

Odonatological Abstract Service

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1997

12849. Jiu, O. (1997): Gomphidae in Heilongjiang Province. *Journal of Heilongjiang Nongken Normal College* 1997(03): 70-73. (in Chinese, with English summary) [10 species of Gomphidae from the Chinese Heilongjiang Province were keyed: *Stylurus flavipes*, *Shaogomphus postocularis epophthalmus*, *Anisogomphus maacki*, *Trigomphus citimus*, *Davidius lunatus*, *Nihonogomphus rutilus*, *Ophiogomphus obscurus*, *Sieboldius albardae*, *Sinictinogomphus clavatus*, *Gomphidia confluens*.] Address: not stated

1998

12850. Korsós, Z. & Mészáros, F. (1998): Diversity of the Hungarian fauna. *Természetvédelmi Közlemények* 7: 125-133. (in Hungarian, with English summary) [Hungarian Odonata diversity was quantified with 65 species.] Address: Korsós, Z. Természetvédelmi Múzeum, Áttattár 1088 Budapest, Baross u. 13, Hungary

12851. Yang, Z.; Ou, Y. (1998): The damselflies in the north of China. *Journal of Hanzhong Teachers College* 16: 57-61. (in Chinese, with English summary) [The paper refers to damselflies reported north of 38° northern latitude in China (Yinchuan, Yan'an, Taiyuan, Shijiazhuang, area north of Dalian latitude) (Liaoning, Hebei, Shanxi, Shaanxi, Ningxia. provinces). 37 species are keyed.] Address: Yang, Z., The Adults Educational College of Hanzhong Teachers College, Hanzhong, Shaanxi, 723000; Heilongjiang Nongken Teachers College, Acheng, 150301, China

1999

12852. Luo, G.; He, H. (1999): A primary study on dragonflies from Xunwu, Jiangxi Province. *Journal of Guangzhou Normal University (Natural Science)* 20(9): 85-86, 94. (in Chinese, with English summary) [In 1996 and 1997, 26 Odonata species were collected in Xunwu

area of Jiangxi Province, China.] Address: Luo, G., Dept. of Biology, Guangzhou Normal Univ. 510400, China

12853. Miyashita, M. (1999): Studies on conservation and restoration of the habitat of the damselfly *Mortonagrion hirosei*. *Proc. Envir. Syst. Res.* 27: 293-304. (in Japanese, with English summary) [Japan; "M. hirosei, was designated as an endangered species by the Environment Agency in 1991, because its habitat is vulnerable to the effects of land reclamation and river improvement. The low-flying insect lives in reed plains and measures about three centimeters long when fully grown. Relationships between the habitat of the damselfly, salinity, topography and vegetation were studied at 9 tidal rivers from Hinuma marsh in Ibaraki Prefecture to the Nagaitaura Bay in the Tsushima Islands. The larvae of the damselfly were collected only from the pool in a sunken place covered with dead leaves on the riverside. Salinity and the time required for the completion of the habitat of the damselfly were above 0.50.PERMIL. and about 4 years, respectively. The damselfly which lived on the riverside at Suigo-ohashi bridge across the Tonegawa River died out in 1998, because of reduced salinity of its habitat. It is supposed that the salinity of the habitat was the most important environmental element required for holding communities of the damselfly." (Author)]

12854. Orr, R. (1999): The dragonflies and damselflies of the Cove Point LNG Site, Calvert county, Maryland. <http://www.covepoint-trust.org/reports/orr-001.pdf>: 31 pp. (in English) ["The Cove Point Liquid Natural Gas Site (Cove Point Site) consists of 900 acres of undeveloped property in Calvert County, Maryland. The property is owned by the Cove Point LNG Limited Partnership and approximately 600 acres are subject to a conservation easement that was granted to the Maryland Environmental Trust and The Nature Conservancy to oversee. The Cove Point Site borders the western shore of the Chesapeake Bay, just south of Calvert Cliffs. A wide variety of pristine and managed aquatic water habitats oc-

cur at the Site including marshes, ponds, streams, and seeps. A survey was conducted for the Odonata of the Cove Point Site during 1998 and 1999 under a Cove Point Natural Heritage Trust Research Contract. Field data were collected on June 5, July 7, July 29, August 22, September 11, September 30, October 14 and December 2 in 1998. In 1999 field data were collected on January 3, March 31, April 23, April 30, May 21, June 6, July 8, September 3, and October 7. The survey was based mostly on adult odonates, but limited cast skins and larvae were also sampled. The species, date and habitat (along with any note-worthy behaviour or life-history observations) were recorded for 10,916 individual dragonflies and damselflies over the course of the survey. 53 species of Odonata were recorded at the Cove Point Site during the 1988-1999 season. 24 species were first records for Calvert County. *Gomphus rogersi*, is ranked as S1 in Maryland. *Cordulegaster bilineata* and *Somatochlora filosa* have tentative ranks of S2, *Archilestes grandis*, *Amphiagrion saucium*, *Anax longipes*, *Gomphaeschna furcillata*, *Celithemis fasciata*, and *Libellula axilena* have tentative ranks of S3. 34. *Erythemis simplicicollis* -- Eastern Pondhawk: *E. simplicicollis* hunts by staying on the ground and flying up to capture prey in the air. An interesting behavioural observation was noticed between the Eastern Pondhawk and one of its prey animals the tiger beetle *Cicindela hirticollis*, on the beach at Cove Point. The dragonfly would only take the tiger beetle when it was in flight which would occasionally happen when I disturbed the beetles while walking on the beach. If the beetle managed to land before being captured, the dragonfly would land next to it, often just a couple of inches away. I got the impression (but it does need to be further observed or tested) that the tiger beetle was behaviourally programmed to run and not fly away from the dragonfly -- thus avoiding capture. When I approached the tiger beetles they appeared to more readily take to the air than they did when a dragonfly was next to them. As a side note -- I have watched the Eastern Pondhawk hunt *Cicindela dorsalis* at Flag Ponds in the early 1990s but did not see any captured (only attempts). However, the Flag Ponds rangers informed me that they had seen them being taken. One thing that is for sure, is that at the beach at Cove Point, during the heat of the day, *E. simplicicollis* are an active predator of tiger beetles." (Author) For the complete study see: <http://www.cove-point-trust.org/studies.html>] Address: Orr, R., Columbia, Maryland 21044, USA

2000

12855. Liu, Z.-y.; Ling, Z.-q.; Liu, A.-y.; Yu, Z.-n. (2000): The SEM observation and analysis of pleomorphism of *Paecilomyces odonatae*. *Mycosystema* 19(1): 56-59. (in Chinese, with English summary) ["The SEM photographs showed clearly that *Paecilomyces odonatae* Liu, Liang & Liu possessed two sorts of conidiogenous structures, which were the *Paecilomyces*-type with ellipsoidal co-

nidia in chain and *Acremonium*-type producing cylindrical conidia in a slime head. The single spore strains obtained by single spore isolation were used in morphological observation and RAPD analysis. The results showed the cultural and morphological characteristics and the bands of DNA RAPD of the ellipsoidal single conidial strains were no much differences from those of cylindrical single conidial strains." (Authors).] Address: Liu, Z.-y., Lab. of Entomogenous Fungi, College of Biotechnology, Guizhou Univ., Guiyang, 550025, China

2001

12856. Ficsór, M.; Szabó, A. (2001): Contribution to the aquatic macroinvertebrate fauna of Szinva and its tributaries, NE Hungary. *Acta biol. debrecina Oecol. Hung.* 26: 75-88. (in English, with Hungarian summary) [Includes records of *Calopteryx splendens*, *Platycnemis pennipes*, *Coenagrion puella*, *Ischnura pumilio*, *Gomphus vulgatissimus*, *Onychogomphus forcipatus*, *Ophiogomphus cecilia*, *Orthetrum brunneum*, *O. cancelatum*, and *O. coerulescens*.] Address: Ficsór, M., North Hungarian Regional Environmental, Nature Conservation and Water Management Inspectorate, Laboratory, 4. Mindszent tér, H-3530, Miskolc, Hungary. E-mail: ficsor.mark@emikofe.kvvm.hu

2003

12857. Roy, A.H.; Rosemond, A.D.; Leigh, D.S.; Paul, M.J.; Wallace, J.B. (2003): Habitat-specific responses of stream insects to land cover disturbance: biological consequences and monitoring implications. *J. N. Am. Benthol. Soc.* 22(2): 292-307. (in English) ["Changes in catchment land cover can impact stream ecosystems through altered hydrology and subsequent increases in sedimentation and nonpoint-source pollutants. These stressors can affect habitat suitability and water quality for aquatic invertebrates. We studied the impact of a range of physical and chemical stressors on aquatic insects, and tested whether the effects of these stressors differed in 3 habitat types: riffles, pools, and banks. Our study was conducted in Piedmont streams in Georgia (USA) where catchment development pressure and the potential for aquatic biodiversity loss are high. We sampled 3 replicates of riffle, pool, and bank habitats within a 100-m reach of 29 streams (11-126 km²) that varied in catchment land cover. Correlations between environmental variables and aquatic insects (both richness and density) within habitat types indicated that riffle habitats (vs pool and bank habitats) exhibited the strongest relations with environmental variables. Riffle assemblages were negatively affected by both physical (e.g., bed mobility) and chemical (e.g., specific conductance, nutrient concentrations) variables. The density of aquatic insects in pools was also correlated to physical and chemical variables, but there were few relationships with pool or bank richness or bank density. Because of greater relative impacts of disturbance in riffles versus

banks, we found greater differences between riffle and bank richness in streams with greater sediment disturbance. The proportion of bank richness (bank richness / bank + riffle richness) increased with finer bed sediment ($r^2 = 0.43$) and increased bed mobility ($r^2 = 0.35$). We compared richness of facultative taxa (found in multiple habitats) between sites we characterized as minimally impacted and sediment-impacted. In riffles, richness of facultative taxa was lower in sediment-impacted vs minimally impacted sites (11.0 vs 20.2, $p = 0.002$, t-test), but was similar for both disturbance groups in banks (20.1 vs 22.7, $p > 0.05$, t-test). Our results suggest that taxa richness may be retained in bank habitats when riffle quality is poor and banks may serve as a refuge in highly disturbed systems. Such shifts in the distribution of benthos may be an early warning indicator of biotic impairment and have implications for biomonitoring and maintenance of habitat." (Authors) Taxa included Odonata and were treated at genus level.] Address: Roy, A.H., Institute of Ecology, The University of Georgia, Athens, Georgia 30602 USA. E-mail: aroy@uga.edu

12858. Zhu, C.-j.; Muraoka, J.; Mizuno, H. (2003): CG simulation of dragonflies based on aerodynamics. Information Processing Society of Japan SIG Notes 2003(15): 31-36. (in Japanese, with English summary) ["A dragonfly is a kind of familiar insect by which the sense of season can be shown. The expression of a dragonfly by CG can be expected as an element which will improve the sense of season in landscape simulation, virtual reality, etc. In this paper, the flight model of a dragonfly, based on aerodynamics, is proposed. In this model, a dragonfly can be made to fly in real time considering the force caused by the flapping of the wings. Steep rise, sudden stop, hover and rapid turn, which are the flight characteristics of a dragonfly, can be performed. Furthermore, depending on the control-points placed in the space, the flight route of a dragonfly can be established easily." (Authors)] Address: Zhu, C.-j., Tohoku Institute of Technology, Japan

2004

12859. Bunnell, F.L.; Campbell, R.W.; Squires, K.A. (2004): Allocating scarce resources for conservation in a species-rich environment: Guidelines from history and science. In: T.D. Hooper, editor. Proceedings of the Species at Risk 2004 Pathways to Recovery Conference. March 2-6, 2004, Victoria, B.C. Species at Risk 2004 Pathways to Recovery Conference Organizing Committee, Victoria, B.C.: 1-20. (in English) ["British Columbia is one of the most species-rich areas in north temperate regions. Its size, location, and topography encourage small incursions of species that are more abundant elsewhere. Given this richness, the province faces formidable challenges in the allocation of limited resources to conservation. The importance of making wise decisions is revealed by recent reviews of North American recovery expenditures that suggest that about 50% of

efforts have failed. Fortunately, lessons from history and science can help formulate guidelines. Part of history's lesson is that we begin too late, and that more resources should be allocated to preemptive measures. We consider criteria to prioritize species and four classes of action appropriate to conditions in British Columbia that can be used to guide the allocation of resources in a cost-effective fashion. For example, about 93% of global bird extinctions since the 1600s have been island endemics. British Columbia hosts at least 90 endemic taxa, of which about 66% are island dwelling. Because centres of endemism are concentrated, preemptive monitoring plans based on a frequency that reflects natural history characteristics and known threats are possible. From a review of natural history characteristics, we have collated lists of species that are appropriate to specific conservation actions (summarized here) and provide a checklist that should precede development of a recovery plan for any specific taxon." (Authors) The paper included several references to Odonata.] Address: Bunnell, F.L., Forest Sciences Dept, University of British Columbia, 270 - 2357 Main Mall, Vancouver, BC, V6T 1Z4, Canada. E-mail fbunnell@interchange.ubc.ca

12860. Jiang, Y. (2004): *Sympetrum infuscatum* as a medicinal dragonfly species in Heilongjiang. Quarterly of Forest By-product and Speciality in China 4(GSNO. 71): 29-30. (in Chinese, with English summary) [China; *S. infuscatum* was analysed for nutrient contents (protein and fat content resulted in 56.22% and 22.93% resp.) and medical/pharmacological purposes in traditional Chinese medicine.] Address: Jiang, Yuxia, Dept of Biology, Mudangjiang Teachers College, Mudangjiang 157012, China

12861. Morrison, F.; McLain, D.; Sanders, L. (2004): Dragonfly abundance and emergence behavior before and after bank stabilization on the Connecticut River in Gill, Massachusetts. <http://www.odes.millersriver.net/Speakers/fredmorrison.htm>: (in English) [Verbatim: While stabilization has become an important tool for reducing excessive riverbank erosion, the impacts on emerging dragonflies are unknown. To investigate the effects of bank stabilization, we surveyed a 1200-ft. stretch of eroding bank on the Connecticut River in Gill, Massachusetts for emerging dragonfly species before (2001) and after (2002-2003) bank stabilization. The site was stabilized in fall 2001 by grading the slope, planting with native vegetation, and adding a rock footing at the average water line. We collected exuviae from the entire site at least weekly from early June to late July each year. We also observed the behaviour of nymphs in the process of emerging from the river. In 2003, we added 4 reference sites for comparison between stabilized and natural habitat. Several of the 15 species showed marked increases in abundance following stabilization. The most dramatic change was with *Gomphus vastus*, which increased from 357 in 2001 to 12,270 in 2003. *Gomphus abbreviatus*, *Stylurus spiniceps*, *S. amnicola*

and *Dromogomphus spinosus* were more abundant after stabilization, but declined in the third year of the study. *Neurocordulia yamaskanensis* and *Macromia illinoisensis* declined in the second year and were most abundant in the third year. *Gomphus ventricosus* was only common in the third year, while *G. fraternus* was absent following stabilization. The changes in abundance between years could not be differentiated between cause-and-effect and natural fluctuations. However, notable changes occurred in the behaviour of emerging nymphs. After stabilization, *G. abbreviatus*, *S. spiniceps*, *S. amnicola*, and *D. spinosus* eclosed close to the water line when the river level was low on the riprap. This behaviour made them susceptible to being splashed by boat waves and submerged by rapidly rising water level. These species were much more abundant at the natural reference sites than at the stabilized sites. Nymphs of *S. spiniceps* crawled a significantly ($\alpha = 0.05$) shorter distance on the riprap (0.9 ft.) than on natural banks (11.2 ft.). Mortality of *G. abbreviatus* from boat waves and rising water was as high as 33% in 2002. While the impact of riprap on dragonfly populations is unknown, the observed mortality indicates that standard-sized riprap does not provide a favourable substrate for dragonfly emergence. Alternative stabilization methods should be explored that incorporate dragonfly conservation.] Address: Morrison, F., A Natural Focus, Montague Rd, Westhampton, MA 01027, USA. E-mail: anaturalfocus@crocker.com

12862. Xu, Q. (2004): A preliminary report of the investigation of dragonflies from Huboliao National Nature Reserve of Fujian. *Natural Enemies of Insects* 26(2): 81-85. (in Chinese, with English summary) [64 Odonata species were reported from Huboliao National Nature Reserve of Fujian, China including 10 species newly recorded in Fujian viz *Mnais andersoni*, *Rhinocypha perforata*, *Anisopleura furcata*, *Euphaea ornata*, *Pseudagrion rubriceps*, *P. spencei*, *Drepanosticta hongkongensis*, *Polycanthagyna erythromelas*, *Orthetrum triangulare*, and *Trithemis festiva*.] Address: Xu, Q., Zhangzhou Education College, Zhangzhou, Fujian 363000, China

12863. Yang, B.-s.; Ren, B.-z. (2004): Two new records of *Cordyceps* from northeastern China. *Journal of Jilin Agricultural University* 26(2): 148-150. (in Chinese, with English summary) ["*Cordyceps tricentri* Yasuda and *Cordyceps odonatae* Kobayasi were reported. The stroma of *Cordyceps tricentri* Yasuda, light yellow in colour, singly grew at the chest of host; its fertile part was clubbed or ellipsoidal; its pyrenocarp was under the skin of stroma, pitcher-shaped and its ostiole protruded a little; its ascospore was linear, and broke into secondary spores when mature. In China, they had only been reported in Zhejiang province, Hebei province, Yunnan province, Guangdong province, Guizhou province and Anhui province before. The stroma of *Cordyceps odonatae* Kobayasi, light yellow in colour, singly grew at the chest of host; its stalk curved; its fertile part

was long-ellipsoidal and with longitudinal grooves; its pyrenocarp was under the skin of stroma, pitcher-shaped and its ostiole was verrucous and protruded a little; its ascospore was linear, and broke into secondary columnar ascospore when mature. In China, it had only been reported in Guizhou province before." (Authors)] Address: Yang, B.-s., Institute of Mycology, Jilin Agricultural University, Changchun 130118, China

2005

12864. DuBois, R.B.; Smith, W.; Pleski, J.M.; Reese, M. (2005): Wisconsin Odonata Highlights in 2004. *Argia* 17(2): 4-6. (in English) [This report is a summary of research highlights pertaining to Odonata for Wisconsin in 2004. Records of *Aeshna sitchensis*, *Enallagma clausum*, *Somatochlora incurvata*, *Williamsonia fletcheri*, *W. lintneri*, *Coenagrion interrogatum*, and *Enallagma aspersum* were treated in detail.] Address: DuBois, R., Wisconsin Dept of Natural Resources, 1401 Tower Ave., Superior, WI 54880, USA. E-mail: robert.dubois@Wisconsin.gov

12865. Fenoglio, S.; Bo, T.; Agosta, P.; Cucco, M. (2005): Mass loss and macroinvertebrate colonisation of fish carcasses in riffles and pools of a NW Italian stream. *Hydrobiologia* 532: 111-122. (in English) ["In this study, we analysed the decomposition of trout carcasses in a low-order Apennine stream, with the aim to investigate the mass loss rate in a Mediterranean lotic system, and to examine the influence of microhabitats on the invertebrates colonising fish carcasses. In May 2003, we put 56 dead rainbow trout (*Oncorhynchus mykiss*) in the stream, placing seven sets (four trout each) in both riffle and pool habitats. At four dates, we removed one trout per set to measure its dry mass and determine the associated macroinvertebrate assemblage. Fifty-eight macroinvertebrate taxa colonised the carcasses, with significant differences between the erosive and depositional microhabitats. Riffle trouts hosted richer and denser colonist communities than pool trouts. Chironomidae, *Serratella ignita*, *Habrophlebia* sp., *Dugesia* sp. and *Protonemura* sp. were the five most abundant taxa. Decomposition was initially very rapid in both environments and then tapered off over time. The mass loss rate was higher ($k = 0.057 \text{ day}^{-1}$) than that found in other studies. Higher Mediterranean temperatures probably increase the process. Although we found no significant difference between riffles and pools, mass loss was more regular in erosive habitats, underlining the importance of local, small-scale conditions. In small, low-order, heterotrophic streams, fish carcasses represent an important resource and shelter for rich and diversified invertebrate assemblages." (Authors) *Calopteryx virgo*, *Onychogomphus* sp., *Boyeria irene*, and *Chalcolestes viridis* were found to have settled on the carcasses.] Address: Fenoglio, S., University of Eastern Piedmont, Di.S.A.V., Via Cavour 84, I-15100 Alessandria, Italy. E-mail: fenoglio@unipmn.it

12866. Heckscher, C.M.; White, H.B. (2005): First Atlantic coastal plain occurrence of *Gomphus fraternus* Say (Odonata: Gomphidae). *Entomological News* 116(4): 271-272. (in English) [*G. fraternus*, 15-V-2002 and 13-V-2004, wooded north shore of Broad Creek, Sussex County, Delaware, USA at approximately 38°34'N, 75°38'W.] Address: Heckscher, C.M., Delaware Natural Heritage Program, Delaware Division of Fish and Wildlife, 4876 Hay Point Landing Road, Smyrna, Delaware 19977 USA. E-mail: christopher.Heckscher@state.de.us.

12867. Subramanian, K.A.; Sivaramakrishnan, K.G.; Gadgil, M. (2005): Impact of riparian land use on stream insects of Kudremukh National Park, Karnataka state, India. *Journal of Insect Science* 5:49: 10pp. (in English) ["The impact of riparian land use on the stream insect communities was studied at Kudremukh National Park located within Western Ghats, a tropical biodiversity hotspot in India. The diversity and community composition of stream insects varied across streams with different riparian land use types. The rarefied family and generic richness was highest in streams with natural semi evergreen forests as riparian vegetation. However, when the streams had human habitations and areca nut plantations as riparian land use type, the rarefied richness was higher than that of streams with natural evergreen forests and grasslands. The streams with scrub lands and iron ore mining as the riparian land use had the lowest rarefied richness. Within a landscape, the streams with the natural riparian vegetation had similar community composition. However, streams with natural grasslands as the riparian vegetation, had low diversity and the community composition was similar to those of paddy fields. We discuss how stream insect assemblages differ due to varied riparian land use patterns, reflecting fundamental alterations in the functioning of stream ecosystems. This understanding is vital to conserve, manage and restore tropical riverine ecosystems." (Authors) (Odonata) taxa were treated at the genus level.] Address: Subramanian, K.A., Centre for Ecological Sciences, Indian Institute of Science, Bangalore-560012, India. E-mail: subbu@ces.iisc.ernet.in

2006

12868. Holdt, E. von (2006): Die Libellen im Raum Hannover. Jubiläumsheft "125 Jahre HVV" (Hannoverscher Vogelschutzverein): 62-69. (in German) [The author introduced into the Odonata fauna of the town of Hannover, Niedersachsen, Germany and the region in the periphery of the settlement. Focus was set on rare species and species with recent range extensions or invasive behaviour.] Address: von Holdt, E., Offensteinstr. 13, 30451 Hannover, Germany. E-mail: ecvohe@t-online.de

12869. Karlsson, M. (2006): Relationship between mate-guarding strategies and the number of ovarioles in Libellulidae (Odonata). Master's thesis in Applied Ecol-

ogy at Halmstad University: 11 pp. ["In Libellulidae there are two types of egg-laying behaviour, non-contact guarding where the male accompany the female during oviposition and tandem guarding where the male is physically coupled with the female. These egg laying strategies also shows differences in egg size distribution and egg size. In species which perform non-contact guarding the egg size is inversely proportionate to the order of laying. In tandem species on the other hand, the egg size is more randomly distributed and the eggs are slightly larger than in non-contact species. To see if there is a difference in the female internal reproductive organs between the two guarding types, the ovariole number was counted. The result shows that in species which perform tandem guarding during oviposition have a fewer number of ovarioles compared to the non-contact species. This difference in ovariole number was also species specific. The impact on ecosystems is increasing and the survival of dragonflies or any other insects can no longer be taken for granted. Therefore this information can be valuable in conservation biology when new habitats are created for preservation of species." (Author) The following species were studied: (a) Non-contact guarders: *Trithemis kirbyi*, *Crocothemis erythraea*, *Leucorrhinia dubia*, *Libellula depressa* (b) Tandem guarders: *Sympetrum fonscolombii*, *Pantala flavescens*, *Philonomon luminans*, *Tramea basilare*, *Urothemis edwardsii*, *Diplacodes lefebvrii*, *S. vulgatum*, *S. danae*, *S. frequens*, *S. infuscatum*.] Address: not stated.

2007

12870. Campbell, W.B.; Novelo-Gutiérrez, R. (2007): Reduction in odonate phylogenetic diversity associated with dam impoundment is revealed using taxonomic distinctness. *Arch. Hydrobiol.* 168(1): 83-92. (in English) ["Taxonomic distinctness is a highly useful index combining species richness and taxonomic (phylogenetic) diversity to detect changes in the taxonomic structure of communities and assemblages. While analysis of an odonate assemblage before and after construction of a hydroelectric impoundment in the state of Hidalgo, Mexico, revealed no significant increase in average monthly species richness (although annual counts were slightly higher for the latter survey), taxonomic distinctness and its variation were reduced. The impoundment converted natural lotic conditions into lentic habitat with more littoral vegetation. Such conditions favoured plant-dependent species (mostly in the Zygoptera) with more species per genus and genera per family relative to those not dependent (mostly in the Anisoptera). High ratios reduce the average risk of losing higher taxonomic structure with loss of a species. Reduced taxonomic distinctness and its variation occurred at the expense of the Gomphidae and Corduliidae, and several genera in the Libellulidae having non-plant dependent species that favour inorganic substrate in flowing waters. The results contrast with the common assumption that higher odonate diversity occurs in lentic habitats. Seasonal pat-

terns of taxonomic distinctness appeared similar between surveys and may reflect reproductive and emergence cycles. The results support the use of taxonomic distinctness and its variation over species richness in ecological assessments and its application in further freshwater research. We encourage its use with aquatic insects, but recommend frequent sampling intervals to account for effects from emergence and reproductive behaviours. These results suggest new and added breadth to the value of taxonomic distinctness in ecological research regarding habitat change." (Authors)] Address: Novelo-Gutiérrez, R., Depto de Entomología, Instituto de Ecología A.C., Km 2.5. antigua carretera a Coatepec, Aparatdo Postal 63, 91000 Xalapa, Veracruz, Mexico. E-mail: rodolfo.novelo@inecol.edu.mx

12871. Dombrovsky, K.O. (2007): Biotopic allocation and dynamics of the number of damselfly larvae (Insecta, Odonata) of the Kakhovskoye water reservoir. Questions of aquatic entomology of Russia and adjacent lands: Materials of the Third All-Russia Symposium on Amphibiotic and Aquatic Insects. Voronezh State University. ISBN 978-5-9273-1169-9: 96-100. (in Russian, with English summary) [Between 1990 and 2000, in the floodplain waterbodies of the Kakhovskoye water reservoir, Ukraine the following Odonata species had been recorded: *Platycnemis pennipes*, *Erythromma najas*, *Enallagma cyathigerum*, *Coenagrion puella*, *C. hastulatum*, *Calopteryx splendens*, *Sympetrum sanguineum*, *Sympetma paedisca*, *Aeshna affinis*, *Anax imperator*, *Libellula depressa*, *Libellula quadrimaculata*, *Leucorrhinia pectoralis*, *Orthetrum cancellatum*, *Gomphus vulgatissimus*, *Somatochlora* sp., and *Ischnura elegans*] Address: Dombrovsky, K.O., Zaporizhzhya National University, Zaporizhzhya, Ukraine

12872. Praveen, J.; Chitra, S. (2007): Odonata watching in south Kerala. *Malabar Trogon* 5(2): 2-5. (in English) [The authors present data on Odonata species observed in three localities in South Kerala, India. A total of 11 hours were spent in the field for over five days in two trips (one during 21-23rd July 2007 and another during 24-25 August 2007). 30 Odonata species were checklisted and annotated.] Address: Praveen, J., B303, Shriram Spurthi, ITPL Main Road, Brookefields, Bangalore, India. E-mail: paintedstork@gmail.com

12873. Raju, D.V. (2007): Odonates of the Kuttanad wetland ecosystem. *Malabar Trogon* 5(1): 12-13. (in English) ["Kuttanad is primarily a deltaic formation of five-river systems, namely, Meenachil, Pamba, Manimala, Muvattupuzha and Achencovil, located in fertile lowlying areas of around Vembanad Lake. It spreads over Alappuzha, Kottayam and Pathanamthitta districts of Kerala, South West India and forms an integral part of the Vembanad-Kol Ramsar site." (Author) 45 Odonata species were listed.] Address: Raju, D.V., Valiyaparambil, Kuzhimattom.P.O, Kottayam, Kerala, India. E-mail: davidraju2007@gmail.com

12874. Vascotto, S.; Friesen-Pankratz, B. (2007): Phase I Ecological assessment of the Bear Rock and The Smokes. Report prepared for Tulita Dene Band by Rescan Environmental Services Ltd: 99 pp. (in English) [Northwest Territories, Canada; the study area is entirely within the Taiga Plains Ecozone. The majority of this ecozone is located in the southwesterly corner of the Northwest Territories, northeastern British Columbia, and northern Alberta. The ecozone is dominated by the Mackenzie River and its tributaries and is bordered to the west by cordilleran mountain ranges, to the east by Great Slave and Great Bear Lakes, and to the north by the Mackenzie Delta. 41 species of odonates were listed. Odonata species occurring in the Taiga Plains Ecozone with Territorial, Federal, or Global Status are: *Somatochlora sahlbergi*, *S. franklini*, *Stylurus notatus*, *Coenagrion resolutum*, *C. angulatum*, *C. interrogatum*, *Enallagma cyathigerum*, *Cordulia shurtleffi*, *Lestes congener*, *L. disjunctus*, *L. dryas*, *Aeshna eremita*, *A. interrupta*, *A. juncea*, *A. septentrionalis*, *A. sitchensis*, *A. subarctica*, *Ophiogomphus colubrinus*] Address: not stated

12875. Yu, W.-y.; Li, Z.-h.; Huang, C. (2007): Faunal study on Odonata in Haihui, Jiangxi province. *Sichuan Journal of Zoology* 26(1): 103-107. (in Chinese, with English summary) [31 of the 52 species recorded in 2004 and 2005 were new records for the Jiangxi Province, China.] Address: Yu, W.-y., Dept of Life Science, Nanjing Xiaozhuang University, Nanjing 210017, China. E-mail: zjyem@sina.com.cn

2008

12876. Ansori, I. (2008): Keanekaragaman nimfa Odonata (Dragonflies) di Beberapa Persawahan Sekitar Bandung Jawa Barat. *Jurnal Exacta* 6(2): 42-50. (in Indonesian, with English summary) [West Java, Indonesia; research on Odonata diversity was conducted in Antapani, Cigadung, Dago Pakar and Dago Pojok paddy fields located in Bandung. *Orthetrum sabina*, *Crocothemis servilia*, and *Anaciaeschna jaspidea* were recorded; *C. servilia* and *O. sabina* were dominant.] Address: Ansori, I., Program Studi Pendidikan Biologi Jurusan PMIPA FKIP UNIB

12877. Finch, O.-D. (2008): Die Tierwelt der Hunte im Spiegel des Aquariums. In: FANSA, M.: Beiträge zum Schauaquarium - Die Hunte: Ein Fluss durch norddeutsche Landschaften (= Schriftenreihe des Landesmuseums für Natur u. Mensch Oldenburg 58): 40-58. (in German) [Niedersachsen, Germany; the author briefly introduced into the rheophilous Odonata fauna of the river Hunte and its tributaries. Ditches in the region were inhabited by *Coenagrion mercuriale* and *C. ornatum*, and eutrophic permanent water bodies by *Aeshna viridis*.] Address: Finch, O.-D., Carl-von-Ossietzky Universität Oldenburg, Inst. Biol., AG Terrestrische Ökologie, PF 2503, 26111 Oldenburg, Germany. E-mail: oliver.d.finch@uni-oldenburg.de

12878. Grand, D.; Grossi, J.-L. (2008): Le marais de Chavas dans le nord de l'Isère et son peuplement odonatologique: inventaire, gestion et menaces. Particularités de la saison 2007. *Martinia* 24(2): 47-63. (in French, with English summary) [France; "Calopteryx haemorrhoidalis, already recorded in south Isère, has recently colonized the Charvas brook, whereas Leucorrhinia pectoralis extends its distribution area to the west of the region. The Charvas marsh has been strongly disturbed in the 30 last years, and the actual marsh represents only 21 % of its initial surface. In spite of this, it has conserved a high fauna and flora diversity. Its odonatofauna is composed of 47 species. But the future of this marsh seems threatened because of the anthropogenic extension and the climate change." (Authors)] Address: Grossi, J.-L., AVE-NIR, 10 rue Raspail, 38000-Grenoble, France

12879. Grütter-Schneider, E. (2008): Libellen im Oberaargau. Ein Beitrag zur Kenntnis der regionalen Fauna. *Jahrbuch des Oberaargaus* 51: 109-148. (in German) [The Oberaargau region is situated in the northeastern part of the Kanton Bern, Switzerland. In the past 30 years, the authors recorded 43 autochthonous Odonata species. These were presented in photographs and with information on morphology and habitat. Some records were documented with greater detail.] Address: not stated

12880. Heidecke, F. (2008): Die Goitzsche-Wildnis und ihre Libellenfauna (Odonata). *Naturschutz im Land Sachsen-Anhalt* 45: 26-35. (in German) [In 2004 and 2005, the Odonata fauna of the Goitzsche-brown coal mining area, Sachsen-Anhalt and Sachsen, Germany was studied for their Odonata fauna. A total of 38 was recorded. The species were assessed according to their habitat preferences and ability to colonize early successions states of vegetation development.] Address: Heidecke, F., Sieverstorstr. 57, 39106 Magdeburg, Germany. E-mail: libellenforscher@web.de

12881. Kolshorn, P. (2008): Kleinvieh & Co. *Naturspiegel* 70: 26. (in German) [17-XI-2008, Sympecma fusca, NSG Hülser Bruch, Krefeld, Nordrhein-Westfalen, Germany] Address: c/o Redaktion Naturspiegel, Hustenfeld 32, D-41379 Brüggen

12882. Luque, P.; Serra, A. (2008): *Macromia splendens* i *Gomphus graslinii*, dues noves espècies d'odonats per a Catalunya. *Butlletí Institució Catalana d'Història Natural* 74(2006): 113-116. (in Catalan) [River Igars, near Arnes, 31TBF6826, 555 m. a.s.l. 15-VI-2007, 23-VI-2007 and 07-VII-2007.] Address: Serra, A., Dept de Biologia Animal, Facultat de Biologia, Univ. de Barcelona, Avda. Diagonal, 645, Spain. E-mail: aserra@ub.edu

12883. Wildlife Conservation Society - Galle (2008): The study of the faunal diversity in Galle district, southern Sri Lanka. Final Report. Wildlife Conservation Society - Galle, Hiyare, Galle, Sri Lanka: iii + 44 pp. (in English) ["Out of 120 species of dragonflies recorded in Sri

Lanka, 62 species belonging to 12 families were recorded during this survey. This represents about 52% of the island's dragonfly fauna. Out of 62 species recorded from Galle district, 54 of them found in Kottawa-Kombala (Hiyare) forest Reserve. There were eighteen endemic and two nationally threatened species among them (IUCN Sri Lanka, 2007). *Elatoneura caesia* and *Macrogomphus lankensis* are the only nationally threatened species found in this survey. Un-described damselfly species belongs to genus *Drepanosticta* was recorded at Kanneliya & Hiyare in this survey and further analysis are ongoing to conform this finding." (Authors) Odonata species collected at 11 localities are presented on pages 15-16] Address: Wildlife Conservation Society - Galle, Biodiversity Education and Research Centre, Hiyare Reservoir, Hiyare, Galle, Sri Lanka. E-mail: info@wildlife.lk

2009

12884. Dziock, F.; Wacowska, K.; Siegl, S.; Briesenick, T.; Ernst, R. (2009): Erfassung und Bewertung der Vorkommen der Asiatischen Keiljungfer und Grünen Flussjungfer an der Elbe bei Roßlau. *Naturschutz im Land Sachsen-Anhalt* 46 (Sonderheft): 169-175. (in German) [Exuviae of *Stylurus flavipes* and *Ophiogomphus cecilia* were quantitatively sampled in groynes along a stretch of river Elbe, Sachsen-Anhalt, Germany. The conservation status of the local populations was assessed and causes of threats (gravelling of the sandy habitats between goynes) were briefly discussed.] Address: not stated

12885. Landmann, A. (2009): Die Höhenverbreitung als Indikator der Gefährdung von Insekten im Alpenraum. *Contributions to Natural History* 12: 829-856. (in German, with English summary) ["Altitudinal distribution as an indicator of threat in insects: an analysis of red data books from the Alps and adjoining regions. — The Alps represent one of the most important biodiversity hot spots in Europe but at the same time are the most developed mountain system in the world. However, human impact is very uneven within alpine landscapes. Topographical conditions restrict the space available for agriculture, settlements, traffic systems and industrial development. Human activities therefore have a focus at valley bottoms and other suitable lowland areas. While large nearly pristine areas still can be found at higher elevations, high local population densities together with intensive tourism have led to an over-exploitation and strong fragmentation of natural habitats at lower altitudes. Specialised lowland species can thus be expected to be under disproportionately strong pressure and should show an unfavourable conservation status. By contrast, species (groups) with broader altitudinal distribution or with preferences for higher elevations should experience less threat and this pattern should be expressed in the red data books as well (percentage of endangered species, distribution over threat-

categories). This hypothesis was tested using data concerning altitudinal distribution and national as well as regional red data books from different areas within the Alps (Switzerland, Austria, Tyrol, Carinthia) and at its northern border (Lower Austria, Bavaria). Dragonflies and grasshoppers were used for analysis because good and recent data are available for both groups and most regions. Species were first grouped into two (Odonata) to three (Saltatoria) main classes regarding their regional altitudinal distribution patterns: "valley (lowland) species", "midmountain species", and "mountain species", and their threat status was compared (separately per region) thereafter. For Tyrol and Switzerland more detailed data about vertical distribution (e.g. the absolute stretch of vertical distribution; the number of altitudinal zones used) exist and were directly correlated with threat status (red data categories). Overall the percentage of species regarded as "safe" (LC = least concern species) in recent red data books was significantly higher in species (species groups) belonging to the "midmountain" and especially the "mountain" groups than in species of the "valley group". The groups (esp. "valley" vs. "mountain") also strongly differed in the overall patterns (dimensions) of threat, valley species exhibiting a much higher proportion of species within the highest categories (CR = critically endangered, EN = endangered). Differences between "valley" and "mountain" species were higher in central parts of the Alps but comparatively low at the northern edge of the Alps, in Lower Austria and Bavaria. This fits to differences in overall landscape settings because both latter regions offer more area and more suitable habitats for sensitive lowland species. Moreover, for dragonflies as well as for grasshoppers, there was a clear trend of decreasing threat with increasing number of altitudinal zones inhabited in the Tyrol and Switzerland. Altitudinal distribution patterns might therefore be a useful indirect indicator of conservation problems (threat status) for animal groups in the Alps and adjoining regions, especially when more direct measures (e.g. data about population trends) are not available. However, further analysis for more and different animal groups are needed and called for to test this hypothesis." (Author)] Address: Landmann, A., Institut für Zoologie der Universität Innsbruck, Technikerstr. 25 & Institut für Naturkunde & Ökologie Karl Kapfererstr. 3, 6020 Innsbruck, Austria. E-mail: Armin.Landmann@uibk.ac.at

12886. Maynou i Sene, X. (2009): A contribution to the study of the Odonata of the Sant Llorenç del Muut Massif and Obac Range. Bull. Inst. Cat. Hist. Nat. 75(2007-2009): 85-98. (in Catalan, with English and Spanish summaries) ["An updated list of 28 species of Odonata recorded in the Sant Llorenç del Munt Massif and Obac Range (Catalonia) in 2007 and 2008 is provided, with an estimation of the degree of presence of each species. The list of species is compared to existing records, old and recent. The species-diversity observed in this study is similar to that in other Catalan nature reserves,

although most of the species found here can be considered ecological generalists. In this survey, data regarding reproduction and phenology are also provided for every species, the most important dragonfly sites are identified and actions for the conservation and improvement of the Odonata community richness are suggested." (Authors) Species of regional interest were *Sympetrum sinaiticum*, *Coenagrion caerulescens*, *C. mercuriale*, *Trithemis annulata*.] Address: Maynou i Sené, X., C. del Dr. Salva, 23. 08224 Terrassa, Spain. E-mail: xavier.maynou@gmail.com

12887. Wildlife Conservation Society - Galle (2009): The study of the faunal diversity in Matara district – southern, Sri Lanka. Final report. Wildlife Conservation Society – Galle, Hiyare, Galle, Sri Lanka: III + 43 pp. (in English) ["Out of 120 species of dragonflies recorded in Sri Lanka, 51 species belonging to 10 families were recorded during this survey. This represents about 42% of the island's dragonfly fauna. There were seventeen (17) endemic and two (2) nationally threatened species among them (IUCN Sri Lanka, 2007). *Elatoneura caesia* and *Macrogomphus lankensis* are the only nationally threatened species found in this survey. The first record of Damselfly *Elatoneura tenax* from the Dediyaigala rain forest reserve that is the lowest elevation of this species recorded in Sri Lanka." (Authors) Checklist of Odonata species recorded during the survey at 14 localities is presented as appendix on pages 14-15.] Address: Wildlife Conservation Society - Galle, Biodiversity Education and Research Centre, Hiyare Reservoir, Hiyare, Galle, Sri Lanka. E-mail: info@wildlife.lk

2010

12888. Aguzzi, S. (2010): Studio sulla comunità di Odonati del Lago Boscaccio. Natura Boscaccio: i Quaderni - n. 1: 77 pp. (in Italian) [20 Odonata species were recorded at lake Boscaccio (Milano province, Italy). *Stylurus flavipes* was for the first time reported from the province and *Gomphus vulgatissimus* represents the first provincial record since the 1960s. Additional species of regional interest were *Orthetrum albistylum*, *Sympetrum pedemontanum*, *S. depressiusculum*, and *S. meridionale*.] Address: Aguzzi, S. c/o Dipto Biol. Anim., Univ. Pavia, Pavia, Italy

12889. Archer, M.W. (2010): Retention, movement, and the biotic response to large woody debris in the channelized Missouri River. M.Sc. Thesis, Graduate College at the University of Nebraska, Lincoln, Nebraska: X + 116 pp. (in English) ["Large woody debris (LWD) is an important component of a healthy aquatic ecosystem. However, little is known about the dynamics of LWD in a large, channelized river such as the Missouri River. My objectives were to first, assess the abundance of LWD found along the channelized portion of the Missouri River. Second, I documented movement of LWD that entered the river. Lastly, using PRIMER software I ana-

lyzed what effect, if any, river segments, bend types, and LWD had on the community composition of the macroinvertebrate and fish that inhabit the river. Abundance of LWD was greater along bends that have flow diverted away from the bank compared to bends that had recent modifications to divert flow to the shore (major modification bends) and areas with little bank armouring, such as, side channel chutes ($P < 0.05$). Recruitment of LWD into the river that could become available as aquatic habitat occurred mostly within 5 m of the bankfull width (BFW). Telemetry analysis of LWD showed that LWD located within the BFW of the river was often (63% of LWD) displaced downstream. Minimum distance of displaced LWD was 0.02 rkm, median distance was 146.50 rkm, and maximum distance was 1454.69 rkm. No differences were found in the community composition of macroinvertebrates between segments ($P = 0.43$) or between bend types (0.074). Community composition did differ between LWD and non-LWD sites ($P = 0.016$). Fish communities differed between the segments ($P = 0.043$) therefore further analyses were split between the segments. Segment 8 fish communities did not differ between bend types ($P = 0.35$) or between LWD and non-LWD sites ($P = 0.55$). Results were similar in Segment 9 (bend types ($P = 0.20$), LWD and non-LWD sites ($P = 0.19$)). Combining the macroinvertebrate communities and fish communities to test for differences in the combined biota community composition showed that differences did not exist between the segments ($P = 0.59$) or bend types ($p = 0.29$). However, the composition of the composite community was different between LWD and non-LWD sites ($P = 0.011$). My results suggest that while retention of LWD is low it still has an effect on the composition of the composite communities that inhabit the Missouri River." (Author Taxa including Odonata are treated at the order level.] Address: Archer, M.W., University of Nebraska at Lincoln, USA. E-mail: michael.archer@huskers.unl.edu

12890. Cobb, M. (2010): The damselfly enigma: better bigger or smaller? Outside JEB doi: 10.1242/jeb.036665 September 1, 2010 J. Exp. Biol. 213: VI. (in English) [Verbatim: "Damselflies show abrupt, darting flight, which is the envy of aero-engineers. This amazing ability is used both to capture prey and, by males, to establish territories that can attract females. Insects are ectothermic, so maintaining this flying ability in the face of fluctuating environmental changes is a major challenge. Furthermore, body size has both a direct effect on manoeuvrability and an indirect effect, through its impact on heat retention. Two Japanese researchers from Kyoto University, Yuka Samejima and Yoshitaka Tsubaki, have studied how body size and temperature affect flight ability in this stunning insect. The damselfly they chose to study – *Mnais costalis* – lives by fast-flowing mountain streams and shows male polymorphism: orange-winged larger males tend to have territories while clear-winged smaller males do not. These morphs reflect different mating strategies, with smaller males

'sneaking' mating opportunities. The authors used an infrared thermographic camera to measure the surface temperature of males, which they manipulated in the laboratory by using a halogen lamp, and studied the flight performance of each male. They estimated maximum lifting force and size-corrected lifting force, which they measured by attaching weights to the insects' wings with fishing line. Size-corrected lifting force is an index of acceleration that is linked to the damselfly's superb aerial acrobatics. The authors found that both measures of flight performance were positively correlated with body temperature. This is not particularly surprising, as it is well known that insect flight muscle activity increases with temperature. However, although body size led to higher maximum lifting force, it was negatively correlated with size-corrected lifting force. Simply put, larger males were less agile. When the authors took their thermographic camera into the field, they discovered that the story was even more complex: larger, territorial, males showed substantial variation in body temperature, as their territory showed varying patches of light and shade. Smaller, non-territorial males, however, generally had higher body temperatures, as they tended to bask in sunlit areas, as part of their 'sneaky' mating strategy. This combination of behavioural ecology and physiology enriches our understanding of the maintenance of polymorphic mating strategies in this species. Due to their smaller body size and their more constant, higher body temperature, smaller males are apparently more agile, and therefore gain an advantage in terms of 'sneaky' mating and avoiding predation. However, their smaller size means that they are less able to lift females – essential during mating – or to combat larger males. The best strategy, it would appear, would be to be a large male with a perpetually sunlit territory. Indeed, the authors' unpublished data suggest that such males have higher reproductive success. However, such territories are rare and may be temporally or physically fragile; natural selection has led to the current polymorphism of alternative male strategies, with underlying alternative physiologies. Who would have thought that the beautiful flight of the damselfly concealed such complexity?" For the full paper see: Samejima, Y. and Tsubaki, Y. (2010). Body temperature and body size affect flight performance in a damselfly. *Behav. Ecol. Sociobiol.* 64, 685-692.] Address: Cobb, M., University of Manchester, UK. E-mail: cobb@manchester.ac.uk

12891. Cordero Rivera, A.; Córdoba-Aguilar, A. (2010): 15. Selective forces propelling genitalic evolution in Odonata. In: Edited by Janet Leonard and Alex Córdoba-Aguilar (eds.): *The Evolution of Primary Sexual Characters in Animals*. ISBN13: 9780195325553. 552 pp: 332-352. (in English) ["Conclusions and suggestions for future research: Although it seems that sexual selection, particularly sperm competition, is an important force shaping genital morphology and function, other selective forces cannot be disregarded. Other sexual selec-

tion forces are cryptic female choice and sexual conflict. A similar argument can be made for natural selection hypotheses, especially the lock and key hypothesis. Further investigations should test hypotheses from both sexual and natural selection. Our knowledge of genital functional morphology is still rather poor for many families of Anisoptera (but see Pfau 2005; for a comprehensive work see Siva-Jothy 1997), and this is especially true for females. Another research priority is tropical families, and also species-poor and primitive taxa, like the Hemiphlebiidae or Petaluridae. Furthermore, study of the genital morphology of highly diverse and localized taxa, like *Megalagrion* in Hawaii (Polhemus & Asquith 1996) or *Nesobasis* in Fiji (Donnelly 1990), both with more than 20 species, would be appropriate tests of hypotheses of genital evolution and speciation on islands. As we have mentioned above, there is limited evidence for mating frequency having negative effects on females, and we lack direct evidence for genital damage, two predictions derived from sexual conflict hypotheses, and therefore open to future studies. Finally, the lock-and-key and pleiotropy hypotheses are still not formally tested with odonates, a group that offers high rewards for future studies of genital diversity." (Authors)] Address: Cordero Rivera, A., Departamento de Ecología e Biología Animal, Universidade de Vigo, E.U.E.T. Forestal, Campus Universitario, 36005 Pontevedra, Spain. E-mail: acordero@uvigo.es

12892. Eichinger, E.; Reinhard, U. (2010): Libellenwochenende - elsässisch-baden-württembergisches Austauschtreffen am 23.- und 24. Juli, diesmal in Baden-Württemberg. *Mercuriale* 10: 53-55. (in German) [Report on a dragonfly weekend in the Lake Constance region.] Address: Eichinger, Eva-Maria, Galgenbergstr. 18, 72072 Tübingen, Germany

12893. Gourmand, A.-L.; Vanappelghem, C. (2010): Protocole de suivi des espèces prioritaires. *Martinia* 26(3-4): 186-187. (in French, with English summary) ["Minutes of the workshop about the French Dragonfly monitoring scheme are summarized. The bases of this project are laid in accordance to the experience of the Dutch Monitoring Scheme." (Authors)] Address: Vanappelghem, C., 14, rue Brûle Maison, F-59000 Lille, France. E-mail: cedvana@free.fr

12894. Hideto, K (2010): [Dragonfly charm]. *Japic News* 313: 8-9. (in Japanese) [Kita Hideto is the responsible director of the pharmaceutical company Novartis for public relations. In this paper, he gives a personal insight in his relationship to dragonflies and introduces into some culture historical aspects of dragonflies in Japan.] Address: not stated

12895. Houard, X. (2010): Le Plan national d'actions (PNA) en faveur des Odonates menacés en France métropolitaine. *Martinia* 26(3-4): 182-185. (in French, with English summary) ["The French action plan for

threatened Odonata. Facing threats to Odonata and aware of issues related to the conservation of those insects which are typical and emblematic of wetlands, the French government launched a national plan of specific actions for their conservation. This plan covers the 18 most endangered dragonfly species in the metropolitan territory (*Lestes macrostigma*, *Sympetma paedisca*, *Coenagrion caerulescens*, *C. lunulatum*, *C. mercuriale*, *C. ornatum*, *Nehalennia speciosa*, *Aeshna caerulea*, *Gomphus flavipes*, *G. graslinii*, *Lindenia telraphylla*, *Ophiogomphus cecilia*, *Oxygastra curtisii*, *Macromia splendens*, *Leucorrhinia albifrons*, *L. caudalis*, *L. pectoralis*, *Sympetrum depressiusculum*). The main types of actions envisaged under this plan are summarized." (Author)] Address: Houard, X., Centre Entomologique de Ressources pour la Conservation, Office pour les insectes et leur environnement (Opie), BP 30, 78041 Guyancourt Cedex, France. E-mail: xavier.houard@insectes.org

12896. Ineichen, S.; Ruckstuhl, M. (2010): Stadtfauna: 600 Tierarten der Stadt Zürich. Haupt Verlag, Bern: 446 pp. (in German) [The chapter on Odonata is written by André Rey. On pages 124-143, he introduces into 38 Odonata species. Each is represented by a photograph, condensed information on habitat and morphology and a map with records in the town of Zürich, Switzerland. The record of *Gomphus simillimus* far away from the next known reproduction habitat along river Rhine is of special interest.] Address: Rey, A. E-mail: ar@andre-rey.ch

12897. Krieg-Jacquier, R. (2010): *Epithea bimaculata* (Charpentier, 1825) dans le département de l'Ain (Odonata, Anisoptera, Corduliidae). *Martinia* 26(3-4): 83-97. (in French, with English summary) ["This paper deals with the distribution of *Epithea bimaculata* in the Ain department (Rhône-Alpes region, France). After the review of the 19 sites where the species occurs, the author points out its possible univoltinism within two of them." (Author)] Address: Krieg-Jacquier, R., 18 rue de la Maçonne, 73000 Barberaz, France. E-mail: regis.krieg.jacquier@gmail.com

12898. Kunz, B. (2010): Ein ungewöhnliches Zuhause: Brutfürsorge der Krabbenspinne *Xysticus cristatus* in einer Vierfleck-Exuvie (*Libellula quadrimaculata*). *Mercuriale* 10: 51-52. (in German) [19-VI-2010, Heimatsee, Schwäbisch-Hall, Baden-Württemberg, Germany; The exuvia of *L. quadrimaculata* is used by a spider for oviposition] Address: Kunz, B., Hauptstr. 111, 74595 Langenburg, Germany. E-mail: libellen@berndkunz.de

12899. Leclerc, D.; Angelibert, S.; Rosset, V. (2010): Les Libellules (Odonates) des étangs piscicoles de la Dombes. *Martinia* 26(3-4): 98-108. (in French, with English summary) [A total of 34 species were observed between 2007 and 2009 in 79 fish ponds of the Dombes region, France. Their distribution and abundance were compared with the illustrated atlas of Odonata

from Rhône-Alpes (Deliry, 2008). *Coenagrion pulchellum*, *Enallagma cyathigerum*, *Erythromma lindenii*, and *Libellula fulva* were new for the Dombes area. "Finally our observations confirm the strong implantation of *Leucorrhinia pectoralis* in the fish ponds of the Dombes region and provide more accurate information on the habitat used by the adults of this species, which possesses a strong heritage value." (Authors)] Address: Leclerc, D., Haute École du Paysage, d'ingénierie et de l'Architecture (HEPIA), 150 route de Lullier, 1254 Jussy-Genève, Switzerland

