

Odonatological Abstract Service

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1997

6081. Anholt, B.R. (1997): Sexual size dimorphism and sex-specific survival in adults of the damselfly *Lestes disjunctus*. *Ecological Entomology* 22(2): 127-132. (in English). ["(1.) A population of adult *Lestes disjunctus* (Odonata: Lestidae) was studied in eastern Ontario, Canada. Mass at sexual maturity and activity rates of individuals were measured. Population density was estimated on transects, while survival rates and population size were estimated using mark-recapture methods. (2.) There was no difference in mass of mated and unmated males. Females were more than 50% heavier than males, and were also more active than males. (3.) Males were almost eight times more abundant on transects than females, but Manly-Parr estimates of male population size were only a maximum of 2.5 times larger than estimates for females. (4.) Males were 2.5 times more likely to be resighted after marking than were females. This accounts for much of the discrepancy between transect estimates and mark-recapture estimates of relative population size. (5.) Daily survival rates of sexually mature females were not significantly less than those of males, and therefore cannot account for a change in sex-ratio from 1 : 1 at emergence to more males than females in sexually mature adults. (6.) Differences in mortality must occur prior to sexual maturity, coincident with the time during which differences in mass gain are also taking place." (Author)] Address: Anholt, B.R., Dept Biology, University of Victoria, PO Box 3020, Victoria, BC, V8W 3N5, Canada; e-mail: banholt@uvic.ca

6082. Asahina, S. (1997): Records of Northern Vietnamese Odonata taken by the expedition members from the National Science Museum, Tokyo. 6. Platystictidae, Megapodagrionidae, Lestidae and Synlestidae. *Bull. natn. sci. mus. Tokio Ser. A.* 23(2): 107-113. (in English). ["Seven species of northern Vietnamese damselflies are classified into four families, Platystictidae (1 new species and 1 new subspecies), Megapodagrionidae (1 new species and 1 species previously known from Lower Burma and Laos), Lestidae (1 common South Asiatic species), and Synlestidae (2 species pre-

viously known from Southwest China, etc.)." (Author) *Drepanosticta vietnamica*, *Rhipidolestes owadai*] Address: Asahina, S., 4-4-24 Takadanobaba, Shinjuku-ku, Tokyo 169, Japan

6083. Beschovski, V.L.; Gashtarov, V. (1997): *Selysiothemis nigra* (Vander Linden, 1825) - a new genus and species for the Bulgarian fauna (Odonata: Anisoptera: Libellulidae). *Ent. Zschr.* 107(7): 309-310. (in English, with German summary). [First record of *S. nigra* in Bulgaria. One male specimen on 4-VI-1996 in the small floodplain of the river Melnishka, a left affluent of the river Struma near the town of Melnik.] Address: Beschovski, V.L., Inst. Zool., Bulgarian Acad. Sci., Boul. Tzar Osvoboditel 1, 1000 Sofia, Bulgaria

6084. Goutner, V.; Furness, R.W. (1997): Mercury in feathers of Little Egret *Egretta farzetta* and Night Heron *Nycticorax nycticorax* Chicks and in their prey in the Axios Delta, Greece. *Archives of environmental contamination and toxicology* 32(2): 211-216. (in English). ["Mercury concentrations were measured in feathers of little egret and night heron chicks and in their prey in the Axios Delta, Greece. Significantly higher concentrations occurred in night heron than in little egret in 1993. In the night heron the mercury content of feathers was negatively correlated to the size of chicks, possibly due to inhibition of growth. Mercury concentrations were higher than reported for heron feathers in seriously polluted sites in North America and Japan, but the toxic hazard is unclear. Diets differed considerably between the two species due to use of different foraging habitats and this seems responsible for different mercury contents of feathers. Mercury concentrations in the pumpkinseed sunfish *Lepomis gibbosus*, goldfish *Carrassius auratus*, and in dragonfly Odonata larvae were the highest among the prey categories. Frogs and water beetles *Dytiscidae* had moderate concentrations whereas saltwater fish and terrestrial prey had very low mercury concentrations. The implication is that the deltaic marshes are the habitat most polluted with mercury. Night heron chick feathers, freshwater fish and dragonfly larvae could be used to monitor mercury contamination in this region, but use of bird feathers alone could give misleading results if changes in diet occurred." (Authors)] Address: Goutner, V., Dept of Zoology, Aristotle-

