergstr. 43, 8630 Rüti, Switzerland. E-mail: hansruedi@wildermuth.ch

12483. Willet, J. (2013): Species Review 7: The Azure Hawker Aeshna caerulea (Ström). J. Br. Dragonfly Society 29(1): 1-19 (in English) ["In the British Isles A. caerulea is restricted to Scotland, where it is classified as Vulnerable and appears to be undergoing a decline, although it remains under-recorded. The characteristics of the larva and adult are described and its habitat, behaviour and distribution are discussed." (Author)] Address: Willet, J., 7 Muirden Rd, Maryburgh, IV7 8EJ, UK

12484. Winterbourn, M.J.; Pohe, S.R. (2013): Life histories of four dragonfly species (Odonata: Anisoptera) in northern New Zealand. New Zealand Entomologist 36(1): 8-14. (in English) ["Life histories of four dragonfly species were investigated in the littoral zone of Lake Heather, a shallow sand dune lake near Kait.aia in the far north of New Zealand. All four species are self-introduced to New Zealand. Collections of larvae made in seven months from February 2011 to February 2012 were used to infer larval development. Aeshna brevistyla, the most abundant species, was semivoltine, Tramea loewii and Hemicordulia australiae were univoltine and, although difficult to interpret, our data suggest Diplacodes bipunctata was bivoltine with autumn and winter-spring generations. Adults of all four species were seen in December and February, T. loewii was also on the wing in late March, A. brevistyla in October and D. bipunctata in November." (Authors)] Address: Winterbourn, M.J., School of Biological Sciences, University of Canterbury, Private Bag 4800, Christchurch 8140, New Zealand. E-mail: michael.winterbourn@canterbury.ac.nz

12485. Wong-Muñoz, J.; Anderson, C.N.; Munguía-Steyer, R.; Córdoba-Aguilar, A. (2013): Body size and morph as drivers of copulation duration in a male dimorphic damselfly. Ethology 119(5): 407-416. (in English) ["Copulation duration is often highly variable within and among species. Here, we explore the roles of body size, male morph, morph frequency, and alternative reproductive tactics to explain copulation duration in the damselfly Paraphlebia zoe. P. zoe has two male morphs (pigmented or hyaline wings) which differ in reproductive tactics (territorial or non-territorial behaviours). We also analyze the effects of season as the frequencies of both morphs tend to vary along the reproductive season. In the first non-experimental year, we found that the relationship between body size and copulation duration depended on the time of year. Early in the season, body size positively correlated with copulation duration, while late in the year, body size negatively correlated with copulation duration. In the second experimental year (when we reversed the frequency of male morphs in the middle of the season: making pigmented males less frequent than hyaline males), size influenced copulation duration as well as morph – body size positively correlated with copulation duration, and hyaline males mated for longer than pigmented males. Contrary to our prediction, changes to the relative abundances of morphs did not influence copulation duration. Hyaline males may be under selection for longer copulation durations to compensate for their reduced access to females, as long copulations potentially lead to more rival sperm to be removed from the female sperm storage organs and /or increased mate guarding. We do not discard, however, other explanations that drive variation in copulation duration such as cryptic female choice and/or predation." (Authors)] Address: Córdoba-Aguilar, A., Departamento de Ecología Evolutiva, Instituto de Ecología, Universidad Nacional Autónoma de México, Apdo. Postal 70-275, Ciudad Universitaria, 04510, México D.F., México. E-mail: acordoba@ecologia.unam.mx

12486. Yang, J.; Gonzalez-Bellido, P.T.; Peng, H. (2013): A distance-field based automatic neuron tracing method. BMC Bioinformatics 2013, 14:93 (in English) ["Background: Automatic 3D digital reconstruction (tracing) of neurons embedded in noisy microscopic images is challenging, especially when the cell morphology is complex. Results: We have developed a novel approach, named DF-Tracing, to tackle this challenge. This method first extracts the neurite signal (foreground) from a noisy image by using anisotropic filtering and automat-

ed thresholding. Then, DF-Tracing executes a coupled distance-field (DF) algorithm on the extracted foreground neurite signal and reconstructs the neuron morphology automatically. Two distance-transform based "force" fields are used: one for "pressure", which is the distance transform field of foreground pixels (voxels) to the background, and another for "thrust", which is the distance transform field of the foreground pixels to an automatically determined seed point. The coupling of these two force fields can "push" a "rolling ball" quickly along the skeleton of a neuron, reconstructing the 3D cell morphology. Conclusion: We have used DF-Tracing to reconstruct the intricate neuron structures found in noisy image stacks, obtained with 3D laser microscopy, of dragonfly thoracic ganglia. Compared to several previous methods, DF-Tracing produces better reconstructions." (Authors)] Address: Yang, J., Key Laboratory of Medical Image Computing, Ministry of Education, Northeastern University, Shenyang, China. E-mail: yangjinzhu@neusoft.com