12900. Lockwood, M. (2010): Nuevas citas de *Cordulegaster bidentata* Selys, 1842 (Odonata: Cordulegasteridae) de los Pirineos catalanes. *Boletín de la S.E.A.* 46(1): 506-508. (in Spanish, with English summary) ["New records of *C. bidentata* from the Catalan Pyrenees: New records of *C. bidentata* from the Catalan Pyrenees are described. The situation of the species in the region is also discussed, along with its possible choice of habitat." (Author)] Address: Lockwood, M., Grupo Oxygastra, Institució Catalana d'Història Natural, Carrer del Carme, 47; 08001 Barcelona, Spain. E-mail: mike@walkingcatalonia.net

12901. Ott, J. (2010): Résumé de la communication orale: Alien Invasive Species (AIS) - a threat for European dragonflies? *Martinia* 26(3-4): 167. (in English) [Verbatim: After the negative effects of climatic changes presently a new threat becomes more and more important for European dragonflies: Alien Invasive Species (AIS). As a consequence of the globalisation, introductions by aquarists and fishermen many new species can be found in the waters. Some of them also do reproduce and are increasing their ranges, out of these species some are having negative - some even dramatic - effects on the biocoenosis. In particular some fish (e.g. *Ctenopharyngodon idella*) and crayfish species (e.g. *Orconectes limosus*, *Procambarus* sp., *P. clarkii*) could be identified as dangerous for the native dragonfly fauna, as they are altering the biotic conditions or the food chain (e.g. reduction of water plants - lack of substrate for oviposition) or as they are strong direct predators for the larvae. As these AIS often are favoured by higher temperatures, climatic changes and AIS now may have synergistic and cumulative effects. After a short review on recent developments and trends of the distribution and ecology of Odonata in Europe the possible consequences for nature conservation and the future for native dragonfly populations are outlined. In this context also the results of a current research on the effects of crayfish on dragonfly larvae and other water organisms will be presented.] Address: Ott, J., Friedhofstr. 28, 67705 Trippstadt, Germany. E-mail: L.U.P.O.GmbH@t-online.de

12902. Savart, J.-P. (2010): Contribution à l'étude des Odonates de Guadeloupe Observations sur trois sites à Pigeon (Commune de Bouillante, Côte-sous-le-Vent,

Basse-Terre). *Martinia* 26(3-4): 168-177. (in French, with English summary) ["The author studied three sites western from the mountains of Basse-Terre, in the vicinity of river Lostau, between its mouth and the central part of Guadeloupe National Parc. Fourteen species were recorded whom three are endemic to the island. With the aim to enhance the conservation of Odonata, especially transfer throughout the Lostau valley, the author emphasizes the role of artificial biotopes and proposes to create aquatic habitats and further, to favour education in order to involve as much people as possible not only in the improvement of knowledge of these insects but also in the conservation of their habitats." (Author)] Address: Savart, J.-P., Habitation Dumoulin, BP 2 Pigeon, 97125 Bouillante, Guadeloupe

12903. Schmitt, V. (2010): Inventaire des populations de *Coenagrion mercuriale* (Charpentier, 1840) dans le bassin de la Chiers (Odonata, Zygoptera: Coenagrionidae). *Martinia* 26(3-4): 123-131. (in French, with English summary) ["For the needs of the project Interreg IVa Big Region entitled "Preservation of the remarkable natural elements of the Chiers basin in the Belgian and French Lorraine", it was necessary to know better the localization of the populations of *C. mercuriale* in the Chiers watershed. The method used and the results are both described in this paper." (Author) 168 habitats were studied. 42 localities harboured local populations of *C. mercuriale*.] Address: Schmitt, V., Conservatoire des Sites Lorrains, 14 rue de l'Eglise, F-57930 Fénétrange, France

12904. Tabarroni, A. (2010): Odonata in the "Malmerendi" Collection, Faenza Civic Museum of Natural Sciences. (*Insecta Odonata*). *Quaderno di studi e notizie di storia naturale della Romagna* 31: 37-46. (in Italian) ["The dragonfly specimens preserved in the entomological collection of Domenico Malmerendi (1900-1980) have been identified. The whole collection is made up of approx. 81,000 specimens and is the principal component of the Civic Museum of Natural Sciences in Faenza (Ravenna, Italy). The Dragonfly section contains 80 specimens, belonging to 16 genera and 30 species. The peculiar interest of this collection is due to its confined geographic provenience and also to the period of time in which it was assembled." (Author)] Address: Tabarroni, A., via Domenico Zampieri, 24, 40129 Bologna, Italy. E-mail: altabar@tiscali.it

12905. Vanappelghem, C.; Hubert, B. (2010): Suivi de la population de *Coenagrion mercuriale* (Charpentier, 1840) dans la Réserve naturelle régionale des dunes et hauts de Dannes-Camiers (Pas-de-Calais) (Odonata, Zygoptera: Coenagrionidae). *Martinia* 26(3-4): 131-137. (in French, with English summary) ["A monitoring of *C. mercuriale* and of its habitat has been tested on a regional nature reserve in the Nord-Pas-de-Calais region, France. Species monitoring appeared to reflect real population trends, but the analysis of key habitat attrib-

utes monitoring could not clearly explain the observed population decline with changes in habitat. However an artificial seasonal variation of the water depth could be related with this decline." (Author)] Address: Vanappelghem, C., 14, rue Brûle Maison, F-59000 Lille, France. E-mail: cedvana@free.fr

12906. Wu, D.-h.; Wang J.-t.; Zhang, Y.; Wang, B.-x.; Li, Y.-q.; Shen, Y.f. (2010): River water bioassessment with benthic macroinvertebrate in Lianyungang, Jiangsu province. *The Administration and Technique of Environmental Monitoring* 22(1): 29-32. (in Chinese, with English summary) ["Benthic macroinvertebrates assemblages were collected from 7 sites of 5 Lianyungang rivers in May, 2008. A total of 67 macroinvertebrate taxa (no taxonomic details are given) were found including 18 genera in Diptera, 11 genera in Odonata, 24 species in Mollusca, 5 species and 4 genera in 4 families of Annelida. All sampling sites were plotted out 3 groups by CCA ordination analysis. The water quality was assessed by the Shannon-Wiener diversity index, Biotic Index and COD, the result of diversity index was quite different from those of BI and COD, while the results between BI and COD were similar. Based on above three indicators, the quality of Qianwei river was clean and other rivers were from slight to middle pollution. The Pearson's correlation analysis showed that BI corresponded strongly with TN ($r=0.913$, $p=0.004$) and Shannon-Wiener diversity index had no correlation with TN ($r=0.257$, $p=0.578$)."] (Authors)] Address: Wu, D.-h., Lab of Aquatic Insects and Stream Ecology, Department of Entomology, Nanjing Agricultural University, Nanjing, Jiangsu 210095, China

2011

12907. Ayme-Southgate, A.; Philipp, R.A.; Southgate, R.J. (2011): Projectin PEVK domain, splicing variants and domain structure in basal and derived insects. *Insect Molecular Biology* 20(3): 347-356. (in English) ["The third elastic filament of striated muscles consists of giant proteins: titin (in vertebrates) and kettin/projectin (in insects). In all three proteins, elasticity is at least partly associated with the so-called PEVK domain. The projectin PEVK domains of diverse insects are highly divergent compared with an otherwise conserved protein organization. We present the characterization of the PEVK domain in two dragonflies (*Pachydiplax longipennis*, *Libellula pulchella*) and in human lice. A conserved segment at the end of the PEVK, the NH(2)-terminal conserved segment-1 (NTCS-1), may serve as an anchor point for projectin to either myosin or actin, providing a mechanical link. The analysis of alternative splicing variants identifies the shortest PEVK isoform as the predominant form in the flight muscles of several insects, possibly contributing to myofibrillar stiffness."] (Authors)] Address: Ayme-Southgate A., Department of Biology, College of Charleston, Charleston, SC, USA. E-mail: southgatea@cofc.edu

12908. Barnard, P. (2011): Royal Entomological Society Book of British Insects. John Wiley & Sons: 368 pp. (in English) ["This book is the only modern systematic account of all 558 families of British insects, covering not just the large and familiar groups that are included in popular books, but even the smallest and least known. It is beautifully illustrated throughout in full colour with photographs by experienced wildlife photographers to show the range of diversity, both morphological and behavioural, among the 24,000 species. All of the 6,000 genera of British insects are listed and indexed, along with all the family names and higher groups. There is a summary of the classification, biology and economic importance of each family together with further references for detailed identification. All species currently subject to legal protection in the United Kingdom are also listed. The Royal Entomological Society (RES) ... began its famous Handbooks for the Identification of British Insects in 1949, and new works in that series continue to be published. The RES Book of British Insects has been produced to demonstrate the on-going commitment of the RES to educate and encourage each generation to study these fascinating creatures. This is a key reference work for serious students of entomology and amateur entomologists, as well as for professionals who need a comprehensive source of information about the insect groups of the British Isles they may be less familiar with."] (Publisher) Chap. 8 treats Odonata.] Address: Royal Entomological Society, The Mansion House, Chiswell Green Lane, St Albans AL2 3NS, UK

12909. Blanchon, V.; Durand, E.; Lambret, P. (2011): Redécouverte de *Gomphus flavipes* (Charpentier, 1825) en Provence-Alpes-Côte d'Azur (Odonata, Anisoptera: Gomphidae). *Martinia* 27(2): 121-122. (in French) [In June and July 2011, exuviae of *Stylurus flavipes* were found at the shore of the Isle of Saxy, Rhône, north of Arles (43,70972° N / 4,618611° E), France.] Address: Blanchon, V., Chemin de la Mourgatte, F-26200 Montélimar, France. E-mail: yoann.blanchon@orange.fr

12910. Bogan, M.T.; Lytle, D.A. (2011): Severe drought drives novel community trajectories in desert stream pools. *Freshwater Biology* 56: 2070-2081. (in English) [Arizona, USA; "(1.) Ecological communities can be relatively stable for long periods of time, and then, often as a result of disturbance, transition rapidly to a novel state. When communities fail to recover to pre-disturbance configurations, they are said to have experienced a regime shift or to be in an alternative stable state. (2.) In this 8-year study, we quantified the effects of complete water loss and subsequent altered disturbance regime on aquatic insect communities inhabiting a formerly perennial desert stream. We monitored two study pools seasonally for 4 years before and 4 years after the transition from perennial to intermittent flow to evaluate pre-drying community dynamics and post-drying recovery trajectories. (3.) Mean species richness

was not affected by the transition to intermittent flow, though seasonal patterns of richness did change. Sample densities were much higher in postdrying samples. (4.) The stream pool communities underwent a catastrophic regime shift after transition to intermittent flow, moving to an alternative stable state with novel seasonal trajectories, and did not recover to pre-drying configurations after 4 years. Six invertebrate species were extirpated by the initial drying event, while other species were as much as 40 times more abundant in post-drying samples. In general, large-bodied top predators were extirpated from the system and replaced with high abundances of smaller-bodied mesopredators. (5.) Our results suggest that the loss of perennial flow caused by intensified droughts and water withdrawals could lead to significant changes in community structure and species composition at local and regional scales." (Authors) *Libellula saturata* was a significant pre-drying indicator.] Address: Bogan, M.T., Department of Zoology, Oregon State University, Corvallis, OR, USA. E-mail: boganmi@science.oregonstate.edu

12911. Courant, S.; Meme-Lafond, B. (2011): Écologie et gestion des populations de *Leucorrhinia albifrons* (Burmeister, 1839) et *L. caudalis* (Charpentier, 1840) (Odonata, Anisoptera: Libellulidae) sur un étang du Saumurois (département du Maine-et-Loire). *Martinia* 27(2): 81-94. (in French, with English summary) ["*Leucorrhinia albifrons* and *L. caudalis* were discovered at a forest pool in Gennes (Maine-et-Loire) during summer 2009, several hundred miles away from their nearest breeding sites. The first is a new species to the Pays de la Loire, whereas the second was regularly observed at a site more and more altered since 2006. Following this discovery, a survey is carried out to study both the ecology of these *Leucorrhinia* species and the crucial habitat parameters for their survival. The research based on both exuviae' and adults' surveys brought us phenological and ecological data on these species, and emphasized the role of dense aquatic vegetation which allows the survival of larvae over their entire development period. Water quality and structure of vegetation also play a vital role for *L. caudalis* and *L. albifrons* during reproduction. The management plan based on these data provides suitable suggestions to ensure the optimal conditions for these Whitefaces." (Authors)] Address: Courant, S., LPO Anjou, 10 rue de Port Boulet, 49080 Bouchemaine, France. E-mail: courantsylvain@yahoo.fr

12912. Doucet, G.; Duret, B. (2011): Contribution à la connaissance de *Somatochlora metallica meridionalis* Nielsen, 1935 en Corse (Odonata, Anisoptera: Corduliidae). *Martinia* 27(1): 33-38. (in French, with English summary) ["The records dealing with *S. meridionalis* in Corsica since its discovery in 2001 are summed up. The discovery of this taxon in the Haute-Corse department in June 2009 extends its range considerably to the North in the island. The habitats from which it is known and the odonatological assemblages associated

to this Corduliidae are detailed." (Authors)] Address: Doucet, G., 74 rue de la Colonie, 75013 Paris, France. E-mail: guillaume.doucet@yahoo.fr

12913. Duda, J.J.; Beirne, M.M.; Larsen, K.; Barry, D.; Stenberg, K.; McHenry, M.L. (2011): Aquatic ecology of the Elwha River estuary prior to dam removal. In: Duda, J.J., Warrick, J.A., and Magirl, C.S., eds., 2011, Coastal habitats of the Elwha River, Washington - Biological and physical patterns and processes prior to dam removal: U.S. Geological Survey Scientific Investigations Report 2011-5120, 264 pp: 175-223. (in English) ["The removal of two long-standing dams on the Elwha River in Washington State will initiate a suite of biological and physical changes to the estuary at the river mouth. Estuaries represent a transition between freshwater and saltwater, have unique assemblages of plants and animals, and are a critical habitat for some salmon species as they migrate to the ocean. This chapter summarizes a number of studies in the Elwha River estuary, and focuses on physical and biological aspects of the ecosystem that are expected to change following dam removal. Included are data sets that summarize (1) water chemistry samples collected over a 16 month period; (2) beach seining activities targeted toward describing the fish assemblage of the estuary and migratory patterns of juvenile salmon; (3) descriptions of the aquatic and terrestrial invertebrate communities in the estuary, which represent an important food source for juvenile fish and are important water quality indicators; and (4) the diet and growth patterns of juvenile Chinook salmon in the lower Elwha River and estuary. These data represent baseline conditions of the ecosystem after nearly a century of changes due to the dams and will be useful in monitoring the changes to the river and estuary following dam removal." (Authors) Taxa (including Odonata) were treated at order level.] Address: not available

12914. Fiorenza, T.; Del Bianco, C.; Chiandetti, I.; Uboni, C.; Zandigiacomo, P. (2011): Gli Odonati del Friuli Venezia Giulia: risultati di uno studio triennale. *Bollettino Soc. Naturalisti "Silvia Zenari", Pordenone* 35: 109-122. (in Italian with English summary) ["During the period 2009-2011, a survey was carried out on the occurrence and distribution of Odonata in the Friuli Venezia Giulia region (north-eastern Italy). The aim of this study is to provide a regional Atlas of the Odonata at the end of 2013. Fifty-one species of Odonata have been found. This number agrees with the previous checklists of Kiauta (1969; 52 species) and Pecile (1984; 55 species). The occurrence of the Zygopteran *Nehalennia speciosa*, a threatened species, and of the Anisopteran *Cordulegaster heros*, a species widespread in the Balkan area and included in the Annexes II and IV of the Habitat Directive (Dir. 92/43/CEE) is extremely important from a naturalistic point of view. Both species are present in Italy only in Friuli Venezia Giulia. Further survey is expected to be planned in the next years, that will lead to the detection in the region of

about ten new species." (Authors)] Address: Fiorenza, T., Via Morosina 17/c, 33100 Udine, Italy. E-mail: E-mail: tizianofiorenza@libero.it

12915. Grand, D.; David, G.; Hahn, J.; Hentz, J.-L.; Krieg-Jacquier, R.; Roncin, P. (2011): *Gomphus flavipes* (Charpentier, 1825) à Lyon (Rhône) et nouvelles localités rhônalpines (Odonata, Anisoptera: Gomphidae). *Martinia* 27(1): 27-30. (in French, with English summary) ["In a previous communication, GRAND et al. (2011) reported the rediscovery of *Gomphus flavipes* in the Rhone hydrographic system, where this species had been found in 33 localities on the Rhône, the Doubs and the Saône rivers. Additional surveys conducted in mid-June 2009 and during summer 2010, allowed us to add 25 new municipalities for this species, its presence being mainly demonstrated by the finding of exuviae. All localities were located in the Ain and Rhone departments and two exuviae were found in the city of Lyon, one on the Saône and the other on the Rhone rivers." (Authors)] Address: Roncin, P., 36 chemin de l'Étang Neuf, 01000 Saint-Denis-lès-Bourg, France

12916. Gu, W.; Ma, L.; Ding, X.H.; Zhang, J.; Han, Z.W. (2011): Insect diversity of different habitat types in Zhalong Wetland, northeast China. *Chinese Journal of Applied Ecology* 22(9): 2405-2412. (in Chinese) ["In order to approach the effects of different habitat types in wetland on insect diversity, an investigation was conducted on the insects in eight types of habitats in Zhalong Wetland. A total of 5822 insects were collected, belonging to 143 species, 58 families, and 11 orders, among which, Orthoptera, Diptera and Odonata ("Libellulidae, Platycnemididae") were the dominant taxa. The species diversity was the highest in grassland meadow, and the Shannon diversity index and evenness index were higher in lakeside but the lowest in wet meadow. Cluster analysis and principal component analysis showed that the similarity of the insect community in the habitats was related to the water source status and vegetation type, and the species and individual number of predatory taxa had important regulation effects on the insect community stability. Lakeside had the strongest insect community stability, while wet meadow had the weakest one, indicating that habitat water source status could affect insect survival, and further, affect the species composition and distribution pattern of insect community." (Authors)] Address: Gu, W., School of Forestry, Northeast Forestry University, Harbin 150040, China. guwei20042109@yahoo.com.cn

12917. Houard, X.; Simon, A. (2011): Bilan à mi-parcours du projet d'atlas des Odonates de Normandie. *Martinia* 27(1): 1-6. (in French, with English summary) ["The Atlas Project of the Dragonflies of Normandy (France) was launched by the volunteer group CERCION in 2004. After the project has running on for six years the mid-term review which is proposed below marks the handover between the two coordinators of

the group. Several maps are presented demonstrating progress in regional mapping of Odonata fauna." (Authors)] Address: Houard, X., Groupe CERCION (Collectif d'Études Régional pour la Cartographie et l'Inventaire des Odonates de Normandie), E-mail: x.houard@gmail.com

12918. Juliand, P.; Guillon, B. (2011): In memoriam Renaud Bemhard. *Martinia* 27(2): 143-144. (in French) [Obituary.] Address: Juliand, P., Le serre F - 07110 Jannas, France. E-mail: christine.juliand@wanadoo.fr

12919. Kiran, C.G.; Raju, D.V. (2011): Checklist of Odonata of Kerala with their Malayalam names. *Malabar Trogon* 9(3): 31-35. (in English) [India; 147 Odonata species were listed.] Address: Raju, D.V., Valiyaparambil, Kuzhimattom.P.O, Kottayam, Kerala, India. E-mail: davidraju2007@gmail.com

12920. Labbaye, O. (2011): Les Odonates du marais de Larchant (département de la Seine-et-Marne). *Martinia* 27(2): 69-80. (in French, with English summary) [France; Odonata species of special interest for the Île-de-France region are *Anaciaeschna isosceles*, *Leucorhinia caudalis*, *L. pectoralis* and *Somatochlora metallica*.] Address: Labbaye, O., Office de Génie Ecologique-O.G.E. 5 boulevard de Créteil, 94100 Saint-Maur-des-Fossés, France. E-mail: o.labbaye@oge.fr

12921. Lambret, P. (2011): Cas d'un mâle d'*Anax parthenope* (Selys, 1839) se nourrissant au sol renversé sur le dos (Odonata, Anisoptera: Aeshnidae). *Martinia* 27(1): 66-67. (in French) [06-VI-2009, Marais Vigueirat, Camargue, France. *A. parthenope* preyed on a male of *Orthetrum cancellatum*. Landing on the ground, *O. cancellatum* clung to short grass stems, causing *A. parthenope* to turn to its back and to devour the prey in this position.] Address: Lambret, P., Cabane de Ligagneau, Marais du Vigueirat, F-13104 Mas-Thibert, France. E-mail: philambret@hotmail.com

12922. Lambret, P. (2011): Observation précoce d'un individu sénéscent de *Crocothemis erythraea* (Brullé, 1832) et discussion sur son origine (Odonata, Anisoptera: Libellulidae). *Martinia* 27(2): 135-137. (in French, with English summary) ["I observed in the beginning of May 2011 an old female of *C. erythraea* which had very damaged wings. This state indicates that this individual was old and could not have emerged in the area during the year of observation. It was rather an individual which succeeded in overwintering and/or which came from southern latitudes." (Author)] Address: Lambret, P., Cabane de Ligagneau, Route de l'Etoumeau 13104 Mas-Thibert, France. Email: philambret@hotmail.com

12923. Lambret, P. (2011): Rejet d'une proie capturée par un Zygoptère (Odonata) et implication en terme de chemioréception. *Martinia* 27(2): 141-142. (in French, with English summary) ["A female of *Lestes macrostigma*

ma which captured a Coleoptera Coccinellidae and abandoned it then has been photographed. It seems that the prey has been rejected because of distasteful reasons. This observation sustains the fact that Odonata have chemoreceptors which are dedicated to taste." (Author)] Address: Lambret, P., Cabane de Ligagneau, Route de l'Etoumeau 13104 Mas-Thibert, France. Email: philambret@hotmail.com

12924. Lin, B.; Hu, H.; Zhu, X. (2011): Preliminary investigation on the dragonfly resources in Jiangxi Jiuliashan National Nature Reserve. *Jiangxi Forestry Science and Technology* 2011(04): 41-43, 63. (in Chinese, with English summary) ["43 species of Odonata from Jiuliashan Nature Reserve including 8 families and 30 genera were reported in this paper. 5 species (*Vestalis gracilis*, *Ceriatagrion latericum* ryukyuanum *Asahina*, 1967 [sic], *Gynacantha japonica*, *Idionyx claudia*, *Orthetrum luzonicum*) were new records of insect from Jiangxi province. Fauna analysis indicated that the dominant fauna in this region are Oriental. Of all these components in the fauna, there are 25 species of Oriental, 13 species of Palaear-oriental species, and 5 wide-spread species, which accounts for 58.14%, 30.23%, and 11.63% of all species, respectively. A few of them belong to Palaearctic species." (Authors)] Address: Lin, B., Jiuliashan National Natural Reserve Administration, Longnan Jiangxi 341700, China. Email: lbzh903@163.com

12925. Lindsay, M.K. (2011): Effects of a Freshwater Turtle (*Trachemys scripta elegans*) on Ecosystem Functioning in Experimental Ponds. Theses and Dissertations-Biology. Paper 38. Texas State University, San Marcos, Texas: XIII + 61 pp. (in English) [Man-made ponds located on Griffith League Ranch in Bastrop, Texas, USA. Turtles were found to have not significant influence on both taxa richness and individual abundance of Odonata.] Address: not stated.

12926. Luczak, C.; Godin, J.; Vanappelghem, C. (2011): Intérêt des listes d'espèces des Naturalistes du XIXe - XXe siècles: le cas du Nord - Pas-de-Calais, de l'ère Giard (XIXe siècle) à l'ère Kérautret (XXe siècle). In: Schmitt, F.G. (ed) *Observation des écosystèmes marins et terrestres de la Côte d'Opale: du naturalisme à l'écologie*. U.O.F., Paris. ISBN: 978-2951062528: 147-156. (in French, with English summary) ["Species list of Mammals, Birds, Dragonflies and Amphibians were compared at a century scale: end of the XIXth century versus end of the XXth century. Presence/absence data of breeding animals were used. The area covered was the Nord - Pas-de-Calais region, northern France (12 500 km²). Biases in data were identified and were taken into account in data selection and analysis (Sørensen index and McNemar test). Significant changes were detected for taxa with great dispersion ability: birds and dragonflies. When the results are viewed at a larger spatial scale in north-west Europe, species at their

southern distribution edge were still present in northern France, and species at their northern distribution edge were extending their range northward. These changes were supposed to be linked to climate changes." (Authors)] Address: Vanappelghem, C., 14, rue Brûle Maisson, F-59000 Lille, France. E-mail: cedvana@free.fr

12927. Meurgey, F.; Poiron, C. (2011): The true *Dythemis multipunctata* Kirby, 1894, from the West Indies and proposed new taxonomic status (Odonata: Anisoptera: Libellulidae). *Zootaxa* 3019: 51-62. (in English) ["The true *D. multipunctata* is illustrated and the female is described for the first time based on specimens from the type locality, St. Vincent (Lesser Antilles). The taxonomic status of the species is discussed, and notes on behaviour, habitat, and range distribution are provided. *D. multipunctata* is to be considered a subspecies of *D. sterilis* (Hagen), and mainland populations previously known as *multipunctata* are now to be called *D. nigra* Martin." (Authors)] Address: Poiron, Celine, Société d'Histoire Naturelle L'Herminier - Muséum d'Histoire Naturelle 12, rue Voltaire, 44000 Nantes, France. E-mail: celine-poiron@hotmail.fr

12928. Mitra, A.; Dow, R.; Subramanian, K.A.; Sharma, G. (2011): Chapter 5. The status and distribution of dragonflies and damselflies (Odonata) of the Eastern Himalaya. The status and distribution of freshwater biodiversity in the Eastern Himalaya: 54-66. (in English) ["5.5 Conclusions and conservation recommendations: Of the 367 species of Odonata considered present within the Eastern Himalayan assessment region, more than one third (135) are Data Deficient. This shows that there is lack of good quality research and recent data from the region. Lahiri (1989) has published a list of 78 Odonata species and subspecies that have not been reported from India since 1948 and 49 of these are part of present assessment. Thirty-eight of these 49 species are in the Data Deficient list of the present assessment. A further 13 of these 49 species were recorded from Nepal from the mid-1960s to late 1980s (Vick 1989), making the records around 30 years old, and records for many other species are of a similar age. Only 50 species of dragonflies have been reported from parts of eastern and southern Bhutan (Mitra 2008), much of Bhutan is still unexplored, a situation that is repeated across much of the assessment region, for example in Arunachal Pradesh in India, and in Myanmar. There is an urgent need for extensive, expert survey across the region. However fresh survey efforts are hampered by existing legislation in some regional countries which make it difficult to obtain permits for collection and loan of invertebrate specimens for scientific research; this is entirely counter productive for conservation efforts. Additional serious constraints include a lack of funding for fieldwork, and the need to train experts in taxonomy and field research methodologies. Moreover, large parts of the assessment region are affected by insurgency and political instability which has discouraged extensive

fieldwork in these areas; the mountainous and forested terrain in many parts of the region itself makes access difficult. Most species considered endemic to the region have been assessed as Data Deficient which raises doubts over their status as endemic to the region. Fieldwork in the unexplored areas within and outside the assessment region, and fresh fieldwork even in the relatively well known areas, might reveal that of some of these species are not actually endemic to the project region, but have wider ranges. Similarly, fieldwork is needed to determine the habitat requirements etc. for the Data Deficient species. Without extensive fieldwork the status of the Data Deficient species cannot change. Indeed, the lack of data can be considered to be a major threat to the Odonata of the region, as until this lack is remedied, proper conservation planning is not possible. The fundamental need is for extensive, good quality, fieldwork over the entire region. There is also a pressing need for high quality taxonomic work on the Odonata of the region. Revisions in many groups would likely result in the discovery that many of the currently Data Deficient species are in fact junior synonyms of better known species on the one hand, and in the discovery of new species in the region on the other. However such taxonomic work is made almost impossible by the lack of material for those groups where the taxonomical problems are most severe, by legislation that hampers international scientific collaboration in some countries, and by difficulties in locating and gaining access to type material for a number of species, as well as by poor maintenance of insect collections in many regional institutions. As far as the conservation of the Odonata fauna of the region is concerned, the only measures that are effective in protecting invertebrate populations are habitat protection measures, which need to be planned using the kind of data that we mostly lack for the region. Lahiri (1989) pointed out that most of the type localities of rare and endemic Odonata of eastern India concentrate in and around northern Bengal and Sikkim and Khasi Hills; however there has been insufficient sampling in other eastern Indian states such as Manipur, Arunachal Pradesh, and Nagaland. With their diverse ecosystems, these areas also sustain the majority of known Indian species. Identifying such pockets in other countries within the assessment region and giving at least parts of such pockets protected status would safeguard a high percentage of species and their habitats. For Odonata, if areas to be protected are chosen carefully, they do not have to be large, in practice more good might be done by protecting many small areas including examples of all habitat types in a particular region, than by protecting one or two large, but homogenous in terms of habitat, areas. To summarize, the following actions are recommended: (1). Funding should be made available for extensive expert sampling of Odonata across the project region, and for relevant training. (2). Priority should be given to taxonomic research. (3). Regional governments should review their existing legislation that affects scientific collection of in-

vertebrates, and loan and exchange of material with researchers in other countries, and remove or revise the ill-advised barriers to these activities that are currently in place. (4). When fresh data becomes available, and any taxonomic studies that are needed become available, Odonata experts should reassess the Odonata of the region currently placed in any category other than Least Concern, and, where necessary make recommendations on the protection of suitable habitat. 5. Standards of curation and storage of regional insect collections should be raised to prevent loss of type and other scientifically valuable material. The actions recommended above are mostly concerned with research, but until this research has taken place, actual conservation measures cannot be planned affectively." (Authors)] Address: Dow, R.A., 6 Bramley Avenue, Coulsdon, Surrey, CR5 2DP, UK. E-mail: rory.dow@virgin.net

12929. Nelson, S.J.; Chen, C.; Roebuck, H.; Zoellick, B. (2011): Sensible sentinels: preliminary mercury data for dragonfly nymphs (Odonata: Anisoptera) across northern New England corroborate expected spatial pattern. Poster presentation. The 10th International Conference on Mercury as a Global Pollutant (ICMGP), 24–29 Jul 2011; Halifax, Canada: (in English) [Verbatim: Mercury (Hg) is a potent neurotoxin that is delivered to ecosystems via deposition from a global atmospheric pool, and ultimately bioaccumulates in aquatic and terrestrial foodwebs. Around the Gulf of Maine, research sites in 'pristine' areas have fish and other biota that exceed thresholds considered safe for human consumption or wildlife protection. All Maine, Vermont, and New Hampshire surface waters are under fish consumption advisory and are considered impaired with respect to Hg because of these patterns and the difficulty in predicting which systems are most affected. Together with a team of citizen scientists, we are evaluating the utility of dragonfly nymphs (Odonata: Anisoptera) as indicators of Hg status in the Gulf of Maine region. We propose that dragonfly nymphs will be good sentinels because they are: (1) widespread and found in most surface waters in the region, (2) long-lived in aquatic systems (1-5 yr as nymphs), (3) exhibit site philopatry, (4) important prey species for fish that are consumed by humans, and (5) simple to capture, process, and analyze at meaningful Hg concentrations. Specifically, because dragonfly nymphs are themselves predators, Hg concentrations are high enough for laboratory and statistical analyses to be meaningful. The average Hg concentration in dragonfly nymphs sampled across Maine was 0.097 ppm (wet weight basis), greater than the proposed wildlife safety criterion (0.077 ppm). At sites across the region (ME, NH, VT, and MA), we used our data to address hypotheses regarding whether Hg varied with body size or by family; these characteristics were less important than a field site's landscape setting. Data from a survey of a variety of surface water sites in or near four National Park areas in ME (Acadia), MA (Boston Harbor Island and Saugus Ironworks), and VT

(Marsh Billings Rockefeller) confirmed that Hg in dragonfly nymphs was more variable among sites than within a site, suggesting that they are useful indicators for Hg. Further, three years of research by citizen scientists has confirmed correlation between Hg in dragonfly nymphs and DOC in five streams within Sunhaze National Wildlife Refuge. Hg in dragonfly nymphs were related to concentrations in other media at three long term monitoring sites within Acadia National Park where Hg in mature forests has been shown to be greater than early successional forests. More research on dragonfly larval life history will help to develop a mechanistic understanding of this spatial variability in Hg bioaccumulation.] Address: Nelson, Sarah, Senator George J Mitchell Center for Environmental and Watershed Research and Department of Plant, Soil, and Environmental Sciences, University of Maine, Orono, ME, USA. E-mail: sarah.nelson@umit.maine.edu

12930. Ruffoni, A. (2011): Nouvelles stations pour *Oxygastra curtisii* et *Cordulegaster bidentata*, Odonates rares en Bourgogne. Rev. sci. Bourgogne-Nature 13: 63-64. (in French) [France; three exuvies of *O. curtisii*, Cure à Voutenay-sur-Cure (89), 28-VI- 2008; nine exuvies of *O. curtisii*, Varenne Saint-Germain (71) 1-VII-2008; two individuals of *C. bidentata*, 10-VII-2008, Arleuf (58); one male of *C. bidentata*, Quarré-les-Tombes (89), 27-VI-2009.] Address: Ruffoni, A., Société d'histoire naturelle d'Autun - Maison du Parc - 58230 Saint-Brisson, France. E-mail: shna.ruffoni@orange.fr

12931. Sansault, E. (2011): Découverte du premier site de reproduction de *Leucorrhinia caudalis* (Charpentier, 1840) en Indre-et-Loire (Odonata, Anisoptera: Libellulidae). *Martinia* 27(2): 115-120. (in French, with English summary) ["A breeding site of *L. caudalis* has been discovered in a small forest pond, north-west of Indre-et-Loire, France, on May 2008. The particular circumstances of this discovery and the following sightings of the species in this area are detailed. Conservation issues linked to the discovery of this endangered species into a protected high nature value area are discussed." (Author)] Address: Sansault, E., A.N.E.P.E. Caudalis. 118, rue de l'Ermitage, F-37100 Tours, France. E-mail: anepe.caudalis@gmail.com

12932. Schmid, F. (2011): Massenschlupf und weite Wanderungen schlüpfbereiter Larven des Zweifelflecks (*Epitheca bimaculata*) an einem See im oberschwäbischen Alpenvorland. *Mercuriale* 11: 27-30. (in German) [Baden-Württemberg, Germany; a mass emergence of *E. bimaculata* at 600 m.a.s.l. in May 2011 is reported. Emerging larvae were found up to 50 m from shore line and up to a height of 5 m.] Address: Schmid, F, Graben 23, 7225 Münsingen, Germany. E-mail: fcschmid@t-online.de

12933. Shah, D.N.; Tachamo Shah, R.D.; Pradhan, B.K. (2011): Diversity and community assemblage of littoral zone benthic macroinvertebrates in Jagadishpur

Reservoir. *Nepal Journal of Science and Technology* 12: 211-219. (in English) ["Littoral benthic macroinvertebrates diversity and community assemblage of Jagadishpur Reservoir were studied during post-monsoon (2008) and pre-monsoon (2009) seasons. Altogether twelve sites in the littoral zone of the reservoir were sampled for benthic macroinvertebrates (including Odonata) ... At each site, benthic macroinvertebrate samples were taken from different possible substrate types. The environmental variables of each site were collected based on Lentic Ecosystem Field Protocol during sampling. Biological metrics were used to describe the diversity and composition of benthic macroinvertebrates. The relationship between benthic macroinvertebrates assemblage and substrate types were examined by using principal component analysis. Cluster analyses were performed to describe the similarity among samples. In total, 50 taxa, belonging to 15 orders were recorded for littoral zone of the reservoir. The recorded higher number of taxa (family level) belonged to order Heteroptera and Diptera, and class Mollusca. Mollusca for post-monsoon and Diptera (particularly Chironomidae) for pre-monsoon shared the highest proportion in the total density. Shannon diversity index (H') for post-monsoon was 1.82 ± 0.46 and for pre-monsoon was 1.38 ± 0.53 and was significantly different between seasons ($p=0.01$). Principal component analysis revealed that increase in taxa numbers were positively correlated to soft substrates while negatively correlated to non-soft substrates in littoral zone of the reservoir. Cluster analyses discriminated the sites into two main groups for both seasons. The study concludes that benthic macroinvertebrates diversity is highly influenced by substrate types, water level fluctuation, and human accessibility to the reservoir. Therefore, in order to stabilize benthic macroinvertebrates diversity and their abundance, it is essential to maintain surface water level, stabilize bank substrate and minimize human pressure." (Authors)] Address: Shah, D.N., Hindu Kush Himalayan Benthological Society, Kathmandu, Nepal. E-mail: deepnarayanshah@hkhbenso.org

12934. Stryjecki, R. (2011): Invertebrate fauna of the Minina River, taking into account environmental factors. *Acta Biologica* 18: 37-48. (in English) [Poland; "A total of 5,613 macroinvertebrate specimens, belonging to 43 taxa (including "Anisoptera, Calopteryx sp., Zygoptera non det.") of varying systematic positions, were collected at four study sites in the Minina River. Dominant in the material collected were *Gammarus* sp. (33.9%), Chironomidae larvae (30.4%) and *Ephemera* sp. larvae (7.0%). More individuals (3,551) and taxa (39) were caught in the lentic zone than in the lotic zone (2,062 specimens and 30 taxa). The biological diversity index ranged from 1.57 to 3.14 within the sites and from 1.04 to 3.77 within habitats (zones of the river). The taxonomic composition and the abundance of the fauna were mainly influenced by biotic factors (e.g. amount of aquatic vegetation) and abiotic factors (e.g. water cur-

rent and type of bottom sediment), while human impact (presence of hydraulic structures, straightening of the river bed) did not significantly affect the fauna." (Author)] Address: Stryjecki, R., Dept of Zoology, University of Life Sciences in Lublin, ul. Akademicka 13, 20-950 Lublin, Poland. E-mail: robstry@wp.pl

12935. Turshak, L.G.; Mwansat, G.S. (2011): Insect diet of some Afrotropical insectivorous Passerines at the Jos Wildlife Park, Nigeria. *Science World Journal* 6 (4): 1-4. (in English) [Odonata contributed 2.29% to the diet of the studied birds. No details were given.] Address: Mwansat, G.S., Dept of Zoology, University of Jos, Nigeria. E-mail: georginamwansat@gmail.com

12936. Xu, H.-c.; Hao, X.-d.; Hung, J.-h.; Ye, T.-x.; Ye, L.-x. (2011): Insects diversity of Fengyanshan mountain in Zhejiang province. *Journal of the Zhejiang A&F University* 28(1): 1-6. (in Chinese, with English summary) [Taxa - including Odonata - are treated at the order level; no details are given.] Address: Xu, H.-c., Institute of Forest Protection, Zhejiang A&F University, Lin'an 311300, Zhejiang, China

12937. Xu, H.-x.; Xin, Z.-y.; Wang, X.-z.; Wang, H.-j. (2011): Investigation and study on insect and the fauna of Heihe Nature Reserve of Gansu province. *Journal of Gansu Forestry Science and Technology* 36(1): 19-24, 42. (in Chinese, with English summary) [In August and September 2008, the insect fauna of the Heihe Nature Reserve in Zhangye of Gansu, China was studied including *Crocothemis servilia*, *Pantala flavescens*, *Anax nigrofasciatus*, *Anax parthenope julius*, *Mnais gregoryi*; *Ophiogomphus spinicornis*, and *Libellula basilea*.] Address: Xu, H.-x., Forestry Sci-tech Extension Station of Gansu Province, Lanzhou 730046, China

2012

12938. Baeta, R.; Sansault, E.; Présent, J. (2012): Repartition et première estimation quantitative des populations de *Leucorrhinia caudalis* (Charpentier, 1840) en Indre-et-Loire (37), région Centre (Odonata, Anisoptera: Libellulidae). *Martinia* 28(2): 109-119. (in French, with English summary) ["Considered as threatened in France, *L. caudalis* is concerned by a National Action Plan. Following the discovery of a small population in 2008 in the Savigne basin (Indre-et-Loire - France), researches have been set up in 2011 and 2012 around the department of Indre-et-Loire. They led to the observation of 124 males, eight females, one larva and 30 exuviae in 10 localities, among which nine were unknown. The population size could therefore be estimated at several hundreds individuals in Indre-et-Loire. Three main areas have been identified: the Savigne basin (seven localities), the south Touraine (two localities) and the Champagne area (one locality). In France and Europe, several populations have been recently discovered, yet the only long term dataset available in Centre region (Brenne)

suggests a relatively negative trend. The Indre-et-Loire populations discovered recently are probably linked to the recent intensification of sampling efforts occurring in this department. In order to get a better understanding of the populations' distribution and functionality, useful field and genetic studies are proposed and detailed." (Authors)] Address: Sansault, E., Association Naturaliste d'Étude et de Protection des Écosystèmes (ANEPE) « Caudalis », 118 rue de l'Ermitage, 37100 Tours, France. E-mail: anepe.caudalis@gmail.com

12939. Bagworth, T. (2012): Reports from coastal stations - 2011: Gibraltar Point NNR, Lincolnshire. *Atropos* 45: 72. (in English) [Records of *Sympetrum fonscolombii*, *Aeshna cyanea*, *A. grandis* and *Calopteryx splendens* were documented.] Address: not stated

12940. Bamann, T.; Jebram, J. (2012): Nachweis der Grünen Flussjungfer (*Ophiogomphus cecilia*) an der nördlichen Ufer. *Mercuriale* 12: 11-14. (in German, with English summary) ["At 02-X-2012 seven adults – males and females – of *O. cecilia* were observed at the shoreline of the prealpine river Iller close to the City of Ulm (48°20'29" N, 10°00'33" O, 484 m a.s.l.) in the federal state of Baden-Württemberg, SW-Germany. The new records are presented and discussed." (Authors)] Address: Bamann, T., Altenhastr. 2, 71111 Waldenbuch, Germany. E-mail: t.bamann@web.de

12941. Bedjanič, M. (2012): On the synonymy of three endemic dragonfly species from Sri Lanka (Zygoptera: Platystictidae, Protoneuridae). *Notul. odonatol.* 7(9): 77-80. (in English) ["Based on re-examination of museum collections and newly available material *Drepanosticta fraseri* Lieftinck, 1955 is synonymised with *Drepanosticta submontana* (Fraser, 1931), *Drepanosticta sinhalensis* Lieftinck, 1971 is synonymised with *Drepanosticta lankanensis* (Fraser, 1931), while *Disparoneura ramajana* Lieftinck, 1971 is a synonym of *Elatoneura leucostigma* (Fraser, 1933)." (Author)] Address: Bedjanič, M., Kolodvorska 21b, SI-2310 Slovenska Bistrica, Slovenia. E-mail: matjazbedjanic@yahoo.com

12942. Bernal Sánchez, A. (2012): Confirmación de la presencia actual de *Lestes macrostigma* (Eversmann, 1832) [sic] (Odonata: Lestidae) en la provincia de Cádiz (sudeste de la Península Ibérica). *Boletín de la Sociedad Entomológica Aragonesa* 50: 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 Donana (Huelva and Seville) and the Natural Reservation Laguna de Fuente de Piedra (Malaga)." (Author)] Address: Bernal Sánchez, A., C/ Juan Ramón Jiménez 28. 11160 - Barbate (Cádiz. Esparta), Spain. E-mail: ArturoJibelula@gmail.com

- 12943.** Borkenstein, A. (2012): Buntspechte erbeuten frisch geschlüpfte *Libellula quadrimaculata*. *Mercuriale* 12: 59-60. (in German, with English summary) [Niedersachsen, Germany; "Great spotted woodpeckers (*Dendrocopos major*) repeatedly approached to birch trees near a forest bog in northwestern Germany and caught several immature individuals of *Libellula quadrimaculata*. The dragonflies were most probably fed to their offspring." (Author)] Address: Borkenstein, Angelika, Lebensborner Weg 5, 26419 Schortens, Germany. E-mail: AngelikaBorkenstein@t-online.de
- 12944.** Bowman, N. (2012): Reports from coastal stations - 2011: Eccles-on-Sea, Norfolk. *Atropos* 45: 71-72. (in English) [UK, *Erythromma viridulum*] Address: not stated
- 12945.** Brunken, H.; Hein, M.; Klugkist, H. (2012): Auswirkungen ökologischer Grabenräumung auf Fische und die Grüne Mosaikjungfer (*Aeshna viridis*) in Bremer Natura-2000-Gebieten. *Natur und Landschaft* 87(8): 370-375. (in German, with English summary) ["Natura 2000 sites in the Weser river lowlands around Bremen, Germany, are known as important secondary habitats for typical floodplain species (e. g. Mud Loach *Misgurnus fossilis*, Spined Loach *Cobitis taenia*, Green Hawker *Aeshna viridis*) listed in Annexes II and IV of the Habitats Directive. Different methods of ditch maintenance, evaluated in a research and development project focusing on Water Soldier populations (*Stratiotes aloides*), revealed no impairments of the above mentioned target species. Different maintenance schemes were found to be favourable for fish and for dragonflies respectively. Ditch maintenance approaches should be modelled on natural floodplain dynamics to provide a habitat mosaic in terms of water level, intensity and time of ditch cleaning, ensuring a connected drainage system composed of different succession levels." (Authors) The number of specimens was higher in ditches maintained in autumn compared with ditches maintained in (late) summer.] Address: Klugkist, H., Senator für Umwelt, Bau und Verkehr, Bremen, Ansgaritorstr. 2, 28195 Bremen, Germany. E-Mail: henrich.klugkist@umwelt.bremen.de
- 12946.** Bühler, W. & H. Hunger (2012): (2012): Neue Funde der Gabel-Azurjungfer (*Coenagrion scitulum*) in Südbaden bei Buggingen, Gottenheim und Riegel (Odonata: Coenagrionidae). *Mercuriale* 12: 27-32. (in German, with English summary) ["Following the rediscovery of *C. scitulum* for Baden-Württemberg in 2010 and the finding of the species at a second site in 2011, seven new sites were found in the southern Upper Rhine Valley in 2012. The distance as the crow flies between the southernmost occurrence near Buggingen and the northernmost south of Riegel is 32 km. The species has established itself successfully at several waters. So far, the immigration into Baden-Württemberg has obviously taken place exclusively from the south or southwest." (Authors)] Address: Bühler, W., Birkenweg 18, 79288 Gottenheim, Germany. E-mail: Willy.Buehler@gmx.de
- 12947.** Cade, M. (2012): Reports from coastal stations - 2011: Portland, Dorset. *Atropos* 45: 52-54. (in English) [Probable *Anax ephippiger* were recorded at 23 April (Groove) and 24 April 2011 (Ferrybridge), UK.] Address: not stated
- 12948.** Cho, K.-T.; Kim, H.-W.; Kim, H.-R.; Jeong, H.-M.; Lee, K.-M.; Kang, T.-G.; You, Y.-H. (2012): Landscape ecological characteristics of habitat of *Nannophya pygmaea* Rambur (Libellulidae, Odonata), an endangered species for conservation. *Korea Society of Wetland* 14(4): 667-674. (in Korean, with English summary) ["This study was conducted to understand landscape ecological characteristics on habitats of *N. pygmaea*, an endangered species in South Korea. The ecological characteristics of the habitats were investigated in abandoned paddy fields where *N. pygmaea* populations have been found in Chungcheongnam-do Kongju, Gyeonggi-do Kwangju and Gyeongsangbuk-do Mungyeong from 2009 to 2010. We surveyed the dominant vegetation, areas, water depth and temperature, and plant height and coverage to compare the wetlands living *N. pygmaea* and not living *N. pygmaea*. As a result, habitats of *N. pygmaea* in all regions were dominated by *Salix koreensis* community. There is no significant difference in the water temperature, plant height and coverage among wetlands of the three different sites, but depth was varied within 2.5~9.5cm. The water depth of habitat was deeper in Gongju than the others. Percentage of open water was 1.7~6% in the wetlands living *N. pygmaea*. but it did not appear in the wetlands not living *N. pygmaea*. Therefore, the ecological characteristics of wetlands as abandoned paddy fields should be taken into account for *N. pygmaea* habitat conservation and restoration." (Authors)] Address: not available
- 12949.** Clancy, S.P. (2012): Reports from coastal stations - 2011: Dungeness Area, Kent. *Atropos* 45: 60-62. (in English) [Verbatim: The most exciting Odonata records of the year involved a series of records of *Hemianax ephippiger*: three were present along Dengemarsh Sewer from 23-24 April with one remaining on 25th, and an additional adult present elsewhere on the RSPB reserve on 24th. *Sympetrum fonscolombii* occurred on just a single occasion, at the Long Pits on 24 July. In addition to three records of *Anax parthenope* on the Reserve on 14 & 26 July, and 1 August, there were 22 records of this species at the Long Pits between 5 July and 17 August, with oviposition noted on 28 July and 17 August.] Address: not stated
- 12950.** Corso, A.; Janni, O.; Pavesi, M.; Sammut, M.; Sciberras, A.; Vigano, M. (2012): Annotated checklist of the dragonflies (Insecta Odonata) of the islands of the Sicilian Channel, including the first records of *Sympetrum*

trum sinaiticum Dumont, 1977 and *Pantala flavescens* (Fabricius, 1798) for Italy. *Biodiversity Journal* 3(4): 459-478. (in English) ["In this paper we report data on the historical and recent status of all Odonata species recorded for the Sicilian Channel islands: the Pelagie islands and Pantelleria, politically belonging to Italy, and Maltese Archipelago islands. The number of species known for the former group of islands raises from 7 to 20. Of these, 2 are new for the Italian fauna, namely *Sympetrum sinaiticum*, noticed through likely sightings starting from 2010 on Lampedusa, and confirmed through voucher specimens collected in April 2012, and *Pantala flavescens*, first noticed in October 2012 on Lampedusa and Linosa; while *Calopteryx* sp. cf. *haemorrhoidalis*, *Ischnura genei*, *Aeshna mixta*, *Orthetrum nitidiverve*, *O. coerulescens anceps*, *Crocothemis erythraea*, *Sympetrum striolatum*, *S. meridionale*, *Brachythemis impartita*, *Trithemis annulata* and *T. kirbyi*, already known for Italy, are new for the Italian islands of the Sicilian channel. The Maltese fauna includes at present 18 recorded species; the previously reported *Trithemis arteriosa* is to be deleted from the list, since the concerned specimen upon reexamination proved to be *T. annulata*."] (Authors)] Address: Corso, A., MISC - Via Camastra, 10 - 96100 Siracusa, Italy. E-mail: voloerrante@yahoo.it

12951. Crabtree, A.G. (2012): Modeling a small pond odonate population: Exploring the complex life history dynamics of *Pachydiplax longipennis* (Odonata: Libellulidae). Thesis, Northern Illinois University. Biological Sciences. Proquest, Umi Dissertation Publishing: 152 pp. (in English) ["Members of the insect order Odonata are excellent examples of organisms that demonstrate complex life histories. Both the larval and adult stages must be studied to understand the dynamics of such species, A population of *P. longipennis* was studied at a small fishless pond in north central Illinois in 2008 and 2009. Additionally, a dynamic population model of the species was developed using the graphical modelling software, STELLA, to further understand the life history dynamics of *P. longipennis*. The larval dragonfly community in the pond was composed of nine species, all of which were also present as adults. The adult dragonfly community contained an additional four species, for a total of 13. Although, the maximum larval density of *P. longipennis*, which occurred in the middle of the summer, was ~15 m² in 2008 and 2009, mean density was higher in 2009. Based on this maximum density, it was estimated the maximum larval population size for the pond was ~170,000. Head capsule width and total length of larvae were used to identify 14 larval instar classes for the species. Changes in head capsule width between adjacent instar classes generally conformed to Dyar's Ratio, with the exception of the changes between the first and last two instars. Skipping of instar classes was common among larvae reared in the lab. Mean maximum *P. longipennis* adult abundance occurred in July in both 2008 and 2009. It was higher in 2008 than that observed in 2009, ~12 per 10 m sector versus 8 per 10 m sector. The

estimated adult population size in 2009 based on mark-recapture data using Craig's estimation method was 2,000. Average clutch size, determined from six captured, mated females, was 1,238+/-431 eggs per clutch. Average clutch survivorship was 27.51%+/-16.38. A density-ceiling model generated a stable population of *P. longipennis* larvae and adults that cycled in 54 week intervals. Short term (2 years) results predicted an early instar larval population of ~175,000 individuals, a late instar larval population of ~40,000, and an adult population of ~4,000. Long term (20 years) results predict early instar larval population of ~300,000 individuals, a late instar larval population of ~75,000, and an adult population of ~6,000. Long term estimates were comparable to those predicted by larval and adult sampling. Sensitivity analysis of varying mortality rates found that changing early instar larval mortality rate had a significant impact on observed abundances in all modelled life stages, while changes in breeding adult mortality had little effect. Simulations of ten different survivorship scenarios of larval and adult mortality resulted in three specific categories of response in terms of larval and adult abundances: one or both reached carrying capacity, both went extinct, or either or both stabilized at an intermediate abundance. Scenario results also suggested a greater importance of larval stage mortality rates, similar to the results of the sensitivity analysis. A density-dependent model generated unrealistic results in both short term and long term simulations."] (Author)] Address: not stated

12952. Deans, M.J. (2012): Reports from coastal stations - 2011: Bawdsey Peninsula, Suffolk. *Atropos* 45: 68-69. (in English) [*Chalcolestes viridis* and *Erythromma viridulum* at several sites on the peninsula.] Address: not stated

12953. Defontaine, P. (2012): Richesse odonatologique d'une mare artificielle. *Martinia* 28(2): 69-82. (in French, with English summary) ["The observations made since 1996 on a garden pond are dealt with. Among the 38 odonata species observed, 19 reproduce among which nine do every year. The odonatological diversity of the pond has increased parallel to the vegetation development. Moreover, several species considered to be rare or endangered in the "Région Centre" have been observed (namely *Lestes dryas*, *Coenagrion mercuriale*, *Oxygastra curtisii*, *Somatochlora metallica*, *Brachytron pratense*, *Libellula fulva* and *Sympetrum danae*). Some of them occasionally breed in the pond."] (Author)] Address: Defontaine, P., place Adrien Rozier, 12000 Rodez, France. E-mail: pdefontaine12@yahoo.fr

12954. Doucet, G.; Jacquot, P. (2012): Éléments sur l'émergence et les exuvies de *Nehalennia speciosa* (Charpentier, 1840) en France (Odonata, Zygoptera: Coenagrionidae). *Martinia* 28(2): 83-88. (in French, with English summary) ["This work is an assessment of the prevalent emergence conditions in the single French population of *N. speciosa*, located in a peat bog in the

south of the Jura department. Most of exuviae were found at the central pool and were located in deep tufts of Sedges at less than 10 cm above the water level. With a size ranging from 10 to 11.5 mm, the exuvia of *N. speciosa* is the smallest of all the exuviae of the French Odonata fauna." (Authors)] Address: Doucet, G., 28A, rue de la Colombière, F-21000 Dijon, France. E-mail: guillaume.doucet@yahoo.fr

12955. Doucet, G.; Ruffoni, A. (2012): *Leucorrhinia caudalis* (Charpentier, 1840), nouvelle espèce pour la Côte-d'Or (21) (Odonata, Anisoptera: Libellulidae). *Martinia* 28(2): 127-130. (in French, with English summary) [13-V-2012; "L. caudalis has been discovered in the Bourgogne region since 2006. It breeds in old gravel pits into which abundant aquatic vegetation is now developed. The observation of this protected species in a new department brings us to increase our investigations in the frame of the regional atlas project." (Authors)] Address: Doucet, G., 28A, rue de la Colombière, F-21000 Dijon, France. E-mail: guillaume.doucet@yahoo.fr

12956. Doucet, G.; Bedrines, G.; Foutel, C. (2012): Premier cas d'émergence à *Hemianax ephippiger* (Burmeister, 1839) en Bourgogne (Odonata: Anisoptera: Aeshnidae). *Martinia* 28(2): 121-122. (in French) [A teneral female of *A. ephippiger* was photographed at 30-VII-2012 near Saint-Seine-Sur-Vingeanne (Côte d'Or, 21), France. At the same site an exuvia of *A. ephippiger* was found at 4-VIII-2012.] Address: Doucet, G., 128A, rue de la Colombière, F-21000 Dijon, France. E-mail: guillaume.doucet@yahoo.fr

12957. Duquef, M. (2012): Reproduction probable d'*Hemianax ephippiger* (Burmeister, 1839) en Guyane (Odonata, Anisoptera: Aeshnidae). *Martinia* 28(2): 126. (in French) [A teneral female of *A. ephippiger* was captured at 21-III-2012 near Sinnamary, French-Guyana.] Address: Duquef, M., 25, rue Paul Baroux, F-80440 Blangy-Tronville, France. E-mail: mauriceduquef@yahoo.fr

12958. Feldwieser, G. (2012): Ein weiterer Fund der Grünen Flussjungfer (*Ophiogomphus cecilia*) im Südosten Baden-Württembergs. *Mercuriale* 12: 15-16. (in German, with English summary) [The observation of a male of *O. cecilia* at a gravel pit (MTB 7922 NO, 48°04'43" N, 9°27'21" O, 544 m a.s.l.) was recorded and shortly discussed." (Author)] Address: Feldwieser, G., Gonningerstr. 27, 72793 Pfullingen, Germany

12959. Fiedler, J. (2012): Blässhuhn mit erbeutetem Tandem der Kleinen Königslibelle (*Anax parthenope*). *Mercuriale* 12: 63. (in German) [NSG Kohlplattenschlag, Landkreis Karlsruhe, Baden-Württemberg, Germany, 10 vi 2008; an Eurasian Coot (*Fulica atra*) preyed on a tandem of *Anax parthenope*.] Address: not stated

12960. FRHO (2012): In Liechtenstein geschützte Arten (Stand 13. Juni 2012). FRHO, Vaduz, 10. August 2012:

[According to the "Verordnung über besonders geschützte Pflanzen- und Tierarten" (Liechtensteinisches Landesgesetzblatt, LGBl. 1996/136; online: <http://www.gesetze.li/Seite1.jsp?LGBl=1996136.xml&Searchstring=arten&showLGBl=true>), the following Odonata species are protected in the state of Liechtenstein: *Enallagma cyathigerum*, *Aeshna cyanea*, *Sympetrum sanguineum*, *Coenagrion pulchellum*, *Pyrrhosoma nymphula*, *Sympetrum fonscolombeii*, *Sympetrum pedemontanum* [sic = pedemontanum], *Calopteryx splendens* [sic = splendens], *Sympetrum flaveolum*, *Somatochlora flavomaculata*, *Lestes sponsa* (sic = sponsa), *Sympetrum vulgatum*, *Cordulia aenea*, *Sympecma fusca*, *Cordulegaster bidentatus*, *Somatochlora metallica*, *Chalcolestes viridis*, *Lestes viridis* [sic], *Sympetrum striolatum*, *Anax imperator*, *Ischnura elegans*, *Aeshna grandis*, *Orthetrum cancellatum*, *Coenagrion mercuriale*, *Aeshna mixta*, *Coenagrion puella*, *Agrion puella* [sic], *Lestes virens*, *Leucorrhinia dubia*, *Ischnura pumilio*, *Orthetrum coerulescens* [sic = coerulescens], *Libellula depressa*, *Sympetrum danae*, *Orthetrum brunneum*, *Sympetrum depressiusculum*, *Aeshna juncea*, *Libellula quadrimaculata*, *Gomphus pulchellus*, and *Cordulegaster boltoni*. According to "Das Übereinkommen über die Erhaltung der europäischen wildlebenden Pflanzen und Tiere und ihrer natürlichen Lebensräume (Berner Konvention, LGBl. 1982/42)" *Coenagrion mercuriale* is protected.]