lian University of Thessaloniki, GR-540 06, Thessaloniki, Greece

6085. Mori, S. (1997): Eco-up design & citizens' participation - from the cases of the dragonfly ponds in Yokohama. *Journal of the Japanese Institute of Landscape Architecture* 60(3): 245-248. (in Japanese, with English translation of the title). [No abstract available. For the full text see: <http://nels.nii.ac.jp/els/contentdisp.php?id=ART0006477675&type=pdf&lang=en&host=cini&orderno=Z00000005400124&ppvtype=0&langsw=&no=1179656446&cp=>]

6086. Olsvik, H. (1997): (Trekkeyenstikker) *Hemianax ephippiger* i Norge, og mulige farste-observasjoner av (takrroyenstikker) *Aeshna serrata*. *Insekt-Nytt* 22(4): 13-14. (in Norwegian, with English summary). ["The migratory dragonfly *Hemianax ephippiger* is reported from Norway for first time. One male was seen, but not collected, near Moss on 11.08.1995. Also, a large male dragonfly observed at Isesjen, Sarpsborg the same day, was very likely *Aeshna serrata*, not previously recorded from Norway." (Author)] Address: Olsvik, H., N-6694 Foldfjorden, Norway. E-mail: haolsvik@frisurf.no

6087. Proess, R. (1997): Erstnachweis der Gabel-Azurjungfer (*Coenagrion scitulum* Rambur, 1842) in Luxemburg (Insecta, Odonata, Coenagrionidae). *Bull. soc. nat. luxemb.* 98: 129-131. (in German, with English summary). [First record of *C. scitulum* on 24.07.1996 in Luxembourg.] Address: Proess, R., ECOTOP, 6, rue Gustave Kahnt, L-1851 Luxembourg, Luxembourg. E-mail: ecotop@pt.lu

6088. Saugestad, T. (1997): Stor torvlibelle *Leucorrhinia pectoralis* (Charpentier, 1825) funnet i Hordaland. *Insekt-Nytt* 22(4): 15-17. (in Norwegian, with English summary). [The genus *Leucorrhinia* is represent in Norway with five species, of which only *L. dubia* is common. Two males of the endangered *L. pectoralis* were recorded on 19.07. and 22.07.1997, at Leirvikvatn, Tysnes, HOY. This is the first record from West-Norway. In addition, 10 taxa also recorded at the locality are listed.] Address: Saugestad, T., Gamle Kalvedalsvei 12B, N-5019 Bergen, Norway

6089. Tani, J.; Qu, J.; Yamaguchi, E. (1997): Rhythmic movement of dragonfly wing model. *Transactions of the Japan Society of Mechanical Engineers. C* 63 (No. 614): 3390-3395. (in Japanese, with English summary). ["This paper describes the model for insect wing movement with the non-linear oscillator. Living things have flexibility for various environments and on the whole structures keep a function even if a part of them is out of order. Recently, biological properties of living things which are autonomous distributed-systems become the focus of attention. The synchronous phenomenon of the system is applied to insect wing model. The equations of motion for insect wings are derived at first, and then Van del Pol equation is used to produce a non-linear rhythmic force. By solving these equations a rhythmic movement of insect wing model is obtained. It is found that various autonomous vibration can be generated using this model." (Authors) For an English version see Tani et al 1998 (OAS 855).] Address: Tani, J., Tohoku Univ., Inst. Fluid Sci., Katahira 2-1-1; Sendai; Miyagi 9808577; Japan

6090. Yabu, S.; Nakashima, A. (1997): Ecological studies on the conservation of *Nannophya pygmaea*

Rambur populations and habitats. *Journal of the Japanese Institute of Landscape Architecture* 60(4): 324-328. (in Japanese, with English summary). [Habitat parameters of *N. pygmaea* in the surroundings of Motegi town, Tochigi Pref., Japan were surveyed. Vegetation and microhabitats within the vegetation preferred by the imagines are outlined. For details see: <http://nels.nii.ac.jp/els/contentdisp.php?id=ART0006477726>] Address: not transliterated into English