12487. Yang, Y.; Wang, L.; Wei, S.; Song, G.; Kenoyer, J.M.; Xiao, T.; Zhu, J.; Wang, C. (2013): Nondestructive analysis of dragonfly eye beads from the Warring States Period, excavated from a Chu tomb at the Shenmingpu Site, Henan Province, China. Microscopy and microanalysis 19(2): 335-343. (in English) ["Dragonfly eye beads are considered to be the earliest types of glass objects in China, and in the past have been considered as evidence of culture interaction or trade between West and East Asia. In this article, synchrotron radiation microcomputed tomography and μ-probe energy dispersive X-ray fluorescence were used to determine the chemical composition, microstructure, and manufacturing technology of four dragonfly eye beads, excavated from a Chu tomb at the Shenmingpu site, Henan Province, China, dated stylistically to the Middle and Late Warring State Period (475 bc-221 bc). First, a nondestructive method was used to differentiate the material types including faience (glazed quartz), frit, glazed pottery (clay ceramic), and glass. Three beads were identified as faience and one bead as glazed pottery. The glaze recipe includes quartz, saltpeter, plant ash, and various copper, and is classified as belonging to the K2O-CaO-SiO2 glass system, which indicates that these beads were not imported from the West. Based on computed tomography slices, the manufacturing technology of the faience eye beads appears to include the use of an inner core, molding technology, and the direct application glazing method. These manufacturing features are consistent with the techniques used in China during this same time period for bronze mold-casting, proto-porcelain, and glass." (Authors)] Address: Wang, C., Laboratory of Human Evolution, IVPP, Beijing, China. E-mail: cswang@ucas.ac.cn

12488. Yong, H.S.; Lim, P.-E.; Tan, J.; Eamsobhana, P. (2013): Genetically determined colour polymorphism in larvae of Ceriagrion chaoi (Insecta: Odonata: Coenagrionidae). The Raffles Bulletin of Zoology 61(1): 47-51. (in English) ["Although genetically determined colour polymorphism is quite common in adult odonates, there is no report on this phenomenon in the larvae of any odonate species up to now. This paper reports, for the first time, the occurrence of two colour morphs (dark and brown) in both the male and female larvae of C. chaoi. The species identity of these colour morphs was confirmed by the partial sequences of 16S rRNA gene as well as observation on emergence. Only a single invariant haplotype was observed, which differed from a congeneric species Ceriagrion cerinorubellum (Brauer) by 39 base pairs. The partial sequences of 16S rRNA gene constitute the first report for these damselflies. Available data indicate that environment/habitat does not seem to play a role in the determination of the colouration in the larvae of C. chaoi. The inheritance and significance of the colour polymorphism however remain to be verified." (Authors)] Address: Yong, H.S., Inst. of Biological Sciences, Univ. of Malaya, 50603 Kuala Lumpur, Malaysia. Email: yong@um.edu.my

12489. Youngman, R. (2013): Altitude limits for the occurrence and breeding of some British dragonflies. J. Br. Dragonfly Society 29(1): 20-22 (in English) ["The altitude at which some species of dragonfly occur and/or breed has been determined at two locations in Inverness-shire, in the Central Highlands of Scotland The importance of aspects of temperature, rather than altitude itself, and of the role of the microclimate are discussed." (Author)] Address: Youngman, R., Blairchroisk Farm Cottage, Ballinluig, Perthshire, PH9 ONE, UK. E-mail: blairchroisk@btinternet.com

12490. Zhang, H.-J. (2013): Cephalaeschna xiangensis spec. nov., a new dragonfly from Shaanxi, China, with a key to the adults of the Chinese members of the genus (Anisoptera: Aeshnidae). Odonatologica 42(1): 39-43. (in English) ["The new species is described and illustrated. Holotype ♂: Maliu village (107°32' E, 32°43'N, altitude 1200m), Xixiangco., Shaanxi prov., China; deposited in the Shaanxi Bioresource Key Lab., Hanzhong, China. A key to the adults of the Chinese Cephalaeschna species is provided." (Author)] Address: Zhang, H., Department of Entomology, College of Natural Resources and Environment, South China Agricultural University, Guangzhou 510642, China. E-mail: zhanghaomiao6988@gmail.com

12491. Zhang, H.-m.; Tong, X.-o. (2013): Descriptions of the final instar larvae of seven Chinese Chlorogomphidae species, with taxonomic notes on adults (Odonata: Anisoptera). Zootaxa 3620 (2): 223-244. (in English) ["The larvae of seven species of Chlorogomphidae from South China are described based on reared larvae, i.e. Chlorogomphus kitawakii Karube, C. nasutus nasutus Needham, C. papilio Ris, C. shanicus Wilson, C. usudai Ishida, C. yokoii Karube and Chloropetalia soarer Wilson. The adult female of C. kitawakii is first described. Biological information on Chlorogomphidae is provided and a diagnosis of the family proposed." (Authors)] Address: Tong, X.-o., Department of Entomology, College of Natural Resources and Environment, South China Agricultural University, Guangzhou, 510642, Guangdong Province, P. R. of China. E-mail xtong@scau.edu.cn

12492. Żurawlew, P.; Piecuch, T. (2013): Site of Sympetrum pedemontanum (O.F. Muller in Allioni, 1766) in the Wysoczyzna Kaliska (Southern Wielkopolska). Odonatrix 9(1): 29-30. (in Polish, with English summary) [Obra Canal near Talary (UTM: XT45) in southern Wielkopolska, Poland. 17.07.2009, 2.08.2012.] Address: Żurawlew, P., Kwileń 67a, 63-313 Chocz, Poland. E-mail: grusleon@gmail.com

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