12961. Fulan, J.A.; Henry, R.; Davanso, R. (2012): Os efeitos da ação antrópica sobre a distribuição de macroinvertebrados no Rio Guareí, São Paulo - Anthropogenic action influence on macroinvertebrates distribution in Guareí River, São Paulo State - Brazil. *Estud Biol.* 34 (82): 51-56. (in Portuguese, with English summary) ["In this study, it was examined, during the period from March to December 2006, the effects of human disturbance on the macroinvertebrates that live near macrophytes in Guareí River, São Paulo State - Brazil. It was questioned if the high conductivity recorded in Guareí River affected the distribution of the macroinvertebrates and what were the most important variables that affect macroinvertebrates in a river with a strong nutrient concentration. The objective of this study was to investigate the effects of environmental variables on densities and composition of the macroinvertebrates. Three stands of aquatic plants were sampled with with 0.25 mm mesh net on a 0.07m² square metal frame. Air and water temperature, depth, pH, electrical conductivity, suspended solids, dissolved oxygen and macrophyte biomass were measured. A canonical correspondence analysis (CCA) was performed using the density of the macroinvertebrates and environmental variables. Chironomidae, Culicidae, Acanthagrion, *Coryphaeschna*, *Erythrodiplax*, *Miathyria marcella*, *Micrathyria*, *Gastropoda*, *Ostracoda* and *Hemiptera* were the only taxa that showed significant correlation with the axes. From the results, we can conclude that the high conductivity recorded in Guareí River due to the high amount of organic matter released during its course did not significantly affected the distri-

bution of the macroinvertebrates during the studied period. However, the ACC recorded that oxygen was the most significant environmental factor for the density variance of the macroinvertebrates, especially larval Odonata." (Authors)] Address: Fulan, J.A., Biólogo, Univ. Estadual Paulista Júlio de Mesquita Filho (Unesp), doutor, Universidade Federal do Amazonas (UFAM), Manaus, AM - Brasil. E-mail: joaofulan@ig.com.br

12962. Gabel, F.; Garcia, X.F.; Schnauder, I.; Püsch, M.T. (2012): Effects of ship-induced waves on littoral benthic invertebrates. *Freshwater Biology* 57: 2425-2435. (in English) ["(1.) Ship-induced waves can affect the physical characteristics of lake and river shorelines, and laboratory studies have shown effects on littoral invertebrates. Here, we explored whether these effects could be observed under field conditions along a natural lake shore affected by wave sequences (trains) produced by boats. (2.) Individuals of five invertebrate species (*Bithynia tentaculata*, *Calopteryx splendens*, *Dikergammarus villosus*, *Gammarus roeselii*, *Laccophilus hyalinus*) were exposed to waves with increasing shear stress in five habitats differing in structural complexity. (3.) Detachment of invertebrates increased with increasing shear stress and was best modelled using sigmoid response curves. Habitat structural complexity mitigated the effects of shear stress, and detachment rate was influenced more by habitat type than by species. A threshold (90% of the individual invertebrates unaffected) stress level of 0.64 N m² was found for a structurally complex reed habitat, compared to 0.37 N m² for a simple sand habitat. (4.) Shear stress associated with wave trains created by recreational boating at a distance of 35 m from the shore and at a speed of 11 km h⁻¹ resulted in 45% detachment of littoral invertebrates. Decreasing the boat-to-shore distance to 20 m increased wave shear stress by 30% and invertebrate detachments up to 75%. (5.) Disturbance of littoral habitats and invertebrate assemblages are widespread in inland waters used for recreational and/or commercial navigation. Our findings show that the integrity of littoral zones of navigable surface waters could be much improved by implementing management measures such as physically protecting complex habitats with dense reed belts and tree roots, and reducing boat speeds and increasing their minimum shoreline distance." (Authors)] Address: Gabel, Fredericke, Dept of Limnology of Shallow Lakes & Lowland Rivers, Leibniz-Institute of Freshwater Ecology & Inland Fisheries, Berlin, Germany

12963. Gabel, F. (2012): Impacts of ship-induced waves on benthic macroinvertebrates. Dissertation, Landwirtschaftlich-Gärtnerischen Fakultät, der Humboldt-Universität zu Berlin: 124 pp. (in English) ["Inland navigation constitutes a major human use of major rivers and lakes worldwide which is expected to increase in the future. Navigation does not only lead to river training and inputs of toxic compounds, but also significantly affects shore habitats by the ship-induced waves. In contrast to

the importance of such pressures, the effects of these hydrodynamic disturbances on benthic invertebrates in the littoral zones are poorly understood, even that invertebrates constitute a central element of littoral food webs. Hence, in this thesis I investigated i) the direct and immediate effects of ship-induced waves on benthic invertebrates (including *Calopteryx splendens*) in the littoral zone, ii) their subsequent effects on trophic interactions and iii) on the growth and fitness of invertebrates, and finally iv) the long-term effects on the community composition of benthic invertebrates in littoral zones. Both laboratory and field experiments showed increasing detachment of invertebrates with higher wave-induced shear stress, following a sigmoid response curve. Detachment was significantly mitigated by higher structural complexity of some habitats, as complex habitats dissipate wave energy and provide better fixing possibilities for invertebrates. Moreover dislodgement of invertebrates resulted in an elevated risk of being preyed upon by fusiform fish. In contrast, deep bodied fish reduced feeding under wave disturbance. Waves also reduced the growth and energy storage of native invertebrates via reduced feeding rate or increased energy expenditure, while non-native invertebrates were not affected. The cumulative impact of the demonstrated various mechanistic effects of ship-induced waves alters the community composition of benthic invertebrates. The abundance of native invertebrates and total species richness was shown to be lower at sites exposed to ship-waves, while non-native invertebrates increased in abundance. Thus, ship-induced waves affect benthic invertebrates on the individual, species, and community levels, as well as the interaction of trophic levels, and hence will alter the ecological structure and function of whole littoral zones. This knowledge on the pathways how ship-induced waves affect littoral zones may be also used to develop scientifically based and target-oriented management plans for surface waters used as inland waterways. Adverse effects of ship-induced waves may be mitigated by specifically protecting structural complex habitats such as tree roots and dense reed belts, and by minimizing wave generation by increasing minimum sailing distance to shore or by adjusting vessel speed." (Author)] Address: Gabel Friederike, Geographie Landschaftsökologie, Heisenbergstr. 2, 48149 Münster, Germany. E-Mail: gabel@igb-berlin.de

12964. Gäde, G.; Marco, H.G. (2012): The adipokinetic hormone (AKH) of one of the most basal orders of Pterygota: structure and function of Ephemeroptera AKH. *Journal of Insect Physiology* 58(11): 1390-1396. (in English) ["This is the first reported primary sequence of a bioactive peptide isolated from three Ephemeroptera families. Peptides of the adipokinetic hormone (AKH) family from the corpora cardiaca of nymphs of *Afronurus* spp. (Heptageniidae), *Siphonurus lacustris* (Siphonuridae) and *Ephemerella danica* (Ephemeridae) were investigated functionally in homologous (hypertrehalosaemic activity

demonstrated in *E. danica* nymphs) and heterologous (active in cockroach and locust) bioassays, and structurally by liquid-chromatography coupled with ion trap electrospray ionisation mass spectrometry. All species investigated synthesise the octapeptide code-named Anaim-AKH (pGlu-Val-Asn-Phe-Ser-Pro-Ser-Trp amide). Confirmation of this peptide being present in corpora cardiaca of *E. danica* nymphs was obtained via reverse phase-high pressure liquid chromatography. Phylogenetically, the presence of only one AKH peptide may constitute a basal condition; all other lower insect orders, e.g. Odonata, Blattodea, Orthoptera, amongst others, have more than one AKH analogue. We propose that Anaim-AKH is the ancestral peptide which may support the Palaeoptera hypothesis that mayflies (Ephemeroptera) and dragonflies (Odonata) form the Palaeoptera clade, the sister group of Neoptera. The structural data cannot, however, shed any light on the phylogenetic scenarios within Ephemeroptera itself. Finally, this study demonstrates the successful use of larvae as an alternative biological source to study neuropeptides in ephemeral, elusive or difficult to obtain adult insects." (Authors)] Address: Gäde, G., Zoology Department, University of Cape Town, Rondebosch, ZA-7701, Republic of South Africa.

12965. Gheteu, D. (2012): Preliminary study on Odonata larvae (Insecta: Odonata) from "Elesteiele Jijiei Si Miletinului" (ROSPA0042): Population dynamics and conservation issues. *Analele Stiintifice ale Universita.ii „Alexandru Ioan Cuza” din Iasi, s. Biologie animala* 58: 13-21. (in English, with Romanian summary) ["Recent studies on Odonata diversity from farm ponds revealed that species assemblages were not correlated with pond use or to landscape variables and farm ponds made a positive contribution to the maintenance of aquatic biodiversity. Our study was made in Oct. 2010-Oct. 2011 in the fish ponds and rivers from "Elesteiele Jijiei Si Miletinului" (ROSPA0042) on Odonata larvae. Population dynamics and diversity of Odonata species lead us to consider their importance in the assessment of biotic integrity and conservation of the wetlands and ponds." (Author) Data referred to *Calopteryx splendens*, *Ischnura elegans*, *Enallagma cyathigerum*, *Platycnemis pennipes*, *Orthetrum albistylum*, *O. cancellatum*, *Anax imperator*, *Onychogomphus forcipatus*.] Address: Gheteu, Diana, Fac. Biol., Alexandru Ioan Cuza Univ. of Ia.i, B-dul Carol I, no. 20A, 700505 Ia.i, Romania. E-mail: dianaghetu@yahoo.com

12966. Gil, J.A.; Chanonoa, G.C.; Coutino Jose, M.A. (2012): Estudio del ámbar con inclusiones biológicas de la Colección Paleontológica de la Secretaría de Medio Ambiente e Historia Natural, Chiapas, México. *Lacandonia* 6(1): 23-29. (in Spanish, with English summary) ["Paleontological Collection of the Secretaría de Medio Ambiente e Historia Natural preserves 215 pieces with biological inclusions that contain a total of 569 organisms. The total of studied organism 73.64 % corresponding to animals and the 26.36 % corresponding to vegetables, bellowing biological groups Magnoliopsida, Lilio-

psida, Coniferopsida, Polypodiopsida, Hepaticopsida, Bryopsida, Insecta, Arachnida, Chilopoda, Diplopoda and Crustacea. The best study biological group is Insecta, being determined the orders Archaeognatha, Thysanoptera, Diptera, Hymenoptera, Coleoptera, Homoptera, Isoptera, Trichoptera, Ephemeroptera, Hemiptera, Orthoptera, Blattodea, Psocoptera, Lepidoptera and Odonata. The order with the greatest number of individuals is Diptera with 143, while Odonata is only represented by one specimen (No further details are given). Have been described six new species, *Swietenia miocenica*, *Hymenaea allendis*, *Episinus penneyi*, *Culoptila aguilerai*, *Plectropsyche alvarezii* and *Antillopsyche mexicana*. Additionally, with the pieces of the amber collection has participated in various cultural scientific events developments within and outside of the State." (Authors)] Address: Gil, J.A., Coordinación Técnica de Investigación, Secretaría de Medio Ambiente e Historia Natural y Facultad de Biología de la Universidad de Ciencias y Artes de Chiapas, Mexico.

12967. Gnanakumar, M.; Ansil, B.R.; Nameer, P.O.; Das, S. (2012): Checklist of Odonates of Chimmomy Wildlife Sanctuary. *Malabar Trogon* 10(1&2): 3-6. (in English) [Chimmomy Wildlife Sanctuary (10°26'N 10°26'N; 76°31'E 76°37'E) (Fig. 1) is situated in Thrissur District of Kerala, India. 55 odonate species including the Western Ghats endemic *Platysticta deccanensis* were recorded.] Address: Gnanakumar, M., Malabar Nat. Hist. Soc., Sushela Mandir, B. G. Road, Nadakavu Post, Calicut-673011, India. E-mail: kumargm33@gmail.com

12968. Hodgson, I.; Beugg, J. (2012): Reports from coastal stations - 2011: Sandwich Bay Bird Observatory, Kent. *Atropos* 45: 64-65. (in English) [UK; *Lestes barbarus*, *Sympetrum fonscolombii*, *Libellula fulva*, *L. quadrimaculata*, and *Anaciaeschna isoceles* were reported.] Address: not stated

12969. Huber, K. (2012): Die Bedeutung neuer Feuchtbiootope für Libellen. *Informativ. Ein Magazin des Naturschutzbundes Oberösterreich* 68: 9. (in German) [Machland, Oberösterreich, Austria. Shallow, well sunned ponds were created and observed for their colonisation by Odonata. The paper briefly outlines without details a few highlights, including the fact that all in Austria represented species of *Orthetrum* could be observed at one locality. *Coenagrion scitulum* could be observed for the first time in 2012 in this federal state.] Address: not stated

12970. Hunter, I.; Hunter, S. (2012): Reports from coastal stations - 2011: Elms Farm, Icklesham, East Sussex. *Atropos* 45: 58-59. (in English) [*Erythromma viridulum* peaked at 24-VIII-2011 to 366 individuals. *Anax ephippiger* was recorded at 13-IX-2011.] Address: not stated

12971. Iorio, E. (2012): Nouvelles observations de *Gomphus graslinii* Rambur, 1842 dans le Canal de la Vallée des Baux à Arles (Bouches-du-Rhône) (Odonata-

ta, Anisoptera: Gomphidae). *Martinia* 28(2): 103-106. (in French, with English summary) ["*G. graslinii* was again observed in the vicinity of the city of Arles (Bouches-du-Rhône department, France) along the Canal de la Vallée des Baux. This time, our observations have been done on the part of the Canal de la Vallée des Baux near the "Barbegal" Castel, of which one on the east of the road D 33. We totalize four contacts with four different specimens along the concerned canal. It suggests a regular presence of this species and supports its autochthony in this place." (Author)] Address: Iorio, E., ÉCO-MED (Écologie & Médiation), Pôle Entomologie, Tour Méditerranée, 65 av. Jules Cantini, F-13298 Marseille Cedex 20, France. E-mail: e.iorio@ecomedit.fr

12972. Jensen, J.K.; Nielsen, O.F. (2012): The Vagrant Emperor Anax ephippiger (Burmeister, 1839) (Aeshnidae, Odonata) found on the Faroe Islands in 2011. *Ent. Meddr.* 80: 3-6. (in Danish, with English summary) ["In the spring of 2011 three specimens of *A. ephippiger* were found on the Faroe Islands. Two were recorded on 13th and one on the 15th of April 2011, all males. There were no other sightings of the species later in 2011. No dragonflies (Odonata) breed in the Faroe Islands and there was only one earlier finding of a dragonfly, an introduced *Calopteryx virgo*." (Authors)] Address: Nielsen, O.F., Tulstrupvej 112, DK 8680 Ry, Denmark. E-mail: ofn.orth@tdcspc.dk

12973. Johnson, A.; Phillips, J. (2012): Reports from coastal stations - 2011: Hayling Island, Hampshire. *Atropos* 45: 56-57. (in English) [30-VII-2011, *Anax imperator* at MV light.] Address: not stated

12974. Jung, K.S. (2012): Odonatological research society of Korea (Osok). *Notul. odonatol.* 7(9): 87-88. (in English) [Verbatim: The Society was founded on 13 May 2006. By September 2011, it had 36 members; the current President is the author of this note. The objective of the Society is the study of odonate systematics, faunistics and distribution in the Korean peninsula. The results are published in the biennial OSOK-Report, the 3rd volume of which is in preparation now. So far 123 species are known to occur in Korea; 102 of these were recorded from South Korea, including 29 Zygoptera (4 families, 13 genera) and 73 Anisoptera (6 families, 39 genera). Since the establishment of the Society, its members brought on record *Paracercion sieboldii*, *Sympetrum fonscolombii* (both in 2007) and *Brachidiplax chalybea flavovittata* (in 2010) for the first time from South Korea. In 2011, an undescribed *Boyeria* species was discovered. The response of the odonates to the recent climate change is receiving particular attention by the Society. As climate-sensitive biological indicator species in Korea were selected *Ceriagrion nipponicum*, *Ischnura elegans*, *Sympetrum speciosum* and *S. striolatum*. Since 2009, the status and habitats of these species are regularly monitored. So far, *Nannophya*

pygmaea has been the sole species on the Odonata Red List of Korea. Following the suggestion by the Society, *Macromia daimoji* and *Libellula angelina* were added in 2011. The publication of the monographic works, *Dragonflies and damselflies of Korea* (2012, Ilgongyuska, Seoul) and *Odonata larvae of Korea* (2011, Nature & Ecology Academic Series, Seoul), both by the author of this note, facilitates the work on the Korean odonates.] Address: Jung, K.S., 6F, IBS Building, 1572-18 Seocho-Dong, Seocho-ku, Seoul 137-070, Korea

12975. Kadye, W.T.; Booth, A.J. (2012): Detecting impacts of invasive non-native sharptooth catfish, *Clarias gariepinus*, within invaded and non-invaded rivers. *Biology and Conservation* 21(8): 1997-2012. (in English) ["In aquatic ecosystems, impacts by invasive introduced fish can be likened to press disturbances that persistently influence communities. This study examined invasion disturbances by determining the relationship between non-native sharptooth catfish *Clarias gariepinus* and aquatic macroinvertebrates in the Eastern Cape, South Africa. A Multiple Before-After Control-Impact (MBACI) experimental design was used to examine macroinvertebrate communities within two rivers: one with catfish and another one without catfish. Within the invaded river, macroinvertebrates showed little response to catfish presence, whereas predator exclusion appeared to benefit community structure. This suggests that the macroinvertebrate community within the invaded river was adapted to predation impact because of the dominance of resilient taxa, such as Hirudinea, Oligochaeta and Chironomidae that were abundant in the Impact treatment relative to the Control treatment. High macroinvertebrate diversity and richness that was observed in the Control treatment, which excluded the predator, relative to the Impact treatment suggests predator avoidance behaviour within the invaded river. By comparison, within the uninvaded river, catfish introduction into the Impact treatment plots indicated negative effects on macroinvertebrate community that was reflected by decrease in diversity, richness and biomass. A community-level impact was also reflected in the multivariate analysis that indicated more variation in macroinvertebrate composition within the Impact treatment relative to the Control in the uninvaded river. Catfish impact within the uninvaded river suggests the dominance of vulnerable taxa, such as odonates that were less abundant in the Impact treatment plots after catfish introduction. From a disturbance perspective, this study revealed different macroinvertebrate responses to catfish impact, and suggests that within invaded habitats, macroinvertebrates were less responsive to catfish presence, whereas catfish introduction within uninvaded habitats demonstrated invasion impact that was shown by a decrease in the abundance of vulnerable taxa. The occurrence of non-native sharptooth catfish within many Eastern Cape rivers is a concern because of its predation impact and potential to influence trophic interrelationships, and efforts should be

taken to protect uninvaded rivers, and, where possible, eradicate the invader." (Authors) Taxa including Odonata were treated at family level.] Address: Booth, A.J., Dept Ichthyology & Fishery Science, Rhodes University, P.O. Box 94, Grahamstown, 6140 South Africa. E-mail: t.booth@ru.ac.za

12976. Keil, P.; Buch, C.; Kowallik, C.; Rautenberg, T.; Schlüpmann, M. & Unseld, K. (2012): Bericht für das Jahr 2011. Jahresberichte der Biologischen Station Westliches Ruhrgebiet, Oberhausen 9, 90 S. 2. korrigierte Ausgabe: 92 pp. (in German) [This report on the activities of the Biologische Station Westliches Ruhrgebiet, Oberhausen for 2011, includes several brief notes on odonatological studies and documented interesting records.] Address: Biologische Station Westliches Ruhrgebiet e. V., Ripshorster Str. 306, 46117 Oberhausen, Germany

12977. Khelifa, R. (2012): Flight period, apparent sex ratio and habitat preferences of the Maghribian endemic *Calopteryx exul* Selys, 1853 (Odonata: Zygoptera). *Revue d'écologie* 68(1): 37-45. (in French, with English summary) [*Calopteryx exul* is an endangered endemic Odonata species restricted to the Maghreb that shows an increasing concern about its conservation status, due to substantial habitat loss. A study dealing with its flight period, the apparent sex-ratio of imagoes and adult habitat preferences was carried out in the Seybouse basin, northeastern Algeria, during two years. The flight period of the species begun on early May and ended on late July, showing a peak around late May / early June. Either a small second generation or delayed emergences was responsible of the record of scarce tenerals and immatures in early September. Additional larval investigations are needed to elucidate the origin of such late emergences. The maturation period was estimated to extend over 11-12 days. The apparent daily sex-ratio in the adult population present on site was mostly biased with 65 to 67% of females. Additional work addressing sex-ratio at emergence is needed to understand this disequilibrium. Multivariate analysis showed that adults of *C. exul* prefer relatively fast flowing shallow water when compared to its congeneric *C. haemorrhoidalis*, which was mainly observed at deeper, slower and very shaded running waters with dense banks vegetation. The population of *C. exul* dealt with in this study is currently the largest one reported so far in the Maghreb. Data on adult phenology and habitat preferences will allow future investigations about the present distribution of the species in Algeria and the whole Maghreb." (Author)] Address: Khelifa, R., Département d'écologie et du génie de l'environnement, Faculté des Sciences de la Nature et de la Vie et des Sciences de la Terre et de l'Univers, Université 08 Mai 1945, Guelma 24000, Algeria

12978. Kiel, E.; Kastner, F.; Lühken, R.; Schröder, M. (2012): Die Wirbellosenfauna in Gräben Norddeutsch-

lands. *Natur und Landschaft* 87(8): 347-350. (in German, with English summary) [Oldenburg, Niedersachsen, Germany; "This article reviews macroinvertebrate studies on ditches in Europe. It focuses on aspects of biodiversity and the role ditches can play in meeting nature conservation objectives. By means of new data on dragonfly fauna and fundamental ecological aspects of specific ditches in northern Germany, we discuss the value of ditch systems in terms of nature conservation practice in an intensively used environment. Examples are given in order to explain the dimension of their positive impact. These data reveal the important ecological value ditch systems can have for rare and endangered aquatic species and the terrestrial fauna even in distant areas." (Authors) Special emphasis was given to the densities of *Aeshna viridis* in meadow ditches.] Address: Kiel, Ellen, AG Gewässerökologie und Naturschutz, Institut für Biologie und Umweltwissenschaften, Carl von Ossietzky Universität Oldenburg, Ammerländer Heerstr. 114 –118, 26129 Oldenburg, Germany. E-mail: ellen.kiel@uni-oldenburg.de

12979. Knill-Jones, S. (2012): Reports from coastal stations - 2011: Isle of Wight. *Atropos* 45: 54-56. (in English) [UK *Anax parthenope*, *Sympetrum fonscolombii*, *S. vulgatum*] Address: Knill-Jones, S.A., 2 School Green Road, Freshwater, Isle of Wight, PO40 9AL, UK

12980. Li, H.-x.; Zhang, R.-q.; Wu, F.-c.; Guo, G.-h.; Feng, C.-l. (2012): Comparison of mercury species sensitivity distributions of freshwater biota in China and the United States. *Acta Scientiae Circumstantiae* 32(5): 1183-1191. (in Chinese, with English summary) ["Based on single-species freshwater acute toxicity data in China and the United States, species sensitivity distributions (SSDs) of vertebrates (including fish) and invertebrates (including arthropods and non-arthropod invertebrates) to mercury were constructed, and species sensitivity to mercury in these two countries were compared. The results of this study indicated that there was no significant difference between sensitivity distributions of the Chinese and American taxa. However, the hazardous concentration for 5% of the species (HC5) range of Chinese species to short-term mercury exposure was lower than that of the American species, especially for non-arthropod invertebrates. HC5 for American non-arthropod invertebrates to mercury was 7D times larger than that for the corresponding Chinese species. Under the 95% protection level and including all the species, the tested invertebrates were more sensitive to mercury than the vertebrates in both China and the United States. However, in the lower taxonomic classification level, the sensitivity decreased in the order of arthropod > non-arthropod invertebrates > fish in China, but the order was arthropods > fish > non-arthropod invertebrates in the United States. Therefore, in determining the water quality criteria based on the sensitivity of all the species, we should also consider the influence of SSD of individual groups. The water quality

criteria derived from the species sensitivity distribution of American species may make the aquatic species in China out of protection." (Authors) The paper includes a reference to Odonata.] Address: Wu, F.-c., State Key Laboratory of Environmental Criteria and Risk Assessment, Chinese Research Academy of Environment Sciences, Beijing 100012, China. E-mail: wufengchang@vip.skleg.cn

12981. Lu, C.-w.; Yang, R.-g.; Chen, Y.; Zhang, B.-l.; Huang J.-h.; Zhou, S.-y. (2012): A preliminary study of Odonata in Mao'er Mt. Nature Reserve of Guangxi, China. *Journal of Guangxi Normal University (Natural Science Edition)* 30(1): 95-104. (in Chinese, with English summary) [The Odonata collection of Insect Collections of Guangxi Normal University includes 57 species from Mao'er Mt. Nature Reserve of Guangxi. Among them, 19 species were newly recorded in Guangxi: *Orthetrum testaceum*, *O. lineostigma*, *Sympetrum ruptum*, *S. kunckeli*, *Lyriothemis flava*, *Zygonyx iris insignis*, *Idionyx victor*, *Somatochlora dido*, *Anotogaster kuchenbeiseri*, *Cephalaeschna acutifrons*, *Gynacantha bayadera*, *Planaeschna shanxiensis*, *Asiagomphus hainanensis*, *Asiagomphus pacificus*, *Lamelligomphus ringens*, *Amphigomphus hansonii*, *Gomphidia kelloggi*, *Mnais andersoni*, and *Coeliccia sexmaculata*.] Address: Lu, C.-w., College of Life Science, Guangxi Normal University, Guilin Guangxi 541004, China

12982. Marković, V.; Vasiljević, B.; Atanacković, A.; Tomović, J.; Zorić, K.; Tubić, B.; Paunović, M. (2012): Status assessment of the Lim River based on macroinvertebrate communities. *BALWOIS 2012 - Ohrid, Republic of Macedonia - 28 May, 2 June 2012*: 4 pp. (in English) ["Status assessment of the Lim River was carried out by using aquatic macroinvertebrates as the most commonly used biological quality element. Investigation was performed during July 2011, and comprised five sites. The saprobic index (Zelinka-Marvan), BMWP and ASPT were calculated to assess of the level of environmental stress i.e. organic pollution. Water quality status according to Zelinka-Marvan index varied from 1.90 to 2.35. Values of BMWP biotic index ranged from 31 to 113 and for ASPT index from 5.17 to 6.65. According to results of the investigation, the ecological status of the water body the Lim River can be evaluated as high to good considering SI and ASPT values and high to moderate status in accordance with BMWP index." (Authors) Only *Gomphus vulgatissimus* was observed in the Lim River.] Address: Marković, Vanja, Institute for Biological Research "Siniša Stanković", Belgrade, Serbia

12983. Miszta, A.; Przondziona, K. (2012): [Dragonflies in the Katowice Forest Park, 2: composition of the odonate fauna during 2002-2011]. *Przyroda Górnego Śląska* 70: 7-10. (in Polish) [Poland; the regional fauna comprises of 38 Odonata species.] Address: Miszta, A.,

Centrum Dziedzictwa Przyrody Górnego Śląska, Katowice, Poland

12984. Miszta, A.; Cuber, P.; Dolný, A.; Liberski, J. (2012): Yellow-spotted Whiteface *Leucorrhinia pectoralis* (Charpentier, 1825) (Odonata: Libellulidae) in the Silesian Province in the years 2002–2012. *Odonatrix* 8(2): 33-42. (in Polish, with English summary) [*L. pectoralis* was studied at 244 sites in the Silesian Province in 2002–2012, and was recorded at 34 sites. "The comparison of the present with historical data from the years 1958–1965 showed that *L. pectoralis* vanishes from peat bogs in this region. The reason for this situation is deteriorating condition of these habitats, mainly because of their desiccation and industrial pollution. It was noted however, that the species is present in a relatively high number on forest sinkhole ponds emerging over coal exploitation areas in the central, industrialized part of the province. Approximately 20% of investigated sinkholes presented conditions favourable for the reproduction and development of *L. pectoralis*. However, these habitats are unstable and do not sustain permanent presence of the species." (Authors)] Address: Miszta, Alicja, Centrum Dziedzictwa Przyrody Górnego Śląska, ul. Św. Huberta 35, 40–543 Katowice, Poland. E-mail: a.miszta@cdpgs.katowice.pl

12985. Norval, G.; Huang, S.-C.; Mao, J.-J.; Goldberg, S.R.; Slater, K. (2012): Additional notes on the diet of *Japalura swinhonis* (Agamidae) from southwestern Taiwan, with comments about its dietary overlap with the sympatric *Anolis sagrei* (Polychrotidae). *Basic and Applied Herpetology* 26: 87-97. (in English) ["*Japalura swinhonis* is an endemic agamid lizard in Taiwan, and although its diet has been examined in northern Taiwan and Orchid Island, it has not been investigated in other parts of its range. Investigating the diet of a species from different parts of its range is crucial due to temporal and spatial variations in it. This study examined the dietary items of 47 *J. swinhonis* from Santzepu and Yunlin, southwestern Taiwan. We also reviewed the diet of *J. swinhonis* and compared it with that of *A. sagrei* from Santzepu, where these species are sympatric in anthropogenically created habitats such as *Areca* catechu plantations and fruit orchards. The diet of *J. swinhonis* from Santzepu was dominated by hymenopterans, followed by coleopterans, lepidopterans and trichopterans, while that of the *J. swinhonis* from Yunlin was dominated by isopterans, followed by hymenopterans, lepidopterans and coleopterans. The diet of *A. sagrei* from Santzepu was mainly dominated by hymenopterans, lepidopterans, araneids, hemipterans, coleopterans, dipterans, isopterans and orthopterans, in that order of frequency. From the results of this study it is evident that in areas where *J. swinhonis* and *A. sagrei* are sympatric there is a substantial dietary niche overlap, and competition for prey is very likely." (Authors) The paper includes a few references to Odonata as prey of *Anolis sagrei*.] Address: Norval, G., Applied Behavioural Ecology & Ecosystem Research

Unit, Department of Environmental Sciences, University of South Africa, Republic of South Africa. E-mail: gnovval@gmail.com

12986. Nowak, M. (2012): Intrasexueller Kannibalismus bei *Ischnura elegans*. *Mercuriale* 12: 61-62. (in German, with English summary) ["In 2008, a case of intrasexual cannibalism was observed in southern France (Pont de Gau, Carmargue): A copulating female was feeding on a immature female of the variation *Ischnura elegans f. violacea*." (Author)] Address: Nowak, M., Fuchseckstr. 16/1, 73114 Schlat, Germany. E-mail: Nowak-Schlat@t-online.de

12987. Odin, N. (2012): Reports from coastal stations - 2011: Landguard Bird Observatory, Suffolk. *Atropos* 45: 67-68. (in English) [UK; *Chalcolestes viridis*, *Brachytron pratense*] Address: not stated

12988. Orr, R. (2012): 2011-2012 Survey of the dragonflies and damselflies (Odonata) of the Cove Point LNG property (Calvert county, Maryland). <http://www.covepoint-trust.org/studies.html>: 20 pp. (in English) [USA; "Full property surveys for Odonata were completed in 1998-1999 and again in 2011-2012. In addition, a limited survey was completed along the LNG pipeline right-of-way in 2005. To date, 62 Odonata species have been recorded from the Cove Point LNG property. Seven of the sixty-two species were added since the end of the 1998-1999 survey. Two State-listed Maryland Endangered dragonflies (*Gomphus rogersi* and *Somatochlora filosa*) complete their life cycle on the property. The known larval site of *G. rogersi* is a small stream along the pipeline right-of-way while the larval site of *S. filosa* is Cove Point Marsh. Between the times of the two full property surveys, the larval site of *S. filosa* (Cove Point Marsh) was impacted by storm breaches resulting in saltwater from the Chesapeake Bay mixing with the freshwater of the marsh. In addition, the larval site of *G. rogersi* (along the LNG pipeline right-of-way) had been intersected by the placement of an additional underground pipeline. Both sites have undergone extensive environmental restoration in the hopes of returning these wetlands to their original condition. Before the 2011-2012 survey the fate of the two State-listed species that were first reported during the 1998-1999 survey were unknown. *S. filosa* and *G. rogersi* were relocated during the 2011-2012 survey. Both species were found in reduced numbers in comparison with the 1998-1999 survey. The reduction in the number of individual *S. filosa* is likely due to a decrease in the size of the larval habitat that is now restricted just to the northern section of Cove Point Marsh. The reduction in the number of individual *G. rogersi* is the result of a beaver dam that flooded the small stream where the larvae previously existed. Human intervention has returned the *G. rogersi* habitat to its 1999 condition by removing the dam plus restoring the surrounding environment from the burying of the new pipeline. The restoration of Cove

Point Marsh is currently in progress and it is reasonable to assume that when (or if) the southern section of Cove Point Marsh returns to a healthy freshwater habitat that *S. filosa* will recover to its earlier numbers." (Author) For the complete study see: <http://www.covepoint-trust.org/studies.html>] Address: Orr, R., Mid-Atlantic Invertebrate Field Studies, www.marylandinsects.com, USA. E-mail: odonata457@comcast.net

12989. Parr, A. (2012): Migrant dragonflies in 2011 including recent decisions and comments by the Odonata Records Committee. *Atropos* 45: 30-35. (in English) [Records of the following species are documented and discussed: *Lestes barbarus*, *Chalcolestes viridis*, *Coenagrion scitulum*, *Ischnura elegans*, *I. senegalensis*, *Erythromma viridulum*, *Aeshna affinis*, *A. mixta*, *Anaciaeschna isocetes*, *Anax ephippiger*, *A. imperator*, *A. parthenope*, *Somatochlora arctica*, *Sympetrum flaveolum*, *S. fonscolombii*, and *S. striolatum*.] Address: Parr, A.J., 10 Orchard Way, Barrow, Bury St. Edmunds, Suffolk IP29 5BX, UK. E-mail: Adrian.parr@bbsrc.ac.uk

12990. Pepa, B.; Papparisto, A.; Keçi, E. (2012): Preliminary data of water quality of Osumi, Devolli and Shkumbini River based on benthic macro invertebrates during summer of year 2011. *BALWOIS 2012 - Ohrid, Republic of Macedonia - 28 May, 2 June 2012*: 1-12. (in English) ["Recently, monitoring of water quality of Albanian River has a high interest. Based on instructions of Water Frame Directive (WFD) for the water body study an efficient element in monitoring and assessment of water quality are benthic macro-invertebrates. Our study was focused on Osumi, Devolli and Shkumbini River during summer 2011, and the purpose is to show relations between benthic macro-invertebrates and water quality. For each River was monitored respectively three stations. Where Osumi River show that, the total number of organisms is 509 that are related to 18 taxons, and in Devolli River are found 389 organisms that are related to 17 taxons. While in Shkumbini River are found 809 organisms which are related to 25 taxons. The result has shown that: EPT-Biotic Index represent different values in different stations. Osumi River: St 1 =4.32, St 2=3.99, St 3 =5.1; Devoll River: St 1 =3.90, St 2=3.93, St 3 =3.76; Shkumbini River: St 1 =3.86, St 2=4.37, St 3 =3.96. Based to these data the water quality of each river is Good (bioclassification 3.75-6.5). Also two others parameters (SWRC-Biotic Index, Family- Biotic Index) are in accordance with EPT- Biotic. Three Rivers have a good water quality with a slight impact." (Authors) Taxa including Odonata were treated at the family or suborder level.] Address: Pepa, B., Faculty of Natural Sciences, Tirana University, Albania. E-mail: bledpepa@hotmail.com

12991. Pessacq, P.; Santos, T.C.; Costa, J.M. (2012): Checklist and updated distribution of Protoneuridae from Brazil. *International Journal of Odonatology* 15(2): 59-73. (in English) ["Protoneuridae are represented in

the Neotropics by 16 genera and 117 species, of which 64 species in 12 genera are known to occur in Brazil. Most of them are known only from the original descriptions or isolated records. During 2009 the Protoneuridae collection of MNRJ was revised; 2800 specimens were studied, belonging to 40 species in nine genera. As a result, the distribution of 25 species is extended, including 50 new records for several states and three new records for the country: *Epipleoneura lamina* Williamson, *Protoneura woytkowskii* Gloyd, and *Psaironeura remissa* (Calvert). The widest distributions are shown by *Neoneura sylvatica* Hagen in Selys, *Epipleoneura venezuelensis* Rácenis, and *Epipleoneura metallica* Rácenis, which are also recorded from the highest number of states: 11 and eight respectively. Additionally, the distribution of most species within previously recorded states is extended." (Authors)] Address: Pessacq, P., CONICET - Facultad de Ciencias Naturales, (LIESA), Universidad Nacional de la Patagonia San Juan Bosco, Sarmiento 849, 9200, Esquel, Chubut, Argentina. E-mail: pablopessacq@yahoo.com.ar

12992. Phiri, C.; Chakona, A.; Day, J.A. (2012): Body-size distribution, biomass estimates and life histories of common insect taxa associated with a submerged macrophyte *Lagarosiphon ilicifolius* in the Sanyati Basin, Lake Kariba, Zimbabwe. *African Journal of Aquatic Science* 37(3): 289-299. (in English) ["The body-size distributions and biomass estimates of *Caenis* (Ephemeroptera: Caenidae), *Cloeon* (Eph.: Baetidae), *Coenagrionidae* (Odonata), *Micronecta* (Hemiptera: Corixidae), *Chironominae* (Diptera: Chironomidae) and *Orthocladiinae* (Chironomidae), the most common and abundant insect taxa associated with a submerged macrophyte *Lagarosiphon ilicifolius* in Lake Kariba, are presented. *Caenis* has a univoltine life cycle, whilst *Cloeon*, *Coenagrionidae*, *Chironominae* and *Orthocladiinae* have multivoltine life cycles. Growth and reproduction of *Micronecta* occurred all year round. The *Coenagrionidae* had the highest mean biomass, which was significantly greater than those of the other taxa. *Caenis* and *Orthocladiinae* were sensitive to variations in water temperature and dissolved oxygen (DO) concentration, their highest biomasses occurring when temperatures were low and DO concentrations high. The biomasses of *Chironominae* and *Orthocladiinae* increased with rising water levels, but that of *Caenis* decreased. Total insect biomass was minimally affected by variations in water physico-chemical variables. The study suggests that water temperature, water level and DO concentration do have an effect on the biomasses of some insect taxa associated with *Lagarosiphon* in Lake Kariba. Mixing processes during de-stratification also affect the abundance and biomass of the insect taxa." (Authors)] Address: Phiri, C., University of Zimbabwe Lake Kariba Research Station, PO Box 48, Kariba, Zimbabwe

12993. Qiu, F.; Zhang, Q.; Li, C.-r.; Spatafora, J.; Fan, M.-z.; Li, Z.-z.; (2012): The genus *Cordyceps* and its al-

lies from Anhui. *Journal of Anhui Agricultural University* 39(5): 803-806. (in Chinese, with English summary) ["In this paper, 20 species of *Cordyceps* and its allies from some nature preserves in Anhui Province were reported as follows: *Cordyceps brongniartii* and its anamorph *Beauveria brongniartii*, *C. cylindrica* and its anamorph *Nomuraea atypicola*, *Metacordyceps guniujiangensis* and its anamorph *Metarhizium* aff. *cylindro-sporum*, *Ophiocordyceps heteropoda* var. *langyashanensis* and its anamorph *Hirsutella heteropoda*, *O. melolonthae*, *O. odonatae*, *O. gryllotalpae*, *C. kusanagiensis* and so on. Among them, *O. melolonthae* is a new record to China mainland and a minor error in original description of *O. odonatae* was revised. Specimens examined are deposited in Research Center on Entomogenous Fungi, Anhui Agricultural University (RCEFAAU)." (Authors)] Address: Qiu, F., Anhui Provincial Key Laboratory for Microbial Control, Hefei 230036, China. E-mail: chunruli@hotmail.com

12994. Rattu, A.; Atzeni, A.; Bzzato, E.; Cillo, D. (2012): 550 - *Selysiotemis nigra* (Van der Linden, 1825) (Odonata Libellulidae). *Boll. Soc. Entomol. Ital.* 144(3): 136. (in Italian) [A record from the isle of Sardegna, Italy is documented: prov. Cagliari, parco Naturale Regionale Molentargius - Saline, Quartu Sant'elena, Is Arenas, 7. & 13.VII.2010, A. Rattu & A. Atzeni leg., 3 specimens. (coll. Rattu); id., Stagno di Quartu S.e., 9.VII.2010, A. Rattu leg., 1 specimen. (coll. Rattu). *Aeshna mixta*, *Crocothemis erythraea*, *Brachythemis impartita* and *Orthetrum trinacria* were collected from the same habitat too.] Address: Rattu, A., via del pozzetto 2, 09130 Cagliari CA, Italy. E-mail: andrearattu@virgilio.it

12995. Sansault, E.; Baeta, R.; Présent, J. (2012): *Leucorrhinia pectoralis* (Charpentier, 1825), une nouvelle espèce pour l'Indre-et-Loire (37), région Centre (Odonata, Anisoptera: Libellulidae). *Martinia* 28(2): 123-125. (in French, with English summary) ["During various biodiversity surveys led by the non profit organization Caudalis in both May and June 2012, three sites hosting males of *L. pectoralis* were discovered in the basin of Savigné area, Indre-et-Loire, France. This discovery represents the first sightings of this species in Indre-et-Loire. One site in particular hosted a dozen of males showing territory behaviour. Even if autochthony can not be proved yet, all sites discovered perfectly match the species' ecological requirements." (Authors)] Address: Sansault, E., Association Naturaliste d'Étude et de Protection des Écosystèmes (ANEPE) « Caudalis », 118 rue de l'Ermitage, F-37100 Tours, France. E-mail: anepe.caudalis@g mail.com

12996. Schiel, F.-J.; Hunger, H. (2012): Vermehrtes Auftreten der Großen Moosjungfer (*Leucorrhinia pectoralis*) in der badischen Oberrheinebene 2012 (Odonata: Libellulidae). *Mercuriale* 12: 37-44. (in German, with English summary) ["In the German Federal State of Baden-Württemberg, the distribution of *L. pectoralis* is mainly

restricted to the southeastern prealpine region. In the Upper Rhine Valley, the species had so far only been recorded at 13 sites between 1959 and 2011; this included one site where the species has reproduced since 2008. In 2012, the species was surprisingly observed 13 times at eleven sites in the Upper Rhine Valley of Baden-Württemberg. Northernmost and southernmost site are about 135 km apart. In only one case a female was observed. All other observations referred to single or few males. The observations in the Upper Rhine Valley corresponded with an increased occurrence in large parts of central and western Europe. Therefore we conclude that there has been long distance dispersal from the northern parts of central Europe which has been favoured by northeasterly winds. It is very probable that this type of dispersal has also occurred to a extent in the past." (Authors)] Address: Schiel, F.-J., Inst. Naturschutz und Landschaftsanalyse, Turenweg 9, 77880 Sasbach, Germany. E-mail: Franz-Josef.Schiel@INULA.de

12997. Schiel, F.-J. (2012): Nachtrag zur Verbreitung von Kleiner und Glänzender Binsenjungfer (*Lestes virens*, *L. dryas*) am Oberrhein (Odonata: Lestidae). *Mercuriale* 12: 23-26. (in German, with English summary) ["Three records of *L. virens* and one of *L. dryas*, documented by E. & K. Westermann from 1977 to 1981 and additionally recent findings of both species in 2012 are supplemented to the synopsis of Schiel (2011). Especially the records of E. & K. Westermann are important for our understanding of the distribution of these two species in the upper Rhine valley. In all *Lestes virens* was recorded at 26 sites in the upper Rhine valley of the German Land of Baden-Württemberg and *L. dryas* at 11 sites. Between 1958 and 1999 *L. virens* was recorded at 11 sites and between 2000 and 2012 at 18 sites. From 1922 to 1999 *L. dryas* was found at four sites in this part of the upper Rhine valley and from 2000 to 2012 at seven sites. New distribution maps are presented and the records are shortly discussed." (Author)] Address: Schiel, F.-J., Inst. Naturschutz und Landschaftsanalyse, Turenweg 9, D-77880 Sasbach, Germany. E-mail: Franz-Josef.Schiel@INULA.de

12998. Schmid, F. (2012): Fehlpaarungen von *Sympetma fusca* und *S. paedisca* (Odonata: Lestidae). *Mercuriale* 12: 33-36. (in German, with English summary) ["In 2011 and 2012, four heterospecific connections between *S. fusca* and *S. paedisca* were observed in the prealpine region of the German Land of Baden-Württemberg. One heterospecific copulation, observed at 04-V-2012, lead subsequently to an interspecific oviposition and was documented by photographs." (Author)] Address: Schmid, F., Graben 23, 72525 Münsingen, Germany. E-mail: fcschmid@t-online.de

12999. Schmid, F. (2012): Bemerkenswerte Schlupföhnen von Zweifleck (*Epithea bimaculata*) und Gemeiner Falkenlibelle (*Cordulia aenea*) an einem See im ober-schwäbischen Alpenvorland (Odonata: Corduliidae). *Mer-*

curiale 12: 57-58. (in German, with English summary) [Baden-Württemberg, Germany; "At a trunk of a *Larix decidua*-tree larvae of *Cordulia aenea* were proofed to climb up to 2.8 m and those of *Epithea bimaculata* up to 6.05 m above the ground." (Author)] Address: Schmid, F., Graben 23, 72525 Münsingen, Germany. E-mail: fcschmid@t-online.de

13000. Schmidt, B. (2012): Widerfund von *Leucorrhinia albifrons* (Burmeister, 1839) (Odonata: Libellulidae) in Baden-Württemberg. *Mercuriale* 12: 17-22. (in German, with English summary) ["On 09-VII-2012, two males of *L. albifrons* were observed at a shallow water shore with reed bed (*Schoenoplectus lacustris*) at lake Badsee, Allgäu (county of Ravensburg, prealpine region, southwest Germany). It's the third time this taxon has been recorded in Baden-Württemberg for the last 100 years. Locality, habitat and water body are described and the origin of the specimens is discussed." (Author)] Address: Schmidt, B.K., Alpenstr.27, 88045 Friedrichshafen, Germany. E-mail: Bertrand.Schmidt@gmx.de

13001. Scon; D.A. (2012): Reports from coastal stations - 2011: Dursey Island, Co. Cork. *Atropos* 45: 78-79. (in English) [UK; *Sympetrum fonscolombii*]

13002. Scott, M.A.; Scott, W.J. (2012): Reports from coastal stations - 2011: Longstone Centre, St Mary's, Isles of Scilly. *Atropos* 45: 44-45. (in English) [22 records of *Sympetrum fonscolombii* between 12 Oct. and 6 Nov 2011; *Anax ephippiger* on 15 Oct. 2011.] Address: not stated

13003. Shi, X.; Yu, H. (2012): Finite element analysis of dragonfly wing structural stiffness. *Nongye Jixie Xuebao* (Transactions of the Chinese Society of Agricultural Machinery) 43(1): 224-229. (in English) ["The dragonfly wings were taken as the study objects, CAD and finite element analysis software ANSYS were applied to establish the finite element model of dragonfly wings. Through static analysis, the main vein structure was determined as load-bearing structure in dragonfly wings, the main vein and secondary veins coordinating so as to make the overall structure more reasonable. According to the characteristics of dragonfly wings wrinkled structure, the mesh model of rectangular and staggered quadrilateral fold structure was established, different mechanical properties under load were analysed. The results showed that under the same uniform load, the greater the height of wrinkling was, the smaller structural deformation, and the greater structural stiffness would be. The analysis of quadrilateral mesh (no membrane) model in a different uniform deformation under load of the trend can be seen in the same wrinkle height, as the load increased, the deformation also increased, but as the wrinkle height increased, and with the smaller amount of deformation of the load increased, the quadrilateral mesh stiffness of the structure became slightly larger than staggered quadrilateral

mesh structure. Under the same load, the deformation of a membrane mesh structure was always less than no membrane mesh structure." (Authors)] Address: not stated

13004. Skalon, T.N.; Skalon, N.V. (2012): Some data on the fauna of Odonata in the Kuznetsk-Salair mountainous region and neighbouring areas of the west Siberian plain. *Bulletin of the Kemerovo State University - Journal of theoretical and applied research* 3(51): 17-21. (in Russian, with English summary) ["This article reports on the fauna of dragonflies from 12 regions of the Kuznetsk-Salair mountainous region and neighbouring region the West Siberian Plain: 1) Salair Ridge, 2) Yin basin (within Coos Netsuke steppe), 3) downstream river Tom, 4) middle course river Tom, 5) the upper reaches of Tom; 6) Shoria Mountain 7) western slope of Kuznetsk Alatau, 8) River basin of Yaya, 9) middle course Kiya; 10) upper reaches of river Kiya, 11) the eastern slope of the Kuznetsk Alatau (tributaries Chulyma - Uryup, Black Yus); 12) the eastern foothills of the Kuznetsk Alatau (Podzaplotskie bogs). 63 species of Odonata have been detected by now. New data on the distribution of these species within the investigated territory are provided." (Authors)] Address: not stated

13005. Smout, A.-M. (2012): Reports from coastal stations - 2011: *Anstruther, Fife. Atropos* 45: 75. (in English) [UK, Scotland; *Ischnura elegans*] Address: not stated

13006. Soontornprasit, K. (2012): Use of aquatic insects as bioindicators of water quality in Kwan Phayao, Phayao province. *Journal of Community Development Research* 5(1): 15-24. (in Thai, with English summary) ["This study measured the aquatic insect diversity and its application as a bioindicator to monitor water quality in Kwan phayao, Phayao Province, Thailand. Shannon-Wiener index were used to assess water quality. Physical, chemical and biological parameters were also measured to compare with the surface water quality standard of Thailand. Results indicated that 3,511 aquatic insect from 26 families in 6 orders (including Odonata, but without details) were identified. The most abundant family found during the year was Geridae in the Hemiptera order. Using aquatic insects as bioindicators, it can be concluded that all sampling sites were shown to standard for surface water quality CLASS 2, depending on land use and human activities. From the correlation analysis, biological indices were related to some physico-chemical properties of water quality. Diversity index were related to some parameters such as DO, alkalinity, temperature and conductivity ($p < 0.05$)."] (Author)] Address: Soontornprasit, K., Division of Fishery, Faculty of Agriculture and Natural Resources, University of Phayao, Phayao 56000, Thailand. E-mail: kanyanats@hotmail.com

13007. Spitzenberg, D. (2012): Dr. Joachim Müller zum 70. Geburtstag. *Naturschutz im Land Sachsen-Anhalt* 49: 80-82. (in German) [The author briefly outlines

some personal achievement in science and life of J. Müller, biologist and odonatologist with great reputation within Germany.] Address: Spitzenberg, D., Zur Tonkuhle 53 · 39444 Hecklingen, Germany. E-Mail: spitzenberg.dietmar@vodafone.de

13008. Stephan, U. (2012): Einfluss der Untersuchungsmethode auf die Erfassung von Cordulegaster Larven. *Mercuriale* 12: 45-52. (in German, with English summary) ["Two methods of sampling larval Cordulegaster were compared according to their efficiency: the "cullender method": the investigator use a sieve, e.g. a cullender, to remove substrate from the bottom of little streams or seepages and to sort out the larvae being contained in the substrate; the "tremor method": the investigator causes tremors by jumping up and down at the stream margin; some larvae react to the tremors by performing movements, e.g. rising their heads out of the substrate, and therefore reveal their positions. The tremor method was more efficient in collecting larvae, especially the larger ones (body length > 15 mm). However, small larvae (body length < 15 mm) could be more efficiently recorded by the cullender method. In addition, the suitability of the methods was affected by habitat structures: at dark, shady stretches and habitats with lots of leaf litter the cullender method should be used, whereas in stony reaches the tremor method is more suitable." (Author)] Address: Stephan, Ulrike, Im Westengarten 12, 79241 Ihringen, Germany. E-mail: stephan.ulrike@gmx.net

13009. Stephan, U.; Schiel, F.J. (2012): Nachruf auf Lothar Gilbert. *Mercuriale* 12: 65. (in German) [Obituary of L. Gilbert, a locally active member of the Schutzgemeinschaft Libellen in Baden-Württemberg.] Address: Schiel, F.-J., Inst. Naturschutz und Landschaftsanalyse, Turenweg 9, D-77880 Sasbach, Germany. E-mail: Franz-Josef.Schiel@INULA.de

13010. Su, Y.; Zhang, Z.; Hong, Y. (2012): Two new ancient griffenflies (Insecta Odonoptera) from the Namurian of Ningxia, China. *Insect Systematics & Evolution* 43: 1-10. (in English) ["Two new ancient griffenflies, members of the Qilianshan Entomofauna from the Namurian B-C (Upper Carboniferous) of Ningxia Hui Autonomous Region, are described. One species, *Sinierasiptera jini* Zhang, Hong & Su, sp.n., is placed in a new family *Sinierasipteridae* within Neodonoptera, and the other, *Paragilsonia orientalis* Zhang, Hong & Su, sp.n., in *Meganeuridae* (Tupinae). The phylogenetic position of the new family *Sinierasipteridae* is discussed." (Authors)] Address: Su, Y., School of the Earth Sciences and Resources, China University of Geosciences Beijing 100083, P. R. China

13011. Sullivan, S.M.P.; Rodewald, A.D. (2012): In a state of flux: The energetic pathways that move contaminants from aquatic to terrestrial environments. *Environmental Toxicology and Chemistry* 31(6): 1175-1183.