1998

6091. Flaspohler, D. (1998): A technique for sampling flying insects. *J. Field Ornithol.* 69(2): 201-208. (in English). ["I describe a procedure for sampling flying insects. Using binoculars, a stopwatch, and a hand-held counter, an observer counts insects passing through a measurable focal volume for a set time. No insect identification skills are needed. I tested the accuracy and repeatability of the procedure under controlled conditions and found that with known limitations, it is a reliable way to sample flying insect abundance. I used the procedure to describe daily activity pattern of flying insects using a clearing adjacent to a neotropical lowland forest reserve. While flycatcher and flying insect activity patterns were not strongly correlated, similarities in activity were noted." (Author) The paper contains some references to Odonata.] Address: Flaspohler, D., Department of Wildlife Ecology, A229 Russell Labs, University of Wisconsin-Madison, Madison, Wisconsin 53706 USA

6092. Sudo, S.; Tsuyuki, K.; Ikohagi, T.; Ohta, F.; Shida, S.; Tani, J. (1998): Wing structure of dragonfly: 2nd report, wing and flight. *Transactions of the Japan Society of Mechanical Engineers. C* 64(No.625): 3526-3533. (in Japanese, with English summary). ["This paper is concerned with the wing structure and the aerodynamic characteristics of a flying dragonflies. The structural properties of dragonfly wings were studied through the measurements of some morphological parameters. The scanning electron microscopic observation showed the morphological characteristics of the dragonfly wing. Dragonflies (*Sympetrum infuscatum*, *S. kunkeli*) were examined in a small low-turbulence wind tunnel. In the experiment on the measurements of wing flapping, an optical displacement detector was used to measure the displacement of the dragonfly wing. In the experiment on the measurements of the velocity fluctuation, a hot-wire anemometer was used to measure the velocity field. The spectrum of dragonfly flight was revealed by the measurement of velocity fluctuation." (Authors)] Address: Sudo, S., Faculty of Systems Science and Technology, Akita Prefectural University, Yurihonjo 015-0055 Japan

1999

6093. Ellington, C.P. (1999): The novel aerodynamics of insect flight: applications to micro-air vehicles. *J. exp. Biol.* 202: 3439-3448. (in English). ["The wing motion in free flight has been described for insects ranging from 1 to 100 mm in wingspan. To support the body weight, the wings typically produce 2-3 times more lift than can

be accounted for by conventional aerodynamics. Some insects use the fling mechanism: the wings are clapped together and then flung open before the start of the downstroke, creating a lift-enhancing vortex around each wing. Most insects, however, rely on a leading-edge vortex (LEV) created by dynamic stall during flapping; a strong spanwise flow is also generated by the pressure gradients on the flapping wing, causing the LEV to spiral out to the wingtip. Technical applications of the fling are limited by the mechanical damage that accompanies repeated clapping of the wings, but the spiral LEV can be used to augment the lift production of propellers, rotors and micro-air vehicles (MAVs). Design characteristics of insect-based flying machines are presented, along with estimates of the mass supported, the mechanical power requirement and maximum flight speeds over a wide range of sizes and frequencies. To support a given mass, larger machines need less power, but smaller ones operating at higher frequencies will reach faster speeds." (Author) The paper deals mainly with Diptera, Hymenoptera and Lepidoptera, and contains only passing references to Protodonata and Odonata.] Address: Ellington, C.P., Dept of Zoology, University of Cambridge, Downing Street, Cambridge CB2 3EJ, UK. E-mail: c.ellington@zoo.cam.ac.uk

6094. Morse, D.H. (1999): Choice of hunting site as a consequence of experience in late-instar crab spiders. *Oecologia* 120(2): 252-257. (in English). ["Earlier experiences may play an important role in the choice of hunting sites, but their effects on the foraging repertoire of most animals remain poorly understood. I tested the role of previous flower choices (hunting sites) by penultimate-instar female crab spiders *Misumena vatia* in making subsequent patch-choice decisions. *M. vatia* is a sit-and-wait predator, and the two flower species used, ox-eye daisy *Chrysanthemum leucanthemum* and common buttercup *Ranunculus acris*, are important hunting sites. Spiders with different immediate experience showed similar abort-term (<1 day) giving-up times on the two flower species, independent of their previous substrate. However, four-fifths of the individuals that remained a day or longer tended to leave buttercups sooner than daisies, especially if they had previously occupied daisies. Thus they may directly assess the quality of a potential hunting site, perhaps in response to prey abundance, but previous experience may play a minor role as well. Of spiders that made several consecutive choices of hunting sites, those on daisies often confined these runs to daisies (one of two years); those on buttercups did not exhibit comparable fidelity. Spiders molting into the adult stage almost always subsequently chose the same flower species (either daisy or buttercup) as the one on which they molted. Thus, juvenile experiences may influence adults, the critical stage when virtually all of the spiders' reproductive resources are gathered, even if this resulted from imprinting on their molt sites rather than carrying information over the molt." (Authors)] Address: Morse, D.H., Brown Univ., Dept Ecol. & Evolutionary Biol., Box G-W, Providence RI 02912; USA. e-mail: dmorse@brown.edu