(in English) ["In this Focus article, we address ecological and societal issues related to the aquatic-to-terrestrial transport of aquatic contaminants, with the spotlight falling on flowing water ecosystems. We highlight the ways in which a new understanding of the aquatic-terrestrial interface has prompted an integrated view of cross-boundary contaminant flows within complex ecological networks. We pay particular attention to aquatic insects (including Odonata), which as an important source of energy for riparian consumers such as arthropods, birds, mammals, and reptiles, are especially likely to move contaminants into terrestrial ecosystems 4–6. The linkages among aquatic and terrestrial systems represent an emerging ecological and environmental issue. We believe that contextualizing contaminant fluxes within this framework will yield significant short- and long-term benefits to ecological health and human well-being." (Authors)] Address: Sullivan, S.M., School of Environment & Natural Resources, The Ohio State Univ., Columbus, Ohio, USA. E-mail: sullivan.191@osu.edu

13012. Tiple, A.D. (2012): Odonata (Damselflies and Dragonflies) fauna of Tadoba National Park and surroundings, Chandrapur, Maharashtra (Central India). *Bionano Frontier* 1: 149-152. (in English) ["A survey of fresh water body sites such as ponds, streams, fields grassland, and forests areas of Tadoba National Park, Chandrapur district area of 623 sq. km. from 2008 to 2010 to collect and record the odonate faunal diversity and their status. A total of 64 species of Odonata ... were recorded. The checklist adds 24 new records for Tadoba National Park. ... Of the total 64 species, 23 were abundant or very common, 24 were common, 12 rare and 5 very rarely in occurrence. The observations support the value of the National park (reserve forest) area in providing valuable resources for Odonata." (Author)] Address: Tiple A. D., Dept of Zoology, Vidyabharti College Seloo, Wardha, Maharashtra, India & Forest Entomology Division, Tropical Forest Research Inst., Jabalpur 482021, India. E-mail: ashishdtiple@yahoo.co.in

13013. Trautmann, S; Lötters, S; Ott, J; Buse, J; Filz, K; Rödder, D; Wagner, N; Jaeschke, A; Schulte, U; Veith, M; Griebeler, E-M; Böhning-Gaese, K. (2012): Auswirkungen auf geschützte und schutzwürdige Arten. In: Mosbrugger, V., Brasseur, G., Schaller, M. und Stribny, B. (Hrsg.) *Klimawandel und Biodiversität - Folgen für Deutschland*. WBG, Darmstadt, (2012), 260-289, ISBN 978-3534252350 (2012): 260-289. (in German) [On the basis of in most cases self-referring papers and mono-causal interpretation of records, the usual speculations of Odonata (chap. 10.4) as climate change indicators are outlined. The paper lacks in any critical discussion on the data base on climatic induced range extensions vs. habitat availability or discussion while species as *Sympetrum pedemontanum* and *Erythromma viridulum* - for long years considered as indicators of climate change - are recently very rare or have lost most of their ranges in the past years.] Address: Ott, J., Fried-

hofstr. 28, D-67705 Trippstadt, Germany. E-mail: L.U.P.O.GmbH@t-online.de

13014. Tunmore, M. (2012): Reports from coastal stations - 2011: Lizard Peninsula, Cornwall. *Atropos* 45: 47-49. (in English) [Verbatim: It was a notable year for Odonata, which began early with a male *Anax ephippiger* ... at Kennack Sands on 19 February. This was the prelude to further occurrences during a period of exceptionally warm weather in April. Unidentified dragonflies seen near Goonhilly on 6 April and at Kynance on 19 April were almost certainly this species. More definite was a male present at Windmill Farm NR on 24 April, with two present on a different part of the reserve the next day and one present on 26th; two males were seen near Mullion on 24 April and an ovipositing pair was observed at a site near Predannack on 26th with at least one still present on 28th. A small arrival of *Sympetrum fonscolombii* also occurred at the same time with six present at Windmill Farm on 25 April and three near Mullion the same day. With exceptionally early emergences of resident Odonata also noted, some local observers were able to see nine species in the month of April. The summer brought a lull in Odonata immigration but small numbers of *S. fonscolombii* continued to be reported from Windmill Farm in early June and again in late July/August. An *Anax imperator* was present there between 28 July and 4 August, which was only the second record for the site. Signs of autumn migration included a *Sympetrum striolatum* in the moth-trap at Church Cove on 2 September and an *Aeshna mixta* in the trap at Cury Cross Lanes on 12 September. Two *S. fonscolombii* were at Cury Cross Lanes on 10 September, followed by one at Windmill Farm on 25 October, whilst a pair of *A. ephippiger* were seen ovipositing near Predannack on 28 October.] Address: Tunmore, M., 36 Tinker Lane, Meltham, Huddersfield, West Yorkshire HD7 3ES, UK. E-mail: Atropos@atroposed.freeserve.co.uk

13015. Velle, L. (2012): Inventaire des Odonates en forêts domaniales de Vierzon et de Vouzeron et première preuve de reproduction de *Leucorrhinia caudalis* (Charpentier, 1840) pour le département du Cher. *Martinia* 28(2): 89-102. (in French, with English summary) ["During an odonatological survey, 2009–2011, the author recorded 31 species of dragonflies from a dozen of forest ponds in the National Forest of Vierzon-Vouzeron, Cher department, Central France. This is more than half of the species known from this under prospected department. Two nationally protected species, which are also included in appendix II and/or IV of the "directive Habitats" have been discovered: *Leucorrhinia caudalis* and *L. pectoralis*. It is the first mention of the successful reproduction of *L. caudalis* in the Cher department. *Leucorrhinia pectoralis*, already known in this department, seems to be well present in the forested wetlands of this area." (Author)] Address: Velle, L., Office National des Forêts - Réseau entomologie Chemin

des Merlins, F-03340 Montbeugny, France. E-mail: laurent.velle@onf.fr

13016. Vircel, G. (2012): Nouvelle observation et nouvelle localité pour *Somatochlora metallica meridionalis* Nielsen, 1935 en Haute-Corse (2B) (Odonata, Anisoptera: Corduliidae). *Martinia* 28(2): 120. (in French) [*S. meridionalis* was recorded at 12-VII-2012 at the river Varagno near Poggio-di-Nazza, Haute-Corse, France (42°2'12,20"N, 9°19'18,58"E).] Address: Vircel, G., LPO PACA, Villa Saint-Jules, 6 avenue Jean Jaurès, F-83400 Hyères, France

13017. Vundtsettel, M.F.; Kuznetsova, N.V. (2012): Ecological characteristics of the river Yakhroma and its benthic fauna. *Vestnik of Astrakhan State Technical University. Series: Fishing Industry.* 2012(1) [ISSN 2073-5529]: 15-21. (in Russian, with English summary) [Yakhroma River, 55 kilometres north of Moscow; Dmitrovsky District of Moscow Oblast, Russia. 170 samples of zoobenthos between 2009-2011 resulted in 86 species from 16 orders. Odonata are represented by *Gomphus vulgatissimus*, *Ophiogomphus cecilia*, *Calopteryx virgo*, *C. splendens*, *Chalcolestes viridis*, *Lestes sponsa*, *Orthetrum cancellatum*, *Platycnemis pennipes*, *Coenagrion armatum*, *Brachytron pratense*, *Aeshna grandis*, *Anax imperator*, and *Somatochlora metallica*.] Address: Vundtsettel, M.F., Astrakhan State Technical University, Dmitrov branch, Russia. E-mail: df-vmf@mail.ru

13018. Wildermuth, H. (2012): Libellengewässer, die kommen und gehen. *Mercuriale* 12: 1-10. (in German, with English summary) ["The dragonfly fauna of two freshly created shallow ponds in open meadows in the Swiss Plateau was monitored during summer 2012. Altogether 24 and 29 species were recorded, respectively, 16 and 15 of them certainly or most probably indigenous. The water bodies proved to be suitable for regionally rare species such as *Ischnura pumilio*, *Orthetrum albistylum*, *O. brunneum*, *Sympetrum depressiusculum* and *S. fonscolombii*. The importance of shallow ponds in open country as breeding habitats for dragonflies, especially during the early succession stages, the problems of rapid overgrowth or complete disappearance 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

13019. Xu, J.; Wang, Q. (2012): Species diversity of flower-visiting insects at Huangjin Main Campus of Gannan Normal University. *Journal of Gannan Normal University* 3: 120-124. (in Chinese, with English summary) [*Crocothemis servilia*, *Orthetrum albistylum*, *Sympetrum croceolum*, *Agriocnemis femina*, *Ischnura senegalensis*, *Ceriaton melanurum*, and *Platycnemis foliacea* were among the insect species found using

flowers as perching substrate.] Address: Xu, J.s., School of Life and Environment Science, Gannan Normal University, Ganzhou 341000, China

13020. Ye, S.-s.; Wang, H.-q.; Chen, Y.; Fang, Y.; Li, K. (2012): Characterization of riparian insect communities in Lingang New Town of Shanghai. *Chinese Journal of Ecology* 31(5): 1207-1213. (in Chinese, with English summary) ["Lingang New Town is a rapidly developing coastal zone in Shanghai metropolitan region, China. To understand the characteristics of the riparian insect communities in the zone under effects of urbanization, an investigation was conducted in different habitats and seasons from October 2009 to September 2010. A total of 7755 insect individuals were collected, belonging to 199 species, 84 families, and 13 orders." (Authors) Odonata were represented by 2.3% of the specimens and only detailed as Libellulidae and Coenagrionidae.] Address: Li, K., Shanghai Key Laboratory for Ecology of Urbanization Process and Eco-Restoration, East China Normal University, Shanghai 200062, China. E-mail: kaili@bio.ecnu.edu.cn

13021. Yu, W.-y.; Li, Z.-h.; Luo, Q.-h.; Cai, Y.; Ren, Y.-h.; Zhao, L.; Chen, X.-r.; Zhou, S.-s. (2012): Study on fauna and diversity of Odonata in Maolan area of Guizhou. *Sichuan Journal of Zoology* 31(5): 828-833. (in Chinese, with English summary) [Transect counts in five localities (Maolan area, Guizhou province, China) in July, 2011 resulted in 65 Odonata species. The records were documented and analysed according to the known species biogeography.] Address: Yu, W.-y., Institute of Applied Ecology, Nanjing Xiaozhuang University, Nanjing 211171, China. E-mail: ywy138519@126.com

13022. Yu, X.; Bu, W.-j.; Zhu, L.; (2012): Research advances in eco-environment assessment using dragonfly as a bioindicator. *Chinese Journal of Ecology* 31(6): 1585-1590. (in Chinese, with English summary) [Odonata as bioindicators were discussed in terms of general environmental assessment, environment pollution degree assessment, environmental improvement assessment, climate change assessment, and large-scale environmental assessment.] Address: Zhu, L., College of Environmental Science and Engineering, Nankai University, Tianjin 300071, China. E-mail: zhulin@nankai.edu.cn

13023. Zoellick, B.; Nelson, S.J.; Schauffler, M. (2012): Participatory science and education: bringing both views into focus. *Front. Ecol. Environ.* 10(6): 310-313. (in English) ["Aligning the goals of scientists and participants becomes more challenging when citizen science moves into middle- and high-school classrooms. Here, we describe a logic model developed in association with the Acadia Learning Project, a collaboration among scientists, teachers, and students that successfully meets both research and educational needs. The logic model is intended to assist other classroom-based citi-

zen-science initiatives with project design and evaluation." (Authors) The paper includes references to Odonata.] Address: Nelson, Sarah, Senator George J Mitchell Center for Environmental and Watershed Research and Department of Plant, Soil, and Environmental Sciences, University of Maine, Orono, ME, USA. E-mail: sarah.nelson@umit.maine.edu

2013

13024. Abdelsalam, K.M.; Tanida, K. (2013): Diversity and spatio-temporal distribution of macro-invertebrates communities in spring flows of Tsuya Stream, Gifu Prefecture, central Japan. The Egyptian Journal of Aquatic Research 39(1): 39-50. (in Spatio-temporal; Macro-invertebrates; Diversity; Mother community; Springs) [Calopteryx atrata, Planaeschna milnei and Anotogaster sieboldii were listed from the stream.] Address: Abdelsalam, K.M., National Institute of Oceanography and Fisheries, Qayet Bey, El-Anfoushy, Alexandria, Egypt. E-mail: kh.abdelsalam@gmail.com

13025. Abhijna, U.G.; Ratheesh, R.; Biju Kumar, A. (2013): Distribution and diversity of aquatic insects of Vellayani lake in Kerala. Journal of Environmental Biology 34: 605-611. (in English) [The diversity of insect fauna of Vellayani lake in Kerala, India was represented by 60 insect species. Odonata count to 12.55% of the taxa.] Address: Kumar, B., Department of Aquatic Biology & Fisheries, University of Kerala, Thiruvananthapuram-695 581, India. E-mail: abiju@rediffmail.com

13026. Acquah - Lamptey, D.; Kyerematen, R.; Owusu, E.O. (2013): Using odonates as markers of the environmental health of water and its land related ecotone. International Journal of Biodiversity and Conservation 5(11): 761-769. (in English) ["The study of Odonata communities along wetlands requires the basic understanding of the abundance, distribution and number of species present. As habitat conditions change, they also exhibit changes in their diversity and distribution. Odonata assemblages were surveyed along the Densu River at Atewa Range Forest Reserve (ARFR) and Nsawam in the Eastern Region of Ghana and Weija in the Greater Accra Region of Ghana. Of the 177 species recorded for Ghana, 66 species (43 dragonfly and 23 damselfly species) were sampled along the Densu River. These belonged to eight families of which the Libellulidae dominated. The distribution of species was significantly different between the sites with the most diverse area being ARFR with 47 species. The various environmental variables along the river were recorded and their effects discussed." (Authors)] Address: Acquah - Lamptey, D., Department of Animal Biology and Conservation Science, P. O. Box LG67, University of Ghana, Legon, Ghana. E-mail: dalquino@gmail.com

13027. Adambukulam, S.P.; Kakkassery, F.K. (2013): Taxonomic studies of the last instar nymph of Lathre-

cista asiatica asiatica (Fabricius 1798) (Family: Libellulidae, Order: Odonata) by using its exuvia. Journal of Entomology and Zoology Studies 1(5): 103-109. (in English) ["L. a. asiatica is a monotypic cosmopolitan dragonfly species of the genus Lathrecista belonging to family Libellulidae, reported from peninsular India to Australia. No literature is available on the description of the nymph of this species, and the present paper describes the nymphal features of the last instar of Lathrecista asiatica asiatica by using its exuviae which was collected at the time of emergence of adult from a temporary pond in Ammadam, Thrissur district, Kerala, India." (Authors)] Address: Kakkassery, F.K., Department of Zoology, St. Thomas' College, Thrissur, India. E-mail: kakkassery@yahoo.com

13028. Afzal, G.; Mushtaq, S.; Rana, S.A.; Sheikh, M.A. (2013): Trophic niche breadth and niche overlap among different guilds of spider species in wheat agroecosystem. Pakistan Journal of Life and Social Sciences 11(2): 107-111. (in English) ["Trophic niche breadth and niche overlap of nine spiders including Pardosa timidula (Roewer, 1951), Hippasa olivacea (Thorell, 1887), Plexippus paykulli (Audouin, 1826), Oxyopes javanus (Thorell, 1887) (hunters), Leucauge decorata (Blackwall, 1864), Tetragnatha javana (Thorell, 1890), Neoscona mokerji (Tikader, 1980), Argiope aemula (Walckenaer, 1841) and Cyclosa spirefera (Simon, 1889) (web builders) inhabited in wheat fields of University of Agriculture, Faisalabad, Pakistan were verified. Study was planned to know how the most abundant spiders of wheat are coexisted in terms of habitat and food resources. Evidences of predation in fields were used to compute the coefficients of niche breadth and niche overlap. Diet breadth values were approximately 1 to 2 times greater than the minimum, which specifies substantial differing degree of feeding specialization. All overlap values were <1.00 (range, 0.05-0.92), which indicated that each species had its own feeding niche in the wheat ecosystem. It was concluded that separation of guild members in microhabitat, high plasticity in their foraging patterns may results in reduced competition and coexistence. Thus, such abundantly found spiders are highly responsible to enhance their biological control potential in wheat agroecosystems." (Authors) Odonata had been preyed by all spider species studied, but in most cases were rarely encountered in the spiders diet.] Address: Afzal, G., Department of Zoology & Fisheries, University of Agriculture, Faisalabad-38040, Pakistan

13029. Albrecht, M.P.; Reis, V.C.S.; Caramaschi, E.P. (2013): Resource use by the facultative lepidophage Roeboides affinis (Günther, 1868): a comparison of size classes, seasons and environment types related to impoundment. Neotropical Ichthyology 11(2): 387-394. (in English, with Portuguese summary) ["We report the consumption of scales and other food resources by the facultative lepidophage Roeboides affinis in the upper

Tocantins River where it was impounded by the Serra da Mesa Hydroelectric Dam. We compared the diet among size classes, between dry and wet seasons, and between sites with distinct water flow characteristics (lotic vs. lentic) related to the distance from the dam and phase of reservoir development. As transparency and fish abundance increased after impoundment, we expected a higher consumption of scales in lentic sites. Likewise, habitat contraction, higher transparency and decrease in terrestrial resources availability, would promote a higher consumption of scales. Scales were consumed by 92% of individuals and represented 26% of the total volume of resources ingested by *R. affinis*. Diet composition varied significantly among size classes, with larger individuals consuming more scales and larger items, especially odonates and ephemeropterans. Scale consumption was not significantly different between dry and wet seasons. *Roeboides affinis* incorporated some food items into the diet as a response to the impoundment, like other species. Scale consumption was higher in lotic sites, refuting our initial hypothesis, what suggests that the lepidophagous habit is related the rheophilic nature of *R. affinis*." (Authors)] Address: Albrecht, Miriam, Universidade Federal do Rio de Janeiro, Departamento de Ecologia, Av. Carlos Chagas Filho, 373, Cidade Universitária, 21941-902 Rio de Janeiro, RJ, Brazil. E-mail: albrechtmp@gmail.com

13030. Andrew, R.J. (2013): Odonates of Zilpi Lake of Nagpur (India) with a note on the emergence of the libellulid dragonfly, *Trithemis pallidinervis*. *Journal on New Biological Reports* 2(2): 177-187. (in English) ["Zilpi lake is a small water-body, formed by the construction of an earth fill dam in 1974 under the irrigation project of the Govt. of Maharashtra. The maximum live storage capacity of the dam is 1.51 MCM. It lies 25 km west of Nagpur city and is today a well known spot for scenic beauty and aquatic birds. A survey of dragonfly fauna of this lake was undertaken during the post monsoon period of 2012. A total of 34 odonate species belonging to the family- Coenagrionidae (7), Lestidae (1), Aeshnidae (3), Gomphidae (1) and Libellulidae (22) were found breeding in this lake. Except the *Diplacodes nebulosa* and *Rhodothemis rufa*, all other species are commonly found in the water bodies of central India. *Trithemis pallidinervis* abundantly breeds in this lake. Study of the emergence pattern of *T. pallidinervis* demonstrates that there is a direct correlation between choice of direction of the larva for emergence and the presence of emergent support and geographic condition of the water edge. 94% of the larvae of *T. pallidinervis* prefer the erect dried twigs of *Cassia tora* (Caesalpiniaceae) to emerge. Maximum larvae (61%) preferred the west side of the lake for emergence because of the gradual sloping edge and large cluster of emergent support. The sex ratio is male biased (53.5% male, 46.5% female) and there was no correlation between the sex of the emerging larva and choice of direction." (Author)] Address: Andrew, R.J., Post Graduate Dept of Zoology,

Hislop College, Nagpur-440001, India. E-mail: rajuan-drew@yahoo.com

13031. Antoniazzi, C.E.; López, J.A.; Duré, M.; Falico, D.A. (2013): Alimentación de dos especies de anfibios (*Anura: Hylidae*) en la estación de bajas temperaturas y su relación con la acumulación de energía en Santa Fe, Argentina. *Rev. Biol. Trop. (Int. J. Trop. Biol.)* 61(2): 875-886. (in Spanish, with English summary) [The diet of *Hypsiboas pulchellus* includes a few Odonata.] Address: Antoniazzi, Carolina Elizabet, Universidad Nacional del Litoral, Facultad de Humanidades y Ciencias, Departamento de Ciencias Naturales, Ciudad Universitaria, Paraje el Pozo S/N (3000), Santa Fe, Argentina; caroantoniazzi@gmail.com

13032. Aspacio, K.T.; Yuto, C.M.; Nuñez, O.M.; Villanueva, R.J.T. (2013): Species diversity of Odonata in selected areas of Buru-un, Iligan City and Tubod, Lanao del Norte, Philippines. *ABAH BIOFLUX - Animal Biology & Animal Husbandry International Journal of the Bioflux Society* 5(2): 145-155. (in English) ["Odonata is known to be sensitive to structural habitat quality and is a valuable tool to evaluate landscape degradation. This study determined the species diversity of Odonata in Buru-un, Iligan City and Tubod, Lanao del Norte, Philippines. Eight sites were assessed on August 27 - 31, 2012 and on October 26 - 30, 2012 for a total of 98 man-hours. Sweep nets were used for collection. Twenty six species were identified from all sampling sites. Lake Babuyan (Site 4) and Kallangan Spring (Site 5) had the highest species richness. *Trithemis aurora*, an oriental species, was the most abundant species. Moderate species diversity was recorded with low endemism (35 %)."] (Authors)] Address: Nuñez, Olga, Department of Biological Sciences, Mindanao State University - Iligan Institute of Technology, Iligan City, Philippines. E-mail: olgamnuneza@yahoo.com

13033. Babu, R.; Subramanian, K.A.; Nandy, S. (2013): Endemic Odonates of India. Records of the Zoological Survey of India. Occasional Paper 347: 1-60. (in English) ["The paper deals with an updated list of 186 species /subspecies belonging to 67 genera of Odonates endemic to India have been compiled along with distribution of each taxon with respective citations. The distributions of more number of endemic species/subspecies are restricted in two biodiversity hotspots of India, Western Ghats and North east India." (Authors)] Address: Babu, R, Southern Regional Centre, Zoological Survey of India, Chennai - 600 028, India

13034. Bailowitz, R.; Danforth, D.; Upson, S. (2013): *Erpetogomphus molossus*, a new species from Sonora, Mexico (Odonata: Anisoptera: Gomphidae). *Zootaxa* 3734(5): 559-570. (in English) ["*E. molossus* is described from 3 male and 3 female specimens (holotype and allotype in collection of Instituto Biológico de la Universidad Nacional Autónoma de México) from the intermit-

tent pine-oak woodland of the Yécora municipio in east-central Sonora, Mexico. Diagnostic features of the new species include the seemingly bulbous tip (in lateral view) and prominent baso-ventral process of the male cerci and the notched and denticled posteromesal corners of the female subgenital plate." (Authors)] Address: Bailowitz, R., 15444 N. Indian Trail, Tucson, AZ 85750 USA. E-mail: raberg2@q.com

13035. Bajwa, Y.; Williams, V.; Ren, Y.; Dong, H. (2013): Investigation into the role of dragonfly wing flexibility during passive wing pitch reversal. *Bulletin of the American Physical Society* 58(18): o.p. (in English) ["Wing deformation is a characteristic part of flapping wing flight. In dragonflies, a torsion wave can be observed propagating from the tip to the root during stroke reversal. In this paper, we utilize high-speed photogrammetry and 3d surface reconstruction techniques to quantify wing deformation and kinematics of a dragonfly. We then use finite elements in the absolute nodal coordinate formulation to estimate strain energy in the wing during wing pitch reversal. We use this data to analyse the role of wing structure in facilitating wing rotation and bringing about the characteristic torsion wave. The influence of the elastic force in facilitating wing rotation is then compared with inertial and aerodynamic forces as well. A quantitative look into the variation of strain energy within the insect wing during wing rotation could lead to more efficient design of dynamic wing pitching mechanisms." (Authors)] Address: not stated

13036. Barry, M.J. (2013): Effects of fluoxetine on the swimming and behavioural responses of the Arabian killifish. *Ecotoxicology* 22(2): 425-432. (in English) ["The selective serotonin reuptake inhibitor fluoxetine has frequently been detected in surface waters around the world. Fluoxetine modulates levels of serotonin, a neurotransmitter that regulates several important physiological and behavioural processes including fear and anxiety, aggression, locomotion and feeding. In this study, groups of sub-adult Arabian killifish (*Aphanius dispar*) were exposed to either 0, 0.03, 0.3 or 3 µg/L fluoxetine hydrochloride for 7 days and their swimming behaviour and social interactions videotaped in a circular arena. The fish were subsequently exposed to a predator alarm chemical (from dragonfly larvae fed with *A. dispar*) and their short-term responses recorded. The video was analysed using the open-sourced software program Ctrax which objectively quantified swimming and social behaviours. Aggression (chasing behaviour was significantly reduced at 3.0 µg/L fluoxetine. After the addition of the predator alarm chemicals fish responded quickly, increasing the percentage of time spent drifting or motionless and reducing average swimming velocity. Controls and fish exposed to 0.03 or 3 µg/L fluoxetine reduced swimming speed by 20-30 % but returned to pre-exposure velocities within 6 min. Fish exposed to 0.3 µg/L fluoxetine reduced swimming speed by 38 % after addition of the predator alarm and did not return to

pre-exposure speeds during the recording period (19 min). Schooling behaviour was also affected by fluoxetine and predator alarm with fish exposed to 0.3 µg/L fluoxetine significantly reducing nearest neighbour distance and swimming speed relative to nearest neighbour the following addition of the predator alarm." (Author)] Address: Barry, M.J., Biology Department, Sultan Qaboos University, PO Box 36, Al Khoud, Muscat, 123, Sultanate of Oman. E-mail: mjbarry@squ.edu.om

13037. Barth, G.; Nel, A.; Franz, M. (2013): Two new odonate-like insect wings from the latest Norian of northern Germany. *Polish Journal of Entomology* 82(3): 127-142. (in English) ["Two new well preserved odonate (damselfly-dragonflies) insect wings from the latest Norian (Upper Triassic) of two different localities are described. Although the rather long distance of more than 250 km separates the localities, the holotypes occur in comparable lithologies and are thus described together. We describe an odonate forewing, *Italophlebia baueri* sp. n., from an abandoned quarry at Langenberg near Seinstedt north of the Harz Mountains (Lower Saxony), which is the first occurrence of this genus outside Italy. The second wing, *Triassothemis gartzii* sp. n., was found in the cored well Gartz 1 (NE Germany). In both occurrences the insect wings were associated with abundant autochthonous as well as allochthonous faunal and floral remnants of shallow subaquatic environments." (Authors)] Address: Barth, G., TU Bergakademie Freiberg, Bernhard-von-Cotta-Straße 2, D-09599 Freiberg, Germany

13038. Baturina, M.A.; Loskutova, O.A. (2013): Fauna of amphibious and aquatic insects of small waterbodies in the environs of Syktyvkar CITY (Komi Republic, Russia). *Materials of the Fifth All-Russia Symposium on Amphibiotic and Aquatic Insects / Papanin Institute for Biology of Inland Waters, Russian Academy of Sciences. – Yaroslavl: Filigran, 2013. – 254 pp: 21-25.* (in Russian, with English summary) ["The fauna of amphibious and aquatic insects has been studied in small rivers and small standing waterbodies in the environs of Syktyvkar. Occurrence frequency, abundance, biomass, and proportion of species in composition of zoobenthos are determined. A rare stonefly species, included in the Red Data Book of Komi Republic, is recorded." (Authors) The following taxa were listed: *Platycnemis pennipes*, *Coenagrion johanssoni*, *Coenagrion* sp., *Aeshna caerulea*, *Brachytron pratense*, *Gomphidae* sp., *Ischnura* sp., *Ophiogomphus* sp., *Epithea bimaculata*, and *Somatochlora metallica*.] Address: Baturina, M.A., Institute of Biology, Komi Scientific Centre, Ural Branch, Russian Academy of Sciences ul. Kommunisticheskaya 28, Syktyvkar, Komi Republic, 167982, Russia. E-mail: baturina@ib.komisc.ru

13039. Bedjanič, M.; van der Poorten, N. (2013): On the synonymy of two enigmatic endemic clubtails from Sri Lanka (Anisoptera: Gomphidae). *Agriion* 17(2): 44-47. (in English) ["Here, we report on an additional case of syn-

onymy recognized only recently while studying the type specimens and their photographs of two enigmatic Sri Lankan representatives of the family Gomphidae, namely *Heliogomphus ceylonicus* (Hagen in Selys, 1878) and *Anisogomphus solitaris* Lieftinck, 1971. ... Comparison of wing venation, thorax, prothorax and head colouration and markings revealed that both taxa are actually conspecific. Thus, *A. solitaris* and *H. ceylonicus* are synonymized, Hagen's senior species name having priority (ICZN, 1999). The systematic positioning of the species by Lieftinck (1971) in the genus *Anisogomphus* is retained until new material and data are available." (Authors)] Address: Bedjanič, M., Rakovlje 42a, SI-3314 Braslovèe, Slovenia. E-mail: matjazbedjanic@yahoo.com

13040. Benoit, J.M.; Cato, D.A.; Denison, K.C.; Moreira, A.E. (2013): Seasonal mercury dynamics in a New England vernal pool. *Wetlands* 33(5): 887-894. (in English) ["Mercury fluxes into and transformations within a small vernal pool in Massachusetts were investigated over a wet-dry-wet cycle. We measured the deposition of total mercury (HgT) and methyl mercury (MeHg) via litterfall between October 6 and December 2, 2010. Litterfall fluxes were 10 $\mu\text{g m}^{-2}$ and 80 ng m^{-2} , respectively, over that time period. Average HgT concentration in litterfall was 33 ± 2 ng gdw^{-1} ; 0.9 % was present as MeHg. The HgT content of the litter layer increased slightly throughout the year, reaching 55 ± 20 ng gdw^{-1} inside and 42 ± 7 ng gdw^{-1} outside the pool. Litter %MeHg increased only to 1.5 % on the forest floor, while it increased dramatically in the vernal pool after inundation in late November, reaching 9 % by early spring. Measurements in pool benthic invertebrates show that two types of shredders bioaccumulated MeHg 4–9-fold relative to the leaf litter substrate. Overall, our results indicate significant production and bioaccumulation of MeHg in this vernal pool. This de novo MeHg could impact resident amphibians or be exported to the surrounding forest." (Authors) The focus was set on Trichoptera, Diptera, Amphipoda, and Isopoda with only one passing reference to Odonata.] Address: Benoit, Janina, Chemistry Dept, Wheaton College, Norton, MA, 02766, USA. E-mail: jbenoit@wheatonma.edu

13041. Bernal Sánchez, A. (2013): Odonatological conference at Natural park "Los Alcornocales", Cádiz, España. *Zygonyx* 1: 14-15. (in English) ["On Saturday 9th June, 2012 we organized a visit in order to observe and take pictures of the emblematic species in the Natural Park "Los Alcornocales". It was a calm and profitable day in which we visited two specific areas in the grid 30STF60." 18 Odonata species are listed including *Macromia splendens*, *Gomphus graslinii*, and *Oxygastrea curtisii*.] Address: not stated

13042. Berquier, C. (2013): Première observation en France d'*Orthetrum trinacria* (Selys, 1841) sur l'île de Corse (Odonata, Anisoptera: Libellulidae). *Martinia* 29(1): 15-18. (in French, with English summary) ["For the first

time in France, *O. trinacria* was found on 14 June 2012 at a coastal wetland in the area of Bastia, Corsica island. This brings to 101 the number of taxa of the French metropolitan odonatological fauna. Considerations about the expansion of this species to the north as a consequence of global warming are dealt with." (Author)] Address: Berquier, C., Office de l'Environnement de la Corse - Observatoire Conservatoire des Insectes de Corse, F-20250 Corte, France. E-mail: cyril.berquier@oec.fr

13043. Bionda, R.; Mekkes, J.-J.; Pompilio, L.; Mosini, A. (2013): Gli Odonati del Parco Naturale delle Alpi Veglia e Devero e aree limitrofe. *Rivista piemontese di Storia naturale* 34: 115-126. (in Italian, with English summary) ["Dragonflies of the Alpi Veglia and Devero Natural Park and surroundings (Piedmont, northern Italy): We present the results of 4 years of dragonfly monitoring in the Alpi Veglia and Devero Natural Park and Alpc Devero Conservation Area, Western Alps, Italia, alongside with records from two neighbouring sites. Altogether we recorded 17 species. *Somatochlora arctica* and *Leucorrhinia dubia* are for the first time recorded for Piedmont." (Authors)] Address: Bionda, R., Ente di gestione delle Aree protette dell'Ossola, viale Pieri 27, 28868 Varzo VB, Italy. E-mail: rada.bionda@libero.it

13044. Blanchon, Y.; Ronne, C. (2013): Afflux d'*Hemianax ephippiger* (Burmeister, 1839) en région PACA en 2011 (Odonata, Anisoptera: Aeshnidae). *Martinia* Hors-série, *Hemianax ephippiger* - migration 2011, mai 2013: 61-64. (in French, with English summary) ["A large and unusual influx of *Hemianax ephippiger* has been observed in 2011 in the Provence-Alpes-Côte d'Azur région (southern France). The records distribution was bimodal between April and November. Abundance peaked in September. Most of observations occurred along the littoral fringe with groups including up to several thousands of individuals. Evidences of breeding were noted in the Camargue." (Authors)] Address: Ronne, Charlotte, 2 8, avenue des Alliés, 13360 Roquevaire, France. E-mail: charlotte.ronne@yahoo.fr

13045. Blanckaert, K.; Garcia, X.-F.; Ricardo, A.-M.; Chen, Q.; Pusch, M.T. (2013): The role of turbulence in the hydraulic environment of benthic invertebrates. *Ecology* 6(4): 700-712. (in English) ["The role of turbulence in the dislodgment of benthic stream invertebrates from the riverbed was investigated experimentally in a laboratory flume. For the first time, technological advances allowed measuring the spatio-temporal patterns of turbulent flow around two free-moving invertebrates (*Aeshna cyanea* and *Somatochlora flavomaculata*). A specific methodology was developed for the analysis of turbulence around benthic invertebrates. The results confirmed two hypotheses: (i) on the contrary to sediment particles, invertebrates are not only sensitive to the peak values of the turbulent flow forcing but also to the temporal fluctuations in this flow forcing; and (ii)

the dominant temporal fluctuations are not due to local turbulent structures of the size of the invertebrate, but to turbulent structures that scale with the flow depth and are inherited from upstream. In 15 of the 17 conducted tests, important turbulent events that scale with the flow depth accompanied by rapid temporal flow fluctuations occurred at the moment of dislodgement. The dominant forcing was consistently a threefold increase in shear stress, and was related to a sweep event in 12 of the 17 tests. Thereby, the increase in longitudinal velocity was typically about 40%, which led to a 100% increase in drag force in comparison with the time-averaged drag force. These results enable a new understanding of the detailed hydraulic conditions leading to passive drift of stream invertebrates. In addition, they open new perspectives to improve models predicting the distribution of benthic invertebrates based on hydrodynamics by accounting for turbulence." (Authors)] Address: Blanckaert, K., State Key Laboratory of Urban & Regional Ecology, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, Shuangqing Road 18, 100085 Beijing, China. E-mail: koen.blanckaert@epfl.ch

13046. Boeglin, Y. (2013): Premières données d'*Hemianax ephippiger* (Burmeister, 1839) pour le département de la Loire (Odonata, Anisoptera: Aeshnidae). *Martinia Hors-série, Hemianax ephippiger - migration 2011, mai 2013*: 73-75. (in French) [France; five records from the Loire department were documented.] Address: Boeglin, Y., 7 rue Jacquemard, F-42110 Feurs, France. E-mail: yoann.boeglin@live.fr

13047. Bogan, M.T.; Boersma, K.S.; Lytle, D.A. (2013): Flow intermittency alters longitudinal patterns of invertebrate diversity and assemblage composition in an arid-land stream network. *Freshwater Biology* 58(5): 1016-1028. (in English) [Arizona, USA; "(1.) Temporary streams comprise a large proportion of the total length of most stream networks, and the great majority of arid-land stream networks, so it is important to understand their contribution to biotic diversity at both local and landscape scales. (2.) In late winter 2010, we sampled invertebrate assemblages in 12 reaches of a large arid-land stream network (including perennial and intermittent headwaters, intermittent middle reaches and perennial rivers) in south-east Arizona, U.S.A. Intermittent reaches had then been flowing for c. 60 days, following a dry period of more than 450 days. We sampled a subset of the perennial study reaches three more times between 2009 and 2011. Since intermittent reaches were dry during these additional sampling periods, we used assemblage data from two other intermittent streams in the study network (sampled in 2004–05 and 2010) to explore interannual variability in intermittent stream assemblage composition. (3.) Invertebrate richness was lowest in intermittent reaches, despite their often being connected to species-rich perennial reaches. The assemblages of these intermittent reaches were not simply a subset of the species in perennial

streams, but rather were dominated by a suite of stoneflies, blackflies and midges with adaptations to intermittency (e.g. egg and/or larval diapause). On average, 86% of individuals in these samples were specialists or exclusive to intermittent streams. Predators were 7–14 times more abundant in perennial than in intermittent reaches. (4.) Despite being separated by long distances (12–25 km) and having very different physical characteristics, the assemblages of perennial headwaters and rivers were more similar to one another than to intervening intermittent reaches, emphasising the prime importance of local hydrology in this system. (5.) The duration and recurrence intervals of dry periods, and the relative importance of dispersal from perennial refuges, probably influence the magnitude of biological differences between neighbouring perennial and temporary streams. Although perennial headwaters supported the highest diversity of invertebrates, intermittent reaches supported a number of unique or locally rare species and as such contribute to regional species diversity and should be included in conservation planning... We found invertebrate predators to be 7–14 times more abundant in perennial headwater and river reaches than in intervening intermittent reaches. While we did not estimate predator biomass, the dominant predators in intermittent reaches (Dytiscidae) were of a similar size to those in perennial reaches (Odonata and Dytiscidae). This suggests that intermittent reaches of arid-land streams may provide a significant refuge from invertebrate predation pressure." (Authors)] Address: Bogan, M.T., Department of Zoology, Oregon State University, 3029 Cordley Hall, Corvallis, OR 97331, USA. E-mail: boganmi@science.oregonstate.edu

13048. Bosch, J.G. van't (2013): Rare dragonflies In the Netherlands in 2006-2009, CWNO-reports 5. *Brachytron* 15(2): 112-122. (in Dutch, with English summary) ["This is the fifth report of the Dutch Committee for records of rare odonates (CWNO). In this report, records from the period 2006-2009 are reviewed. Acceptability is judged independently by each of the committee members, based on the documentation available (e.g. descriptions, drawings, pictures or collected material). Only accepted records are reviewed. Of each accepted record the Province, nearby city and/or municipality, location, date, number, gender and names of the observers are given. If photographs are available, this is also mentioned. In most cases only the first record is given. Subsequent records of the same individual or population are accepted on the basis of the first record and are not reviewed. For these first observation the locations are marked with an asterisk *. These locations are regarded as a 'known location'. New records from a known location will not be reviewed in the future. 2006 - A male and a female *Leucorrhinia caudalis* were observed near Maastricht (Limburg). This was the first record of this species since 1970. Unfortunately the species was not found there in subsequent years. Reproduction of *Anax parthenope* was proven for the first time, at one

location in Gelderland and one location in Limburg. In 2006, a very large influx of *Sympetrum meridionale* took place with observations of at least 30 individuals accepted. There were only four previous records of this species. 2007 - The first population of *Coenagrion scitulum* was discovered at Cadzand-Bad (Zeeuws-Vlaanderen). The fifth ever observation of *Anax ephippiger* was near Zeist (Utrecht). The first known reproduction of *Sympetrum meridionale* took place at Westvoorne (Zuid-Holland). A maximum of 15 individuals was seen. Numbers of this species in other parts of the country were also high. At least three males of *Somatochlora flavomaculata* were found near Wassenaar (Zuid-Holland). 2008 - A male *Leucorrhinio caudalis* was seen at Ottema Wiersma reserve (Friesland). Two new populations of *Somatochlora arctica* were discovered in Overijssel. A female *Sympetrum depressiusculum* was found at Hoge Veluwe (Gelderland), far from the few known reproduction locations. Exceptional wanderers of *Somatochlora flavomaculata* were found at Eemshaven (Groningen) and on the Wadden Sea island Schiermonnikoog (Friesland). 2009 - A male *Leucorrhinia caudalis* was photographed in De Weerribben (Overijssel) by a group of Belgian observers. A male *Ophiogomphus cecilia* was photographed at Groote Peel (Limburg), away from the two rivers where populations are known. One of the highlights of 2009 was the observation of at least six males and one female *Onychogomphus forcipatus* along the river Grensmaas near Meers (Limburg). *Coenagrion scitulum* was found at four new locations in Zeeuws-Vlaanderen." (Author)] Address: van't Bosch, J., Newtonplein 62, 2562 JX Den Haag, The Netherlands. E-mail: johanvantbosch@yahoo.co.uk

13049. Bota-Sierra, C.A.; Wolff Echeverri, M.I. (2013): Taxonomic revision of *Mesamphiagrion* Kennedy, 1920 from Colombia (Odonata: Coenagrionidae), with the description of four new species. *Zootaxa* 3718(5): 401-440. (in English, with Spanish summary) ["The genus *Mesamphiagrion* Kennedy, 1920, occurs in the Pante-pui region and northern Andes in South America and is most speciose in Colombia where the genus is less known. In this work, we record 10 species of *Mesamphiagrion* from Colombia, including four new species (*Mesamphiagrion gaudiimontanum* Bota-Sierra sp. nov., *M. nataliae* Bota-Sierra sp. nov., *M. rosleri* Bota-Sierra sp. nov., and *M. santainense* Bota-Sierra sp. nov.). We also re-describe the male of *M. risi* (De Marmels 1997) and describe the females of *M. risi*, *M. ovigerum* (Calvert, 1909), and *M. occultum* (Ris, 1918), which were previously unknown. Descriptions, photographs, illustrations, distribution maps, natural history notes, and a diagnostic key for males and females of *Mesamphiagrion* from Colombia are provided." (Authors)] Address: Bota-Sierra, C.A., Grupo de Entomología Universidad de Antioquia (GEUA), Medellín-Colombia. AA 1226, Colombia. E-mail: corneliobota@gmail.com

13050. Boudot, J.-P. (2013): *Hemianax* versus *Anax ephippiger* (Burmeister, 1839) (Odonata: Anisoptera: Aeshnidae). *Martinia Hors-série, Hemianax ephippiger - migration 2011, mai 2013*: 3-11. (in French, with English summary) ["Since its description under the name *Aeschna ephippigera* by Burmeister (1839), the Vagrant Emperor has changed of genus name several times. During a long time, it was included in the genus *Hemianax*, then transferred in the genus *Anax*, basing mostly on wings venation parameters. However modern cladistic studies use much more structural and/or genetic criteria. Waiting for more information in this field, the SFO prefers to maintain the Vagrant Emperor in the genus *Hemianax*." (Author)] Address: Boudot, J.-P., Limos - UMR 7137 CNRS / Université de Lorraine, Faculté des sciences, BP 70239, F-54506 - Vandoeuvre-lès-Nancy cedex, France. E-mail: jean.pierre.boudot@numericable.fr

13051. Bouton, F.M. (2013): Observation d'*Hemianax ephippiger* (Burmeister, 1839) en Sarthe au printemps 2011 (Odonata, Anisoptera: Aeshnidae). *Martinia Hors-série, Hemianax ephippiger - migration 2011, mai 2013*: 65-68. (in French, with English summary) [In 2011, *H. ephippiger* has been recorded for the first time in the Sarthe department, France. During the spring, a few individuals and breeding behaviour were observed in two alluvial gravel pits.] Address: Bouton, F.M., 18, rue Saint Pavin de la Cité, 72000 Le Mans, France. E-mail: fmb72@yahoo.fr

13052. Brossman, K. (2013): Tails and toxins: Exploring life history traits and predator-induced defenses in Eastern Red-spotted newts (*Notophthalmus viridescens viridescens*). M.Sc. thesis, The Graduate School, The Huck Institute of Life Sciences, The Pennsylvania State University: 68 pp. (in English) [Pennsylvania, USA; Chapter 2. *N. v. viridescens* larvae alter morphological but not chemical defences in response to predator cues focus on tadpole-dragonfly (*Anax junius*, *Aeschna sitchensis*, *Gomphaeschna antilope*, and *Aeschna juncea*) interactions: "Prey traits are often modified in response to exposure to predators, a phenomenon known as predator-induced phenotypic plasticity. Morphological plasticity in response to predator cues is well documented in amphibians; however, predator-induced chemical defences have received relatively little attention. *N. v. viridescens*, which possesses tetrodotoxin – a toxin for chemical defence, is most vulnerable to predation during its larval stage. I assessed whether exposing Eastern Red-spotted Newt larvae to predator scent cues (from dragonfly larvae) would elicit change in their morphological and chemical defences. Newt larvae exposed to scent cues of predatory dragonfly larvae exhibited significantly deeper tail depths, which should enhance predator escape ability by allowing them to swim faster, but did not differ in mass, snout-vent length or tail length. Newt larvae toxin concentrations were not significantly affected by exposure to these predator cues. Larval toxicity may be maternally-derived and in-

flexible, or induced toxicity may only be detectable later in development. Predator-induced phenotypic plasticity, especially of chemical defences, warrants greater attention, as potentially important outcomes of species interactions remain unclear." (Author)] Address: Brossman, Kelly, The Pennsylvania State University, The Graduate School, The Huck Institute of Life Sciences

13053. Buczyński, P.; Zawal, A.; Dąbkowski, P.; Szlauer-Lukaszewska, A. (2013): Dragonflies (Odonata) of the nature reserve "Świdwie". *Parki Narodowe i Rezerваты Przyrody* 32(2): 3-13. (in Polish, with English summary) ["32 odonate species were recorded in the year 2010 in the nature reserve "Świdwie" (NW Poland). Ecological, zoogeographical and conservation aspects of the fauna were analysed." (Authors)] Address: Buczyński, P., Dept of Zool., Maria Curie-Skłodowska University, Akademicka 19, PL-20-033 Lublin, Poland. E-mail: pawbucz@gmail.com

13054. Buczyński, P. (2013): Polish and dedicated to Poland odonatological papers. 11. The year 2012. *Odonatrix* 9(2): 72-76. (in Polish, with English summary) [The author presents a list of Polish and dedicated to Poland odonatological papers that were published in the year 2012. In the reported time period, 47 papers of various kind were published. One paper published in the year 2011 is given too." (Author)] Address: Buczyński, P., Dept of Zool., Maria Curie-Skłodowska University, Akademicka 19, PL-20-033 Lublin, Poland. E-mail: pawbucz@gmail.com

13055. Buczyński, P.; Tończyk, G. (2013): Dragonflies (Odonata) of Tuchola forests (northern Poland). 1. *Wdzydzki Landscape Park*. *Annales UMCS, Biologia* 68(1): 75-103. (in English, with Polish summary) ["The Wdzydzki Landscape Park lies in the Tuchola Forests which are among the areas of key importance for conservation of dragonflies in Poland. In the years 2002-2009, 55 dragonfly species were recorded in the park and its buffer zone. Lakes and Sphagnum bogs housed the highest species richness. Among the recorded species, one is included in the IUCN Red List of Threatened Species, two in the European Red List, two in the Polish Red List, ten species legally protected in Poland and ten "umbrella species". Peatbog lakes and Sphagnum bogs were most important for conservational issues. Dragonfly fauna of the studied area is among the species-richest in Poland. Its conservation value is high due to occurrence of stenotopic species, its importance for the conservation of rare and endangered species as well as for maintenance of odonatocoenoses typical of a range of natural waters. It results mostly from the forest coverage and high richness, variety and good ecological state of the surface waters. Interesting from the zoogeographical point of view was development of some thermophilic species in the lake littoral. It may be an indication of changes in thermal regime of surface waters, related to climate warming." (Authors)] Address:

Buczyński, P., Dept of Zool., Maria Curie-Skłodowska University, Akademicka 19, PL-20-033 Lublin, Poland. E-mail: pawbucz@gmail.com

13056. Büsse, S.; Hörschemeyer, T. (2013): The thorax musculature of Anisoptera (Insecta: Odonata) nymphs and its evolutionary relevance. *BMC Evolutionary Biology* 2013, 13:237 doi:10.1186/1471-2148-13-237: 13 pp. (in English) ["Background: Among the winged insects (Pterygota) the Odonata (dragon- and damselflies) are special for several reasons. They are strictly aerial predators showing remarkable flight abilities and their thorax morphology differs significantly from that of other Pterygota in terms of the arrangement and number of muscles. Even within one individual the musculature is significantly different between the nymphal and adult stage. Results: Here we present a comparative morphological investigation of the thoracic musculature of dragonfly (Anisoptera) nymphs. We investigated representatives of the Libellulidae, Aeshnidae and Cordulegasteridae and found 71 muscles: 19 muscles in the prothorax, 26 in the mesothorax and 27 in the metathorax. Nine of these muscles were previously unknown in Odonata, and for seven muscles no homologous muscles could be identified in the neopteran thorax. Conclusion: Our results support and extend the homology hypotheses for the thoracic musculatures of Odonata and Neoptera, thus supplementing our understanding of the evolution of Pterygota and providing additional characters for phylogenetic analyses comprising all subgroups of Pterygota." (Authors)] Address: Büsse, S., Abteilung Morphologie, Systematik & Evolutionsbiologie, JFB-Institut für Zoologie & Anthropologie der Georg-August-Universität Göttingen, Germany. E-mail: sebastian.buesse@biologie.uni-goettingen.de

13057. Büsse, S.; Hörschemeyer, T. (2013): The thorax musculature of Anisoptera nymphs (Odonata). 6th Dresden Meeting on Insect Phylogeny, Dresden, September 27–29, 2013. Abstracts — Poster Presentations: 40-41. (in English) [Verbatim: Among the winged insects (Pterygota) the Odonata are special for several reasons. Their thorax morphology differs significantly from that of other Pterygota by a reduced number of muscles (e.g. Asahina 1954; Maloeuf 1935). Even within one individual, between the nymph and adult stage, the musculature is significantly different (e.g. Maloeuf 1935). Here we present a comparative morphological investigation of the thoracic musculature of Anisoptera nymphs. For representatives of the Libellulidae, Aeshnidae and Cordulegasteridae we describe 71 muscles, 19 muscles of the prothorax, 26 muscles of the mesothorax and 27 muscles of the metathorax. This includes nine muscles that were so far unknown in Odonata, as well as seven muscles for which no homologous muscles could be identified in the neopteran thorax. Our results support and extend the homology hypotheses for the thoracic musculature of Odonata and Neoptera (Büsse et al. 2013) thus supplementing our understand-

ing of the evolution of Pterygota and providing additional characters for phylogenetic analyses comprising all subgroups of Pterygota. References: Asahina S. 1954: A morphological study of a relic dragonfly *Epiophlebia superstes* Selys (Odonata, Anisozygoptera). Tokyo: The Japan Society for the Promotion of Science 153 pp. — 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 — Maloeuf N.S.R. 1935: The postembryonic history of the somatic musculature of the dragonfly thorax. Journal of Morphology 58: 87–115.] Address: Büsse, S., Abteilung Morphologie, Systematik & Evolutionsbiologie, JFB-Institut für Zoologie & Anthropologie der Georg-August Universität Göttingen, Germany

13058. Büsse, S. (2013): The Thorax of Odonata (Insecta) including remarks on evolution and phylogeny. Dissertation. Georg-August-Universität Göttingen: 211 pp., app.-I. ["The aim of my dissertation was to study the morphology and evolution of the thorax of damselflies and dragonflies (Odonata). One focus was the morphology of the thorax musculature and the homology between Odonata and a generalized Neoptera thorax as well as ground pattern of Pterygota (all winged insects). Furthermore, wing base skeletal element morphology was studied to extend and underscore the recent homology hypotheses. Beyond that, I examined the morphology, genetics and biogeography, and relating phylogeny of a very rare and enigmatic group of Odonata, *Epiophlebia*. *Epiophlebia* present a unique position within the Odonata. The group of *Epiophlebia* is closely related to all dragonflies but represents the only group of Odonata not belonging to dragonflies (Anisoptera) or damselflies (Zygoptera). The four known species of *Epiophlebia* are adapted to an extreme habitat in Asian mountain regions. They prefer cold and swiftflowing mountain streams at an altitude ranging from 1000 to 3500 meters above sea level (stenoecious lifestyle). The habitats of the *Epiophlebia* species are highly separated from each other on the Asian continent. Their respective range shows no overlap areas today, which typifies speciation via spatial isolation (separation). Results of genetic investigation of three of the four species' DNA segments (sequences) show surprising, extreme homogeneity. These results lead to a biogeographical scenario, which assumes a shared habitat of *Epiophlebia* during the Würm ice age (approximately 20,000 years ago). When the warming phase started, *Epiophlebia*-populations were separated into distinct populations each located in a different glacial refuge (simplified, cold withdraw areas). This short time frame could explain the genetic homogeneity observed. Nevertheless, the question of the species status of *Epiophlebia* remains: Is there only one species – *Epiophlebia superstes* – in four different populations or are there four different species? During a subsequent morphological study the species status at least of *Epio-*

phlebia laidlawi Tillyard, 1921 could also be confirmed. Another study that draws directly on the genetic investigation of *Epiophlebia*, comprises a genetic sequence (S4-region of the 28s rRNA gene), which is suitable as a universal species identification tool for insects. Most insect specimens from all insect groups were successfully identified to species level with this tool. The investigation comprised 85 samples of 65 insect species, with at least one species per major clade of which the former represented a genus. We were able to demonstrate that our analysis system – which provides universal applicability and extended functionality – has advantages over the existing one (e.g. COI). The S4-method is applicable for degraded DNA that has, for example, been caused by aging, weathering or chemical influences. Investigation of the Odonata thorax comprised three studies. Two of the musculature and sclerites of adult Zygoptera flight apparatus and one of the entire nymphal Anisoptera thorax musculature. The aim was to understand and highlight peculiarities of the odonatan thorax. To obtain the data and reach the best overall result possible, traditional morphological methods – such as dissecting and hand drawing – were combined with one of the latest morphological methods, which included computer tomography (SR!CT) aided by 3D reconstruction. By doing this, we discovered a total of 11 new, previously unknown muscles for Odonata. These morphological data were used to present the first complete homologization scheme of Odonata and neopterous insect thorax musculature. Furthermore, the homologies of the skeletal elements of the flight apparatus were confirmed and distinctly enhanced. This study also mark the first time muscle attachment points were discussed as important homology criteria. As a whole, these homology assessments allow unprecedented direct comparison between Odonata, which have a highly derived flight apparatus, and all other insects. Insights into the evolution and ground pattern of Odonata, even of all winged insects (Pterygota), were consequently gained. The homologies enable comparison and provide a complete new set of characters for subsequent analysis of the relationship (phylogenetic analysis) of Pterygota. A key, wing base sclerites' characteristic – the subalare –, points to the phylogenetic hypothesis of Paleoptera [Odonata+Ephemeroptera (mayflies)]. A generalized Odonata thorax that includes all recently known muscles will allow simplified work and access to the complex structure for future studies and will aid in furthering knowledge. This generalized thorax might be the initial point for a hypothetical ground pattern of pterygote insects and will allow insights into the development and evolution of the insect flight apparatus." (Author)] Address: Büsse, S., Abteilung Morphologie, Systematik & Evolutionsbiologie, JFB-Institut für Zoologie & Anthropologie der Georg-August Universität Göttingen, Germany

13059. Büsse, S. (2013): Generalized Odonata thorax. 6th Dresden Meeting on Insect Phylogeny, Dresden,

September 27–29, 2013. Abstracts — Poster Presentations: 41. (in English) [Verbatim: The odonatan thorax is a highly specialized and therefore a highly derived character system (e.g. Asahina 1954; Büsse et al. 2013). The generalized odonatan thorax shows all the muscles that have been found in Odonata to date. It compiles all the results of Büsse et al. (2013) and Büsse & Hörnschemeyer (subm.) and is completed by four muscles located independently by both Asahina (1954) and Maloeuf (1935), only. For simplicity's sake, for comparison to Neoptera in particular, the generalized odonatan thorax is shaped like a nymphal thorax, which resembles the neopteran thorax. In order to present an overview, all structures, attachment points and directions have been simplified. It includes all muscles found homologous to Neoptera (Büsse et al. 2013; Büsse & Hörnschemeyer subm.) and the newly described Odonata muscles with no homologies to neopteran thorax (Büsse & Hörnschemeyer subm.). The aim of the generalized odonatan thorax is to gain clear understanding of Odonata's muscle setup. It also represents an initial attempt to develop a hypothetical odonatan ground pattern of a stem-group representative. References: Asahina S. 1954: A morphological study of a relic dragonfly *Epiophlebia superstes* Selys (Odonata, Anisozygoptera). Tokyo: The Japan Society for the Promotion of Science 153 pp. — 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 — Büsse S., Hörnschemeyer T. submitted: The nymphal thorax musculature of Anisoptera (Insecta: Odonata) and its evolutionary relevance. BMC Evolutionary Biology. — Maloeuf N.S.R. 1935: The postembryonic history of the somatic musculature of the dragonfly thorax. Journal of Morphology 58: 87–115.] Address: Büsse, S., Abteilung Morphologie, Systematik & Evolutionsbiologie, JFB-Institut für Zoologie & Anthropologie der Georg-August Universität Göttingen, Germany

13060. Butler, S.G.; Orr, A.G. (2013): The larva of *Heliaeschna simplicia* Karsch, 1891 (Anisoptera: Aeshnidae). *Odonatologica* 42(2): 151-156. (in English) ["The female larva is figured and described for the first time, based on exuviae from a reared specimen and an F larva collected from runnels in peat swamp forest in Sarawak, Malaysia. The larva is compared with those of *Heliaeschna filostyla* Martin, 1906 and *H. uninervulata* Martin, 1909, the only other species of the genus so far described, as well as certain other aeshnid genera. Notes on habitat and behaviour are included." (Author)] Address: Butler S.G., Red Willow, All Stretton, Shropshire SY6 GHN, UK. E-mail: sgbutler15@btopenworld.com

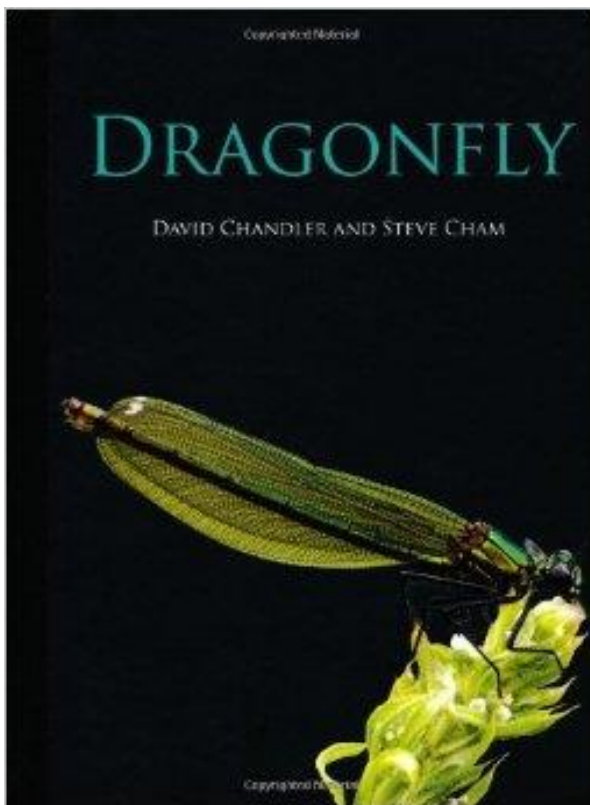
13061. Carle, F.L.; May, M.L.; Kjer, K.M. (2013): A supermatrix approach to the phylogeny of Odonata. 6th Dresden Meeting on Insect Phylogeny, Dresden, September 27–29, 2013. Abstracts — Oral Presentations: 21. (in

English) [Verbatim: Over the past decade, a number of research teams have explored the phylogeny of Odonata with molecular data. Each has targeted their own set of genes, and their own taxa, and little effort has been made to coordinate efforts, or consolidate data from multiple sources. Here we construct a supermatrix from 4 independent genes (28S, 18S; 12S, 16S, COI, COII; EF1a and H3) and over 500 species, representing all families of Odonata. Our phylogenetic results are largely congruent with those we reported in Carle et al. 2008, with monophyletic suborders (Anisoptera and Zygoptera). We find coenagrionoids and calopterygoids together with lestoids relatively basal. We find *Epiophlebia* as sister to Anisoptera, with aeshnoids at the base of the Anisoptera. We discuss our strategies for alignment, data exclusion, combining taxa, discovering contaminants and reducing missing data. References: Carle F.L., Kjer K.M., May M.L. 2008: Evolution of Odonata, with special reference to Zygoptera. *Arthropod Systematics & Phylogeny* 66: 37–44.] Address: Frank L. Carle (Rutgers University, Dept of Entomology, 93 Lipman Dr., New Brunswick, NJ 08901, USA

13062. Carvalho, F.G.; Pinto, N.S.; Oliveira Júnior, J.M.B.; Juen, L. (2013): Effects of marginal vegetation removal on Odonata communities. *Acta Limnologica Brasiliensia* 25(1): 10-18. (in English, with Portuguese summary) ["Aim: Here we assess the effects of habitat degradation on individuals of the two suborders of Odonata community of Borecaia river sub-basin. More specifically, we tested the hypothesis that Anisoptera richness would be positively affected by removal of vegetation; on the other hand, Zygoptera richness would be adversely affected by virtue of their ecophysiological requirements; Methods: We selected 10 streams of similar orders, six preserved and four degraded. Streams characterized as preserved had values of Index of Habitat Integrity (IHI) above 0.70 (0.77 ± 0.07 , mean \pm SD) and continuous forest on both sides with a minimum width of 70 meters. Each site was sampled three times on different days. The effect of vegetation removal on richness was assessed using richness estimated by first order Jackknife; Results: Decreased physical integrity (measured with IHI) of streams had no significant effect on the estimated richness to Odonata in general. However, the estimated richness of Anisoptera showed an inverse relationship with the integrity ($r^2 = 0.485$, $P = 0.025$), i.e., there was a reduction in their species richness with increasing integrity; Discussion: As a general pattern, Anisoptera presents higher richness in an altered site; on the other hand, Zygoptera presents higher richness in a preserved one. This pattern suggests that Odonata needs to be considered at the sub-order level to access the effects of habitat degradation on these insects. Because of its restrictions ecophysiological Odonata varied widely in their composition and species richness between the two types of environments, it reinforces the potential of the order of studies and environmental monitoring also shows that Zygoptera be more affected by changes in

habitat. However, further studies including more samples and different streams are need to confirm this pattern, being an interesting line of research for future works." (Authors)] Address: Carvalho, F.G., Curso de Especialização em Perícia Ambiental, Pontífica Universidade Católica de Goiás – PUC Goiás, Av. Universitária, 1069, Área 4, Bloco A, Campus I, Setor Universitário, CEP 74605-010, Goiânia, GO, Brazil. E-mail: nandocarvalhog@hotmail.com

13063. Catil, J.-M. (2013): Gomphus simillimus Selys, 1840 au menu des hirondelles de fenêtre (Delichon urbica) (Odonata, Anisoptera: Gomphidae). Martinia 29(1): 42. (in French) [9 vi 2011, Mauvezin (Gers [32], France); in the nest of a house martin (Delichon urbica), two teneral specimens of G. simillimus were found. Obviously they had not been consumed by the young. The author proposed that the gomphids had been to large to be devoured by the nestlings.] Address: Catil, J.-M., CPIE Pays Gersois, Au Château, F-32300 L'Isle de Noé, France. E-mail: jmcatil@yahoo.fr



13064. Chandler, D.; Cham, S. (2013): Dragonfly. New Holland's Natural History Monographs 4. 128 pp (in English). ["Supremely colourful, among the most voracious predators of the insect world and on the wing for more than 300 million years, dragonflies and damselflies capture the imagination in so many ways. Yet many aspects of their fascinating lives are little-known to humans. Dragonfly provides an insight into a hidden world through engaging text and stunning close-up photography. Dragonfly combines insightful writing with rarely seen images of the life and behaviour of the

world's dragonfly and damselfly species. There are chapters on subjects such as hunting, courtship and the emergence of the nymphs and their subsequent transformation into adult dragonflies. These insects are further brought to life through the personal experiences of the author and photographers, and these are woven into the text." (Publishers)]

13065. Chen, J.; Yu, X. (2013): Odonata diversity of the middle and lower reaches of the Red River basin, Yunnan, China. Journal of Insect Biodiversity 1(9): 1-11. (in English) ["Eighty six species of Odonata are recorded from the middle and lower reaches of the Red River basin. Archineura hetaerinoidea is recorded from China for the first time. Five genera and five species are new to Yunnan Province. Among the six types of odonate habitats, forest streams have the highest species diversity whereas ponds have the most species shared with other habitats. Both of these two habitats are important in biodiversity conservation and need urgent protection." (Authors)] Address: Yu, X., Institute of Entomology, College of Life Sciences, Nankai University, Tianjin, 300071, China. E-mail: lannysummer@163.com

13066. Chen, Y.H.; Skote, M.; Zhao, Y.; Huang, W.M. (2013): Dragonfly (Sympetrum flaveolum) flight: kinematic measurement and modelling. Journal of Fluids and Structures 40: 115-126. (in English) ["Highlights: • The kinematics of the wing is studied thoroughly using high-speed videography. • The costa is shown to be two parts hinged with physical constraint of forty degrees. • Two flapping patterns are revealed: simple figure-eight and a double figure-eight. • Kinematic modelling is established. • Previous misunderstandings regarding the wing rotation during pronation are clarified. The kinematics of the flapping hindwing of S. flaveolum is investigated. Several tracking points along the leading edge and trailing edge of the hindwing are recorded and studied using high-speed videography. By applying more tracking points along the leading edge around the nodus, it is shown that the leading edge is not one rigid piece, but two pieces hinged at the nodus with physical constraint of forty degrees. Such arrangement also eases the difficulties in rotating the wing during pronation by bending the leading edge forward and flattening the wing. From the kinematic experiments, two flapping patterns of the dragonfly wing are revealed as a simple figure-eight and a double figure-eight flapping pattern. Kinematic modelling of the two flapping patterns is then established by transforming the flapping motions into angular rotations about the pivoting wing root in a local body-fixed spherical coordinate system." (Authors)] Address: Skote, M., School of Mechanical & Aerospace Engineering, Nanyang Technological Univ., 50 Nanyang Av., Singapore 639798, Republic of Singapore. E-mail: mskote@ntu.edu.sg

13067. Cheng, S.; Cheng, L.; Zhang, C.; Wushu, Y.; Yuanrong, B.; Mao, Y. (2013): Observations on diet of Cab-

ot's Tragopan at Huanggangshan in Jiangxi Province, China. Chinese Journal of Zoology 48(1): 36-42. (in Chinese, with English summary) ["Food composition and behaviour of Tragopan caboti were studied with methods of field observation and captive observation simulated natural environment from May, 2004 to June, 2012 in Jiangxi Wuyishan National Nature Reserve. 78 species (categories) were recorded for food intake by T. caboti during the study period. Among of these foods, 74 species belong to higher plants in 39 families and 65 genera] ... including Odonata (without any taxonomic details) [respectively. Research results show that T. caboti is phytophagous and trophic broad with strong ability of ingestion learning and environment suitability. But the feeding habits of T. caboti are significant different in different environment condition." (Authors)] Address: Cheng, S., Jiangxi Wuyishan National Nature Reserve Yanshan 334500 China. E-mail: songlin513@126.com

13068. Cherevichko, A.V.; Mikhailov, A.E. (2013): Amphibiotic insects (Ephemeroptera, Odonata, Plecoptera, Trichoptera) in the benthos of intensely polluted small rivers in Pskov Oblast. Materials of the Fifth All-Russia Symposium on Amphibiotic and Aquatic Insects / Papanin Institute for Biology of Inland Waters, Russian Academy of Sciences. – Yaroslavl: Filigran, 2013. – 254 pp: 233-236. (in Russian, with English summary) ["The composition of macrozoobenthos of some small rivers in Pskov Oblast has been studied in areas with intensely polluted with undertreated wastewaters of enterprises or populated areas. Considerably decreased species richness and abundance of amphibiotic insects have been revealed in areas of wastewater discharge, compared to background values of these parameters." (Authors) The following Odonata species were listed: Calopteryx splendens, C. virgo, Cordulia aenea, Gomphus vulgatissimus, Ischnura elegans, Leucorrhinia rubicunda, Libellula fulva, Lestes viridis, Platycnemis pennipes, and Sympetrum vulgatum.] Address: Cherevichko, A.V., Pskov Branch, State Res. Inst. of Lake & River Fisheries ul. Gorkogo 13, Pskov, 180007, Russia. E-mail: acherevichko@mail.ru

13069. Clausnitzer, H.-J.; Clausnitzer, C.; Hengst, R. (2013): Veränderung der Libellenfauna in 43 Jahren im NSG Breites Moor bei Celle, Niedersachsen (Odonata). Libellula 32(1/2): 31-44. (in German, with English summary) [Germany; "In total, 49 dragonfly species were observed. In the years 1970-2001, the species composition remained almost constant. In the years 2002-2012, however, the species number increased. Those species with a Mediterranean origin especially immigrated for the first time and became successfully established. On the other hand, two species reproduced no longer in the nature reserve. Climate change and habitat succession are discussed as causes for this development." (Authors)] Address: Clausnitzer, H.-J., Eichenstr. 11, 29348 Eschede, Germany. E-mail: H.-J.Clausnitzer@t-online.de

13070. Conniff, K.; Bedjanic, M. (2013): Two new endemic representatives of the genus Archibasis from Sri Lanka (Zygoptera: Coenagrionidae). Odonatologica 42(3): 189-202. (in English) ["A. lieftincki sp. n. (holotype male: Gin Ganga river at Deniyaya; Matara distr.; Southern prov.; N 6.34°, E 80.56°; 02-V-2003; to be deposited at Sri Lanka National Museum, Colombo) and A. oscillans hamvellanensis subsp. n. (holotype male: Hanwella; Colombo distr.; Western prov.; N 6.90°, E 80.09°; 06-11-2011; to be deposited at Sri Lanka National Museum, Colombo) are described as new to science. Distribution, habitat requirements and threat status of these two endemic taxa are briefly commented." (Authors)] Address: Conniff, Karen, do ICIMOD, GPO Box 3226 Kumalthar, Kathmandu, Nepal. E-mail: karoconniff@gmail.com

13071. Dayaram, A.; Potter, K.A.; Moline, A.B.; Rosenstein, D.D.; Marinov, M.; Thomas, J.E.; Breitbart, M.; Rosario, K.; Argüllo-Astorga, G.R.; Varsani, A. (2013): High global diversity of cycloviruses amongst dragonflies. Journal of General Virology 94: 1827-1840 (in English) ["Members of the family Circoviridae, specifically the genus Circovirus, were thought to infect only vertebrates; however, members of a sister group under the same family, the proposed genus Cyclovirus, have been detected recently in insects. In an effort to explore the diversity of cycloviruses and better understand the evolution of these novel ssDNA viruses, here we present five cycloviruses isolated from three dragonfly species (Orthemtrum sabina, Xanthocnemis zealandica and Rhionaeschna multicolor) collected in Australia, New Zealand and the USA, respectively. The genomes of these five viruses share similar genome structure to other cycloviruses, with a circular ~1.7 kb genome and two major bidirectionally transcribed ORFs. The genomic sequence data gathered during this study were combined with all cyclovirus genomes available in public databases to identify conserved motifs and regulatory elements in the intergenic regions, as well as determine diversity and recombinant regions within their genomes. The genomes reported here represent four different cyclovirus species, three of which are novel. Our results confirm that cycloviruses circulate widely in winged-insect populations; in eight different cyclovirus species identified in dragonflies to date, some of these exhibit a broad geographical distribution. Recombination analysis revealed both intra- and inter-species recombination events amongst cycloviruses, including genomes recovered from disparate sources (e.g. goat meat and human faeces). Similar to other well-characterized circular ssDNA viruses, recombination may play an important role in cyclovirus evolution." (Authors)] Address: Varsani, A., School of Biological Sciences, University of Canterbury, Christchurch 8140, New Zealand. E-mail: arvind.varsani@canterbury.ac.nz

13072. Davenport, J.M.; Chalcraft, D.R. (2013): Non-consumptive effects in a multiple predator system reduce the foraging efficiency of a keystone predator. Ecology and Evolution 3(9): 3063-3072. (in English) [

"Many studies have demonstrated that the nonconsumptive effect (NCE) of predators (*Anax* sp.) on prey traits can alter prey demographics in ways that are just as strong as the consumptive effect (CE) of predators. Less well studied, however, is how the CE and NCE of multiple predator species can interact to influence the combined effect of multiple predators on prey mortality. We examined the extent to which the NCE of one predator altered the CE of another predator on a shared prey and evaluated whether we can better predict the combined impact of multiple predators on prey when accounting for this influence. We conducted a set of experiments with larval dragonflies, adult newts (a known keystone predator), and their tadpole prey. We quantified the CE and NCE of each predator, the extent to which NCEs from one predator alters the CE of the second predator, and the combined effect of both predators on prey mortality. We then compared the combined effect of both predators on prey mortality to four predictive models. Dragonflies caused more tadpoles to hide under leaf litter (a NCE), where newts spend less time foraging, which reduced the foraging success (CE) of newts. Newts altered tadpole behaviour but not in a way that altered the foraging success of dragonflies. Our study suggests that we can better predict the combined effect of multiple predators on prey when we incorporate the influence of interactions between the CE and NCE of multiple predators into a predictive model. In our case, the threat of predation to prey by one predator reduced the foraging efficiency of a keystone predator. Consequently, the ability of a predator to fill a keystone role could be compromised by the presence of other predators." (Authors)] Address: Davenport, J.M., Divi. Biol. Sciences, Univ. of Montana, Missoula, Montana 59812, USA. E-mail: jon.davenport@mso.umt.edu

13073. De Knijf, G.; Adriaens, D.; Van Elegem, B.; Paelinckx, D. (2013): Natura 2000 habitats – more than floral Criteria and use of typical fauna species when assessing the conservation status of a Natura 2000 habitat. *Natuur.focus* 11(3): 109-120. (in Dutch, with English summary) ["The European Habitats Directive dictates that the assessment of the conservation status of a habitat type takes, amongst others, into account the conservation status of its typical fauna species. Therefore, a list of typical species for each habitat type is required, together with a description of the method used to assess their conservation status. When choosing typical fauna species the following considerations should be taken into account: 1) typical species should be good indicators for a favourable habitat quality, 2) it should be possible to detect typical species by non-destructive and inexpensive means and 3) the list of typical species should ideally remain stable over the mid- to long-term. Here we present a list of 153 typical fauna species for the different habitat types present in Flanders. Only species reproducing in a specific habitat type were selected. Distinction is made between species exclusively (type E) present in the habitat type, characteristic species (type K) having half of their popula-

tion reproducing in it, and species which are consistently present (type Ca and Cab), but not restricted to it. Assessment of the status of typical species can be based on best expert opinion, general national surveys, site-based sampling or Red List information. A typical species which is likely to become extinct within the next ten years will automatically lead to an overall unfavourable conservation status of that habitat type. Otherwise assessment will be based on the expected decline of a certain percentage of all typical species for a certain habitat type." (Authors) Odonata were prominently represented as indicator species for freshwater habitats: *Aeshna isocetes*, *A. juncea*, *Brachytron pratense*, *Calopteryx splendens*, *Coenagrion hastulatum*, *C. lunulatum*, *C. pulchellum*, *Cordulegaster boltonii*, *Gomphus vulgatissimus*, *Leucorhinia dubia*, *L. pectoralis*, *L. rubicunda*, *Libellula fulva*, *Somatochlora arctica*, *S. flavomaculata*, and *Sympetrum depressiusculum*.] Address: Knijf, G. de, Instituut voor Natuurbehoud, Kliniekstraat 25, B-1070 Brussel, Belgium. E-mail: geert.deknijf@inbo.be

13074. De Knijf, G.; Demolder, H. (2013): Early spring observations of Odonata from Cyprus. *Libellula* 32(1/2): 59-74. (in English, with German summary) ["During a two-week visit to the island of Cyprus in April 2012, 17 species of dragonfly were observed. In particular, the discovery of a large population of *Lestes macrostigma* is worth mentioning, as this species has not been reported in Cyprus for over 60 years. Concerning the flight period, very early records in the season for the eastern Mediterranean were noted for *Epallage fatime*, *Onychogomphus forcipatus albotibialis*, *Orthetrum taeniolatum* and *Selysiothemis nigra*. For the latter, this is the earliest observation date ever reported. Furthermore, several very old individuals of *Sympetrum meridionale* and *S. striolatum* were seen in early April, providing strong evidence for these species to be able to overwinter in small numbers as adults. These are the first worldwide records of overwintering for *S. meridionale* in the adult stage." (Authors)] Address: Knijf, G. de, Instituut voor Natuurbehoud, Kliniekstraat 25, B-1070 Brussel, Belgium. E-mail: geert.deknijf@inbo.be

13075. De Marmels, J.; Gaspar Neiss, U. (2013): Description of the larva of *Neuraeschna claviforcipata* Martin, 1909 (Insecta: Odonata: Aeshnidae). *Zootaxa* 3721 (1): 97-100. (in English) ["The ultimate stadium larva of *N. claviforcipata* is described and illustrated based on an F-0 exuvia of a reared female from northern Amazonas State, Brazil. This larva differs from the other two known larvae of the genus in lacking the spiny lateral prominence of the mandible, and in having only a short spine each side of the median cleft of the prementum; labium is shorter and cercus longer. Noteworthy is the presence of a hair brush on each occipital lobe behind mesal angle of compound eye. The larva was found in a small blackwater pool with abundant leaf litter in an open, "campina"-type habitat, with sandy soil and low, bushy vegetation." (Authors)] Address: De Marmels, J., Museo

del Instituto de Zoología Agrícola "Francisco Fernández Yépez" (MIZA), Facultad de Agronomía, Universidad Central de Venezuela, Apartado 4579, Maracay 2101-A, Venezuela. E-mail: demarmjc@gmail.com

13076. Dijkstra, K.-D.B.; Bechly, G.; Bybee, S.M.; Dow, R.A.; Dumont, H.J.; Fleck, G.; Garrison, R.W.; Hämäläinen, M.; Kalkman, V.J.; Karube, H.; May, M.L.; Orr, A.G.; Paulson, D.; Rehn, A.C.; Theischinger, G.; Trueman, J.W.H.; van Tol, J.; von Ellenrieder, N.; Ware, J. (2013): The classification and diversity of dragonflies and damselflies (Odonata). In: Zhang, Z.-Q. (Editor). *Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness*. *Zootaxa* 3703 (1): 36-45. (in English) ["An updated classification and numbers of described genera and species (until 2010) are provided up to family level. We argue for conserving the family-group names Chlorocyphidae, Euphaeidae and Dicterididae, as well as retaining Epiophlebiidae in the sub-order Anisozygoptera. Pseudostigmatidae and New World Protoneuridae are sunk in Coenagrionidae and Old World Protoneuridae in Platycnemididae. The families Amphipterygidae and Megapodagrionidae as traditionally recognized are not monophyletic, as may be the superfamily Calopterygoidea. The proposal to separate Chlorogomphidae, Cordulegastridae and Neopetaliidae from Libelluloidea in their own superfamily Cordulegastroidea is adopted. Macromiidae, Libellulidae and Synthemitidae and a restricted Corduliidae are accepted as families, but many genera of Libelluloidea are retained as incertae sedis at present. 5952 extant species in 652 genera have been described up to 2010. These are placed here in 30 families; recent proposals to separate additional families from Amphipterygidae and Megapodagrionidae have not yet been incorporated." (Authors)] Address: Dijkstra, K.D., Netherlands Centre for Biodiversity Naturalis, P.O. Box 9517, NL-2300 RA, Leiden, The Netherlands. E-mail: dijkstra@nrm.nl

13077. Din, A.U.; Zia, A.; Bhatti, A.R.; Khan, M.N. (2013): Odonata naiads of Potohar Plateau, Punjab, Pakistan. *Pakistan J. Zool.* 45(3): 695-700. (in English) ["A series of collection surveys conducted during two consecutive years (2011-12) to explore Odonata naiads of Potohar plateau revealed 34 species under 6 families and 21 genera. Specimens were collected from different aquatic habitats that include almost all sort of waters including static, flowing, acidic, alkaline, brackish or saline. Details showing valid names, collection localities, ecological observations, number of individual male/female collected are provided for each species." (Authors) In any case, the identification of the Westmediterranean *Boyeria irene* should be revalidated.] Address: Zia, S.A., National Insect Museum, National Agriculture Research Centre, Islamabad – Pakistan. E-mail: saiyedahmed@yahoo.com

13078. Dow, R.A.; Reels, G.T.; Butler, S.G. (2013): Previously unpublished Odonata records from Sarawak,

Borneo. Part II. Kubah National Park. *Faunistic Studies in South-East Asian and Pacific Island Odonata* 6: 1-27. (in English, with Bahasa Melayu summary) [Malaysia; "Records of Odonata from Kubah National Park, near Kuching in west Sarawak, are presented. Eighty-five species are known from the national park. Notable records include *Drepanosticta drusilla*, *Rhinocypha* species cf. *spinifer*, *Bornagriolestes* species, *Anaciaeschna* species and *Macromidia genialis erratica*." (Authors)] Address: Dow, R.A., Naturalis Biodiversity Centre, P.O. Box 9517, 2300 RA Leiden, The Netherlands. E-mail: rory.dow230@yahoo.co.uk

13079. Dow, R.A. (2013): *Drepanosticta burbachi* spec. nov. from Sarawak, Borneo, a new species allied to *D. dulitensis* Kimmins, with notes on related species (Zygoptera: Platystictidae). *Odonatologica* 42(3): 203-210. (in English) ["The new species is described and compared with its closest congener, *D. dulitensis*. Holotype male: Malaysia Sarawak, Kuching Division, Gunung Penrissen, Borneo Highlands Resort trail system, steep boulder stream, 24-VII-2012; deposited in RMNH, Leiden. New records for *D. dulitensis* are documented and the species is discussed." (Author)] Address: Dow, R.A., Naturalis Biodiversity Centre, P.O. Box 9517, 2300 RA Leiden, The Netherlands. E-mail: rory.dow230@yahoo.co.uk

13080. Drissner, J.; Steigmüller, M.L.; Hille, K. (2013): Environmental education outside school: effects of a half-day teaching programme. *Education Journal* 2(6): 231-235. (in English) ["The "Green Classroom" in the Botanical Garden of the University of Ulm is a learning forum outdoor school that is used by about 2,500 school students annually. Its educational concept is based on experiential learning and is geared towards expanding students' biological knowledge and awareness of small animals such as invertebrates and insects. In the first study, 66 students (grade 4) were asked to draw a picture of a pond as a habitat. 33 of these students had previously visited the "Green Classroom" (intervention group). Students of the intervention group drew more of the smaller types of animals in their pictures and furthermore a bigger variety of species of animals and plants than the control group. In the second study, the same students (66, grade 4) were given a list of animal species, and were asked to tick those which are typical to a pond. Students who had visited the "Green Classroom" ticked more animals off correctly than their peers in the control group." (Authors) The pictures also represent dragonflies.] Address: Drissner, J., Botanical Garden, University of Ulm, D - 89081 Ulm, Germany. E-mail: juergen.drissner@uni-ulm.de

13081. Dubois, P. (2013): Observation d'un cas de coloration atypique chez *Orthetrum coerulescens* (Fabricius, 1798) (Odonata, Anisoptera: Libellulidae). *Martinia* 29(1): 9-14. (in French, with English summary) ["During July 2010, I made a picture of a male of *O. coerulescens*

which had transversal black strips on the abdomen (Alex, Drome region, France). Due to the publication of this observation on an Internet odonatist forum and thanks to further discussion, possible reasons for this uncommon pattern are proposed and similar observations are reported." (Author)] Address: Dubois, P., Goely, les Fougères, 42520 Macias, France. E-mail: pdubois@online.fr

13082. Dunbier, J.R.; Wiederman, S.D.; O'Carroll, D.C. (2013): Mapping predictive facilitation in a dragonfly target neuron. *Front. Physiol. Conference Abstract: International Conference on Invertebrate Vision*. doi: 10.3389/conf.fphys.2013.25.00002: n.p. (in English) [Verbatim: Dragonflies are masters of aerial pursuit, executing prey capture flights with a 97% success rate. In perching Libellulids, such flights are brief (average 184ms, [1]), although target motion is also tracked from the perch prior to take-off. However many dragonflies also engage in longer duration territorial and courtship pursuits of conspecifics, that can last tens of seconds. These chase sequences include changes in velocity and direction, as well as the possibility of target occlusion by matched background texture. Recent work shows that responses of dragonfly small target motion detector (STMD) neurons may be facilitated over prolonged time courses (up to 500ms) of continuous motion [2,3]. We hypothesize that such facilitation may play a role in increasing robustness by predictively increasing the gain of detectors in the direction of future travel. We tested this in CSTMD1, a dragonfly neuron recently shown to express a form of selective attention for one target in the presence of a distractor [4]. We presented single target stimuli that moved along an initial 'priming' path for 500ms before undergoing spatial, temporal or combined discontinuities in their trajectories. We quantified the facilitation state by comparing the neuronal response (spike rate) in a 200ms window following the discontinuity with that for a naive control, tested at the same receptive field location. We found that facilitation is initially spatially localized: only the smallest spatial displacement tested in the direction of target travel (4°) gives significantly stronger responses than control. When larger spatial displacements were combined with a delay in reappearance, however, responses were significantly elevated, even for a 20° displacement with a 500ms delay in reappearance. Backward displacements (i.e. across previously traversed location) yield strongly inhibited responses. This suggests that facilitation is mediated by a process of local gain modulation that actively spreads from the last seen location of a stimulus and in the approximate direction of travel. Such predictive modulation of local target salience may be a key mechanism for selective attention during target tracking. Acknowledgements: We thank the manager of the Botanic Gardens of Adelaide for allowing insect collection. Funding was received from the US Air Force Office of Scientific Research (grants FA2386-10-1-4114 and FA9550-09-1-0116). References: [1] Olberg, R. M., Worthington, A. H., and Venator, K. R. (2000). Prey pursuit and interception in dragonflies. *J. Comp. Physiol.*

A 186, 155–162. [2] Nordström, K., Bolzon, D. M., and O'Carroll, D. C. (2011). Spatial facilitation by a high-performance dragonfly target-detecting neuron. *Biol. Lett.* 7, 588–592. [3] Dunbier, J.R., Wiederman, S.D., Shoemaker, P.A. and O'Carroll, D.C. (2012). Facilitation of dragonfly target-detecting neurons by slow moving features on continuous paths. *Front. Neural Circuits* 6:79. [4] Wiederman, S.D. and O'Carroll D.C. (2013) Selective attention in an insect visual neuron. *Curr. Biol.* 23, 156–161.] Address: Dunbier, J.R., The University of Adelaide, School of Medical Sciences, Adelaide, Australia. E-mail: james.dunbier@adelaide.edu.au

13083. Dunbier, J.R., Wiederman, S.D.; Shoemaker, P.A.; O'Carroll, D.C. (2013): Facilitation of dragonfly target-detecting neurons by slow moving features on continuous paths. *Frontiers in Neural Circuits* 6(79): 11 pp. (in English) ["Dragonflies detect and pursue targets such as other insects for feeding and conspecific interaction. They have a class of neurons highly specialized for this task in their lobula, the "small target motion detecting" (STMD) neurons. One such neuron, CSTMD1, reaches maximum response slowly over hundreds of milliseconds of target motion. Recording the intracellular response from CSTMD1 and a second neuron in this system, BSTMD1, we determined that for the neurons to reach maximum response levels, target motion must produce sequential local activation of elementary motion detecting elements. This facilitation effect is most pronounced when targets move at velocities slower than what was previously thought to be optimal. It is completely disrupted if targets are instantaneously displaced a few degrees from their current location. Additionally, we utilize a simple computational model to discount the parsimonious hypothesis that CSTMD1's slow build-up to maximum response is due to it incorporating a sluggish neural delay filter. Whilst the observed facilitation may be too slow to play a role in prey pursuit flights, which are typically rapidly resolved, we hypothesize that it helps maintain elevated sensitivity during prolonged, aerobically intricate conspecific pursuits. Since the effect seems to be localized, it most likely enhances the relative salience of the most recently "seen" locations during such pursuit flights." (Authors)] Address: Dunbier, J.R., The University of Adelaide, School of Medical Sciences, Adelaide, SA 5005, Australia. E-mail: ames.dunbier@adelaide.edu.au

13084. Fate, C.; Lapeyrie, J.; Nel, A. (2013): A new Permagoniidae from the Middle Permian of the South of France (Odonatoptera: Protozygoptera). *Zootaxa* 3702(4): 397-400. (in English) ["The new permagoniid protozygopteran genus and species *Salagoulestes wesleyi* is described from the Middle Permian of Lodève Basin, Salagou Formation. It seems to be more closely related to the two genera *Scytolestes* and *Permagonia* than to any other Permagoniidae. It increases the diversity of the odonatopteran fauna in the Salagou Formation to 14 different species." (Authors)] Address:

Fate, Caitin, 1225 Sequoia Drive, San Anselmo, CA 94960, California, USA. E-mail: caitinfate@gmail.com

13085. Ferrand, M.; Dommange, J.-L. (2013): *Hemianax ephippiger* (Burmeister, 1839) en Île-de-France en avril et mai 2011 (Odonata, Anisoptera: Aeshnidae). *Martinia* Hors-série, *Hemianax ephippiger* - migration 2011, mai 2013: 55-60. (in French, with English summary) ["The discovery of *H. ephippiger* in the région Ile-de-France is presented and discussed. The species was observed in two areas separated by a gap of ca. 40 km in the Yvelines department. The first is an open and vegetated settling tank. In April 2011, ten individuals were observed patrolling or hunting. The second site is a wet depression in which seven individuals were observed either in tandem or laying. The eggs were inserted into various substrates, namely stems, moss, plant debris, etc. No larval development could be observed. The authors suppose that other sites in the Paris basin were also invested by the great migratory." (Authors)] Address: Ferrand, M., SFO, 7 rue Lamartine, F-78390 Bois-d'Arcy, France

13086. Fleck, G.; Li, J.; Schorr, M.; Nel, A.; Zhang, X.; Lin, L.; Gao, M. (2013): *Epiophlebia sinensis* Li & Nel 2011 in Li et al. (2012) (Odonata) newly recorded in North Korea. *International Dragonfly Fund - Report* 61: 1-4. (in English) [A male of *E. sinensis* was collected in June 2012 in North Korea. The record was briefly documented and discussed.] Address: Li, J., P.O. Box 22, Vientiane, Laos. E-mail: lucanus123@163.com

13087. Frackiel, K.; Henel, A.; Taylor, J.R.E. (2013): Distribution and habitat selection of *Nehalennia speciosa* (Charpentier, 1840) (Odonata: Coenagrionidae) in Biebrza valley. *Odonatrix* 9(2): 55-64. (in Polish, with English summary) ["Eight new localities of *N. speciosa* were found in the Biebrza river valley, NE Poland, six of them in the Biebrza National Park (Figs 1, 2). The Biebrza river valley is famous as the largest complex of marshes in Poland and in Central Europe. *N. speciosa* has never been recorded there before. Six out of eight localities were found in the southern basin of the river that is best preserved, with vast areas of fen mires. The locality "Osowiec-Twierdza" (Fig. 1) represents small dystrophic water bodies with the *Sphagnum* moss mat; *N. speciosa* is present in the nearby *Carex rostrata* swamp. Habitats of the other seven localities (fen mires) are different from those most typical of the species in Poland as they do not contain *Sphagnum*. Additionally, these fen mires are floristically rich in comparison with many other habitats of *N. speciosa* in Poland. Locality "Bagno Ławki" is especially untypical as the plant community there is dominated by *Equisetum fluviatile* that is known from only very few other localities of *N. speciosa* in Poland. Special feature of five out of six localities in the lower basin of the Biebrza valley is the dominance of *Carex rostrata* that is a common characteristic of the localities in eastern Poland. The presence of *N. speciosa*, recorded in vast are-

as of fen mires of the Biebrza valley may suggest that other localities of the species are to be discovered there." (Authors)] Address: Frackiel, K., Biebrzański Park Narodowy, Osowiec-Twierdza 8, 19-110 Goniądz, Poland. E-mail: kfrackiel@biebrza.org.pl

13088. Frauendorf, T.C.; Colón-Gaud, C.; Whiles, M.R.; Barnum, T.R.; Lips, K.R.; Pringle, C.M.; Kilham, S.S. (2013): Energy flow and the trophic basis of macroinvertebrate and amphibian production in a neotropical stream food web. *Freshwater Biology* 58(7): 1340-1352. (in English) ["Despite the typically high taxonomic and functional diversity of tropical habitats, little is known about the roles of individual consumers in their ecosystem structure and function. We studied the trophic basis of production in a tropical headwater stream by identifying major sources of energy, measuring energy flow through consumers and characterising interactions among trophic levels and functional groups. We examined gut contents of 18 dominant macroinvertebrate (including *Heteragrion* and *Neurocordulia*) and two tadpole taxa and used these data, along with previously published estimates of secondary production, to quantify food-web structure and energy flow pathways. We also examined the prevalence of omnivory and patterns of resource consumption across seasons and habitats. Non-algal biofilm, a heterogeneous polysaccharidic matrix, was the most utilised food resource in the stream. Contrary to some studies of Old World tropical stream food webs, detrital energy sources were consumed at relatively high rates and contributed significantly to overall energy flow, although much of this was attributable to a single shredder taxon. Algal consumption rates were similar to values reported for temperate streams and were highest during the dry season. Omnivory was prevalent across all functional groups, particularly predators, suggesting traditional functional and trophic assignments based on temperate regions may not be appropriate for tropical systems. Seasonal patterns of resource consumption appeared linked to hydrological disturbance. This is the first study to provide quantitative estimates of energy flow through a neotropical stream food web. Extirpation and extinction rates in tropical freshwater habitats are high; our study provides baseline information for conservation and management of remaining systems, and for quantifying the consequences of further losses of biodiversity such as ongoing amphibian declines." (Authors)] Address: Frauendorf, Therese, Institute of Pacific Island Forestry, 60 Nowelo St., Hilo, HI 96720, USA. E-mail: tfrauend@hawaii.edu

13089. Fulan, J.A.; Davanso, R.C.S.; Henry, R. (2013): A profundidade como fator determinante na variação anual da densidade dos macroinvertebrados associados à *Salvinia auriculata* Aublet. *Revista Brasileira de Biociências* 9(2): 214-219. (in Portuguese, with English summary) ["The depth as a factor in determining annual change density of macroinvertebrates associated with *Salvinia auriculata*: The aim of this work was to study

the effects of water annual variation of Paranapanema River and others variables on macroinvertebrates that lives in macrophytes roots, from March 2006 to February 2007. The sampled was realized with a hand-net ... We measured air and water temperature, depth, dissolved oxygen, pH, K25 and suspended matter. The normality was tested and a Canonical Correspondence Analysis (CCA) was realized. Telebasis showed high density in period studied. There was a high variation in depth: 6.07 m in April 2006 to 1.83 m in November 2007. The CCA showed that Culicidae, Ephemeroptera, Ostracoda, Calopterygidae, Coryphaeschna and Cyanallagma were significative correlated with the depth. We concluded that the effect of the depth on larvae Odonata can not have been direct, but indirect by the effect in substrates as aquatic plants." (Authors)] Address: Fulan, J.A., Univ. Fed. Amazonas (UFAM). CEP: 69800-000, Humaitá, AM, Brasil. E-mail: joaofulan@ig.com.br

13090. Garcia-Trejo, F.; Hurtado-Gonzalez, S.L.; Soto-Zarazúa, G.; Alatorre-Jacome, O.; Gutiérrez-Yurrita, E. R.P.J. (2013): Ecophysiological responses to the effect of annual management on an endemic viviparous fish in central plateau of México. *Neotropical Ichthyology* 11(1): 117-123. (in English, with Spanish summary) ["Studies on the biological aspects of fish typically focus on species that currently have commercial value, causing species that lack such market value to be ignored. This is the case of several freshwater fish, specifically of several members of the Goodeidae family. In the State of Querétaro there are several species of this family characterized for being viviparous and having distinctive sexual dimorphism that may have commercial potential. The subject of this study is *Girardinichthys multiradiatus*, a viviparous fish endemic to the upper-half of the Lerma River basin. The lack of knowledge regarding its biology and ecology has prevented the development of guidelines to manage its habitat and to preserve its population. The objective was to determine the ecophysiological responses of *G. multiradiatus* to its environmental management. From the sampling (24 hours every two months) population structure and dynamics were analyzed throughout a hydrological cycle using meristic data (standard length). Trophic and ecophysiological responses to fluctuations in environmental factors were also identified. Although the mexcalpique is a polytrophic species, results show that it prefers feeding on Diptera or Cladocera, while detritus is the third substance frequently found in their stomachs. Environmentally, the water regime is responsible for fluctuations in the population dynamics of the species, while temperature changes are the most influence its energy balance. These results can guide efforts to conserve this species and its habitat." (Authors) Odonata contributed up to ca 3% to the diet items *G. multiradiatus*.] Address: Garcia-Trejo, F., División de Investigación y Posgrado, Fac. de Ingeniería, Univ. Autón. de Querétaro, Centro Universitario, Cerro de las Campanas S/N, C.P. 76010, Querétaro, Qro., México. E-mail: fernando.garcia@uaq.mx

13091. Garrison, R.W.; von Ellenrieder, N. (2013): A contribution to the study of the biodiversity of Odonata in Costa Rica with an emphasis on the genus *Argia* (Insecta: Odonata: Coenagrionidae). *International Dragonfly Fund - Report 62*: 1-23. (in English) ["A two week trip to Costa Rica was conducted between 26 May and 8 June 2013, sampling odonates in several provinces along the centre to the pacific southern portion of the country. A total of 86 species in 34 genera were found, including 16 species of the genus *Argia*. Lists of all species by locality, photographs of live specimens, and illustrations and notes of described species of *Argia* are presented to facilitate identification to other collectors." (Authors) Drawings of caudal appendages of *Argia adamsi*, *A. chelata*, *A. rogersi*, *A. terira*, *A. underwoodi* and *A. pulla* are presented.] Address: Garrison, R.W., Associate Insect Biosystematist, Plant Pest Diagnostics, California Department of Food & Agriculture, 3294 Meadowview Road, Sacramento, CA 95832-1448, USA. E-mail rgarrison@cdfa.ca.gov

13092. Gaspar Neiss, U.; Fleck, G.; Alta Feitoza, L.A.; Hamada, N. (2013): Description of the adult male of *Aeschnosoma auripennis* Geijskes, 1970 (Odonata: Corduliidae s.s.). *Zootaxa* 3718(6): 596-599. ["The male of *A. auripennis* is described for the first time, based on a specimen reared from a larva collected in the Reserva Biológica do Uatumã, Amazonas State, Brazil. The species is newly reported from the Roraima State, Brazil." (Authors)] Address: Gaspar Neiss, U., Inst. Nacional de Pesquisas da Amazônia (INPA), Coordenação de Biodiversidade (CBio), Avenida André Araújo, n 2936, Caixa Postal 478, CEP 69067-375, Manaus, Amazonas, Brazil

13093. Gayet, P.; Ruffoni, A. (2013): *Afflux d'Hemianax ephippiger* (Burmeister, 1839) en Bourgogne au printemps 2011 (Odonata, Anisoptera: Aeshnidae). *Martinia Hors-série, Hemianax ephippiger - migration 2011*, mai 2013: 47-50. (in French, with English summary) ["In the frame of its massive migration during 2011, *H. ephippiger* has been observed several times in the Bourgogne region. The species is new for the Yonne department but was already recorded in the past from the three other departments of the region. The authors present the 2011 observations and their characteristics." (Authors)] Address: Gayet, P., 3, route de Perrigny, 71620 Guerfand, France. E-mail: gayet-philippe@orange.fr

13094. Gerlach, J. (ed.) (2013): Odonata, Hemiptera, Hymenoptera and other insects of the Seychelles islands. *Siri Scientific Press*: 400 pp. (in English) ["The Seychelles islands are biogeographically interesting, with ancient affinities to Africa and Asia, recent colonizing species from the Indo-Pacific and modern introductions. Until recently, relatively little was known about the biodiversity of the islands. This has changed through the publication of a series of monographs on the Seychelles fauna, presenting the latest information on all the terrestrial and freshwater animals of the is-

lands. In this current volume on the Odonata, Hemiptera, Hymenoptera and other insects of the Seychelles islands, 15 expert scientists from nine different countries have provided contributions that cover all 954 species of these insect orders and other orders not covered in previous volumes (e.g. Protura, Collembola, Diplura, Microcoryphia, Zygentoma, Thysanoptera, Psocodea, Neuroptera, Siphonaptera and Trichoptera) recorded from the islands. The volume includes taxonomic keys, diagnostic illustrations and descriptions for many species, in addition to distribution records and assessments of species conservation status as defined by the International Union for the Conservation of Nature (IUCN)."(Publisher)]

13095. Gliwa, B. (2013): Die Libellen der Moorgebiete "Praviršulio tyrelis" und "Didysis Tyrulis" in Litauen. Build and Conserve a Livable Environment in the Countryside. ISBN 978-609-95323-1-8: 164-198. (in German, with English and Lithuanian summary) ["Odonata of two nature reserve boglands in Lithuania: Praviršulis and Didysis Tyrulis. While Didysis Tyrulis has been largely destroyed due to peat cutting, Praviršulis remained healthy, however, with disorders of natural hydrological conditions in a large part. As a result Praviršulis contains still two natural lakes and plenty of raised bog and fen. By contrast, at Didysis Tyrulis one finds no natural water bodies at all but lots of secondary „lakes“ in the digged pools together with a dense set of ditches. Praviršulis is well researched in terms of dragonflies, 45 species have been recorded. Among them some species strongly specialized in bogland, e.g. *Nehalennia speciosa*, *Somatochlora arctica*. Due to still started research, only 27 species have been recorded at Didysis Tyrulis, among them rare species as *Coenagrion armatum* and *Coenagrion lunulatum*. As a surprise, a large of population of *N. speciosa* could be observed as well. This is the first report of this species in a renaturating habitat. Really large populations were recorded for *Leucorrhinia rubicunda* and *L. pectoralis* in 2012." (Author)] Address: Gliwa, B., Sargeliu bendruomenes centras, Sargeliai, Raseiniu r., LT-60443, Lithuania. E-mail: info@sargeliai.org

13096. Gonzalez-Bellido, P.T.; Peng, H.; Yang, J.; Georgopoulos, A.P.; Olberg, R.M. (2013): In dragonflies, descending visual neurons code prey direction in population vector form. *Front. Physiol.* Conference Abstract: International Conference on Invertebrate Vision. doi: 10.3389/conf.fphys.2013.25.00058: n.p. (in English) [Verbatim: The population vector is the weighted vectorial sum activity of an ensemble of neurons and it was first shown to predict the direction of an upcoming arm movement in monkeys (Georgopoulos et al. 1983, 1986). In this study we show that in the dragonfly *Libellula luctuosa*, the population vector algorithm also decodes the target direction information relayed from the brain to the wing motor centers by a group of 16 neurons. Moreover, these 16 neurons (named Target Selective De-

scending Neurons or TSDNs; Olberg 1986), perform such directional information coding with high accuracy across 360°. This is significant because the monkey motor cortex requires upwards of 200 neurons to achieve the same performance (Georgopoulos et al. 1988). To obtain the TSDNs directional tuning curves, we impaled a total of 51 TSDNs from 38 animals with sharp electrodes and recorded their responses to a battery of 3497 target trajectories. The target had a constant speed and size, but random location and direction. To confirm cell ID, Lucifer yellow was injected into 32 of the recorded cells. Although the preferred direction, receptive field and morphological traits (3D tracings) for each TSDN type were consistent among animals, spike rates were not. Importantly, 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 findings of this study are published in Gonzalez-Bellido et al. 2013. References: Georgopoulos AP, Caminiti R, Kalaska JF, Massey JT. 1983. Spatial coding of movement: a hypothesis concerning the coding of movement direction by motorcortical populations. *Experimental Brain Research Supplement* 327-336; Georgopoulos AP, Kettner RE, Schwartz AB. 1988. Primate motor cortex and free arm movements to visual targets in three-dimensional space. II. Coding of the direction of movement by a neuronal population. *Journal of Neuroscience* 8: 2928-2937; Georgopoulos AP, Schwartz AB, Kettner RE. 1986. Neuronal population coding of movement direction. *Science* 233: 1416-19; Gonzalez-Bellido PT, Peng H, Yang J, Georgopoulos AP, Olberg RM. 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: 696-701.; Olberg RM. 1986. Identified target-selective visual interneurons descending from the dragonfly brain. *Journal of Comparative Physiology. A, Sensory, Neural, and Behavioral Physiology* 159: 827-840.] Address: Gonzalez-Bellido, Paloma, Marine Biological Laboratory, Marine Resources Center, Woods Hole, MA, 02543, USA. E-mail: pgonzalez@mbl.edu