6095. Paulson, D. (1999): Dragonflies of Washington. Seattle Audubon Society. ISBN 0-914516-15-9: 32 pp. (in English). [This is a very condensed fieldguide with 84 colour pictures and brief information on the Odonata of Washington, USA. The species text chapters contain information on geographic distribution in Washington, their phenology, and habitat. A key, and some informa-

tion on morphology, dragonfly photography, finding and collecting dragonflies, rearing larvae, dragonfly conservation, and a glossary are added.] Address: Paulson, D.R., Slater Museum, Univ. of Puget Sound, Tacoma, WA 98416, USA. E-mail: dpaulson@ups.edu

2000

6096. Ishii, M.; Kanata, T.; Kobayashi, K.; Michishita, Y. (2000): Vegetation and species diversity of aquatic insects in the Ziou marsh, northern Osaka. Scientific report of the College of Agriculture, Osaka Prefecture University 52: 29-41. (in Japanese, with English summary). ["Vegetation and species diversity of aquatic insects were investigated in the Ziou Marsh in Nose Town, northern Osaka Prefecture, central Japan from April to November, 1998. A total of 60 species of vascular plants belonging to 40 families were found in the marsh. Dominant species were *Isachne globossa*, *Scirpus fuirenoides*, *Potamogeton fryeri*, *Juncus effusus* var. *decipiens*, *Haloragis micrantha*, etc. A total of 52 species of aquatic insects were observed in the water. In 20 (39%) and 22 (42%) out of the 52 species, only larvae and adults were observed respectively. Dominant species were *Notonecta triguttata*, Chironomidae sp.1, *Sigara* spp., *Gerris latiabdominis*, and Chironomidae sp.2, *Cloeon* sp., and *Aeshna nigroflava*, representing about 80% of the total number of aquatic insects observed in this marsh. As for adult Odonata, a total of 29 species from 9 families were found in this marsh. Dominant species were *Sympetrum kunckeli*, *Nannophya pygmaea*, *Indolestes peregrinus*, *S. darwinianum*, and *Cercion calamorum*, representing about 60% of the total individuals found. Adults of the tiny dragonfly, *N. pygmaea*, were observed from May to August in this marsh, though females disappeared about half a month earlier." (Authors)] Address: Ishii, M., College of Agriculture, Osaka Prefecture University, Japan

6097. Uniyal, V.P.; Mitra, A.; Mathur, P.K. (2000): Dragonfly fauna (Insecta: Odonata) in Great Himalayan National Park. *Annals of Forestry* 8(1): 116-119. (in English). [India; six odonate species are listed and briefly discussed.] Address: Uniyal, V.P., Wildlife Institute of India, Post Box # 18, Chandrabani Dehradun, Uttarakhand – 248 001, India. E-mail: uniyalvp@wii.gov.in

2001

6098. Bernath, B.; Szedenics, G.; Molnar, G.; Kriska, G.; Horvath, G. (2001): Visual ecological impacts of "shiny black anthropogenic products" on aquatic insects: oil reservoirs and plastic sheets as polarized traps for insects associated with water. *Archiv für Naturschutz und Landschaftspflege* 40: 89-109. (in English). [The waste oil lake in Budapest (Hungary) deceived, attracted and killed insects in large numbers and acted as a huge insect trap for 50 years from 1951. Records of insects made between August 1997 and September 1998 also included Odonata, namely *Aeshna mixta*, *Anax imperator*, and *Sympetrum vulgatum*.] Address: Horvath, G., Biooptics Laboratory, Department of Biological Physics, Loránd Eötvös University, 1117 Buda-

pest, Pázmány Péter sétány 1, Hungary. E-mail: gh@arago.elte.hu

6099. Bönsel, A. (2001): Hat *Aeshna subarctica* (Walker 1908) in Nordostdeutschland eine Überlebenschance? Die Entwicklung zweier Vorkommen im Vergleich zum gesamten Bestand in Mecklenburg-Vorpommern. *Natur und Landschaft* 76(6): 257-261. (in German, with English summary). [Exuviae of *A. subarctica* have been recorded since 1995 in the Göldenitzer Moor mire in the German regional state of Mecklenburg/Western Pomerania. The abundance declined from 322 to 12 emerged individuals within 6 years. This was associated with the simultaneously observed disappearance of *Sphagnum* species. The loss of *Sphagnum* plants is due to intensive drainage and elevated nutrient availability. In the Horster Moor mire, a presumably extinct population re-established itself after restoration measures as an abundant and autochthonous population. Restoration of the Horster Moor site, where peat had previously been extracted industrially, commenced in 1986 by waterlogging of this ombrogenous bog. At first, *Sphagnum* cover developed slowly. However, a stand of *Eriophorum* species developed in shallow flooded areas with mossy bog ponds. In areas where manual peat-digging was practised, flooded *Sphagnum* grew again after the water level rose. Consequently, after 14 years of re-vegetation, *A. subarctica* has re-established itself with a major autochthonous population. However, this population remains endangered by eutrophication of its larval waters. In Mecklenburg/Western Pomerania there are currently 9 further occurrences of *A. subarctica*. These are all similarly severely endangered. Therefore, medium-term extinction of this dragonfly in north-eastern Germany appears likely.] Address: Bönsel, A., Vasenbusch 15, D-18337 Gresenhorst, Germany. E-mail: andre.boensel@gmx.de

6100. Derka, T.; Kováčová, J.; Bulánková, E. (2001): Substrate importance for selected macrozoobenthic communities in Rudava river. *Folia faunistica Slovaca* 6: 59-68. (in Slovakian, with English summary). ["The macroinvertebrate communities inhabiting different substrate types were investigated in a small sandy bottom river in SW Slovakia. Special attention was paid to macroinvertebrates associated with wood debris and submersed root mats of riparian trees. A total of 57 taxa of temporal fauna were recorded at two sites; the lowest number of taxa was found on the sandy substrate. The muddy substrate with detritus was also inhabited relatively poorly, whereas the most diverse was the community on the woody debris (35 taxa collected). At all substrate types, the highest biomass values were found in amphipods. Trichoptera were important on debris and the habitats associated with roots. Densities were highest on muddy habitats with detritus but the biomass was lower than that on the roots and debris. Sandy bottom showed the lowest values of densities and biomass. Woody debris and submersed roots were found to be essential for the maintenance of diversity and abundance of macroinvertebrate community." (Authors) The paper includes notes on *Calopteryx splendens*.] Address: Bulankova, Eva, Institute of Ecology, Faculty of Natural Sciences, Comenius University, Mlynská dolina B-II, SK-84215 Bratislava., Slovakia; tel.+ 421-7-728 922, e-mail: Bulankova@fns.uniba.sk

6101. Han, F.-y. (2001): Study on the significant variation in the abdominal spot patterns in the male adult

Coenagrion barbatum Needham. *J. Shanxi Univ. (Nat. Sci.)* 24(4): 341-343. (in Chinese, with English summary). [Spot variability in the abdominal segments 2 and 8-10 was studied.] Address: Han, F.-y., Dept Life Sciences, Shanxi University, Taiyuan 030006, China

6102. Nakamoto; Sekioka (2001): Construction of ponds to make the environment more suitable for plants and animals. *Journal of the Japanese Society of Revegetation Technology* 27(1): 355-356. (in Japanese, with English translation of the title). [no abstract available] Address: not stated