13097. Grand, D. (2013): Les libellules du rio Cabriel, provinces d'Albacete, Cuenca et Valencia (Espagne) (Odonata): distribution et observations biologiques. *Martinia* 29(1): 1-8. (in French, with English summary) ["The part of the rio Cabriel which has been studied is located to the centre east of Spain, at the confines of the provinces of Albacete, Cuenca and Valencia. I investigated it along more than 120 km in July 2000, and then from late May to late September for six years (2006-2011). I observed 31 Odonata species of which *Onychogomphus costae* is cited for the first time from the province of Valencia. *Brachythemis impartita* was seen far from the maritime border of the province of Valencia, where it is usually know. *Orthetrum chrysostigma* and *Trithemis annulata* were found in few places of the rio

Cabriel. *Onychogomphus costae* and *Zygonyx torridus* are respectively considered as Endangered and Vulnerable by the IUCN European Red List. A monitoring of the main populations of both species will therefore be settled next years." (Author)] Address: deceased

13098. Gremyachikh, V.A.; Komov, V.T.; Trankvilevsky, D.V.; Shapovalov, M.I.; Motorin, A.A. (2013): Levels of mercury in water and amphibiotic insects from different waterbodies and watercourses of European Russia. Materials of the Fifth All-Russia Symposium on Amphibiotic and Aquatic Insects / Papanin Institute for Biology of Inland Waters, Russian Academy of Sciences. – Yaroslavl: Filigran, 2013. – 254 pp: 46-51. (in Russian, with English summary) ["Data are provided on the levels of mercury in members of abundant species of amphibious insects of the orders Plecoptera, Coleoptera, Heteroptera, Trichoptera and Odonata collected in waterbodies and watercourses of Vologda, Voronezh, Novgorod and Yaroslavl Oblasts and the Republic of Adygea." (Authors) *Coenagrion* sp., *Aeschna* sp., *Anax imperator*, *Gomphus vulgatissimus*, *Calopteryx splendens*, *Somatochlora metallica*.] Address: Komov, V.T., Papanin Institute for Biology of Inland Waters, Russian Academy of Sciences Borok, Nekouzsky District, Yaroslavl Oblast, 152742, Russia. E-mail: vkomov@ibiw.yaroslavl.ru

13099. Halupka, K.J.; Wiederman, S.D.; Cazzolato, B.S.; O'Carroll, D.C. (2013): Local facilitation improves success in closed loop simulations of insect small target pursuit. Front. Physiol. Conference Abstract: International Conference on Invertebrate Vision. doi: 10.3389/conf.fphys.2013.25.00001: (in English) ["Detecting and intercepting a small target is a computationally challenging task, but one solved elegantly by the small brain of flying insects, which have evolved several strategies for pursuit of either prey or conspecifics [1, 2]. Male houseflies track other flies, constantly updating their heading towards the target, based on an error angle between target and pursuer [3, 4], thus mimicking movements of the target on a spiralling flight path that ends in capture. By contrast, predatory dragonflies use an interception strategy, steering to minimise movement of the prey's image on the retina, resulting in a collision course [5]. To evaluate these two strategies for target pursuit against visual clutter, we developed a closed-loop model inspired by insect STMD (Small Target Motion Detector) neurons and pursuit behaviour, set in natural scenery. This allows quantification of the merits of alternative pursuit strategies and of key stages of visual processing that cannot yet be obtained from *in vivo* analysis. We found that the velocity tuning of STMD neurons [6, 7] imposed a lower bound on the discriminable velocity of targets. However the intercept method enabled successful pursuits even when the target was moving significantly faster than pursuer. The preliminary stage of the detection algorithm is readily distracted by false positives generated by complex backgrounds. However, addition of a facilitation mecha-

nism, inspired directly by recent physiological analysis of dragonfly STMD neurons [8, 9] prevents such breakthrough responses by amplifying the weak signal of tiny targets moving on long trajectories. With this additional 2nd order salience-enhancing algorithm, we saw a significant improvement in successful target interception, from just over 50% to almost 80% (Chi square=5.87, p=0.015, n=44, Fig. 1). Acknowledgements: This work was supported by the US Air Force Office of Scientific Research (FA2386-10-1-4114) and the Australian Research Council (DP130104572). References: [1] RM Olberg. Visual control of prey-capture flight in dragonflies. *Curr Opin Neurol*, 22:267–271, 2012. [2] TS Collett and MF Land. Visual control of flight behaviour in the hoverfly. *J Comp Physiol., A*, 99(1):1-66, 1975. [3] MF Land and TS Collett. Chasing Behaviour of Houseflies (*Fannia Canicularis*). *J Comp Physiol A*, vol. 89, pp. 331-357, 1974. [4] C Wehrhahn, T Poggio, and L Bult-hoff. Tracking and chasing in houseflies. *Biol Cybern*, 45(2):123-130, 1982. [5] RM Olberg, A Worthington, and K Venator. Prey pursuit and interception in dragonflies. *J Comp Physiol., A*, 186(2):1-9, 2000. [6] SD Wiederman, PA Shoemaker, and DC O'Carroll. A model for the detection of moving targets in visual clutter inspired by insect physiology. *PLoS ONE*, 3(7):1-11, 2008. [7] KJ Halupka, SD Wiederman, BS Cazzolato, and DC O'Carroll. Discrete implementation of biologically inspired image processing for target detection. *Proc. ISSNIP*, 143-148, 2011. [8] K Nordström, DM Bolzon, and DC O'Carroll. Spatial Facilitation by a High-Performance Dragonfly Target-Detecting Neuron. *Biol Lett*, 2:588-592, 2011. [9] JR Dunbar, SD Wiederman, PA Shoemaker, and DC O'Carroll. Facilitation of Dragonfly Target-Detecting Neurons by Slow Moving Features on Continuous Paths. *Front Neural Circuits*, 6:1-11, 2012." (Authors)] Address: Halupka, Kerry, The University of Adelaide, School of Medical Sciences, Australia. E-mail: kerry.halupka@gmail.com

13100. Hamamoto, M.; Ohta, Y.; Hara, K.; Hisada, T. (2013): Three-dimensional free-flight analysis of the rapid turning of a dragonfly using fluid-structure interaction analysis. *Journal of Computational Science and Technology* 7(1): 75-88. (in English) ["Recent studies of the flapping flight of insects have succeeded in solving the unsteady aerodynamics of hovering and contributed to realizing bio-inspired micro aerial vehicles (MAVs). However, the effect of wing deformation on the aerodynamics has not been investigated because of a lack of appropriate analysis methods. As an initial step to creating a "total" simulator for flapping flight, we developed a free-flight simulator by combining fluid-structure interaction finite element analysis based on the arbitrary Lagrangian-Eulerian method, which can quantitatively treat the strong interaction between the wing deformation and its surrounding airflow, and a rigid body dynamics analytical solver. With biologically-inspired flapping motion, which mimicked the changes in the stroke motion of the wing, the numerical model of the dragonfly per-

formed rapid turning over 1200°/s of yaw angular velocity. Although the flapping motion for the left wing on the trigger flapping and the right wing on the resumed flapping (or its inversed combination) are identical, a considerable difference in the deformation of the wing during this identical flapping between the former and latter halves of the turn was observed. Thus, while these actuations were identical, the directions of the aerodynamic forces were largely controlled by passive deformations of the wings. These results meant that the effect of wing deformation on its aerodynamics should be taken into account and thus fluid-structure interaction analysis is required to effectively design the actuation of the wing on an artificial MAV." (Authors) Symptetrum] Address: Hamamoto, M., Advanced Technology Research Laboratories, Corporate Research and Development Group, Sharp Corporation, 2613-1 Ichinomoto-cho, Tenri, Nara 632-8567, Japan. E-mail: hamamoto.masaki@sharp.co.jp

13101. Hansen, G.J.A.; Hein, C.L.; Roth, B.M.; Vander Zanden, M.J.; Gaeta, J.W.; Latzka, A.W.; Carpenter, S.R. (2013): Food web consequences of long-term invasive crayfish control. *Canadian Journal of Fisheries and Aquatic Sciences* 70(7): 1109-1122. (in English) ["Controlling invasive species can restore ecosystems while also quantifying species interaction strengths. We experimentally removed invasive rusty crayfish (*Orconectes rusticus*) from a Wisconsin lake. Rusty crayfish abundance declined by 99% in eight years, did not significantly increase four years post-harvest, and no compensatory recruitment response was observed. Native crayfish (*O. virilis*) and sunfish (*Lepomis* spp.) abundances increased by two orders of magnitude as rusty crayfish abundance declined, and macrophyte cover increased significantly in 2-4 m waters. We expected benthic macroinvertebrate densities to increase as rusty crayfish were removed; however, fish consumption of invertebrates increased as rusty crayfish density declined, and macroinvertebrate responses varied among families and habitats. Total Gastropoda density increased 300-fold in cobble, while the density of one gastropod family declined in macrophytes. Ephemeroptera, Odonata, and Amphipoda densities also declined in certain habitats as rusty crayfish were removed, suggesting that they are indirectly facilitated by rusty crayfish. This study highlights the importance of considering indirect effects when assessing the impacts of invasive species, and demonstrates that these impacts may be reversed over relatively short timescales" (Authors)] Address: Hansen, Gretchen, Center for Limnology, University of Wisconsin-Madison, 680 N. Park Street, Madison, WI 53706, USA. E-mail: ghansen2@wisc.edu

13102. Hanun, S.O.; Dahelmi, S.S. (2013): Dragonflies species in Kandi Wildlife Park Area, Sawahlunto City, West Sumatra. *Jurnal Biologi Universitas Andalas* 2(1): 71-76. (in Indonesian, with English summary) [15 Odonata species were documented from the Kandi

Wildlife Park Area, Sawahlunto City, West Sumatra.] Address: Hanun, Silvy Olivia, Laboratorium Taksonomi Hewan, Jurusan Biologi, FMIPA Universitas Andalas, Kampus UNAND Limau Manis Padang – 25163, Indonesia. E-mail: oliviahannum@gmail.com

13103. Heckmann, S.; Hörschemeyer, T.; Büsse, S. (2013): The thorax musculature of Zygoptera nymphs (Odonata). 6th Dresden Meeting on Insect Phylogeny, Dresden, September 27–29, 2013. Abstracts — Poster Presentations: 39. (in English) [Verbatim: Odonata are arguably the insect group with the most impressive flight skills (e.g. Corbet 1999). Each wing pair can be controlled independently and some species are even able to fly backwards (Hatch 1966). The muscles responsible for the wing movement are connected directly to the wings (Tannert 1958). This exclusively direct mechanism of wing movement distinctly sets Odonata apart from all other winged insects; where the wing beat is done mainly through a system of indirect muscles, many of which are highly reduced or missing in the Odonata (e.g. Snodgrass 1935). Here we present a comparative morphological investigation of the thoracic flight musculature of Zygoptera. The results for *Nehalennia speciosa* and *Ischnura elegans* allow first insights into our comprehensive study. Nymphs are aquatic predators, which feed on other Arthropods, whereas adults are arial predators (e.g. Corbet 1999). The amount and kind of muscles therefore significantly differ between nymphal and adult Odonata, which are adapted to their respective habitat (e.g. Asahina 1954; Maloeuf 1935). We used synchrotron radiation micro computed tomography (S μ CT), aided by 3-D reconstruction to study the thorax of Zygoptera. The muscles were identified following the nomenclature introduced by Friedrich and Beutel (2008) as well as the homology hypothesis of Büsse et al. (2013) and Büsse & Hörschemeyer (subm.). References: Asahina S. 1954: A morphological study of a relic dragonfly *Epiophlebia superstes* Selys (Odonata, Anisozygoptera). Tokyo: The Japan Society for the Promotion of Science 153 pp. — Büsse S., Genet C., Hörschemeyer 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 — Büsse S., Hörschemeyer T. submitted: The nymphal thorax musculature of Anisoptera (Insecta: Odonata) and its evolutionary relevance. *BMC Evolutionary Biology*. — Corbet P.S. 1999: *Dragonflies: Behavior and Ecology of Odonata*. New York: Cornell Univ. Press. — Friedrich F., Beutel R. 2008: The thorax of *Zorotypus* (Hexapoda, Zoraptera) and a new nomenclature for the musculature of Neoptera. *Arthropod Structure & Development* 37: 29–54. — Maloeuf N.S.R. 1935: The postembryonic history of the somatic musculature of the dragonfly thorax. *Journal of Morphology* 58: 87–115. — Snodgrass R.E. 1935: *Principles of Insect Morphology*. New York: Mc Graw-Hill Book Company. — Tannert W. 1958: Die Flügelgelenkung bei Odonaten. *Deutsche Entomologische*

Zeitschrift 5: 394–455.] Address: Heckmann, Saskia, Abteilung Morphologie, Systematik & Evolutionsbiologie, JFB-Institut für Zoologie & Anthropologie der Georg-August Universität Göttingen, Germany

13104. Heger, P.; George, R.; Wiehe, T. (2013): Successive gain of insulator proteins in arthropod evolution. *Evolution* 67(10): 2945-2956. (in English) ["Alteration of regulatory DNA elements or their binding proteins may have drastic consequences for morphological evolution. Chromatin insulators are one example of such proteins and play a fundamental role in organizing gene expression. While a single insulator protein, CTCF (CCCTC-binding factor), is known in vertebrates, *Drosophila melanogaster* utilizes six additional factors. We studied the evolution of these proteins and show here that—in contrast to the bilaterian-wide distribution of CTCF—all other *D. melanogaster* insulators are restricted to arthropods. The full set is present exclusively in the genus *Drosophila* whereas only two insulators, Su(Hw) and CTCF, existed at the base of the arthropod clade and all additional factors have been acquired successively at later stages. Secondary loss of factors in some lineages further led to the presence of different insulator subsets in arthropods. Thus, the evolution of insulator proteins within arthropods is an ongoing and dynamic process that reshapes and supplements the ancient CTCF-based system common to bilaterians. Expansion of insulator systems may therefore be a general strategy to increase an organism's gene regulatory repertoire and its potential for morphological plasticity." (Authors) Several clades/orders were omitted for clarity. Ephemeroptera and Odonata are combined in Palaeoptera.] Address: Heger, P., Cologne Biocenter, Institute for Genetics, University of Cologne, Zùlpicher Str. 47a, 50674 Köln, Germany. E-mail: peter.heger@uni-koeln.de

13105. Heintzman, L. (2013): Examination of Polycyclic Aromatic Hydrocarbons in an urban stormwater system and bioaccumulation in Odonata. M.Sc. thesis, Biology, Texas Tech University: 94 pp. (in English) ["Polycyclic aromatic hydrocarbons (PAHs) are toxic organic pollutants produced from combustion processes. Associated with urban runoff they have been detected worldwide in urban wetlands. PAH contaminations in wetlands are known to be influenced by hydrology and environmental factors. Because PAHs and their associated metabolites are carcinogenic, mutagenic, and teratogenic, they pose significant risks to wetland-dependent organisms. Provided meager scientific data on PAHs in playa wetlands, I investigated the occurrence of 16 PAHs within playa surface water samples and tissues of amphibious organisms (Odonata, a flagship group of predatory wetland insects) from seven urban playas along a runoff gradient in Lubbock, Texas. PAH detections from surface water samples were highly variable across sites and dates, with naphthalene and pyrene occurring most often in water samples. Adult Odonata PAH detections were also variable but significantly different from corre-

sponding surface water samples (suggesting bioaccumulation rather than passive chemical exposure), with naphthalene and fluoranthene occurring most often. The number of specific PAH compound detections was significantly associated with percent impervious surface within 300 m of a playa, but not with gradient position or number of inflows. Therefore, results indicate that for urban playas of Lubbock, land-use factors are more important in determining PAH contamination than hydrologic factors." (Author)] Address: not stated

13106. Heiser, M.; Schmitt, T. (2013): Tracking the boundary between the Palaeartic and the Oriental region: new insights from dragonflies and damselflies (Odonata). *Journal of Biogeography* 40(11): 2047-2058. (in English) ["Aim: We aim to define the hotspots, faunal regions and faunal elements of Odonata in Eurasia. We describe the location and the extent of the transition zone between the Palaeartic and Oriental realms. Location: Eurasia. Methods: Odonata are suitable for this study because the number of species in the group is sufficient for the required analyses, their distributions are mostly known, and they are split into the highly dispersive Anisoptera and the weakly dispersive Zygoptera. For our analyses, Eurasia was classified into 63 regions, within which we determined the presence or absence of each of the 1765 Odonata species. We calculated species richness maps and performed cluster analysis and principal components analysis to extract faunal regions and elements. Results: Occurrence records of Eurasian Odonata were partitioned among three major biogeographical entities: (1) Europe, North Africa and North Asia; (2) India, Indochina and southern China; and (3) northern China, Korea and Japan. Each of these entities has further notable substructures and faunal elements, especially in Southeast Asia. The tropical rain forest region of Southeast Asia is the species diversity hotspot of odonates and has the highest number of (often localized) faunal elements. The northern border of the Oriental region reaches southernmost China and the southern slopes of the Himalayas, but the transitional zone between the Oriental and the Palaeartic region extends much farther north, and includes northern China, Japan and Manchuria. The lower dispersal ability of Zygoptera compared with that of Anisoptera is mirrored in various biogeographical patterns: (1) the Western Palaeartic influence on the Eastern Palaeartic is stronger in Anisoptera than in Zygoptera; (2) Zygoptera have more faunal elements on islands than do Anisoptera; and (3) Zygoptera are isolated by the Strait of Gibraltar, but do not show a finer-grained structure of their faunal elements on the mainland. Main conclusions: The less severe impact of the ice ages in Southeast Asia resulted in the evolution and survival of Odonata species in many regional refugia. These faunal elements have had a greater impact on the post-glacial colonization than previously thought and strongly influence the composition of Odonata in East Asia." (Authors)] Address: Schmitt, T., Biographie, Fachbereich

VI, Gebäude N, Raum 303, Universität Trier, 54286 Trier, Germany. E-mail: thsh@uni-trier.de

13107. Helmker, B.; Hörnschemeyer, T.; Büsse, S. (2013): The thorax musculature of *Epiophlebia* nymphs (Odonata). 6th Dresden Meeting on Insect Phylogeny, Dresden, September 27–29, 2013. Abstracts — Poster Presentations: 39–40. (in English) [Verbatim: *Epiophlebia* is the single taxon inside the recent Odonata, which combines characters of the Anisoptera and the Zygoptera. The four known species of *Epiophlebia* differ in only a few morphological features (e.g. Asahina 1961; Li et al.2011; Carle 2012). Recent publications (Büsse et al. 2012) show that the genetics of three of these species varies very little. This study investigates the thoracic musculature of different nymphal instars of *Epiophlebia laidlawi* and *E. superstes* in order to further reveal the relationship of the two species. Based on Maloef's (1935) nomenclature for the thoracic musculature of the Odonata and Asahina's (1954) studies on *E. superstes*, the nymphs were examined via Synchrotron radiation micro computer tomography (S μ CT). Furthermore the identified muscles were homologized with the ones found in the Zygoptera (Büsse et al. 2013) and Anisoptera (Büsse & Hörnschemeyer subm.), based on the nomenclature established by Friedrich & Beutel (2008). The thoracic musculature of *E. laidlawi* and *E. superstes* is highly similar. Every muscle described by Maloef (1935) and Asahina (1954) could be confirmed in both species. Five muscles differ from the description of both authors. In addition, thirteen new muscles could be identified, of which one might be unique to the Eiprocta. References: Asahina S. 1954: A morphological study of a relic dragonfly *Epiophlebia superstes* Selys (Odonata, Anisozygoptera). Tokyo: The Japan Society for the Promotion of Science 153 pp. — Asahina A. 1961: Is *Epiophlebia laidlawi* Tillyard (Odonata, Anisozygoptera) a good species? *International Revue der Gesellschaft für Hydrobiologie* 46: 441–446. — Büsse S., von Grumbkow P., Hummel S., Shah D.N., Tachamo Shah R.D., et al. 2012: Phylogeographic Analysis Elucidates the Influence of the Ice Ages on the Disjunct Distribution of Relict Dragonflies in Asia. *PLoS ONE* 7(5): e38132. doi:10.1371/journal.pone.0038132 — 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 — Büsse S., Hörnschemeyer T. submitted: The nymphal thorax musculature of Anisoptera (Insecta: Odonata) and its evolutionary relevance. *BMC Evolutionary Biology*. — Carle F.L. 2012: A new *Epiophlebia* (Odonata: Epiophlebioidea) from China with a review of epiophlebian taxonomy, life history, and biogeography. *Arthropod Systematics & Phylogeny* 70(2): 75–83. — Friedrich F., Beutel R. 2008: The thorax of *Zorotypus* (Hexapoda, Zoraptera) and a new nomenclature for the musculature of Neoptera. *Arthropod Structure & Development* 37: 29–54. — Li J.-K., Nel A., Zhang X.-P.,

Fleck G., Gao M.-X., et al. 2011: A third species of the relict family Epiophlebiidae discovered in China (Odonata: Eiproctophora). *Systematic Entomology* 37(2): 408–412. doi: 10.1111/j.1365–3113.2011.00610.x. — Maloef N.S.R. 1935: The postembryonic history of the somatic musculature of the dragonfly thorax. *Journal of Morphology* 58: 87–115] Address: Helmker, B., Abteilung Morphologie, Systematik & Evolutionsbiologie, JFB-Institut für Zoologie & Anthropologie der Georg-August Universität Göttingen, Germany

13108. Höpstein, G. (2013): Eine Kiesgrube im Saaletal bei Etzelbach als „Naturerbe“ der NABU-Stiftung. *Landschaftspflege und Naturschutz in Thüringen* 50(2): 70–74. (in German, with English summary) [“The conservation of a gravel pit as a wetland near Etzelbach is described in the article. The effects of the development in the last five years after acquisition are illustrated. The focus of the research stands on dragonflies, grasshopper, fishes, amphibians, and reptiles. The gravel pit near Etzelbach is an important area for the development of dragonflies in the middle Saale valley. Typical representatives and characteristic species are *Erythromma viridulum*, *Orthetrum cancellatum*, and *Anax imperator*. Remarkable records are *Erythromma lindenii*, *Gomphus pulchellus* and *Anax parthenope*.” (Author)] Address: Höpstein, G., Flecke 17, 07422 Bad Blankenburg, Germany

13109. Hykel, M. (2013): The occurrence and bionomy of *Cordulegaster bidentata* at selected localities in the Western Carpathians Mts. Bachelor's thesis, Department of Ecology and Environmental Sciences, Faculty of Science, Palacky University in Olomouc: VII + 29 + III pp. (in Czech, with English summary) [Czech Republic, Western Carpathians Mts., Palkovice hills, Šostýn hills. “Habitat of larvae were small streams and spring areas – width of watercourse 40–180 cm, depth of water column 4–45 cm, volume flow 25–80 cm³s⁻¹, shading 40–80% and riparian vegetation coverage 0–60%. Diurnal activity was observed on selected spring area in Palkovice hills. ... During the 8 days was found 41 males and 17 females. Reappearance was 29 males and 5 females. Diurnal activity of males was recorded from 8:30 until 17:44. Egg-laying was recorded between 8:27 to 17:29. The highest abundance was between 9:00–12:00 and between 16:00–16:30. The average interval visit of imagoes was 13 minutes.” (Author)] Address: not stated

13110. Ikemeyer, D.; Olthoff, M. (2013): First record of *Onychogomphus assimilis* (Schneider, 1845) in northwestern Turkey. *Libellula* 32(1/2): 91–94. (in English, with German summary) [“In 2011 a male *O. assimilis* was recorded at the river Devrek in the province of Zonguldak in northwestern Turkey. Previously, the species in Turkey had only been found in rivers close to the Mediterranean Sea and some eastern provinces. The finding of *O. assimilis* indicates a population in the river systems of the Pontic Mountains in northern Turkey.” (Au-

thors)] Address: Ikemeyer, D., Billerbecker Str. 6, 48329 Havixbeck, Germany. E-mail: dkjikemeyer@t-online.de

13111. Iorio, E. (2013): Nouveau record d'altitude en France pour *Aeshna affinis* Vander Linden, 1820 (Odonata, Anisoptera: Aeshnidae). *Martinia* 29(1): 19-22. (in French, with English summary) ["*Aeshna affinis* has been discovered at an altitude-record of 1325 m in a pond in the Hautes-Alpes department. Behaviour suggesting autochthony of this species in this pond have been observed." (Author)] Address: Iorio, E., ECO-MED (Ecologie & Mediation), Pole Entomologie, TourMediterranee, 65 av. Jules Cantini, 13298 Marseille Cedex 20, France. E-mail: e.iorio@ecomед.fr

13112. Johansson, N. (2013): The genetic effects (mtDNA COI) of the invasive *Anax imperator* on the native *Aeshna grandis* from populations in southern Sweden. B.Sc. thesis. Halmstad University: (in English) ["Climate change will increase the range of some species, including *A. imperator* which first was observed in Sweden in the year 2000 and are now observed annually in the region of Scania (Skåne) and other parts of southern Sweden. *A. grandis* is a common dragonfly from south to north of Sweden and at some places they now share the habitat with *A. imperator*. The changing climate will benefit *A. imperator* and the species will spread north in Sweden. How this will affect the native *A. grandis* is not yet known however this study may reveal some light on the subject. By extracting mtDNA from larvae of *A. grandis* from 16 different sites; 8 sites with observations of *A. imperator* and 8 without, it is possible to reveal if there is a genetic difference between locals within the invasive species range and outside it. This study have used the COI region in mtDNA in *A. grandis* larvae to reveal if the haplotypes in populations that inhabits same habitats as *A. imperator* are negatively affected or, contrary to different sources, they are able to co-exist. The mtDNA were sequenced, MEGA version 5 was used to construct phylogenetic trees and the program TCS was used to estimate the gene genealogies. In this study there was no correlation between habitats within *A. imperator* range and outside of its range, however it is interesting that the tree constructed in MEGA divides the larvae in two groups and the graph in TCS also divides the larvae into two groups. This could still be an effect of climate change; it could be the result of *A. grandis* from Europe immigrating to Sweden. Another hypothesis is two kinds of larvae: one fast-growing larvae which has already adapted to the rising temperatures and have a shorter larva-stage and one slower growing, not yet adapted to temperatures. It could also be a result of an ongoing sympatric speciation however further studies are required to investigate the two types and more importantly, the cause of the two types of larvae." (Authors)] Address: Johansson, Nathalie, Halmstad University, School of Business and Engineering (SET)

13113. Jolley, J.C.; Albin, E.S.; Kaemingk, M.A.; Willis, D.W. (2013): A survey of aquatic invertebrate communities in Nebraska Sandhill lakes reveals potential alternative ecosystem states. *Journal of Fish and Wildlife Management* 4(1): 151-162. (in English) ["Aquatic invertebrate communities are important to shallow lake ecosystem form and function, providing vital components to the food web that link primary producers to consumers and thereby important to lake management goals of maximizing food resources for birds, fish and mammals. We characterized lake invertebrate communities and physicochemical variables in six Nebraska Sandhill lakes and examined these characteristics within an alternative stable state framework. Surveys were conducted during 2005 within each of these six Nebraska Sandhill lakes by sampling aquatic macroinvertebrate abundance, zooplankton abundance and biomass, phytoplankton biomass, and physicochemical variables. When placed within an alternative stable state framework, the response variables exhibited a gradient of different ecosystem states. Two lakes appeared congruent with the clear water state (dense submergent vegetation, high invertebrate abundance and diversity, and low phytoplankton), two were congruent with the turbid water state (high phytoplankton, low vegetation coverage, low invertebrate abundance and diversity), while two lakes were intermediate, likely in a state of hysteresis. Principal component groupings further supported these findings by following similar lake-specific patterns with attributes of a clear water state (high secchi depth, abundant benthic macroinvertebrates) or turbid water state (total dissolved solids, biomass of small-bodied zooplankters) grouping meaningfully according to multiple lake states. . The lakes studied contained varied fish communities, which may have influenced the diversity, density, and biomass of invertebrate and zooplankton communities. Generally lakes dominated by piscivorous fish displayed the clear water state while those with abundant planktivores displayed the turbid water state. Shallow lakes containing dense invertebrate communities likely provide a rich food base to important fauna (migratory waterfowl) that aid in reaching desired management objectives for these systems. Multiple small lakes, in close proximity, displaying divergent ecosystem states invites the opportunity for more in-depth analyses of driving mechanisms that will undoubtedly add to our ability to effectively manage these systems in the future." (Authors) Taxa included Odonata and were treated at the family level.] Address: Jolley, J.C., United States Fish and Wildlife Service, Columbia River Fisheries Program Office, 1211 SE, USA. E-mail: jeffreyjolley@fws.gov

13114. Jones, R.W.; Obregon-Zuniga, A.; Guzman-Rodriguez, S. (2013): Preliminary assessment of biogeographic affinities of selected insect taxa of the state of Sonora, Mexico. In: Gottfried, Gerald J.; Ffolliott, Peter F.; Gebow, Brooke S.; Eskew, Lane G.; Collins, Loa C. *Merging science and management in a rapidly chang-*

ing world: Biodiversity and management of the Madrean Archipelago III and 7th Conference on Research and Resource Management in the Southwestern Deserts; 2012 May 1-5; Tucson, AZ. Proceedings. RMRS-P-67. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 133-137. (in English) ["The biogeographic affinities of butterflies (Lepidoptera: Papilionoidea and Hesperidae), Odonata, and ants (Hymenoptera: Formicidae) reported from the State of Sonora, Mexico were analysed using published species lists. The combined distribution of these taxa was proportionally greater (47.4%) for those species within the Mega-Mexico3 biogeographic category (Southwestern United States south to northern Central America). Formicidae was the most highly restricted taxon with greater proportions of Sonoran desert endemics. Butterflies had a greater proportion of tropical species (82.8%), whereas Odonata from Sonora were most widely distributed either north or south of Mega-Mexico. Differences in the biogeographic affinities of the three insect taxa are attributed to specificity of immature host plants and the distribution and persistence of species habitats." (Authors)] Address: Jones, R.W., Facultad de Ciencias Naturales, Universidad Autónoma de Querétaro, Querétaro, Qro., México

13115. Juslen, A.; Hyvärinen, E.; Virtanen, L.K. (2013): Application of the Red-List Index at a national level for multiple species groups. *Conservation Biology* 27(2): 398-406. (in English) ["The International Union for Conservation of Nature (IUCN) Red List Index (RLI) is recognized as one of the key indicators of trends in the status of species. The red-list assessment done by Finnish authorities of species in Finland is taxonomically one of the most extensive national assessments. We used the Finnish Red Lists from 2000 and 2010 to calculate for the first time the national RLIs for 11 taxonomic groups (including Odonata) at different trophic levels and with different life cycles. The red-list index is calculated on the basis of changes in red-list categories and indicates trends in the status of biological diversity of sets of species. The RLI value ranges from 0 to 1. The lower the value the faster the set of species is heading toward extinction. If the value is 1, all species in the set are least concern and if the value is 0, all species are (regionally) extinct. The overall RLI of Finnish species decreased. This means that, in Finland, these taxonomic groups were heading toward extinction faster in 2010 than in 2000. Of the analysed groups of organisms, RLIs of 5 decreased and RLIs of 6 increased. At the national level, the RLIs and status trends varied markedly between species groups. Thus, we concluded that generalizations on the basis of RLIs of a few taxa only may yield a biased view of ongoing trends in the status of biological diversity at the species level. In addition, one overall RLI that includes many different species groups may also be misleading if variation in RLI among species groups is not considered and if RLI values are not presented separately for each

group." (Authors)] Address: Juslén, A., Finnish Museum of Natural History, Zoology, FI-00014 University of Helsinki, Finland. E-mail: aino.juslen@helsinki.fi

13116. Karle-Fendt, A.; Stadelmann, H. (2013): Entwicklung der Libellenfauna eines regenerierenden Hochmoores nach Renaturierungsmaßnahmen (Odonata). *Libellula* 32(1/2): 1-30. (in German, with English summary) ["The Bavarian Felmer Moos (47°33'N, 10°15'E), a highly fragmented and disturbed bog, was regenerated stepwise since 1986. Starting in 2000, intensive monitoring of the odonate fauna was carried out in order to investigate possible relationships between the technical measures and the dynamics of the dragonfly species typical for moorland habitats and their populations. In total, 47 species of Odonata were recorded as imagines. By quantitative sampling of Anisoptera exuviae between 2001 and 2012 we tried to find a relation between selected species and different types of water bodies and their succession stages respectively. The results showed that the populations were strongly augmented by the increase of the number and size of water bodies as well as by the rising number of various succession stages. In years with unusually warm springs we observed conspicuous decline of the populations. From the results conclusions were drawn for the regeneration concept." (Authors)] Address: Karle-Fendt, A., Hofenerstr. 49, 87527 Sonthofen, Germany. E-mail: karle-fendt@t-online.de

13117. Kaunisto, K.M.; Viitaniemi, H.M.; Leder, E.H.; Suhonen, J. (2013): Association between host's genetic diversity and parasite burden in damselflies. *Journal of Evolutionary Biology* 26(8): 1784-1789. (in English) ["Recent research indicates that low genetic variation in individuals can increase susceptibility to parasite infection, yet evidence from natural invertebrate populations remains scarce. Here, we studied the relationship between genetic heterozygosity, measured as AFLP-based inbreeding coefficient f_{AFLP} , and gregarine parasite burden from eleven *Calopteryx splendens* populations. We found that in the studied populations, 5–92% of males were parasitized by endoparasitic gregarines (Apicomplexa: Actinocephalidae). Number of parasites ranged from none to 47 parasites per male, and parasites were highly aggregated in a few hosts. Mean individual f_{AFLP} did not differ between populations. Moreover, we found a positive association between individual's inbreeding coefficient and parasite burden. In other words, the more homozygous the individual, the more parasites it harbours. Thus, parasites are likely to pose strong selection pressure against inbreeding and homozygosity. Our results support the heterozygosity-fitness correlation hypothesis, which suggests the importance of heterozygosity for an individual's pathogen resistance." (Authors)] Address: Kaunisto, K.M., Section of Ecology, Department of Biology, University of Turku, FI-20014 Turku, Finland. E-mail: kkauni@utu.fi

13118. Kempster, C. (2013): The Abundance and biodiversity of arthropods in biofuel crops: Insects and arachnids in corn, switchgrass and native mixed grass prairie fields. M.Sc. thesis, Environmental Science at Rochester Institute of Technology, Rochester, New York 14623-5603: V + 80 pp. (in English) [Michigan, USA. "Concerns about fossil fuel prices and harmful effects have prompted research and investment in biofuel development. Biofuels have the potential to provide a stable fuel source that reduces carbon emissions. However, the ecological impacts of different crop choices should be examined. Arthropod communities in corn and switchgrass monocultures and mixed grass prairie polycultures were examined to determine the impact of the crop choice on the arthropod communities. Results show that, when compared to corn and switchgrass fields, mixed grass prairie fields had higher values for arthropod biomass, number, size, the number of orders present, the number of individuals in each order, and the overall arthropod diversity. Corn fields were dominated by Diptera (61.83%) and contained very low abundance of the other orders found in this study. Mixed grass prairie fields also showed Diptera as the most prevalent order (43.47%), followed by Hemiptera (17.89%) and Homoptera (13.65%), Hymenoptera (6.12%), Coleoptera (5.61%), with the others each less than 2.5%, Thysanoptera, Acari, Araneae, Lepidoptera, Orthoptera and Odonata. Switchgrass fields showed arthropod communities with diversity levels between that of corn and mixed grass prairies, with Diptera (39.33%), Coleoptera (17.91%) and Hemiptera (16.33%) dominating the community. Hymenoptera 5.53% and Lepidoptera, Odonata, Orthoptera, Thysanoptera, Acari and Araneae total 17%. Average arthropod abundance was 49.33 individuals and 98 milligrams in mixed grass prairie fields, 35.59 individuals and 49 milligrams in switchgrass fields, and only 23.93 individuals and 23 milligrams in corn fields. The average number of orders found was also correlated to field type, with 4.17 in corn fields, 5.53 in switchgrass fields, and 7.08 in mixed grass prairie fields. It is concluded that transitioning from planting fields with corn to growing mixed grass prairie, or switchgrass, for cellulosic ethanol and biodiesel production would increase the overall abundance and biodiversity of the arthropod community." (Author)] Address: Kempster, Caitlin. not stated

13119. Kerry, L. (2013): On the relationship between the Small Red Damselfly *Ceriatagrion tenellum* and the terrestrial mite *Leptus killingtoni*. J. Br. Dragonfly Society 29(2): 69-83. (in English) ["Larvae of the terrestrial mite, *Leptus killingtoni* were identified on a population of *Ceriatagrion tenellum* on the East Devon Pebblebed Heaths in 2011. An investigation was undertaken on the interaction between these species during the flight period in 2012. In total 567 individuals (382 males and 185 females) were caught and marked and the location of a total of 808 mites were noted (498 on first capture and a further 310 on recaptures). The highest numbers of *L.*

killingtoni were seen in the middle and driest period at the end of July. Only 19% of immature *C. tenellum* were found to have mites, whereas 36% of male and 49% of female mature damselflies had mites. Paired females were more likely to be infested than unpaired females and males (whether paired or not). Mites were recorded most often from areas more difficult to groom, with 26.6% recorded on the ventral surface of the thorax (and especially between the legs), 20.9% on the abdomen and 17.3% on the femur. Female melanogastrum were recaptured nearly twice as often as *typica*, despite similar numbers being marked." (Author)] Address: Kerry, L., Mount Pleasant, Stoneyford, Colaton Raleigh, Sidmouth, Devon. EX10 OHZ, UK

13120. Khelifa, R. (2013): Book review: Karjalainen S. & Hämäläinen M. 2013: *Demoiselle damselflies: Winged jewels of silvery streams*. Caloptera, Helsinki, 223 pp. (bilingual, Finnish and English). ISBN 978-952-93-1045-6. Price EUR 36.00 (hardcover). Eur. J. Entomol. 110(4): 703. (in English) [Book review.] Address: Khelifa, R., Faculty of Biological and Agricultural Sciences, Biology Department, University of Tizi Ouzou, Tizi Ouzou 15000, Algeria. E-mail: rassimkhalifa@gmail.com

13121. Kholmogorova, N.V. (2013): Amphibiotic insects of the Izh River. Materials of the Fifth All-Russia Symposium on Amphibiotic and Aquatic Insects / Papanin Institute for Biology of Inland Waters, Russian Academy of Sciences. – Yaroslavl: Filigran, 2013. – 254 pp: 223-227. (in Russian, with English summary) ["Amphibiotic insects of the Izh River and the Izhevsk Reservoir have been studied. A significant reduction in the number of amphibionts in the regulated part of the river (the Izhevsk Reservoir, Russia), compared to the upper reaches of the river, and gradual recovery of their biodiversity with distance downstream from the dam has been revealed. A total of 183 species and higher taxa of amphibiotic insects have been recorded, including representatives of the following orders: Trichoptera, 35 species; Ephemeroptera, 24; Plecoptera, 1; Odonata, 16; Coleoptera, 51; Heteroptera, 18; Sialidae, 2; and Lepidoptera, 3." (Author) Only *Coenagrion hastulatum*, *Libellula depressa*, *Calopteryx splendens*, *Platycnemis pennipes*, and *Leucorrhinia pectoralis* were briefly mentioned in the text.] Address: Kholmogorova, N.V., Udmurt State University ul. Universitetskaya 1, Izhevsk, Udmurt Republic, 426034, Russia. E-mail: nadja-holm@mail.ru

13122. Kiauta, B. (2013): Obituary: Gordon Pritchard. *Odonatologica* 42(3): 257-261. (in English) ["A brief appreciation of the odonatological work of Dr G. Pritchard (1939-2012), Professor Emeritus of the University of Calgary (Canada), is followed by his odonatological bibliography (1963-2008). Among his main interests were, e.g., odonate prey capture and the structure and operation of the organs involved, the biology of *Argia vivida* in the Alberta (Canada) thermal springs, and various as-

pects of life history and behaviour. Other studies of importance include his work on the ecological classification of odonate mating systems, larval identification by means of cellulase acetate electrophoresis and egg development." (Author)] Address: Kiauta, B., P.O. Box 124, NL-5854 ZJ Bergen/LB, The Netherlands

13123. Kim, D.E.; Kim, J.M. (2013): Insect fauna of Ungok wetland in Gochang, Jeonbuk, Korea, designated as a wetland protection area at Ramsar Convention. *Journal of Environmental Science International* 22(9): 1141-1152. (in Korean, with English summary) [In 2011, a total of 149 species belonging to 11 orders and 57 families were recorded. Odonata were represented by 10.1% of the species (15 species): *Ceriagrion melanurum*, *Atrocalopteryx atrata*, *Calopteryx japonica*, *Orthetrum albistylum*, *O. japonicum*, *O. melania*, *Lyriothemis pachygastra*, *Crocothemis servilia mariannae*, *Sympetrum darwinianum*, *S. frequens*, *S. eroticum*, *S. infuscatum*, *S. kunckeli*, *S. parvulum*, and *Rhyothemis fuliginosa*.] Address: Kim, D.E., Ecosystem Assessment Division, National Institute of Environmental Research, Incheon 404-708, Korea. E-mail: un19781978@naver.com

13124. Kim, Y.H.; Kwona, D.H.; Lee, S.H. (2013): Biochemical characterization of two distinct acetylcholinesterases possessing almost identical catalytic activity in the damselfly *Vestalis gracilis*. *Journal of Asia-Pacific Entomology* 16(4): 465-471. (in English) ["Highlights: • Two acetylcholinesterases were identified in *Vestalis gracilis*. • Both VgAChE1 and VgAChE2 were almost equally active in *V. gracilis*. • Both VgAChE1 and VgAChE2 probably have similar neuronal functions. • VgAChEs were primarily associated with the membrane via the GPI anchor. • VgAChEs exhibited different sensitivities to insecticides. Most insects possess two different acetylcholinesterases (AChEs) (i.e., AChE1 and AChE2). It has been recently reported that only one AChE (either AChE1 or AChE2) has been selected for as the main synaptic enzyme and it varies with different insect lineages (Kim et al., 2012 and Kim and Lee, 2013). Interestingly, however, both AChE1 and AChE2 are almost equally active in a damselfly species, providing a unique example of the incomplete specialization of one AChE function after duplication, where, consequently, both AChE1 and AChE2 likely play a similar role in synaptic transmission. In this study, therefore, we investigated the tissue distribution patterns and the molecular and inhibitory properties of two AChEs (i.e., VgAChE1 and VgAChE2) from *V. gracilis* as a model species possessing two AChEs that are equally active. VgAChEs exhibited almost identical catalytic activity and were expressed in the central nervous system (CNS). The most predominant molecular form of both VgAChEs was a disulfide-bridged dimer, which is associated with the cell membrane via a glycosylphosphatidylinositol anchor. In an inhibition assay, however, VgAChE1 and VgAChE2 exhibited different sensitivities to organophosphate and carbamate insecticides de-

pending on the structure of the inhibitors. These findings suggest that both VgAChEs have neuronal functions. In addition, soluble monomeric and cleaved molecular forms were detected in both the CNS and peripheral nervous system tissues by an AChE2-specific antibody, implying that VgAChE2 probably shares both neuronal and non-neuronal physiological functions in *V. gracilis*. Our results support the notion that both VgAChEs, paralogous of each other, are involved in synaptic transmission, with VgAChE2 being in the early stage of acquiring non-neuronal functions." (Authors)] Address: Lee, S.H., Research Institute for Agriculture and Life Sciences, Seoul National University, 151-921, Republic of Korea. E-mail: shlee22@snu.ac.kr

13125. Koch, K.; Schneider, J.; Birkmann, L.; Weis, J.; Kotulla, A. (2013): Ein Vergleich zweier Großlibellenpopulationen (Odonata: Anisoptera) in Mainz. *Mainzer naturwissenschaftliches Archiv* 50: 321-331. (in German, with English summary) ["Over a period of two months we compared two populations of Anisoptera in the city of Mainz (Rhineland-Palatinate, Germany) by applying three methods: exuviae sampling, adult screening and mark-recapture. The areas under investigation comprised parts of the nature reserve Laubenheimer-Bodenheimer Ried as well as an assemblage of artificial ponds on the campus of the University of Mainz. The two habitats differed in size and structure. Nevertheless, partly the differences between the two populations in number of species and number of specimen, in sex ration, recapture rate, species diversity and the evenness were smaller than expected or even contrary to our expectations (species diversity of the exuviae). The cause of this observation might be that we worked less intensively on the larger area of Laubenheimer. However, we interpret our observation as a hint that even small artificial ponds can offer an adequate habitat for various Anisoptera." (Authors)] Address: Koch, Kamilla, Abteilung Ökologie, Institut für Zoologie, Johannes-Gutenberg-Universität Mainz, Johann-Joachim-Becherweg 13, 55128 Mainz, Germany. E-Mail: kochka@uni-mainz.de

13126. Krieg-Jacquier, R. (2013): In memoriam Daniel Grand. *Martinia* 29(1): 75-76. (in French) [France, personal obituary for one of the most expressed and productive French odonatologists of the past decades.] Address: Krieg-Jacquier, R., 18 rue de la Maconne, 73000 Barberaz, France. E-mail: regis.krieg.jacquier@gmail.com

13127. Kulijer, D.; Zawal, A.; Baker, R.A. (2013): Further studies on the Odonata from Bosnia & Herzegovina and their mite parasites. *J. Br. Dragonfly Society* 29(2): 97-106. (in English) ["A brief review of the present knowledge of the Odonata from Bosnia and Herzegovina is followed by further work on their mite parasites; in particular their identification, distribution and host records. A total of 301 mites were mounted, counted and identified, most of them to species. *Arrenurus bicuspidator*, *A. bruzelii*, *A. cuspidator*, *A. cuspidifer*, *A. maculator* and *A.*

papillator were identified on 13 odonate host species, including three Anisoptera: *Aeshna isosceles*, *Sympetrum flaveolum* and *Anax imperator*. The Zygoptera were *Ischnura pumilio*, *I. elegans*, *Coenagrion puella*, *C. pulchellum*, *C. scitulum*, *Pyrrhosoma nymphula*, *Enallagma cyathigerum*, *Erythromma najas*, *Lestes dryas* and *Platycnemis pennipes*. Size measurements indicate that larval mites of the same species are much larger on anisopterans than on zygopterans and reasons for this are discussed." (Authors)] Address: Kulijer, D., National Museum of Bosnia and Herzegovina, Zmaj od Bosne 3, 71000 Sarajevo, Bosnia & Herzegovina

13128. La Porta, G.; Dell'Otto, A.; Speziale, A.; Goretti, E.; Rebora, M.; Piersanti, S.; Gaino, E. (2013): Odonata biodiversity in some protected areas of Umbria, central Italy. *Odonatologica* 42(2): 125-137. (in English) ["Odonate assemblages of 4 wetlands included in the Biotopes Inventory of Italy (Natura 2000 project) have been investigated. A total of 36 species has been recorded and no species-area relationship was found. The richness observed is about 60-90% of the potential richness of the biotopes. The occurrence of *Trithemis annulata*, previously unknown from the Umbria region, and new findings for the biotopes are reported. The odonate flight period spanned from early April to the end of November. Diversity and evenness profiles have shown more diverse communities at sites with a greater habitat heterogeneity and multivariate dispersion analysis has revealed higher homogeneity for Zygoptera than for Anisoptera." (Authors)] Address: La Porta, G., Dipartimento di Biologia Cellulare e Ambientale, Sezione di Biologia Animale e Ecologia, Università degli Studi di Perugia, 06123 Perugia, Italy. E-mail: gianandrea.laporta@unipg.it

13129. Lambret, P.; Boudot, J.-P. (2013): *Hemianax ephippiger* (Burmeister, 1839) (Odonata, Anisoptera: Aeshnidae): présentation générale. *Martinia* Hors-série, *Hemianax ephippiger* - migration 2011, mai 2013: 13-27. (in French, with English summary) ["The life history and behaviour of *H. ephippiger* are summarized in order to better understand the recent migratory activity of the species observed in Europe. The key criteria for a fast identification of the adults are given. *H. ephippiger* ranges from the South of Africa to the North of Europe and to India. It is autochthonous in the tropical zone and the Mediterranean where the larvae grow rapidly and preferentially in shallow waters, either permanent or temporary. The species is an obligate migrant which leaves early its native habitat, at the post-teneral stage. Following mass emergences, mass migrations bring the species to the north and the west and the latter has been observed as far as Iceland, Central Asia, French Guyana and the West-Indies. Such long-distance migrations are accompanied by successful local breeding and appear to be mostly passive, being allowed for by strong winds blowing into the same direction for several days. In Africa, migrations are initiated mostly from September to November, taking advantage of the mass

emergences launched by the rainfalls of the summer monsoon. Migrations occur first during the winter along the Atlantic African coast and are accompanied by local breeding and production of a new generation. They continue in Western Europe until the spring. More to the east, inland swarms fail to cross the Atlas range during the winter and accumulate in the Sahara before being able to start again northwards in spring. These two Coastal and inland migration pathways are accompanied by successful breeding in suitable habitats in the north of Africa, Mediterranean Europe and sometimes Central Europe. Similar migrations with successful local breeding are also known from the Arabian Peninsula, both along the coasts and inland. They seem to reach Anatolia and Central and Eastern Europe. Central Asian records could result from Indo-Iranian migrations. The secondary generations appearing north of the Saharan/Arabian belt may lead to new mass migrations in summer and autumn in Southern Europe. Due to the obligate migratory behaviour of the species, the European individuals leave their native habitats for unknown destinations; a return to Africa can be advocated but remains highly hypothetical. Egg laying in Europe in autumn is therefore very rare and in this case the European winter conditions make a larval development highly improbable, except in its southernmost parts of the continent. Other noteworthy behaviours of the species are reminded." (Authors)] Address: Lambret, P., Le Trident B2 n°55, rue de la Sansouïre, F-13310 St-Martin-de-Crau, France. E-mail: philambret@hotmail.com

13130. Lambret, P. (2013): De l'émergence et de la coloration chez *Lestes macrostigma* (Eversmann, 1836) (Odonata, Anisoptera: Lestidae). *Martinia* 29(1): 53-64. (in French, with English summary) ["Both the emergence and the colour pattern all along the imaginal life of *L. macrostigma* were studied from 2009 to 2013 in the national natural reserve of the Marais du Vigueirat. Between the break of the larval skin and the moment when the abdomen reaches its final length, the emergence lasted about two hours. Emergences mainly took place in early morning and the exuviae were found around 30 cm above the water table. The sex-ratio at emergence was close to 1 and both sexes emerged synchronously. The coloration of the imagines changed rapidly during the first days. That of the day of the emergence and/or the day after was unique, depending both on the time of emergence as well as the weather, so that it is possible to know if an individual has emerged the day or the day before its observation. The pruinosity seems to cover a maximal surface during the mating period and then decreases, whereas the abdominal tergites darken. The record of tenerals appears to be sufficient to show the autochthony of a population. Coloration patterns can help to identify local populations and their breeding localities." (Author)] Address: Lambret, P., Le Trident B2 n°55, rue de la Sansouïre, F-13310 Saint-Martin-de-Crau, France. E-mail: philambret@hotmail.com

13131. Lambret, P.; Gully, F. (2013): Nouveau cas d'aile de Zygoptère transpercée par une plante: *Ceriatrigon tenellum* (Villers, 1789) (Odonata, Zygoptera: Coenagrionidae). *Martinia* 29(1): 46. (in French) [*C. tenellum* was trapped at the spine of a leaf of *Cirsium arvense* at 27 juin 2007, lake Roud ar Roc'h (Lannion, Department of Côtes-d'Armor, France).] Address: Lambret, P., Cabane de Ligagneau, Route de l'Etoumeau 13104 Mas-Thibert, France. Email: philambret@hotmail.com

13132. Lambret, P.; Deschamps, C. (2013): Bilan de la migration d'*Hemianax ephippiger* (Burmeister, 1839) en France en 2011 (Odonata, Anisoptera: Aeshnidae). *Martinia* Hors-série, *Hemianax ephippiger* - migration 2011, mai 2013: 29-46-appendix: 76-96. (in French, with English summary) ["The migration waves of *H. ephippiger* observed in Western Europe in 2011 was so huge that it remains unparalleled in human mind in the region. Basing on a large network of 177 volunteers, we gathered 560 data in France, distributed in 57 departments and covering 18 regions. Most of data were recorded from April to June, corresponding to a first immigration wave. A second wave ranged from July to November, with locally swarms of thousands individuals coming from the south. Immature imagoes were encountered throughout the presence of the species in the country, but some individuals were already very old during the spring immigration. Given the general lack of known significant winter larval development in Europe, spring adults originated most likely from Africa. They bred in France in various standing waters (ponds, gravel pits with well-developed vegetation, lakes...). Imagoes recorded in summer and autumn were in part the offspring of the spring breeders and in part new southern incomers. A wide coastal Atlantic pathway was especially used for this 2011 migration, although the Rhône river axis was more usual in previous migrations. For this reason, and because of its dramatic abundance, *H. ephippiger* is new to 31 French departments. The affinity of *H. ephippiger* for lowlands is obvious: 83.6 % of the observations referred to localities ranging from 0 to 200 m a.s.l. However, *H. ephippiger* was seen at 1428 m a.s.l and bred successfully still at 640 m a.s.l, the latter elevation being to our knowledge the highest known for the species in Europe. Few other noteworthy records about the behaviour of the individuals observed are given." (Authors)] Address: Lambret, P., Cabane de Ligagneau, Route de l'Etoumeau 13104 Mas-Thibert, France. Email: philambret@hotmail.com

13133. Li, Y.-J.; Nel, A.; Ren, D.; Pang, H. (2013): A new damselfly dragonfly from the Mesozoic of China with a hook-like male anal angle (Odonata: Isophlebioptera: Campteropteroptera). *Journal of Natural History* 47(29-30): 1953-1958. (in English) ["A new genus and species of campteropteroptid dragonfly, *Angustiphlebia mirabilis* gen. nov. et sp. nov., is described from the Jiulongshan Formation in China. It has some remarkable venational structures, i.e. a hypertrophy of the male hind wing anal

angle, a quite long gaff, and a secondary branch of the anal anterior near subdiscoidal cell in hind wing, supporting the hypothesis of a sister-group relationship with the genus *Oreophlebia*. These new data will help to solve the phylogenetic relationships within the Campteropteroptera." (Authors)] Address: Nel, A., Lab. Ent. Mus. Natn. Hist. Nat., 45 rue Buffon, F-75005 Paris, France. E-mail: anel@cimrs1.mnhn.fr

13134. Lim, P.-E.; Tan, J.; Eamsobhana, P.; Yong, H.S. (2013): Distinct genetic clades of Malaysian Copera damselflies and the phylogeny of platycnemine subfamilies. *Scientific Reports* 3, Article number: 2977: 7 pp. (in English) ["The phylogenetic relationships of some taxa in the Platycnemidinae at the species and generic levels have been investigated. Phylogenetic trees were generated from both individual mitochondrial encoded COI, COII, 16S rDNA and nuclear encoded 28S rDNA and also combined sequences; these data indicate that the component taxa of the genus *Copera* belong to two distinct genetic clades – the marginipes group and the annulata group. There was no distinct genetic difference between the red-legged and yellow-legged morphs of *C. vittata*. Molecular data showed that the annulata group is considered a member of the genus *Platycnemis*, as originally proposed. The genus *Coeliccia*, a member of the subfamily Calicnemiinae (Platycnemididae), is not grouped with the Platycnemidinae. The Disparoneurinae of the 'Protoneturidae' showed a closer relationship to the Platycnemidinae than the Calicnemiinae. The dataset supports the placement of the Disparoneurinae as a subfamily of the Platycnemididae. This resolves the monophyly of Platycnemididae." (Authors)] Address: Lim, P.-E., Institute of Biological Sciences, University of Malaya, 50603 Kuala Lumpur, Malaysia [2] Institute of Ocean and Earth Sciences, University of Malaya, 50603 Kuala Lumpur, Malaysia.

13135. Liu, G.; Li, C.; Dong, H. (2013): Does dragonfly's abdomen flexion help with fast turning maneuvers? *Bulletin of the American Physical Society* 58(18): o.p. (in English) ["Dragonflies are able to achieve fast turning maneuvers during take-off flights. Both asymmetric wing flapping and abdomen flexion have been observed during the fast turning. It's widely thought that the asymmetric wing beats are responsible of producing the aerodynamic moment needed for the body rotation. However, the dynamic effect of the abdomen flexion is not clear yet. In this study, an integrated experimental and computational approach is used to study the underlying dynamic effect of dragonfly abdomen flexion. It's found that dragonfly abdomen tended to bend towards the same side as the body reorienting to. Quantitative analysis have shown that during take-off turning maneuver the abdomen flexion can modulate the arm of force by changing the position of the centre of mass relative to the thorax. As a result, roll and yaw moments produced by the wing flapping can be enhanced." (Au-

thors)] Address: Liu, G., Dept. of Mechanical and Aerospace Engineering, University of Virginia, USA

13136. Louboutin, B.; Jaulin, S.; Houard, X. (2013): Premières mentions pour *Leucorrhinia dubia* (Vander Linden, 1825) et *Coenagrion hastulatum* (Charpentier, 1825) dans l'Aude et observation d'une femelle andromorphe de *L. dubia* (Odonata: Libellulidae, Coenagrionidae). *Martinia* 29(1): 65-74. (in French, with English summary) ["A new breeding locality for *L. dubia* and *C. hastulatum* was discovered during an entomological survey conducted for the Office national des forêts (ONF) by the Office pour les insectes et leur environnement (Opie), at a small peaty pond in the La Fajolle forest (Aude department, France). The station is located in a mountainous area under continental bioclimatic influences. Although this area has been poorly prospected in the past, it appears potentially very rich and original from an entomological point of view. Detailed information is given on the habitat and the local Odonatological assemblage, and conservation prospects are mentioned. Finally, the capture of an andromorphic female of *L. dubia* at the site is emphasized." (Authors)] Address: Louboutin, B., Office pour les insectes et leur environnement (Opie), antenne du Languedoc-Roussillon, CBGP Campus de Baillarget - 34988 Monferrier-sur-Lez Cedex, France. E-mail: bastien.louboutin@insectes.org

13137. Manger, R.; Martens, A. (2013): First records of *Forcipomyia paludis* (Diptera: Ceratopogonidae), an ectoparasite of dragonfly adults, in The Netherlands. *Entomologische Berichten* 73(5): 182-184. (in English, with Dutch summary) ["On June 7th 2008, *Leucorrhinia pectoralis* individuals having the biting midge *Forcipomyia* (*Pterobosca*) *paludis* on their wings were photographed in National Park Weerribben-Wieden (The Netherlands). This ceratopogonid or biting midge is a temporary ectoparasite of dragonfly adults and the only ceratopogonid species known to specifically feed on this insect group in Europe. The photographs are the first evidence of the presence of *F. paludis* in The Netherlands, but reference material still has to be collected and stored. *Forcipomyia paludis* is already known from Ireland, England, France, Germany, Switzerland, Austria, Sweden, Poland, Italy and Croatia." (Authors) Five biting midges on a female *Crocothemis erythraea*, 05.vii.2008, National Park Weerribben-Wieden were documented.] Address: Manger, R., MangerEco, Stoepveldsingel 55, 9403 SM Assen, The Netherlands. E-mail: rene@mangereco.nl

13138. Manger, R. (2013): De Libellen von Kefalonia. Privately published. www.mangereco.nl: 5 pp. (in Dutch) [In endApril/May 2013, five localities on the island Kefalonia (Greece) were studied for their Odonata fauna. A total of 16 species including *Coenagrion pulchellum* and *C. scitulum* found were recorded.] Address: Manger, R., MangerEco, Stoepveldsingel 55, 9403 SM Assen, The Netherlands. E-mail: rene@mangereco.nl

13139. Marinov, M.; Chinn, W.; Edwards, E.; Patrick, B.; Patrick, H. (2013): A revised and updated Odonata checklist of Samoa (Insecta: Odonata). *Faunistic Studies in South-East Asian and Pacific Island Odonata* 5: 1-21. (in English) ["Odonata records of the Samoan Archipelago are updated and an updated checklist provided. It is part of an ongoing assessment of the fauna, taxonomy and distribution of the Pacific island dragonflies. The checklist follows recent reviews published/prepared about the Solomon Islands, New Caledonia, Fiji and Kingdom of Tonga. This study draws on recent dragonfly records following general insect surveys spanning 2008-2012 funded by Critical Ecosystem Partnership Fund (CEPF) via Conservation International (CI) to the authors and to Secretariat Pacific Regional Environment Program (SPREP) and also by funding from Japan International Cooperation Agency (JICA). Other unpublished data from Samoan Archipelago and Niue are included as well. All, but one, of the newly collected Odonata species are widespread within the Pacific region. *Hemicordulia cupricolor* is the only species from the recent collections which is endemic to Samoa, previously reported for Savai'i and Upolu Islands. It has never been confirmed since its original description in 1927. The new study shows the species as an inhabitant of high altitude zones of Savai'i. It is recommended inland areas of Savai'i and other islands within the Samoan Archipelago should be targeted in further field studies." (Authors) The study also discusses the knowledge on the taxonomic status between *Anaciaeschna jaspidea* and *A. melanostoma*.] Address: Marinov, M., 7/160 Rossall Str., Merivale 8014, Christchurch, New Zealand. E-mail: milen.marinov@mpi.govt.nz

13140. Maxwell, J. (2013): Parametric investigations into fluid-structure interactions in hovering flapping flight. M.Sc. Thesis, Department of Mechanical Engineering, University of Maryland, College Park: XI + 128 pp. (in English) ["A parametric investigation into flapping flight is presented. For a Reynolds number of 75, harmonically forced flapping dynamics is studied. A wing section is modelled as two rigid links connected by a hinge with a torsion spring-damper combination. This section is wrapped in a smooth aerodynamic surface for immersion in the fluid domain. An immersed boundary method is employed on a two-dimensional structured Cartesian grid to solve the incompressible form of the Navier-Stokes equations for low Reynolds numbers by using a finite difference method. Fully coupled fluidstructure interactions are considered. Performance metrics, which include cycle-averaged lift, drag, power, and their ratios, are used to characterize the effects of different parameters and kinematics. Principal components of flow-field structures are quantified, and the system's response is correlated to performance. The thesis findings can serve as a basis to understand and identify flapping frequencies that provide high performance." (Author) Figure 3.3 presents a Principal component analysis of a dragonfly picture (*Anax junius*).] Address: not stated

13141. McLamb, S. (2013): Shropshire (VC40) Dragonfly Newsletter. Shropshire (VC40) Dragonfly Newsletter. Spring 2013: 7 pp. (in English) [Content: Flight Season 2012; First and Last Recorded Sightings 2012; Species: A total of 27 species were recorded in 2012 comprising 16 dragonfly and 11 damselfly species; New / Rediscovered Populations: *Sympetrum fonscolombii*, *Ischnura pumilio*; Missing In Action...: The most notable 'missing species' of 2012 was the Keeled Skimmer (*Orthetrum coerulescens*); Coming Soon to a Pond Near You?: *Erythromma viridulum*; BDS National Atlas; Shropshire Dragonflies- the next project!] Address: McLamb, Sue, mclamb1@btinternet.com.

13142. Medvedev, A.F.; Kosterin, O.E.; Malikova, E.I.; Schneider, W. (2013): Descriptions of *Somatochlora exuberata* Bartenev, *Leucorrhinia intermedia* Bartenev and *Sympetrum vulgatum grandis* Bartenev, the fate of A.N. Bartenev's type specimens and designation of the lectotype of *L. intermedia* (Anisoptera: Corduliidae, Libellulidae). *Odonatologica* 42(3): 211-228. (in English) ["Descriptions of *S. exuberata*, *L. intermedia* and *S. vulgatum grandis* were published simultaneously but 4 times in 2 languages and in 3 years, 1910, 1911 and 1912. One of the 1910 publications was fragmented and published in 4 subsequent journal issues, involving confusion with the order of parts and the paper title, but it is this publication which has priority. The date of publication of the above mentioned names is Oct. 1, 1910. Hence *Somatochlora exuberata* Bartenev, 1910 has priority over *Somatochlora japonica* Matsumura, 1911. Syntypes in Bartenev's own collections were most probably lost, as were most of his types, but some may remain in European collections as received by foreign odonatologists from Bartenev in exchange. A male syntype of *L. intermedia* from Ris' collection, kept in Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt/Main, Germany (FMS), is designated as the lectotype of this taxon." (Authors)] Address: Medvedev, A.F., Department of Hydrobiology, Faculty of Biology, Moscow State University, Leninskie Gory 1-12, Moscow, 119991, Russia

13143. Mikolajewski, D.J.; Wohlfahrt, B.; Joop, G.; Beckerman, A.P. (2013): Sexual size dimorphism and the integration of phenotypically plastic traits. *Ecological Entomology* 38(4): 418-428. (in English) ["Sexual size dimorphism (SSD) reflects adaptive differences in male and female reproductive roles. Understanding the mechanisms generating SSD is of broad ecological and evolutionary interest, because body size is closely linked to fitness. Sex-specific phenotypic plasticity in growth as a response to environmental conditions represents one of the major sources mediating variation in SSD. We investigated phenotypic plasticity associated with predation and seasonal time constraints in development as a source of SSD in *Coenagrion puella*. We complemented this with an analysis of trait correlations (integration) of body size with behavioural, physiological

and life-history traits to investigate how dimorphism manifests. Our results reveal that: (i) plasticity in SSD is mediated by environmental variation; and (ii) environment-dependent, sex-specific changes in the association of body size with growth rate and fat storage mediated changes in the offset of SSD. Our results highlight sex-specific trait responses to the environment channel manifestation of SSD. These findings may be crucial to understanding large parts of the widely documented intraspecific variation of SSD." (Authors)] Address: Mikolajewski, D.J., Laboratory of Aquatic Ecology and Evolutionary Biology, Katholieke Universiteit Leuven, Charles Debériotstraat 32, 3000 Leuven, Belgium. E-mail: d.j.mikolajewski@sheffield.ac.uk

13144. Miłaczewska, E. (2013): 10th National Symposium of the Odonatological Section of Polish Entomological Society – Izabelin, June 28–30, 2013] 77. *Odonatrix* 9(2): 77-80. (in Polish, with English summary) [The author discusses the symposium organized in June 2013 in the Kampinoski National Park (central Poland). One scientific session and a several field sessions took place. During the field sessions, at 16 sites 34 dragonfly species were found with one regional new species (*Erythromma viridulum*) which makes together 53 species known in this area. Moreover, the recently discovered population of *Nehalennia speciosa* at the transitional peat bog Długie Bagno was studied with respect to its numbers (at least several thousands of specimens) and the characteristic of its habitat." (Author)] Address: Miłaczewska, Ewa, ul. Cichociemnych 3 m. 13, 03-984 Warszawa, Poland. E-mail: ewa.milaczewska@gmail.com

13145. Mitra, A. (2013): Cinderella's new shoes – how and why insects remodel their bodies between life stages. *Current Science* 104(8): 1-9. (in English) ["Metamorphosis in insects is a remarkable phenomenon where the larva undergoes a striking morphological reorganization to give rise to the adult. Over the years, various physiological factors and pathways that govern metamorphosis have been discovered, and at the same time, some understanding about the origins of this phenomenon has also emerged. This review summarizes the current state of knowledge of both the mechanisms underlying metamorphosis, as well as the theories put forward to explain its evolution." (Author) The paper includes references to Odonata.] Address: Mitra, A., Department of Biology, Washington University in St Louis, Monsanto 411, Campus Box 1137, One Brookings Drive, St. Louis, MO 63130-4899, USA. E-mail: mitra.aniruddha@gmail.com

13146. Mittmann, K. (2013): Interessante Libellen am Silbersee in Bobenheim-Roxheim. *Pollichia Kurier* 29(4): 32. (in German) [Rheinland-Pfalz, Germany; the focus of the anecdotal observations was set on *Anax parthenope* and *Crocothemis erythraea*] Address: not stated

13147. Monster, L. (2013): Vleugels van libel zijn natuurraadsel. Kunst- en vliegwerk. *Landleven* 18(5): 54-57. (in Dutch) [This is a popular account on dragonflies in a Dutch journal for garden lovers.] Address: Landleven, Postbus 4, 7000 BA Doetinchen, The Netherlands. E-mail: redactie@redactielandleven.nl

13148. Moreno-Benítez, J.M.; Ripoll Rodríguez, J.; Toro, F.; Winter, P. (2013): Contribución al conocimiento de los odonatos (Odonata) de la provincia de Málaga (España). *Boletín de la Red de Observadores de Libélulas en Andalucía* 3: 77-107. (in Spanish, with English summary) ["Dragonflies (Odonata) records from the province of Malaga, Spain, during the period 2005-2012, are reported. The available literature is reviewed and the provincial catalogue is updated. Currently 56 species are known within Malaga." (Authors)] Address: E-mail: lorquini@gmail.com

13149. Ndueze, O.U.; Noutcha, M.A.E.; Umeozor, O.C.; Okiwelu, S.N. (2013): Arthropods associated with wildlife carcasses in Lowland Rainforest, Rivers State, Nigeria. *European Journal of Experimental Biology* 3(5): 111-114. (in English) [Odonata belong to the arthropods associated with the carcass of the Mona monkey, *Cercopithecus mona*. "Odonata were probably transients, with no discernible impact on the decomposition process." (Authors)] Address: Ndueze, O.U., Entomology & Pest Management Unit, Department of Animal and Environmental Biology, University of Port Harcourt, Nigeria

13150. Negi, R.K.; Mangain, S. (2013): Seasonal variation of benthic macro invertebrates from Tons River of Garhwal Himalaya Uttarakhand. *Pakistan Journal of Biological Sciences* 16: 1510-1516. (in English) ["Present investigation was carried out to assess the seasonal variation of benthic macro-invertebrates from the Tons river, a tributary of Yamuna River in Garhwal Himalaya, Uttarakhand during December, 2007 to November, 2009. The seasonal benthic diversity was correlated with various physico-chemical parameters which documented that the macrobenthic diversity is mostly regulated by the dissolved oxygen in the water while temperature and free CO₂ were found to be inversely correlated with the benthic fauna. Maximum diversity of benthos was reported at the upstream site ('H' 0.204) during the winter season while it was recorded minimum during the rainy season at all the sites. Maximum diversity is reported during the winter season at all the sites. The benthic fauna is represented by three phylum, 4 classes and 10 orders with Insecta emerging as the most dominant class. Maximum genera were reported from mid-stream site as it acts as ecotone between upstream and downstream." (Authors) The list of taxa includes Odonata at the genus level. Some of them were probably misidentified.] Address: Negi, R.K., Dept of Zoology and Environmental Sciences, Gurukula Kangri University, Haridwar UK-249404, India

13151. Nel, A.; Krzeminski, W.; Szewo, J. (2013): *Elektroephaea* gen.n., the oldest representative of the modern Epallaginae from Eocene Baltic amber (Odonata: Zygoptera: Epallagidae). *Insect Systematics & Evolution* 44(2): 129-140. (in English) ["*Elektroephaea flecki* gen.n. sp.n., the oldest representative of the modern damselfly subfamily Epallaginae, is described from the Middle Eocene Baltic amber. This study confirms a Palaeocene age (or older) for the Epallagidae, previously supported by the presence of representatives of Eodichrominae from the Palaeocene-Eocene Mo-clay Formation of Denmark and from Baltic amber." (Autors)] Address: Nel, A., Lab. Ent. Mus. Natn. Hist. Nat., 45 rue Buffon, F-75005 Paris, France. E-mail: anel@cimrs1.mnhn.fr

13152. Netz, H. (2013): Paarung in der Libellen-Disco. Neuer Lebensraum für die Grüne Keiljungfer. *Naturschutz heute* 3/13: 14-15. (in German) [The paper reports on current attempts to improve habitats of *Ophiogomphus cecilia* in the region Fränkisches Becken, Bayern, Germany. The project is EU founded. For more details see: <http://www.lbv.de/unsere-arbeit/life-naturprojekte/life-projekt-keiljungfer/tagebuch.html>] Address: not stated

13153. Nordström, K. (2013): Robust prey detection in a small nervous system. *PNAS* 110(2): 389-390. (in English) ["Vision plays a huge role for us humans, as well as for many other animals. If you have ever tried to walk in a straight line with your eyes closed, you know how important self-generated optic flow is for maintaining a straight trajectory. Besides such widefield optic flow cues, we can also visualize the motion of objects that move independently of the remaining visual surround. Such targets may represent the motion of a ball during a game of cricket, tennis, or baseball (take your pick, depending on your cultural heritage and location in the world). Despite the fact that you are moving, and thereby generating optic flow across your visual field, you can still visualize and identify the independent trajectory of the ball. Motion vision is not only important for human sports stars (1), but also for insects who use these cues for tasks such as maintaining a straight flight trajectory (2), avoiding colliding with approaching tree trunks, and, importantly, identifying targets such as potential prey (3), the subject of a paper published in PNAS (4). Studying the neurophysiology underlying target detection in human subjects, and other vertebrates, quickly becomes quite complicated. Besides the relative inaccessibility of the vertebrate visual cortex, there is the additional inconvenient complication of the eyes being able to move independently of the head (5). In insects, however, the eyes are fixed to the head's exoskeleton, which means we know what the insect looks at if we know what direction the head is facing. Intriguingly, however, despite vertebrates and insects being separated by huge evolutionary distances (6), and being equipped with completely different eyes (7), mo-

tion vision is coded in remarkably similar ways in the vertebrate visual cortex and the insect brain (8). We can therefore, somewhat surprisingly, use the insect visual system to understand ... Dragonflies have compound eyes, which limit the spatial resolution severely compared with the single lens eyes of vertebrates (7). In a compound eye, the maximum resolution is given by the spacing of the individual lenses. Dragonflies, and many other insects that depend on successful target detection, have therefore evolved areas in the compound eye with increased spatial resolution, called acute zones (16). The dragonfly's acute zone is located in the dorso-frontal visual field, in the same area as Gonzalez-Bellido et al. describe the peak TSDN sensitivity (4). This is also the part of the visual field where STMD receptive fields tend to cluster (17), and where dragonflies position their prey during target pursuit (3, 9). Taken together, this highlights the coevolution of optics, neural machinery and behaviour for optimizing successful target pursuit despite the limited hardware—in the form of poor and a small brain—provided." (Author)] Address: Nordström, Karin, Department of Neuroscience, Uppsala University, SE-751 24 Uppsala, Sweden. E-mail: karin.nordstrom@neuro.uu.se.

13154. Noskovič, J.; Rakovská, A.; Porhajašová, J.; Babošová, M.; Čeryová, T. (2013): Biological evaluation of the water quality in the water flow in the southwestern part of the Slovak Republic. *Research Journal of Agricultural Science* 45(2): 171-181. (in English) ["Assessment of the surface water quality in the whole Europe affected the Directive 2000/60/EC of the waters, according to which is the evaluation method of surface waters based on the the evaluation of the ecological and chemical status of the surface water bodies. For environmental assessment are key information on the qualitative and quantitative composition of communities aquatic organisms. On this basis, we collected 28 samples of water flow at 7 sites Caradice brook during year 2009, in the southwestern part of the Slovak Republic. In the water flow Ęaradice stream, which spring in the mountain of Pohronský Inovec and is righthand tributary of the Hron River, thus we obtained 30 776 individuals macrozoobenthos. By determining the mentioned number of the individuals, we found the presence of 146 kinds that were included into 16 systematic groups: Turbellaria, Oligochaeta, Hirudinea, Gastropoda, Bivalvia, Isopoda, Amphipoda, Ephemeroptera, Plecoptera, Odonata, Heteroptera, Megaloptera, Coleoptera, Trichoptera, Diptera, Chironomidae. From these systematic groups the largest number of representatives of the systematic group Amphipoda had regularly occurred at all sampling sites. Most widespread type of this systematic group and also the most numerous of all species of macroinvertebrate found in the waters of the Caradice stream was *Gammarus fossarum*, which we regard to its mass occurrence (28%) identified as eu-dominant species. The smallest numerous individuals were represented systematic group Megaloptera that

monitored the water flow occurred infrequently, so we included them to subprecedent species. The greatest constancy, i.e. stability of in the community had species *Eiseniella tetraedra*, *Gammarus fossarum*, *Pisidium obtusale*, which we evaluated as the species always present. The species of *Cloeon dipterum*, *Erpobdella octocolata*, *Hydropsyche angustipennis* was species the almost always present. The greatest frequency had family Chironomidae (100%). The Saprobic indices in the reporting period ranged from 1.7151 to 2.2399 on the basis of what we categorized the water from Caradice stream to the level of beta - mesosaprobity. The average annual value of the saprobic index of benthic invertebrates of Caradice brook (SAS=2,00) does not meet the requirements of the indicator of water quality - Part E "biological and microbiological parameters, which are set out in Government Regulation No. 269/2010 Coll. (SAS = 1,3)." (Authors)] Address: Noskovič, J., Dept of Environmental Sciences and Zoology, Slovak University of Agriculture in Nitra, Tr. A. Hlinku 2, 949 76 Nitra – Slovakia. E-mail: Jaroslav.Noskovic@uniag.sk

13155. Obasi, K.O.; Okechukwu, R.I.; Nwokocha, N.J. (2013): Species diversity and evenness of some organisms in Usumani and Imo Rivers, Abia State, Nigeria. *International Journal of Science and Technology* 2(9): 690-695. (in English) ["Shannon Weiner's diversity index (H), and Pileos's evenness index (J) or Equitability, were adopted in establishing the diversity and evenness of the species respectively. Results of the study show that the highest diversity index of 2.0312 and equitability (evenness) index of 0.8471 were recorded at Usumani river. At Imo river Uzuaku, diversity index of 0.6560 and equitability of 0.4076 were recorded. In addition, Imo river Owerrinta had diversity index of 0.7407 and equitability of 0.4134." (Authors) The material includes "Aeshna sp. dragonfly larvae".] Address: Obasi, K.O., Department of Biological Science, School of Science Federal University of Technology; Owerri, Nigeria.

13156. Obregon-Romero, R.; Cano-Villegas, J.; Tamañon-Gomez, R.; Lopez Tirado, J. (2013): Primeras citas de *Trithemis kirbyi* Séllys, 1891 (Odonata, Libellulidae) en las provincias de Ciudad Real y Huelva, y nuevas aportaciones para la provincia de Badajoz (España). *Boletín de la SAE* 22: 88-93. (in Spanish, with English summary) [T kirbyi was recorded, for the first time, from Ciudad Real (first record from Castilla La Mancha) and Huelva (Andalusia). The presence in the province of Badajoz (Extremadura) was also confirmed. These records document the range extension of the species towards inland habitats and the Atlantic coast.] Address: Obregón-Romero, R., Dpto. Botánica, Ecología y Fisiología Vegetal. Área de Ecología. Campus de Rabanales. Universidad de Córdoba, Spain. E-mail: rafaobregonr@gmail.com

13157. Olomukoro, J.O.; Osamuyiamen, I.M.; Dirisu, A.-R. (2013): Ecological survey of macrobenthic inver-

tebrates of selected ponds in Agbede flood plain, southern Nigeria. *Journal of Biology, Agriculture and Healthcare* 3(1): 23-29. (in English) ["Ecological study on three selected ponds of Agbede flood plain was fortnightly carried out between January and June, 2007 to assess and document the macrobenthic fauna composition, abundance and distribution, as well as the physicochemical status of some parameters in water which were collected and analyzed monthly. Benthos was sampled for using the Ekman Grab operated by hand in shallow waters together with the Kick sampling method. Among the eight physicochemical characteristics investigated, pH fluctuated from slightly acidic to slightly alkaline with range of values (5.90 – 7.35) at the studied stations. Significant difference ($P < 0.05$) was observed for biological oxygen demand (BOD5) and dissolved oxygen (DO). A total of ten (10) groups comprising macroinvertebrates taxa with one thousand and thirty one (1,031) individuals were recorded in this study. Most dominant groups were represented by Coleopterans (35.79% and 374 individuals), Hemiptera (20.19% and 211 individuals) and Dipterans (18.47% and 193 individuals). Evenness was highest in pond 1 (0.4973). The highest number of macroinvertebrates were collected from pond 2 (416) where no human activities occurred and however implied that human activities can rapidly alter any previously stable communities of aquatic environments." (Authors) Identification of taxa is obscure because the checklist includes Palaearctic and Nearctic taxa.] Address: Olumukoro, J.O., Department Of Animal And Environmental Biology, Faculty Of Life Sciences, University Of Benin, Benin City, P.M.B. 1154, Nigeria. E-mail: olomsjo@yahoo.com

13158. Orwa, P.O.; Raburu, P.O.; Kipkemboi, J.; Rongoi, P.; Owuor, O. (2013): Use of macroinvertebrate assemblage to assess the ecological integrity of Nyando Wetlands, Kenya. *Journal of Ecology and the Natural Environment* 587: 152-164. (in English) ["This study aimed to investigate changes in macroinvertebrate assemblage within Nyando wetlands and developed an index of biotic integrity for monitoring human disturbances. Triplicate macroinvertebrate samples were collected monthly for seven months using a scoop net. They were sorted live, counted and identified to genus level. Water samples for nutrients were collected and analyzed using standard methods. Physico-chemical parameters were taken in situ using electronic meters. Macroinvertebrates were analyzed for richness, diversity, dominance and abundance. Abundance was correlated with physico-chemical parameters. Kruskal-Wallis test was used to test spatial differences in macroinvertebrate community. Metrics for index of biotic integrity were chosen, tested, and a 5, 3, 1 scoring criteria was used. A total of 45 genera (including four Odonata genera) were identified and Kruskal-Wallis test analysis revealed significant spatial differences in macroinvertebrate abundance. Repeated measures ANOVA showed significant spatio-temporal differences. Tolerant ma-

croinvertebrates were abundant at the disturbed sites whereas intolerant taxa showed a strong negative correlation with nutrient levels. Sites with higher disturbance recorded a total index score far below the reference site score. The results indicated that macroinvertebrates in Nyando wetlands can be used to monitor its ecological integrity. The IBI developed should be used to protect the lake from eutrophication." (Authors)] Address: Orwa, P.O., Department of Fisheries and Aquatic Sciences, University of Eldoret, P.O. Box 1125, Eldoret, Kenya

13159. Outomuro, D.; Dijkstra, K.-D.B.; Johansson, F. (2013): Habitat variation and wing coloration affects wing shape evolution in dragonflies. *Journal of Evolutionary Biology* 26(9): 1866-1874. (in English) ["Habitats are spatially and temporally variable, and organisms must be able to track these changes. One potential mechanism for this is dispersal by flight. Therefore, we would expect flying animals to show adaptations in wing shape related to habitat variation. In this work, we explored variation in wing shape in relation to preferred water body (flowing water or standing water with tolerance for temporary conditions) and landscape (forested to open) using 32 species of dragonflies of the genus *Trithemis* (80% of the known species) (*Trithemis aconita*, *T. adelpha*, *T. aenea*, *T. aequalis*, *T. africana*, *T. annulata*, *T. arteriosa*, *T. aurora*, *T. basitincta*, *T. bifida*, *T. bredoi*, *T. dejouxi*, *T. dichroa*, *T. donaldsoni*, *T. dorsalis*, *T. ellenbeckii*, *T. festiva*, *T. furva*, *T. grouti*, *T. hartwigi*, *T. hecate*, *T. imitata*, *T. kalula*, *T. kirbyi*, *T. monardi*, *T. nuptialis*, *T. pluvialis*, *T. pruinata*, *T. selika*, *T. stictica*, *T. tropicana*, *T. wernerii*). We included a potential source of variation linked to sexual selection: the extent of wing coloration on hindwings. We used geometric morphometric methods for studying wing shape. We also explored the phenotypic correlation of wing shape between the sexes. We found that wing shape showed a phylogenetic structure and therefore also ran phylogenetic independent contrasts. After correcting for the phylogenetic effects, we found (i) no significant effect of water body on wing shape; (ii) male forewings and female hindwings differed with regard to landscape, being progressively broader from forested to open habitats; (iii) hindwings showed a wider base in wings with more coloration, especially in males; and (iv) evidence for phenotypic correlation of wing shape between the sexes across species. Hence, our results suggest that natural and sexual selection are acting partially independently on fore- and hindwings and with differences between the sexes, despite evidence for phenotypic correlation of wing shape between males and females." (Authors)] Address: Outomuro, D., Dept of Ecology and Genetics, Population Biology and Conservation Biology, Norbyvägen 18 D, 752 36 Uppsala, Sweden. E-mail: david.outomuro@ebc.uu.se

13160. Pacini, N.; Donabaum, K.; De Villeneuve, P.H.; Konecny, R.; Pineschi, G.; Pochon, Y.; Salerno, F.;

Schwaiger, K.; Tartari, G.; Wolfram, G.; Zieritz, I. (2013): Water quality management in a vulnerable large river: the Nile in Egypt 11(2). *International Journal of River Basin Management*: 205-219. (in English) ["We review the severe water management problems of the Nile Basin, where physical water scarcity is associated with high demographic growth, leading to a sharply-rising demand for competing water uses such as hydropower and large-scale irrigation. Rapid economic growth is perceived as the means to emerge from the poverty trap that afflicts livelihoods in the Upper Basin and vital wetland ecosystem services such as fish biomass, freshwater biodiversity, groundwater recharge, flow regulation and local climate moderation are threatened by the water development schemes and pollution that follow from this policy. Their cumulative impacts remain unaddressed. The High Aswan Dam's impacts on freshwater biodiversity are incompletely understood; a significant number of species may have become threatened as a result of its construction. Today the reservoir water quality is high, it is thought to support 47 fish species, its local human activities are restricted by central government regulations and recent estimates indicate that eutrophication threats are unlikely. Sediment and nutrient inputs coming into it from upstream will, however, continue to decrease in the near future as a result of newly built and planned dams in the upper basin. The dams will also reduce discharge and cause further loss of connectivity between the river and its floodplain; exacerbated by the possible completion of the Jonglei Canal bypassing the Sudd swamps. These impacts will affect the Nile's vulnerable aquatic biodiversity and regulatory services that are likely to affect local climate conditions. Under the current geopolitical scenario, management decisions that could favour participatory and sustainable options are over-ruled by high-level political trade-offs between the numerous riparian states. The financing of major hydropower developments by vested interests creates a scenario that is unlikely to favour sustainable resource management and conflict resolution.... Below Aswan, the whole river can be described as a potamon dominated by Odonata, Coleoptera, Corixidae and Chironomidae." (Authors)] Address: Pacinia, N., Dept of Environmental & Chemical Engineering, Univ. of Calabria, Arcavacata di Rende, Italy

13161. Panigalli, G.; Tessmann Soligo, K. (2013): Diversidade de insecta (Arthropoda) associada à carcaça de *Sus scrofa* L. em um fragmento de Mata Atlântica de Xanxerê Santa Catarina. *Unoesc & Ciência - ACBS, Joaçaba* 4(1): 15-26. (in Portuguese, with English summary) ["The lack of information about the insect fauna associated with decaying corpse of vertebrates in tropical motivated this study lifting Insecta (Arthropoda) carcass of *Sus scrofa* (Linnaeus 1758) in a fragment of Atlantic Forest in the town of Xanxerê, SC. The animal-bait was exposed in an environment characterized by rural mosaic of forest remnants and area of agricultural activity and observed until its skeletonization, the specimens being collected daily from Insecta associated with hous-

ing. We used metal cage, modified Shannon trap, pitfall traps, insect nets and bait-casting of the animal. We collected a total of 3,226 arthropods analyzed and classified into 44 species. The order Diptera was the most frequent, followed by Coleoptera, Lepidoptera, Hymenoptera, Hemiptera/Heteroptera, Orthoptera, Mantodea and Odonata." (Authors) A single Odonata-specimen was recorded; it was considered without any functional relationship to the carcass of *S. scrofa*.] Address: Panigalli, Gerusa, Mestre em Ciências Biológicas; Professora do Curso de Ciências Biológicas na Universidade do Oeste de Santa Catarina; Rua Dirceu Giordani, 696, Bairro Jardim Tarumã, 89820-000, Xanxerê, SC, Brasil. E-mail: gerusa.panigalli@unoesc.edu.br

13162. Panov, E.N.; Opaev, A.S. (2013): Behavior of males in a reproductive aggregation of the banded damselfly *Calopteryx splendens* (Insecta, Odonata). *Entomological Review* 93(7): 805-813. (in English) ["The view according to which damselfly males practice two alternative reproductive tactics of access to females is critically discussed. It is widely accepted that some males ("territorial" ones) have priority as potential female partners, while others ("sneakers" or "wanderers") are incapable of retaining an individual territory. They have a chance of mating only by intruding briefly into the area defended by a "territorial" male when a female is present there. Thus, the tactics of a "territorial" male consists in waiting for a female in its territory and copulating with it "by agreement," whereas non-territorial males resort to forced copulations. By observation of individually marked males (48 out of 118) it was shown that every male could be regarded as "territorial" during a certain period and as a "wanderer" before and after it. Thus, no correlation between the modes of space use by a male (residence/mobility) and the characters of its external morphology and/or signal behaviour appears to be possible in principle. According to the data obtained, a more plausible explanation is that the female chooses not the male but the best area for oviposition. In addition, it was ascertained that adherence to forced copulations cannot constitute successful "tactics" since they rarely result in insemination, neither by "territorial" nor "non-territorial" males. In other words, we are dealing not with certain alternative tactics (i.e., specialized adaptive mechanisms that have evolved in the species) but simply with the results of different sets of circumstances at a given moment." (Authors) Original Russian Text © E.N. Panov, A.S. Opaev, 2013, published in *Zoologicheskii Zhurnal*, 2013, Vol. 92, No. 1, pp. 24–33.] Address: Panov, E.N., Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences, Moscow, 119071, Russia. E-mail: panoven@mail.ru

13163. Payton, G. (2013): The effects of predator chemical cues on the behavior of spotted salamander larvae (*Ambystoma maculatum*). *BIOS 35502: Practicum in Field Biology, Advisor: Shayna Sura*: 15 pp. (in English) [Wisconsin, Michigan, USA "The detection of kair-

omones, or chemical cues released by hunting predators, is an important ability of prey that allows them to exhibit anti-predator behaviour, thus increasing their chance of survival and fitness. This study aims to elucidate the effect of the kairomones of two native predators, diving water beetle larvae and dragonfly larvae (Libellulidae), on the behaviour of spotted salamander larvae. Observational laboratory trials were conducted to determine the effect that the addition of kairomone-containing water had on the larvae's preference for depth and cover in their environment. I predicted that the larvae would prefer to live in a shallow environment when treated with dragonfly larvae chemical cues, a deep environment if exposed to diving water beetle chemical cues, and an even split between the two depths when exposed to the kairomones of both predators, based on the predators' different hunting methods. I also hypothesized that the salamander larvae would prefer to inhabit areas with foliage to areas with no foliage when treated with the kairomones of dragonfly larvae and/or diving water beetles. However, it was found that there was no significant difference in mean time spent in each quadrant between each of the treatments. Perhaps the effect of chemical cues is a learned trait for the salamander larvae, and thus the predator naïve larvae used in this experiment had no knowledge of the predators' effects or hunting techniques." (Author) For details see: <http://www3.nd.edu/~underc/east/education/documents/George2013.pdf> Address: not stated

13164. Pinto, H.A.; Melo, A.L. (2013): Metacercariae of Eumegacetes medioximus (Digenea: Eumegacetidae) in larvae of Odonata from Brazil. *Biota Neotropica* 13(2): 351-354. (in English, with Portuguese summary) ["During studies on the participation of larval Odonata in the life cycle of trematodes carried out at the Pampulha reservoir, Belo Horizonte, State of Minas Gerais, Brazil, between May and September 2011, larvae of *Orthemis discolor* and *Perithemis mooma* were found harbouring metacercariae identified as *Eumegacetes medioximus* Braun, 1901. This is the first report and morphological description of metacercariae of *E. medioximus* in the Neotropical region." (Authors)] Address: Pinto, H.A., Laboratório de Taxonomia e Biologia de Invertebrados, Departamento de Parasitologia, Instituto de Ciências Biológicas, Universidade Federal de Minas Gerais – UFMG, CP 486, CEP 30123-970, Belo Horizonte, MG, Brasil

13165. Prasad, K.K.; Ramakrishna, B.; Srinivasulu, C.; Srinivasulu, B. (2013): Odonate diversity of Manjeera Wildlife Sanctuary with notes on female polymorphism of *Neurothemis tullia* (Drury, 1773) (Odonata: Libellulidae) and some species hitherto unreported from Andhra Pradesh, India. *Journal of Entomology and Zoology Studies* 1(4): 99-104. (in English) [28 Odonata species were recorded from the Manjeera Wildlife Sanctuary between December 2010 to October 2012. *Anaciaeschna jaspidea*, *Coenagrion dyeri*, *Pseudagrion decorum*, and *Rhodischnura nursei* were reported for the

first time from Andhra Pradesh. Female polymorphism of *Neurothemis tullia* from the Manjeera Wildlife Sanctuary, Medak District, Andhra Pradesh was documented and discussed in detail.] Address: Prasad, K.K., Wildlife Biology and Taxonomy Lab, Department of Zoology, Osmania University, Hyderabad – 500 007, India. E-Mail: kpmanjeera@gmail.com

13166. Prorochuk, V. (2013): Rare insect species of the NNP "Gutsulschyna": [Current status and future conservation]. *Visnyk of the Lviv University. Series Biology* 61: 110-118. (in Ukrainian) [*Calopteryx virgo*, *Anax imperator*, *Cordulegaster bidentata*, and *Sympetrum pedemontanum* were among the 38 insect species introduced in the National park of "Hutsulshchyna" and considered as rare inhabitants of the Park.] Address: Prorochuk, V., Natsional'nyy pryrodnyy park «Hutsul'shchyna» vul. Druzhby, 84, Kosiv, Ivano-Frankivs'ka obl. 78600, Ukraina. E-mail: gutsulpark@rambler.ru

13167. Prunier, F.; Ripoll Rodríguez, J.; Schorr, M. (2013): Citas bibliográficas de odonatos en Andalucía. *Boletín de la Red de Observadores de Libélulas en Andalucía* 3: 43-76. (in Spanish, with English summary) ["Bibliographical data on Andalusian, Spain dragonflies are abstracted and ordered by province and 10x10 kilometers squares. Doubtful records as well as species to be confirmed in the region are discussed. The Andalusian catalogue of dragonflies is updated." (Authros)] Address: Prunier, Florent, C/ Maestro Priego López, 7, 2D, 14004 Cordoba, Spain. E-mail: florent.prunier@yahoo.fr

13168. Prunier, F.; Ripoll Rodríguez, J.; Chelmick, D. (2013): Segundo Atlas de odonatos en Andalucía: incorporando 25 años de investigación. *Boletín de la Red de Observadores de Libélulas en Andalucía* 3: 5-41. (in Spanish, with English summary) [Spain; "The second Andalusian atlas of dragonflies is presented, updating the publication of the first in 1984. This work is based on the subsequent literature review and data of ROLA's recording scheme. For each species, a map represents the last period in which its presence has been detected (prior to 1984, 1984-2000, after 2000)." (Authors)] Address: Prunier, Florent, C/ Maestro Priego López, 7, 2D, 14004 Cordoba, Spain. E-mail: florent.prunier@yahoo.fr

13169. Quina, C.L.; Pelli, A.; Costa Martins, A.G. (2013): Succession of benthic macroinvertebrates on rat carcasses in Uberaba river - MG. *SaBios-Revista de Saúde e Biologia* 8(2): 73-80. (in Portuguese, with English summary) ["There are patterns of ecological succession in different stages of decomposition in the rat carcasses. According to the stages of decomposition, the succession happens in stages characterized by defined groups and species. The aim of this research was to evaluate the ecological succession in animal carcasses in lotic environments. Five neonates rats previously sacrificed in cold anesthesia were evaluated. Within a bag of shade, the material was deposited in lotic environments and re-

moved in intervals of 1 to 4 days. The analysis was performed in the laboratory after sieving the sample solution and preserved in alcohol 75%. The material was sorted and identified under a stereoscopic microscope. Insecta was the dominant group. Trichoptera and Diptera were dominant with three families, followed by two Ephemeroptera families and one family of Coleoptera and Odonata ("Libellulidae") orders. Two orders of Crustacea, the phyla Annelida and Sarcodina were also observed. There was a succession of organisms related to functional or morphological behaviour. There was a tendency of increase in density and species richness and that the pattern of succession in artificial substrate - carcasses - reflects the environmental conditions." (Authors)] Address: Pelli, A., Universidade Federal do Triângulo Mineiro Departamento de Patologia, Genética e Evolução, Disciplina de Ecologia & Evolução Av. Frei Paulino, 30. Uberaba/MG - CEP 38025-180, Brazil. E-mail: apelli.oikos@icbn.uftm.edu.br

13170. Ramaker, A.J. (2013): First population of *Coenagrion scitulum* in Dutch Limburg. *Brachytron* 15(2): 123-127. (in Dutch, with English summary) ["In 2010 the second population of *C. scitulum* in the Netherlands was found in province of Limburg. The other population in the Province of Zeeland, was discovered in 2007. The discovery and the reproduction location are discussed, as well as the expansion in the north-west of Europe. Females of the population in Limburg are almost all of the multicoloured morph, which appears to be rarer in the populations in Zeeland and western Belgium." (Author)] Address: E-mail: dolf@goyatlah.nl

13171. Rebora, M.; Piersanti, S.; Gaino, E. (2013): The mechanoreceptors on the endophytic ovipositor of the dragonfly *Aeshna cyanea* (Odonata, Aeshnidae). *Arthropod Structure & Development* 42(5): 369-378. (in English) ["This study investigates the mechanoreceptors located on the cutting valvulae of the ovipositor of *A. cyanea*, using both SEM and TEM, with the aim of providing an overview of the sensory equipment of an odonatan endophytic ovipositor. Four kinds of sensilla have been described. Notwithstanding their different external and internal morphology, they show features typical of mechanoreceptors. Three of them are evident along the external surface of the two cutting valvulae in the form of sub-spherical pegs, pit organs type 1 (holes) and pit organs type 2 (depressions), these last similar to amphinematic scolopidia, while the fourth type is represented by subintegumental mononematic scolopidia having no direct relationship with the cuticle. In spite of their structural differences, the morphology of the described mechanoreceptors is consistent with performing a main role in allowing the perception of compression/ stretching of the thick cuticle of the valvulae and their bending due to the pressure acting on the distal end of the ovipositor during substrate penetration. Such an organization is coherent with the need of endophytic Odonata to be able to evaluate the stiffness of the plant where to lay eggs." (Authors)]

Address: Rebora, Manuela, Dipartimento di Biologia Cellulare e Ambientale, Università di Perugia, 06123 Perugia, Italy. E-mail: rebora@unipg.it

13172. Reeve, B.C.; Crespi, E.J.; Whipps, C.M.; Brunner, J.L. (2013): Natural stressors and ranavirus susceptibility in larval Wood Frogs (*Rana sylvatica*). *EcoHealth* 10(2): 190-200. (in English) ["Chronic exposure to stressors has been shown to suppress immune function in vertebrates, making them more susceptible to pathogens. It is less clear, however, whether many natural stressors are immunosuppressive. Moreover, whether stressors make disease more likely or more severe in populations is unclear because animals respond to stressors both behaviourally and physiologically. We tested whether chronic exposure to three natural stressors of wood frog tadpoles—high-densities, predator-cues, and low-food conditions—influence their susceptibility to a lethal ranavirus both individually in laboratory experiments, and collectively in outdoor mesocosms. Prior to virus exposure, we observed elevated corticosterone only in low-food treatments, although other treatments altered rates of growth and development as well as tadpole behaviour. None of the treatments, however, increased susceptibility to ranavirus as measured by the proportion of tadpoles that became infected or died, or the time to death compared to controls. In fact, mortality in the mesocosms was actually lower in the high-density treatment even though most individuals became infected, largely because of increased rates of metamorphosis. Overall we find no support for the hypothesis that chronic exposure to common, ecologically relevant challenges necessarily elevates corticosterone levels in a population or leads to more severe ranaviral disease or epidemics. Conditions may, however, conspire to make ranavirus infection more common in metamorphosing amphibians ... Predator cues were generated by feeding wood frog tadpoles to a dytiscid beetle larvae (Dytiscidae) or dragonfly larvae (families Libellulidae, Aeshnidae, and Corduliidae), each in 400 mL of water." (Authors)] Address: Brunner, J.L., School of Biol. Sciences, Washington State Univ., P.O. Box 644236, Pullman, WA, 99164, USA. E-mail: jesse.brunner@wsu.edu

13173. Renoult, J.P. (2013): Arrivée de la Libellule purpurine *Trithemis annulata* (De Palisot de Beauvois, 1805) dans la vallée du Rhône. *Sympetrum* 17: 81-82. (in French) [19-X-2008, camping 'La Brise' (GPS-43.4579/4.4396), Saintes-Maries de la Mer (Bouches-du-Rhône), France; one mature male and immature male and female.] Address: E-mail: jujurenoult@hotmail.com

13174. Röller, O.; Schotthöfer, A. (2013): Großes Ochsenauge und Großer Blaupfeil - zwei hierzulande gegenwärtig häufige Arten, die ebenso wie viele andere Arten unsere vermehrte Aufmerksamkeit verdienen. *Pollichia Kurier* 29(4): 32-35. (in German) [Rheinland-Pfalz, Germany. The phenology of *Orthetrum cancellatum* and *Libellula fulva* in the River Rhine alluvium was outlined on

the basis of citizen science data.] Address: Röller, O., c/o Pollichia, Bismarckstr. 33, 67433 Neustadt, Germany

13175. Roh, C.; Saxton-Fox, T.; Gharib, M. (2013): Characterization of ventilatory modes in dragonfly nymph. *Bulletin of the American Physical Society* 58(18): n.p. (in English) ["A dragonfly nymph's highly modified hindgut has multiple ventilatory modes: hyperventilation (i.e. jet propulsion), gulping ventilation (extended expiratory phase) and normal ventilation. Each mode involves dynamic manipulation of the exit diameter and pressure. To study the different fluid dynamics associated with the three modes, Anisopteran larvae of the family Aeshnidae were tethered onto a rod for flow visualization. The result showed distinct flow structures. The hyperventilation showed a highly turbulent and powerful jet that occurred at high frequency. The gulping ventilation produced a single vortex at a moderate frequency. The normal ventilation showed two distinct vortices, a low-Reynolds number vortex, followed by a high-Reynolds number vortex. Furthermore, a correlation of the formation of the vortices with the movement of the sternum showed that the dragonfly is actively controlling the timing and the speed of the vortices to have them at equal distance from the jet exit at the onset of inspiration. This behaviour prevents inspiration of the oxygen deficient expired water, resulting in the maximization of the oxygen intake." (Authors)] Address: not stated

13176. Ronne, C.; Blanchon, Y. (2013): Redécouverte de *Brachytron pratense* (Müller, 1764) dans le département du Var (Odonata, Anisoptera: Aeshnidae). *Martinia* 29(1): 43-45. (in French, with English summary) ["*B. pratense* has been found for the last time in the Var department at Hyeres in 1921. An exuvia of the species was found again on 29 April 2012 in Tourves. This data is the first proof of successful breeding in the department." (Authors)] Address: Ronne, Charlotte, 8, avenue des Allies, F-13360 Roquevaire, France. E-mail: charlotte.ronne@yahoo.fr

13177. Ruffoni, A.; Varanguin, N.; Millard, R. (2013): L'enquête *Coenagrion ornatum* (Selys in Selys et Hagen, 1850) en Bourgogne (Odonata, Zygoptera: Coenagrionidae): protocole et premiers résultats. *Martinia* 29(1): 23-41. (in French, with English summary) ["*C. ornatum* is a damselfly which is widespread in Central Europe, the Balkans and Asia Minor. The species shows a small disjunct area in Burgundy, France, from where it extends very rarely to the neighbouring departments of the Loire (Rhône-Alpes Region), Allier (Auvergne Region) and Cher (Centre Region). It turned extinct in northern Alsace, where population(s) were connected to the German ones and constituted the western limit of the continuous species range, shortly after its discovery. Its occurrence in the French northern Alps and the Jura Plateau had been claimed but remained never documented. First data from Burgundy available in 2002 remained scattered and the rarity of this species was underlined. In

2009, the new Burgundy Odonatological Group (GOB) decided to bring an important effort dealing with the distribution and the status of this species in Burgundy. This paper described the field protocol used as well as the first results." (Authors)] Address: Ruffoni, A., Société d'histoire naturelle d'Autun, Maison du Parc, F-58230 Saint-Brisson, France. E-mail: shna.ruffoni@orange.fr

13178. Rumpold, B.A.; Schlüter, O.K. (2013): Nutritional composition and safety aspects of edible insects. *Molecular Nutrition & Food Research* 57(5): 802-823. (in English) ["Insects, a traditional food in many parts of the world, are highly nutritious and especially rich in proteins and thus represent a potential food and protein source. A compilation of 236 nutrient compositions in addition to amino acid spectra and fatty acid compositions as well as mineral and vitamin contents of various edible insects as derived from literature is given and the risks and benefits of entomophagy are discussed. Although the data were subject to a large variation, it could be concluded that many edible insects provide satisfactorily with energy and protein, meet amino acid requirements for humans, are high in MUFA and/or PUFA, and rich in several micronutrients such as copper, iron, magnesium, manganese, phosphorous, selenium, and zinc as well as riboflavin, pantothenic acid, biotin, and in some cases folic acid. Liabilities of entomophagy include the possible content of allergenic and toxic substances as well as antinutrients and the presence of pathogens. More data are required for a thorough assessment of the nutritional potential of edible insects and proper processing and decontamination methods have to be developed to ensure food safety." (Authors) The analysis includes references to Odonata.] Address: Schlüter, O.K., Leibniz Institute for Agricultural Engineering Potsdam-Bornim, Max-Eyth-Allee 100, 14469 Potsdam, Germany. E-mail: oschlueter@atb-potsdam.de

13179. Ryazanova, G.I. (2013): Populational variability of wing venation in the dragonfly *Ischnura elegans* (Vander Linden, 1820). *Materials of the Fifth All-Russia Symposium on Amphibiotic and Aquatic Insects / Papanin Institute for Biology of Inland Waters, Russian Academy of Sciences. – Yaroslavl: Filigran, 2013. – 254 pp: 156-160.* (in Russian, with English summary) ["The number of wing cells was studied in four populations of *I. elegans* in 2010–2012. It is revealed that this characteristic has significant variability both within a season and between seasons in each population. Individuals emerging early in the season have a significantly greater number of cells in the wings than those emerging at the end of the season. Interseasonal changes in the number of cells in the wings in different populations are independent in direction and degree, indicating high phenotypic mobility. The lack of stable interpopulation differences in the studied characteristic does makes it impossible to use it for assessing the degree of isolation for populations." (Author)] Address: Ryazanova, G.I.,

Biological Faculty, Moscow Lomonosov State Univ., Moscow, 119992, Russia. E-mail: ryazanovagi@mail.ru

13180. Sansault, E.; Baeta, R.; Présent, J. (2013): Synthèse des observations d'*Hemianax ephippiger* (Burmeister, 1839) réalisées en 2011 en région Centre (Odonata, Anisoptera: Aeshnidae). *Martinia Hors-série, Hemianax ephippiger - migration 2011*, mai 2013: 69-72. (in French, with English summary) [Records (imagos, exuviae) from the departments Indre-et-Loire and Indre are documented.] Address: Sansault, E., A.N.E.P.E. Caudalis, 118, rue de l'Ermitage, 37100 Tours, France. E-mail: anepe.caudalis@gmail.com

13181. Sato, S.; Masuma, Y.; Hasegawa, Y.; Choi, M.-K.; Kassai, H. (2013): Fundamental study on ecosystem support canal using porous concrete. *Int. J. of Geomate* 4(2): 580-584. (in English) ["This research aimed to enhance the compressive strength of porous concrete as well as to develop the porous concrete that can support and improve the ecosystem preservation by itself. Several porous concrete specimens were prepared for the measurement of mechanical properties. As a result, it was confirmed that the radius of coarse aggregate affected significantly to mechanical properties of porous concrete under the same unit weight of cement. It was also revealed that strengths at age 28 days were stable despite of different sizes of coarse aggregate. The bio-adhesive ability of porous concrete specimen was evaluated against water bugs and adhesive algae. Every porous concrete specimen was soaked in same environmental condition at the bottom of actual concrete canal. From this experiment, it was confirmed that preference environment for some specific species of water bugs are possible to be supplied when the porosity and the size of coarse aggregate would be adjusted." (Authors) Calopterygidae, Gomphidae] Address: Shushi Sato, S., Faculty of Agriculture, Kochi University, Japan

13182. Schmidt Furieri, K.; Santos, J.S. dos (2013): As libélulas (Odonata: Insecta) da Reserva Natural Vale. XI Congresso de Ecologia do Brasil, Setembro 2013, Porto Seguro - BA: 3 pp. (in Portuguese) [Brasil; the Odonata collection of the reserve also included *Mecistogaster amalia* and *Leptagrion dispar*.] Address: Schmidt Furieri, Karina, Universidade Federal do Espírito Santo - UFES / Instituto de Pesquisas da Mata Atlântica - IPEMA, Brail. E-mail: kfurieri@gmail.com

13183. Schut, D.; de Vos, M.; Rademaker, J. (2013): *Calopteryx virgo* near Winterswijk: Did a rare damselfly of streams profit from restoration measures? *Brachytron* 15(2): 102-111. (in Dutch, with English summary) ["This article describes the population trends of *C. virgo* in several streams in the Winterswijk area (Gelderland), in the Eastern part of the Netherlands. From the mid 1970s a strong decline of the species was observed. The decrease can be attributed to decreasing water quality. Since the mid 1990s the species has recovered

and has recolonised its historic distribution area. The increase can be attributed to several restoration measures, improving the ecological quality of the streams. These measures focused both on water quality and stream morphology." (Authors)] Address: Schut, D., Pieter Postplein 20, 6543 LV Nijmegen, The Netherlands. E-mail: verhipsel@gmail.com

13184. Seehausen, M.; Schardt, L. (2013): Die exotischen Libellen des Naturhistorischen Museums Mainz / Landessammlung für Naturkunde Rheinland-Pfalz (Insecta: Odonata). *Mainzer naturwissenschaftliches Archiv* 50: 333-342. (in German, with English summary) [The exotic Odonata in the collection of the Mainz Museum of Natural History / State Collection of Natural History of Rhineland-Palatinate were identified and revised. The records originate from Rwanda, Peru, Cuba and the Dominican Republic. *Atoconeura pseudodoxia* from Rwanda represents the first documented proof for the so far unknown easternmost distribution of this species.] Address: Seehausen, M., Museum Wiesbaden, Naturhistorische Sammlungen, Friedrich-Ebert-Allee 2, 65183 Wiesbaden, Germany. E-Mail: malte.seehausen@museum-wiesbaden.de

13185. Sharkey, C.R.; Roberts, N.W.; Partridge, J.C. (2013): Dragonfly larval polarization sensitivity as a contrast enhancer in turbid water. *Front. Physiol. Conference Abstract: International Conference on Invertebrate Vision*. doi: 10.3389/conf.fphys.2013.25.00078: n.p. (in English) [Verbatim: A challenge faced by visual systems underwater is the presence of scattered light haze, or 'veiling light', that reduces the contrast of the scene. Light scattered underwater by sub-wavelength particles is polarized, forming a light field that is maximally polarized in a band orthogonal to the direction of the sun (Waterman, 2006). An animal able to filter out this scattered, polarized light would benefit from a greater perceived contrast, enhancing the detection of objects in an underwater scene (Rowe et al., 1995; Schechner et al., 2003). If this mechanism were present, it could potentially benefit an aquatic predator by enhancing prey detection. We compared the responses of three larval instars of dragonfly, *Anax imperator*, to moving gratings with a range of spatial frequencies, seen by the insects through turbid water under different illumination conditions. Animals were placed in an optomotor drum, with a surrounding circular tank filled with diluted milk; the grating to be tested being placed on the outside of the drum. The milky solution was illuminated from above through linear Polaroid filters with transmission axes aligned either radially or tangentially with respect to the drum, thereby creating either a weakly (10%) vertically polarized or a more strongly (30%) horizontally polarized light field, respectively. The head angles of animals, during the experiment, were measured and 'gain', the rotational velocity (degrees per second) of the animal's head was expressed as a fraction of that of the drum, used as a measure of their response. Data were

log transformed and analysed by fitting Linear Mixed Models. For all three larval instars, responses to the moving gratings were significantly stronger overall when the light field was polarized horizontally (?deviance=5.945, d.f.=1, p=0.015; Fig.1, bars represent SE) particularly at 0.09 cycles/degree. Animals responded differently to different spatial frequencies, exhibiting reduced responses at the highest and lowest frequencies tested. Responses to different spatial frequencies were dependent on instar, with response peaking at a lower frequency for earlier instars (?deviance=13.56, d.f.=6, p=0.035). The increase in response, observed when animals are in a horizontally polarized light field, may be due to a contrast-enhancing effect of polarization sensitivity, a suggestion supported by preliminary data, derived from on-going behavioural experiments. This contrast enhancing effect could increase the chance of a successful strike during hunting and increase the distance at which both predators and prey can be detected. References: Rowe, M. P., Pugh, E. N., Tyo, J. S., & Engheta, N. (1995). Polarization-difference imaging: a biologically inspired technique for observation through scattering media. *Optics letters*, 20(6), 608–610.; Schechner, Y. Y., Narasimhan, S. G., and Nayar, S. K. (2003). Polarization-based vision through haze. *Applied optics* 42, 511–525.; Waterman, T. H. (2006). Reviving a neglected celestial underwater polarization compass for aquatic animals. *Biological reviews of the Cambridge Philosophical Society* 81, 111–115.] Address: Sharkey, Camilla, The University of Bristol, Ecology of Vision Group, Bristol, BS8 1UG, United Kingdom. E-mail: cs7750@bristol.ac.uk

13186. Shep, H.; Konan, M.K.; Doumbia, L.; Ouattara, M.; Boussou, C.K.; Ouattara, A.; Gourène, G. (2013): Feeding relationships among *Tilapia zillii* (Gervais, 1848), *Tilapia guineensis* (Bleeker, 1862) and their hybrid in Ayamé man-made lake, Côte d'Ivoire. *Pakistan J. Zool.* 45(5): 1405-1414. (in English) ["The stomach contents of 122 specimens of *Tilapia zillii*, 121 of *Tilapia guineensis* and 227 of their hybrid were studied in Ayamé man-made lake during two years between August 1995 and September 1997 in order to analyze their diet composition and interspecific diet overlap. ... Diptera and macrophytes were the most important item in the diet of these species." (Authors) Odonata were of minor importance as food.] Address: Shep, H., Laboratoire d'Environnement et de Biologie Aquatique, Université Nangui Abrogoua, 02 BP 801 Abidjan 02, Ivory Coast

13187. Silina, A.E. (2013): Amphibiotic insects (Insecta) of Reservoirs of the Rovensky Nature Park. Materials of the Fifth All-Russia Symposium on Amphibiotic and Aquatic Insects / Papanin Institute for Biology of Inland Waters, Russian Academy of Sciences. – Yaroslavl: Filigran, 2013. – 254 pp: 166-178. (in Russian, with English summary) ["Checklist and data on abundance of amphibiotic insects (Insecta), excluding Chironomidae, of the Rovensky Nature Park in Belgorod Oblast are

given. Two streams, two small rivers, the upper reaches of the Aydar River and two standing reservoirs are surveyed. A total of 169 species of amphibiotic insects from orders of Collembola, Plecoptera, Ephemeroptera, Odonata, Coleoptera, Trichoptera, Lepidoptera, Hymenoptera, Megaloptera and Diptera are recorded. Abundant and rare species are identified, and distribution of insects in the studied waterbodies is determined." (Author) The following Odonata species/taxa were listed: *Calopteryx splendens*, *C. virgo*, *Sympetma paedisca*, *Lestes dryas*, *Coenagrion hastulatum*, *C. pulchellum*, *Ischnura elegans*, *I. pumilio*, *Ischnura* sp., *Platycnemis pennipes*, *Aeshna grandis*, *A. caerulea*, *Aeshna* sp., *Anax parthenope*, *Gomphus vulgatissimus*, *Libellula fulva*, *Epiteca bimaculata*, *Sympetrum danae*, *S. striolatum*, *S. meridionale*, *S. sanguineum*, and *S. flaveolum*.] Address: Silina, A.E., Belogorye State Nature Reserve per. Monastyrsky 3, Borisovka, Belgorod Oblast, 309342, Russia. E-mail: allasilina@list.ru

13188. Silva-Méndez, G.; Lorenzo-Carballe, M.O.; Cordero-Rivera, A.; Watts, P.C. (2013): Microsatellite loci for two threatened dragonfly (Odonata: Anisoptera) species: *Oxygastra curtisii* (Dale, 1834) and *Macromia splendens* (Pictet, 1843). *Conservation Genetics Resources* 5(4): 1171-1174 (in English) ["Twenty one polymorphic microsatellite loci were isolated from *Macromia splendens* (n = 8 loci) and *Oxygastra curtisii* (n = 13 loci). Both species have their main distribution areas in southwestern Europe, with records in the north of Africa in the case of *O. curtisii*. *M. splendens* is listed as vulnerable by IUCN, while *O. curtisii* is regarded as near threatened. Genetic diversity was assessed in samples from the Iberian Peninsula representing two populations for each species. Number of alleles per locus ranged from 5 to 11 (*O. curtisii*) and between 4 and 16 (*M. splendens*), while mean expected heterozygosity varied between 0.118–0.745 (*O. curtisii*) and 0.130–0.849 (*M. splendens*). Five loci (four for *O. curtisii* and one for *M. splendens*) showed significant deviations ($P < 0.05$) from expected Hardy–Weinberg equilibrium conditions, with the locus from *M. splendens* experiencing null alleles. These loci are currently being used to assess spatial genetic structure in these protected species." (Authors)] Address: Silva-Ménde, G. da, Evolutionary Ecology and Conservation Group, Department of Ecology and Animal Biology, Universidad de Vigo, EUE Forestal, Campus Universitario A Xunqueira s/n, 36005, Pontevedra, Spain. E-mail: genarodasilva@uvigo.es

13189. Simon, S.; Brugler, M.R.; DeSalle, R.; Hadrys, H. (2013): First insights in the embryonic development of the damselfly *Ischnura elegans*. 6th Dresden Meeting on Insect Phylogeny, Dresden, September 27–29, 2013. Abstracts — Oral Presentations: 21-22. (in English) [Verbatim: The new sequencing technologies have massively increased the amount of data available for comparative transcriptomics which can be used to infer insect relationships but also to study the transcriptional

signatures and dynamics of developmental processes. In addition, for *Drosophila* species it has been shown that expression divergence correlate with sequence divergence among putative orthologous genes, making comparative gene expression analyses to a useful tool in molecular phylogenetics (Zhang et al. 2007; Kalinka et al. 2010). However, transcriptomic data across developmental stages are mainly available for derived holometabolous insects, especially drosophilid dipteran species. Here, we fill in an important gap for future comparative gene expression analyses by analyzing and comparing transcriptomic data across the embryonic development of *I. elegans*. Roche 454-multiplexed transcriptomic data was generated for four time-periods (day 1–3, 4–5, 6–7, 8–9) spanning the entire embryonic lifespan. The assembled 454 reads and comparative analyses between the different embryonic stages will provide the first insights in the temporal gene expression changes during early damselfly development. In addition, highquality ds cDNA libraries for each embryonic developmental stage (day) were generated for further in-depth gene expression analyses using quantitative RT-PCR. The long-term goal of this ongoing research project is to systematically search for expression divergence between distantly related insect species, their correlation to sequence divergence (known phylogenetic relationships) and to study their role in morphological changes. References: Kalinka A.T., Varga K.M., Gerrard D.T., Preibisch S., Corcoran D.L., Jarrells J., Ohler U., Bergman C.M., Tomancak P. 2010: Gene expression divergence recapitulates the developmental hourglass model. *Nature* 468: 811–814. — Zhang Y., Sturgill D., Parisi M., Kumar S., Oliver B. 2007: Constraint and turnover in sex-biased gene expression in the genus *Drosophila*. *Nature* 450: 233–237.] Address: Simon, Sabrina, Sackler Institute for Comparative Genomics, American Museum of Natural History, New York, NY 10024, USA

13190. Singh, K.M.; Singh, M.P.; Kumawat, M.M.; Riba, T. (2013): Entomophagy by the tribal communities of North East India. *Indian Journal of Entomology* 75(2): 132-136. (in English) ["A survey was conducted to document the edible insects available at East Siang District, Arunachal Pradesh and Bishnupur District, Manipur, northeast India. East Siang district is predominated by the Adi tribe and Bishnupur district by the Meitei community. The two ethnic groups, viz. Adi and Meitei accept insects as their food. Most of the edible insects belong to the order Hymenoptera, Hemiptera, Orthoptera, Odonata and Coleoptera. *Philosamia ricini* is a commercialized insect species as food in Arunachal Pradesh. Based on their resources, Adis of East Siang accepted more terrestrial insects compared to Meiteis of Bishnupur. Meitei community of Bishnupur consumed more aquatic insects. One or the other species of insects are available in all the seasons, however, more species are available in the warm season. Most of the insects are consumed after processing. Some points to

be considered for encouraging these edible insects as human food are also discussed." (Authors)] Address: Singh, K.M., College of Horticulture and Forestry, Central Agricultural University, Pasighat, Arunachal Pradesh, India. E-mail: mamoento@gmail.com

13191. Sluvko, A.A. (2013): On the changes introduced in the Red Data Book of Astrakhan oblast: Order Odonata (Dragonflies and damselflies). Materials of the Fifth All-Russia Symposium on Amphibiotic and Aquatic Insects / Papanin Institute for Biology of Inland Waters, Russian Academy of Sciences. — Yaroslavl: Filigran, 2013. — 254 pp: 182-186. (in Russian, with English summary) [Russia; "The Red Data Book of the Astrakhan region is the official register of the state of rare and endangered species of the flora and fauna of Astrakhan Oblast. The first edition of the Red Data Book of Astrakhan Oblast was published in 2004. The second edition is currently in preparation. Work on the inventory of the dragonfly fauna and subsequent assessment of this fauna resulted in improvements of the checklist of species. Analysis of the data allowed to petition the commission on rare and endangered species of animals, wild plants and fungi of Astrakhan Oblast for including four dragonfly species with local distribution in Astrakhan Oblast into the Red Data Book of Astrakhan Oblast." (Author) *Onychogomphus forcipatus*, *Erythromma najas*, *Sympetrum pedemontanum*, and *S. danae* were detailed.] Address: Sluvko, A.A., Federal Service for Veterinary and Phytosanitary Surveillance (Astrakhan Oblast Department) ul. Admiralteyskaya 51, Astrakhan, 414040, Russia. E-mail: asluvko@mail.ru

13192. Smirnova, D.A.; Sklyarova, O.N.; Epova, Y.V. (2013): The amphibiotic insect fauna of the Tengiz-Korgalzhyn lake system (Kazakhstan) in 2012. Materials of the Fifth All-Russia Symposium on Amphibiotic and Aquatic Insects / Papanin Institute for Biology of Inland Waters, Russian Academy of Sciences. — Yaroslavl: Filigran, 2013. — 254 pp: 187-189. (in Russian, with English summary) ["The amphibiotic insect fauna of the Tengiz-Korgalzhyn lake system (n = 10 lakes studied) was represented in 2012 by 56 species and taxa not identified to species. Chironomids were the most diverse group. It is noted that amphibiotic insect diversity depended on water salinity." (Authors) The single Odonata species listed was *Sympecma paedisca* from lake Bozaral.] Address: Smirnova, D.A., Kazakhstan Agency of Applied Ecology ul. Zvereva 47, Almaty, 050010, Kazakhstan. E-mail: d.smirnova@kape.kz

13193. Soboleva, V.A.; Golub, V.B. (2013): On the dragonfly and damselfly diversity (Insecta: Odonata) of the Tellerman Forest in Voronezh Oblast. Materials of the Fifth All-Russia Symposium on Amphibiotic and Aquatic Insects / Papanin Institute for Biology of Inland Waters, Russian Academy of Sciences. — Yaroslavl: Filigran, 2013. — 254 pp: 189-195. (in Russian, with English summary) [Russia "A total of 18 species of 15 genera

and eight families of dragonflies are recorded from materials collected in August 2011 and May and June 2012 in the Tellerman upland oak forest (Voronezh Oblast). *Aeshna mixta* (Aeshnidae) is reported from Voronezh Oblast for the first time. *Sympetma paedisca* and *Stylurus flavipes*, species on the European Red List, and *Anax imperator* and *Calopteryx virgo*, included in the Red Data Book of Voronezh Oblast, are recorded in the forest. The basis of the zoogeographical structure of the dragonfly fauna of extreme eastern Central Russian Forest-Steppe is formed by species that have trans-Palaearctic and western Palearctic ranges occupying temperate latitudes." (Authors)] Address: Soboleva, V.A., Voronezh State University Universitetskaya pl. 1, Voronezh, 394006, Russia. E-mail: strekozavr@bk.ru

13194. Speh, E.; Lamy, A.-M. (2013): Découverte de *Gomphus graslinii* Rambur, 1842 dans le département du Cher, France (Odonata, Anisoptera, Gomphidae). *Martinia* 29(1): 47-48. (in French) [29 vi 2012, a female *G. graslinii*, was observed app 3.5 km away from the river Amon, Saint-Hilaire-en-Lignières, département Cher, France.] Address: Speh, Emmanuelle, Conservatoire d'espaces naturels de la région Centre, Antenne Cher/Indre, 16 rue du Bas-de-Grange, F-18100, Vierzon, France. E-mail: emmanuelle.speh@cen-centre.org

13195. Stanford, B.; Albertani, R.; Lacore, D.; Parker, G. (2013): Proper orthogonal decomposition of flexible clap and fling elastic motions via high-speed deformation measurements. *Experimental Mechanics* 53(7): 1127-1141. (in English) ["Many complex unsteady mechanisms are thought to facilitate the high efficiency and agility commonly observed in small biological flyers. One of these, the flexible clap and fling maneuver, has not been extensively studied; an experimental characterization is the focus of this work. The clap-fling mechanism is approximated with a single flexible membrane flapping wing, replacing the symmetry plane between two wings with a splitter plate simulating the pair wing. This produces a complex vibro-impact aeroelastic problem, the deformation resulting from which is measured with a high-speed visual image correlation system. A low-dimensional representation of the ensuing large data set is obtained with proper orthogonal decomposition. The POD modes, and the relative importance of each, can help elucidate crucial mechanisms and relationships within the flapping system, and are computed for various membrane wing structures and flapping frequencies, with or without the presence of the splitter plate." (Authors) The paper includes references to Odonata] Address: Albertani, R., U.S. Air Force Research Lab., Wright-Patterson AFB, OH, 45433, USA. E-mail: roberto.albertani@oregonstate.edu

13196. Sumanapala, A.P.; Bedjanic, M. (2013): Rediscovery of a long lost endemic damselfly *Sinhalestes orientalis* (Hagen in Selys, 1862) from Peak Wilderness Sanctuary, Sri Lanka (Zygoptera: Lestidae). *Asian Journal of Conservation Biology* 2(1): 44-47. (in English) ["S.

orientalis the only representative of its genus, is an endemic and globally critically endangered damselfly in Sri Lanka. It was first collected from Rambodde, Sri Lanka in 1858 and after that no new information on this species has been available. Here, we report on the re-discovery of *S. orientalis* from the Peak Wilderness Sanctuary, Sri Lanka after 154 years from its last and only record." (Authors)] Address: Sumanapala, A.P., Young Biologists' Association, Institute of Biology, 120/10, Vidya Mawatha, Colombo 7, Sri Lanka. E-mail: apsumanapala@gmail.com

13197. Tennessen, K.J.; Valley, S.A. (2013): New records for *Gomphus lynnae* Paulson (Odonata: Gomphidae), with a description of the nymph. *Proc. Ent. Soc. Washington* 115(4): 333-341. (in English) ["*Gomphus* (*Gomphurus*) *lynnae* Paulson, known from only a few localities in the states of Washington and Oregon, U.S.A., is reported from 10 localities in a 260 km stretch of the John Day River in Gilliam, Grant, Sherman, and Wheeler counties and a 59 km stretch of the Owyhee River in Malheur County, Oregon, all within the Columbia River watershed. We collected adults, nymphs and exuviae from several localities and two nymphs were associated with adults. Nymphs of this rare species have not been fully characterized. The nymph is described and illustrated; its closest congener is *G. externus* Hagen, from which it is distinguished by the lack of a distinct posterolateral spine on abdominal segment 6, shorter posterolateral spine on abdominal segment 9, and the presence of only two or three denticles, sometimes lacking, on the lateral margins of abdominal segment 8. Nymphs of *G. lynnae* occupy substrates of mixed sand and silt in riffle/run areas of large, slow flowing rivers." (Authors)] Address: Tennessen, K., 125 N. Oxford St, Wautoma, WI 54982, USA. E-mail: ktennessen@centurytel.net

13198. Tennessen, K.J.; Krotzer, R.S. (2013): Description of the last stadium nymph of *Leptobasis lucifer* (Odonata: Coenagrionidae). *Proc. Ent. Soc. Washington* 115 (2): 182-188. (in English) ["Nymphs of *L. lucifer* were collected in shallow water in a cypress (*Taxodium distichum* (Linnaeus) Richard (Taxodiaceae)) dome in southern Florida. They differ from *L. vacillans*, the only *Leptobasis* species previously described, by ratio of length of antennomere 2 to antennomere 1 (1.6 in *L. lucifer*, 1.4 in *L. vacillans*), cercus length (0.13–0.17 mm in *L. lucifer*, 0.08–0.13 mm in *L. vacillans*), and length—width ratio of caudal lamellae (> 4.0 in *L. lucifer*, < 4.0 in *L. vacillans*). *Leptobasis* is most similar to *Ischnura* Charpentier and *Enallagma* Charpentier; a combination of characters, including head width and the arrangement of setal bases on the lateral carinae of the abdominal segments, is necessary to separate these genera." (Authors)] Address: Krotzer, R.S., 2238 Haysop Church Road, Centreville, Alabama 35042, USA. E-mail: rskrotze@southernco.com

13199. Ternois, V. (2013): Premières mentions d'*Hemianax ephippiger* (Burmeister, 1839) pour la Champag-

ne-Ardenne (Odonata, Anisoptera: Aeshnidae). *Martinia Hors-série*, *Hemianax ephippiger* - migration 2011, mai 2013: 51-54. (in French, with English summary) ["*H. ephippiger* has been observed for the first time in the Champagne-Ardenne région during its mass migration in 2011. All data recorded in the region (n = 8) are dealt with." (Authors)] Address: Ternois, V., Société française d'Odonatologie (Champagne-Ardenne) s/c CPIE du Pays de Soulaïnes, Domaine de Saint-Victor, 10200 Soulaïnes-Dhuys, France. E-mail: cpie.vincent.temois@wanadoo.fr

13200. Thuyet, D.Q.; Watanabe, H.; Motobayashi, T.; Ok, J. (2013): Behavior of nursery-box-applied fipronil and its sulfone metabolite in rice paddy fields. *Agriculture, Ecosystems & Environment* 179(1): 69-77. (in English) ["Highlights: • Behaviour of insecticide fipronil in paddy environment was examined. • Fipronil concentrations in paddy water were different depending on the treatment. • Fipronil indicated half-lives less than 3.1 days in water and 26.4 days in soil. • Concentrations in root zone were about 10 times higher than in the inter-row zone. • Toxic metabolite fipronil sulfone was found in every water and soil samples. The granular insecticide fipronil has been widely applied in rice nursery boxes, both before transplanting (BT) and during at-sowing (AS) treatments to control insect pests at the early stages of rice cultivation in Japan. Although a potential effect of fipronil on paddy ecosystems and downstream aquatic environments has been observed, the environmental effect of this substance in paddy fields remains unsought. Here we investigate the environmental behaviour of nursery-box-applied granular fipronil and its sulfone metabolite in paddy water and paddy soils during BT and AS treatments performed in a paddy field in Japan. Although the fipronil concentrations in the paddy water in the AS treatment were significantly lower than those measured in the BT treatment, no significant differences were observed in the paddy soil between the two treatments. Fipronil was mainly found in the 0- to 5-cm surface soil layer of the rice-root zone, where its concentrations were approximately ten times higher than those in the soil of the inter-row zone. The insecticide concentration in the 0- to 1-cm layer of the inter-row zone in the surface soil was approximately 2.5 times higher than that in the 0- to 5-cm layer. The maximum concentrations of fipronil in the 0- to 1-cm surface soil layer ranged from 65.8 to 92.1 µg/kg on the first day after rice transplanting (DAT), and the corresponding values in the paddy water ranged from 0.9 to 2.5 µg/L. The dissipation of fipronil from the paddy water and paddy soil was described by first-order kinetics. The compound's half-life (DT50) was 0.9–3.1 days in paddy water and 12.3–26.4 days in paddy soil. Compared to the BT treatment, the AS treatment may pose a smaller risk to the paddy water and the adjacent environment. Fipronil sulfone was found in every water and soil sample, with the maximum concentrations ranging from 0.4 to 0.9 µg/L in the paddy water and from 9.7 to

59.2 µg/kg in the paddy soil on the third DAT. These values gradually decreased over time. Ecotoxicological risk assessments of fipronil products in rice paddies should not only consider the toxicity of fipronil itself but also that of fipronil sulfone because of its relatively high concentrations in paddy water and paddy soil. ...The studies of the environmental impact of fipronil on paddy fields suggest that the dragonfly (*Sympetrum* species) population has rapidly decreased since 1989, and that the observed reduction was positively correlated with the increased use of nursery-box-applied fipronil ..."] (Authors)] Address: Motobayashi, T., Tokyo University of Agriculture and Technology, 3-5-8, Saiwaicho, Fuchu, Tokyo 183-8509, Japan. E-mail: pochi@cc.tuat.ac.jp

13201. Touron-Poncet, H.; Bernadet, C.; Compin, A.; Bargier, N.; Céréghino, R. (2013): River classification as the basis for freshwater biological assessment in overseas Europe: Issues raised from Guadeloupe (French Lesser Antilles). *International Review of Hydrobiology* 98: 34-43. (in English) ["Over the past decade, Europe's Water Framework Directive (WFD) has prompted a large amount of ecological research aiming at establishing river typologies and ecological indicators in member States. Yet, the lack of robust bioindicators in Europe's overseas regions arguably reflects minimal knowledge of the distribution patterns of aquatic species in the Community's outermost areas. Specifically, there has been no published classification of rivers for any European overseas region. 51 sites were sampled for benthic invertebrates and environmental variables (land-cover, physical habitat, and water chemistry) in Guadeloupe, French Lesser Antilles. Redundancy analysis and k-means clustering were used to bring out spatial patterns in species composition in relation to environmental conditions. Our results highlighted the importance of land cover and geomorphology in delineating three ecological sub-regions (clusters) for freshwater invertebrates. Deviation from predictable community structure only occurred when river sites were subjected to harsh water chemistry alterations (urban runoff, wastewaters). Changes in species richness did not detect environmental stress efficiently within a given sub-region, probably because most sites are naturally species-poor due to the insular context and/or because disturbance is often weak. However, differences existed between clusters in terms of species identity and numerical dominance. Our a posteriori typology of sites was compared to local a priori expert opinion of river health, in an attempt to better characterize the network of survey sites, and to target sites for reference conditions." (Authors) Odonata in this study were represented by *Argia concinna*, *Enallagma coecum*, *Ischnura ramburii*, *Libellulidae* *Brechmorhoga*, *Macrothemis celeno*, and unidentified taxa.] Address: Céréghino, R., UPS EcoLab Univ. Toulouse, 118 Route de Narbonne, 31062 Toulouse Cedex 9, France. E-mail: regis.cereghino@univ-tlse3.fr

13202. Tummylovich, O.A. (2013): Interannual dynamics of the species composition and relative abundance of dra-

gonflies in one of the ponds of Kaliningrad. Materials of the Fifth All-Russia Symposium on Amphibiotic and Aquatic Insects / Papanin Institute for Biology of Inland Waters, Russian Academy of Sciences. – Yaroslavl: Filigran, 2013. – 254 pp: 214-218. (in Russian, with English summary) ["Dragonfly larvae and changes in anthropogenic pressure on the ecosystem were monitored for 4 years (2005–2007) in one of the ponds of Kaliningrad. In 2004, the pond had virtually no anthropogenic pressure, and it was inhabited by seven species of dragonflies (*Libellula quadrimaculata*, *L. depressa* Enallagma cyathigerum, *Coenagrion hastulatum*, *C. pulchellum*, *Ischnura elegans*, and *Aeshna grandis*). Anthropogenic influence increased during the period of study, leading to degradation of aquatic vegetation, soil pollution, and disruption of the shoreline due to the increased recreational pressure. This was accompanied by a decrease in the occurrence frequency of all dragonfly species and average number of larvae per sample (from 2.71 to 0.31 individuals), and the gradual disappearance of six species. In 2007, only *L. quadrimaculata* remained in the pond, the most widespread and abundant species, not only in Kaliningrad Oblast, but throughout Russia and Europe." (Author)] Address: Tummylovich, O.A., Kaliningrad State Technical University Sovetsky prosp. 2, Kaliningrad, 236000, Russia. E-mail: levente@rambler.ru

13203. Valk, van der, R. (2013): Calculation of the maturation period of the Black Darter (*Sympetrum danae*). *Brachytron* 15(2): 128-132. (in Dutch, with English summary) ["The maturation period of *S. danae* was studied over a period of three years and calculated using the statistical model that Underhill & Zuchinni (1986) used to describe primary moult in birds. The development of the pterostigma colour was used as a measure for maturation. During the maturation period the pterostigma colour changes from white to intense black. To visualize this process the stages of the maturation were estimated in the field as follows: • stage "fresh": the colour of the pterostigma is practically white and the body is more or less pale; • stage "immature": the colour of the pterostigma is not white anymore but also not completely dark; • stage "mature": the colour of the pterostigma is black. In this manner the number of dragonflies in each stage is counted. As a result of this model the duration t in days of the maturation period (stage "immature") can be calculated. In addition two other parameters are calculated i.e. the mean starting date μ and the standard deviation σ of the starting dates. In this model it is assumed that the starting dates have a Gaussian distribution $N[\mu, \sigma]$. These parameters were calculated using a computer programme. The duration of the maturation period in the year 2007 stands out with respect to the year 2006. 2005 appeared to be a more average year. The duration of the maturation period of *S. danae* appears to depend strongly on weather conditions (Table 2). In 2005 the duration of the maturation period was seventeen days, which is in ac-

cordance with the duration mentioned in Nederlandse Vereniging voor Libellenstudie (2002). In years with more extreme weather conditions the duration of the maturation period may differ by as much as a factor three." (Author)] Address: Valk, van der, R., J. Buiskoolweg 10A, 9695 TT Bellingwolde, The Netherlands. E-mail: valk0078@kpnmail.nl

13204. Vassilenko, D.V. (2013): Dragonflies of the family Kennedyidae Tillyard, 1925 (Insecta: Odonata) in Permian odonatofaunas. Materials of the Fifth All-Russia Symposium on Amphibiotic and Aquatic Insects / Papanin Institute for Biology of Inland Waters, Russian Academy of Sciences. – Yaroslavl: Filigran, 2013. – 254 pp: 32-35. (in Russian, with English summary) ["Kennedyid dragonflies are a group of protozygopterans specialized on living among dense vegetation. The fossil record of Kennedyidae is extremely incomplete. Members of this family are invariably scant and rather uniform in Permian deposits, which is explained by their mode of life and low probability of their fossilization under typical sedimentation conditions. Owing to the fossil site Isady, which gives an idea of the fauna of a small waterbody and its environs, it has been shown that kennedyids played a very important role in such biotopes. The actual taxonomic diversity of the family was considerably higher than documented, not only because of the incompleteness of the fossil record, but also because of wing venation reduction, which results in low variation of venation even at the level of genera, and thus in underestimations of the number of identifiable species." (Author)] Address: Vassilenko, D.V., Borisiak Palaeontological Institute. Russian Academy of Sciences ul. Profsoyuznaya 123, Moscow, 117997, Russia. E-mail: lab@palaeoentomolog.ru

13205. Venkatesh, A.; Tyagi, B.K. (2013): Predatory potential of *Bradinopyga geminata* and *Ceriagrion coromandelianum* larvae on dengue vector *Aedes aegypti* under controlled conditions (Anisoptera: Libellulidae; Zygoptera: Coenagrionidae; Diptera: Culicidae). *Odonatologica* 42(2): 139-149. (in English) ["The predatory potential of *B. geminata* and *C. coromandelianum* larvae on *Aedes aegypti* larvae was investigated under laboratory condition with a view to screening these predators for use in the control of *Ae. aegypti* breeding in dengue prone areas. The feeding rate of 8th instar *B. geminata* on *Ae. aegypti* showed maximum predation on 1st instar larvae (86%), followed by 2nd, 3rd and 4th instars (72%, 66% and 48%), respectively. In the first hour, the consumption rate was maximal for all instars and a low intake (about 5%) was observed in subsequent hours. In 12th instar *B. geminata* larvae maximum predation was observed for the 1st and 2nd instar larvae (98%) of *Ae. aegypti*, followed by 3rd and 4th instars (92% and 78%), respectively. The feeding rate of 12th instar *C. coromandelianum* larvae on *Ae. aegypti* larvae showed that the maximum predation was of the 1st instar larvae (82%), followed by 2nd, 3rd and 4th in-

stars (51%, 35% and 24%) respectively. The first hour consumption rate was maximum for all instars and no significant intake was seen in the following hours. The predation of *Aedes* larvae by the 2 spp. of odonate larvae was compared for the 4 mosquito larval instars by using one way ANOVA. No significant difference was found between them for 1st instar larvae of *Ae. aegypti* but there was a significant difference ($P < 0.05$) in predation on the other 3 instars, with *B. geminata* consuming more mosquito larvae. A single anisopteran larva is sufficient for eliminating the huge mass of larval mosquitoes breeding in a cement tank or a cement cistern. Therefore, this biological control agent could be released to control *Aedes* larval production in areas of dengue epidemics." (Authors)] Address: Tyagi, B.K., Centre for Research in Medical Entomology, Indian Council of Medical Research, 4 Sarojini Street, Chinna Chokkikulam, Madurai-625 002, Tamil Nadu, India. E-mail: bktyagi@sify.com

13206. Walker, B. (2013): Some observations on the effect of temperature on dragonfly recording. *J. Br. Dragonfly Society* 29(2): 84-96. (in English) ["The British Trust for Ornithology added odonates to the species that contributors are asked to record from 2011. Records for the first two years of dragonfly records from this scheme have been analysed and indicate a marked difference in observations in the spring between 2011 and 2012. Spring 2011 was warmer than the recent average and noticeably warmer than in 2012 and dragonflies were recorded earlier in numbers in 2011 than in 2012. Based on a comparison of the records and the average weekly temperatures a correction factor is proposed to account for reduced dragonfly activity when temperatures are lower and it is suggested that this can explain some fluctuations in the raw data. It is also noted that the reduction in records from their peak can be described by a daily survival rate approach." (Author)] Address: Walker, B., 49 Roman Way, Wantage, Oxon OX12 9YF, UK

13207. Wang, C.-x.; Yu, W.-Y.; Li, Z.-h.; Cai, Y.; Ren, Y.-h.; Liu, Y. (2013): Study on fauna and diversity of Odonata in Yuntai mountain, Jiangsu Province. *Hubei Agricultural Sciences* 52(8): 1821-1832. (in Chinese, with English summary) [41 species were recorded between 2000 and 2010. The records were analysed according biogeographical regions.] Address: Wang, C.-x., Biochemical and Environmental Engineering college, Nanjing Xiaozhuang University, Nanjing 211171, China

13208. Warren, J.M.B. (2013): An assessment of benthic macroinvertebrate communities from three wadeable streams in central Texas. *Water Quality Technical Series Publication WQTS-2013-01. PWD PWD RP V3400-1784.* Texas Parks and Wildlife Department, Austin, TX: V + 16 pp. (in English) ["Benthic macroinvertebrates were collected and identified from three streams in the middle Brazos River Basin as a vehicle

for a biologist to gain experience in study design and working with an unfamiliar taxonomic group. The three streams selected for the study were among the few streams that continued to flow in the middle Brazos River Basin during an extreme drought in 2011. The sample sites were the Leon River at FM 1829, Salado Creek at Pace Park in Salado and Tehuacana Creek upstream of FM 2491. All three streams shared similar substrate and cover at the sample sites. Benthic macroinvertebrates were collected from riffles dominated by cobble, algae and leaf debris. Flow varied among the three streams, ranging from 1.0 ft³/s at Tehuacana Creek to 6.6 ft³/s at Salado Creek. Instantaneous physicochemical data varied among the three streams as well. Benthic macroinvertebrate taxa were most numerous at Salado Creek with 29 collected. Tehuacana Creek and Leon River taxa were 19 and 15, respectively. Numbers and types of individuals collected from each creek translated into an aquatic life use (ALU) scores that are the sum of 12 individual metrics. Salado Creek's ALU ranked high (score = 37), the Leon River scored intermediate (26), and Tehuacana Creek scored intermediate (28). Data results agreed with field observations and instantaneous physico-chemical data, and the study challenged the novice benthic macroinvertebrate taxonomist." (Authors) The list of taxa includes *Argia*, *Enallagma*, *Erpetogomphus*, and *Libellula*.] Address: Bronson Warren, Jennifer M., Water Resources Branch, Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, Texas 78744, USA

13209. Wasserberg, G.; White, L.; Bullard, A.; King, J.; Maxwell, R. (2013): Oviposition site selection in *Aedes albopictus* (Diptera: Culicidae): Are the effects of predation risk and food level independent? *Journal of Medical Entomology* 50(5): 1159-1164. (in English) ["For organisms lacking parental care and where larval dispersal is limited, oviposition site selection decisions are critical fitness-enhancing choices. However, studies usually do not consider the interdependence of the two. In this study, we evaluated the effect of food level on the oviposition behaviour of *Aedes albopictus* (Skuse) in the presence or the absence of a nonlethal predator (caged dragonfly nymph). We also attempted to quantify the perceived cost of predation to ovipositioning mosquitoes. Mosquitoes were presented with oviposition cups containing four levels of larval food (fermented leaf infusion) with or without a caged libellulid nymph. By titrating larval food, we estimated the amount of food needed to attract the female mosquito to oviposit in the riskier habitat. As expected, oviposition rate increased with food level and decreased in the presence of a predator. However, the effect of food level did not differ between predator treatments. By calculating the difference in the amount of food for points of equal oviposition rate in the predator-present and predator-absent regression lines, we estimated the cost of predation risk to be 1950 colony-forming-units per millilitre. Our study demonstrated the importance of considering the possi-

ble interdependence of predation risk and food abundance for oviposition-site-seeking insects. This study also quantified the perceived cost of predation and found it to be relatively low, a fact with positive implications for biological control." (Authors)] Address: not available

13210. Weihrauch, F.; Erfurth, L. (2013): He who is too slow is punished by life: *Calopteryx virgo* (L.) entangled by the tendril of a vetch during emergence (Zygoptera: Calopterygidae). *Odonatologica* 42(3): 253-256. (in English) ["At a rivulet in the western fringe area of Munich, Germany, an immature male was photographed with its right forewing tightly entwined around by the tendril of a vetch. Obviously the tendril had entangled the not yet unfolded wing briefly after emergence. The living insect was unable to escape from its bonds. This is only the third published case of a biotic interaction of this type." (Authors)] Address: Weihrauch, F., Jägerstr. 21A, 85283 Wolnzach, Germany. E-mail: Florian.Weihrauch@t-online.de

13211. Więcek, M.; Martin, P.; Gąbka, M. (2013): Distribution patterns and environmental correlates of water mites (Hydrachnidia, Acari) in peatland microhabitats. *Exp. Appl. Acarol.* 61: 147-160. (in English) ["In Europe peatlands are wetlands of postglacial origin. Because of climatic changes and agricultural activities (i.e. drainage and peat extraction), they are one of the most endangered ecosystems worldwide. Water mites are well known as indicators of changing environments in other ecosystems such as springs and lakes. For our study we selected seven peatlands located in North-Western Poland and focused on water mite distribution and associated habitat and water quality variables. We described water mite fauna in various microhabitats (aquatic and semiaquatic) along the mineral-richness gradient to test whether this gradient is reflected in the composition of water mite assemblages. We selected conductivity, pH and vegetation as variables reflecting the poor-rich gradient. Additionally, we measured water depth, temperature and dissolved oxygen, which are often important parameters for water mites. We also noted presence of prey and host taxa of particular water mite species. Based on physicochemical parameters we identified three types of habitats harbouring three distinctive species groups of water mites. We were able to distinguish species that appear to be typical of spring fens (e.g. *Hygrobatas norvegicus*, *Lebertia separata*), connected with acidic, nutrient poor pools (e.g. *Arrenurus neumani*, *A. pustulator*) and species seemingly typical of temporary habitats dominated by *Sphagnum* mosses (e.g. *Piersigia intermedia*, *Zschokkea oblonga*, *A. stecki*). The poor-rich gradient is strongly reflected in the composition of water mite assemblages. We also found strong correlations between the water mite fauna and both conductivity and pH gradient. Our results show that water conductivity is the most important of the examined factors, driving mite-species distribution in peat-

lands." (Authors) The paper includes many references to Odonata.] Address: Więcek, M., Dept of Animal Morphology, Faculty of Biology, Adam Mickiewicz University, Umultowska 89, 61-614 Poznań, Poland. E-mail: roztoc@wp.pl

13212. Wildermuth, H. (2013): Buchbesprechungen: Karjalainen S. & M. Hämäläinen 2013. *Demoiselle Damselflies – Winged Jewels of Silvery Streams*. *Entomo Helvetica* 6: 198. (in German) [The review introduces into the wonderful book on the Calopterygoidea.] Address: Wildermuth, H., Haltbergstr. 43, CH-8630 Rüti, Switzerland. E-mail: hansruedi@wildermuth.ch

13213. Wildermuth, H. (2013): SAGLS-Exkursion 2012 im Ronfeld am Baldeggersee. *Entomo Helvetica* 6: 190-191. (in German) [The 'Schweizerische Arbeitsgemeinschaft für Libellenschutz' (SAGLS) realised an excursion to the Baldeggersee region, Kanton Luzern, Switzerland. Most interesting species recorded were *Orthetrum albistylum*, *Sympetrum depressiusculum*, and *Anax parthenope*. For more details on the region see: <http://www.pronatura-lu.ch/ronfeld.php>.] Address: Wildermuth, H., Haltbergstr. 43, CH-8630 Rüti, Switzerland. E-mail: hansruedi@wildermuth.ch

13214. Wildermuth, H. (2013): Natur- und Fotoreise zu den Heuschrecken Südfrankreichs. *Entomo Helvetica* 6: 192-195. (in German) [This extensive orthopterological report on a journey to southern France, includes some odonatological notes: records of Odonata from the Canal de Vergière, Crau, and Marais du Vigueirat, Camargue, Département Bouches-du-Rhône, as well as the river Hérault.] Address: Wildermuth, H., Haltbergstr. 43, 8630 Rüti, Switzerland. E-mail: hansruedi@wildermuth.ch

13215. Wu, X.; Li, F.; Cong, R.; Chu, B. (2013): Preliminary Analysis on Feeding Habits of *Megalurus pryeri* in Nanji Wetland, Jiangxi. *Sichuan Journal of Zoology*: 438-441. (in Chinese, with English summary) ["The feeding habits and food composition of marsh grassbird *Megalurus pryeri* in Nanji Wetland National Nature Reserve (Jiangxi province) were investigated during breeding season (April, 2011) and non-breeding season (November, 2011). The brood behaviour of parent birds was observed by using binoculars and cameras in breeding season, and the stomach contents of 7 dead individuals collected from bird banding in non-breeding season were examined also. The results showed that the marsh grassbird mainly eat arthropods including dragonfly insects, spiders, imago or larva of *Grillotapidae* (mole crickets) and *Lepidoptera* insects in breeding season. While the diet was made up of both arthropods (70.24%) and vegetation (29.76%) such as *Orthoptera*, *Coleoptera*, *Odonata*, *Lepidoptera* insects, spiders and seeds, foliage in non-breeding season. In conclusion, the feeding habits of mash grassbird are different in breeding and non-breeding season, and this difference is due to seasonal changing of food composition in the

habitats and that the nestlings need higher protein nutrition food." (Authors) Odonata contributed with 8.36% to the diet.] Address: Li, F., College of Wildlife Resources, Northeast Forestry University, Harbin 150040, China. E-mail: lifeng604@163.com

13216. Xu, Q.-h. (2013): Descriptions of the final stadium larva and female adult of *Coeliccia mingxiensis* Xu (Odonata: Zygoptera: Platycnemididae). *Zootaxa* 3721 (1): 92-96. (in English) ["The final stadium larva of *C. mingxiensis* is described and illustrated. The female adult is also described for the first time. The larva can be easily separated from all known *Coeliccia* larvae by the following distinct morphological characters: (1) prementum longest in all known *Coeliccia* larvae; median lobe with 4 pairs of premental setae and palpal lobe with 6 palpal setae; (2) caudal gills shortest of all known *Coeliccia* larvae when compared with body length; median gill rounded at apex and lateral gill with a small median projection at apex. The female is similar to the male in many respects, differing chiefly in several respects as follows: the transverse yellow band on vertex of head broader and straighter than in male; antehumeral stripe on mesepisternum somewhat incurved basally, not forming a strong hook, which is present in male; distal abdomen with obviously different colour pattern; anal appendages brownish-black, shorter than S10; vulvar scales robust, brownish-yellow, projecting well beyond end of abdomen." (Author)] Address: Xu, Q.-h., Department of Garden and Horticulture, Zhangzhou City University, Zhangzhou, Fujian 363000, China. E-mail: qhx363000@gmail.com

13217. Yapo, L.M.; Atsé, C.B.; Kouassi, P. (2013): Composition, abundance and diversity of aquatic insects in fishponds of southern Ivory Coast, West Africa. *Entomologie Faunistique – Faunistic Entomology* 66: 123-133. (in English, with French summary) ["Abundance, density, biomass, and diversity of aquatic insects collected in water column from fishponds in southern Ivory Coast were studied. Monthly samplings have been conducted from December 2007 to November 2008. A total of 27,381 individuals belonging to 64 taxa, 25 families and 6 orders (Ephemeroptera, Odonata, Hemiptera, Lepidoptera, Coleoptera, and Diptera) were collected. Among these six orders, Hemipterans dominated quantitatively and qualitatively aquatic insect's community structure. The most abundant species were *Anisops sardea* Kirkaldy 1904 (64.17%), *Plea pullula* Stål 1855 (5.87%), *Eurymetra* sp. (3.87%), *Amphiops* sp. (3.79%), *Mesovelgia* sp. (3.41%) and *Cloeon bellum* Navas 1931 (2.21%). A spatiotemporal variation was observed for the different recorded parameters (density, biomass, and diversity). The maximum abundance, density, and biomass were recorded during the rainy season in the station of Layo. The Shannon-Weaver index indicated that the highest diversity of aquatic insects was obtained during the rainy season in the stations of Banco, Anyama I and Anyama II. In contrast, evenness reached

maximum values during the dry season in the stations of Layo, and Banco. Local environmental conditions (i.e. temperature, dissolved oxygen, pH, transparency, conductivity, ammonium, nitrite and phosphorus) accounted for 91.70% of variation in aquatic insect assemblages using canonical correspondence analysis (CCA). Seasonal trends in aquatic insect community composition were also related to changes in environmental characteristics of the fishponds." (Authors)] Address: Atsé, C.B., Département Aquaculture, Centre de Recherches Océanologiques (CRO), BPV 18 Abidjan, Côte d'Ivoire. E-mail: atsebouacelestin@hotmail.com

13218. Youprom, P.; Panich-Pat, T.; Prommi, T.-O. (2013): Aquatic insect communities and water quality in wetland, northern Thailand. *Journal of Applied Sciences in Environmental Sanitation* 8(3): 161-169. (in English) [Nong Leng Sai wetland is situated in the north of the town of Phayao, Mae Chai District, Phayao Province. Aquatic insects were monthly collected from January to August 2009. The Hemiptera had the highest abundance with 43.34% of the total specimens, followed by Odonata (19.66%). Taxa are treated at the family level.] Address: Youprom, P., Faculty of Liberal Arts and Science, Kasetsart University, Kamphaeng Saen Campus, Nakhon Pathom, Thailand. E-mail: faastop@ku.ac.th

13219. Zhang, H.; Cai, Q.; Liao, M. (2013): Three new *Cephalaeschna* species from central China with descriptions of the hitherto unknown sex of related species (Odonata: Aeshnidae). *International Journal of Odonatology* 16(2): 157-176. (in English) ["Three new *Cephalaeschna* species, *C. discolor* sp. nov. (holotype male; Shennongjia National Nature Reserve, Shennongjia City, Hubei province, China, 16 August 2012), *C. mattii* sp. nov. (holotype male; Lujiahe River, Zigui County, Hubei province, China, 18 September 2012) and *C. solitaria* sp. nov. (holotype male; Dalongtan in Shennongjia National Nature Reserve, Shennongjia City, Hubei province, China, 19 July 2012) are described, illustrated in colour and compared with the known Chinese *Cephalaeschna*. All the holotypes are deposited in the Collection of Aquatic Animals, Institute of Hydrobiology, Chinese Academy of Sciences, Wuhan City, Hubei Province, China. The hitherto unknown male of *C. obversa* and female of *C. patrum* are also described and illustrated. Brief notes on biology of each species are also provided." (Authors)] Address: Zhang, H., Department of Entomology, College of Natural Resources and Environment, South China Agricultural University, Guangzhou 510642, China. E-mail: zhanghaomiao6988@gmail.com

13220. Zhu, R.; Ayodeji Bode-Oke, A.; Yan Ren, Y.; Dong, H. (2013): Analysis of dragonfly take-off mechanism: Initial impulse generated by aerodynamic forces. *Bulletin of the American Physical Society* 58(18): o.p. ["Take-off is a critical part of insect flight due to not only that every single flight initiates from take-off, but also that the take-off period, despite its short duration, ac-

counts for a relatively large fraction of the total energy consumption. Thus, studying the mechanism of insect take-off will help to improve the design of Micro Air Vehicles (MAVs) in two major properties, the success rate and the energy efficiency of take-off. In this work, we study 20 cases in which dragonflies (species including *Pachydiplax longipennis*, *Epitheca cynosura*, *E. princeps* etc.) take off from designed platform. By high-speed photogrammetry, 3-d reconstruction and numerical simulation, we explore how dragonflies coordinate different body parts to help take-off. We evaluate how aerodynamic forces generated by wing flapping create the initial impulse, and how these forces help save energy consumption." (Authors)] Address: not stated

13221. Živić, I.; Živić, M.; Milošević, D.; Bjelanović, K.; Stanojlović, S.; Daljević, R.; Marković, Z. (2013): The effects of geothermal water inflow on longitudinal changes in benthic macroinvertebrate community composition of a temperate stream. *Journal of Thermal Biology* 38(5): 255-263. (in English) ["Highlights: • We monitored effects of water temperature increase on macrozoobenthos communities. • Water temperature increase severely decreased macrozoobenthos diversity. • Warm waters were dominated (98.9%) by Chironomidae, Mollusca and Oligochaeta. • Plecoptera, Coleoptera, Gammaridae, and Odonata completely disappeared in warm waters. • Significant warm waters annual temperature variations had profound influence too. Studies of macroinvertebrate communities in thermal streams are highly geographically localized and mostly faunistical, making the efforts to understand in situ water thermal regime effects on those biocoenoses barely achievable. We examined the effects of geothermal water inflow on benthic macroinvertebrate community composition in a temperate stream. Environmental data analysis has shown that water temperature is a major factor determining the faunistical composition, especially downstream of the geothermal water inflow situated some 20 m upstream of locality V3. The increase in mean annual water temperature from 11.5 ± 4.1 °C at locality V2 to 22.0 ± 5.0 °C at locality V3 induced an enormous shift in community composition from a diverse one, composed mainly of Gammaridae, Simuliidae, Chironomidae, Trichoptera and Ephemeroptera, and to a lesser extent of Plecoptera, Coleoptera, other Diptera, Hirudinea, Odonata, Mollusca and Oligochaeta, to a uniform one strongly dominated by Chironomidae, Mollusca and Oligochaeta, comprising $98.9 \pm 0.5\%$ of collected individuals. While the disappearance of Plecoptera and Ephemeroptera and the increase in representation of Mollusca and Oligochaeta at locality V3 might be solely explained by water temperature increase, in the case of Chironomidae the increase in water discharge and relatively high annual water temperature variation at locality V3 had additional positive effects. However, the latter factor induced disappearance of Gammaridae at locality V3. In addition to the increase in water temperature, increase of water velocity significantly determined the

longitudinal dynamics of Coleoptera." (Authors)] Address: Živić, Ivana, University of Belgrade, Faculty of Biology, Studentski trg 16, 11000 Belgrade, Serbia

13222. Zinman, A.R.; Balter, M.L.; Olberg, R.; Ramasubramanian, A.; Hodgson, D.A. Design, construction, and testing of a flying prey simulator. ASME 2012 5th Annual Dynamic Systems and Control Conference joint with the JSME 2012 11th Motion and Vibration Conference Volume 3: Renewable Energy Systems; Robotics; Robust Control; Single Track Vehicle Dynamics and Control; Stochastic Models, Control and Algorithms in Robotics; Structure Dynamics and Smart Structures; Fort Lauderdale, Florida, USA, October 17–19, 2012: 59-65. (in English) ["The goal of this research project is to investigate the neuronal control of flying prey interception in dragonflies by designing, constructing, and testing 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 with good repeatability with little variability between trials. Preliminary dragonfly testing with the apparatus showed favourable results, indicating proof of concept." (Authors)] Address: Balter, M., Mechanical Engineering and Biology Departments, Union College, 807 Union Street, Schenectady, NY 12308 USA

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