6103. Papavero, N.; Ibanez-Bernal, S.I. (2001): Contributions to a Mexican history of dipterology, part 1. Entomologists and their works before the *Biologica Centrali Americana*. *Acta zoologica Mexicana (N.S.)* 84: 115-173. (in English). [This paper contains an interesting "life history" of the well known odonatologist Friedrich Moritz Brauer, Austria. A few additional information are given to Carl Eduard Adolph Gerstäcker, author of a few papers on Odonata.] Address: Ibanez-Bernal, S., Instituto de Ecología, A.C. Departamento de Entomología, km 2,5 carretera antigua a Coatepec No 351, Congregación El Haya, 91070 Xalapa Veracruz, Mexico

6104. Pliuraite, V. (2001): Seasonal changes of the abundance, biomass, species composition of macrozoobenthos in the rivers Merkys and Svventoji. *Ekologija* 2001(4): 16-30. (in Lithuanian, with English summary). [Lithuania, *Calopteryx splendens*, *Gomphus vulgatissimus*, and *Libellula quadrimaculata* are listed from different stretches of the rivers.] Address: Pliuraite, V., Ekologijos institutas, Akademijos g.2, LT-2600 Vilnius, Lithuania

6105. Ramos Elorduy, J.; Pino, J.M. (2001): Contenido de vitaminas de algunos insectos comestibles de México. *Revista de la Sociedad Química de México* 45(2): 66-76. (in Spanish, with English summary). ["The concentrations of Vitamins A, C, D, and B (thiamine, riboflavin and niacin) in 35 species of edible insects were determined. It is noted the role of these substances for the development and growth of the human organism, as well as for health. The concentrations obtained for the edible insects studied were compared with those of conventional edible products rich in these micronutrients, noting that in many cases certain species surpass the vitaminic content of various common edible products, therefore, some edible insects species can be considered as a good vitaminic source. This is the case of *Periplaneta americana* (adults) in vitamin A, *Latebraria amphipyrioides* (larvae) in vitamin C, *Acheata domestica* (nymphae) in vitamin D, and *Copestylum anna* and *C. haggi* (larvae) in thiamine, riboflavin, and niacin. It is observed that the insects species studied possess more content in vitamins of the B group, It is pointed out the importance of the presence of these vitamins for the diet of peasants of the rural area of Mexico, who regularly consume insects, and even store and commercialize them." (Authors) Exclusively vitamin B was found - in low concentrations - in the larvae of *Anax* sp.] Address: Ramos-Elorduy, Julieta, Instituto de Biología, Universidad Nacional Autónoma de México. Circuito Exterior, Ciudad Universitaria, Ap. Postal 70-153, México 04510, D.F.

6106. Schlüpmann, M. (2001): Der Plattbauch (*Libellula depressa* LINNAEUS, 1758) – Insekt des Jahres 2001 – in Hagen. Homepage des Umweltamtes

2001 – in Hagen. Homepage des Umweltamtes der Stadt Hagen 2001: www.umweltamt.hagen.de/umwelttipps/tippstexte/Plattbauch.pdf: 13 pp. (in German). [This is a "blueprint" of *Libellula depressa* with special emphasis on the situation in the town Hagen, Nordrhein-Westfalen, Germany. The habitat selection of the species is stressed.] Address: Schlüpmann, M., Hierseier Weg 18, D-58119 Hagen, German. E-mail: martin-schluempmann@t-online.de

6107. Sibl, J. (2001): Contribution to the knowledge of dragonflies (Insecta: Odonata) of the National Park Muránska planina (Slovakia). *Folia faunistica Slovaca* 6: 53-58. (in Slovakian, with English summary). ["The dragonfly fauna at 36 localities was studied in the national park Muránska planina (central Slovakia) and its surroundings. The occurrence of 16 dragonfly species was recorded, or 27 when including literature records. The occurrence of *Leucorrhinia pectoralis*, which is considered rare in Slovak republic, as well as in some other European countries, was confirmed in the study area. 8 species - *Pyrrhosoma nymphula*, *Ischnura pumilio*, *Sympecma fusca*, *Leucorrhinia pectoralis*, *Crocothemis erythraea*, *Orthetrum cancellatum*, *Cordulia aenea*, *Aeshna cyanea* - were for the first time recorded from the study area." (Author)] Address: Sibl, J., J. Stanislava 15, SK 84105 Bratislava, Slovakia. E-mail: sibl@changenet.sk

6108. Torres, L.; Onore, G. (2001): Diversidad de Odonata en ríos del bosque nublado Otonga y sus alrededores. In: Nieder, J. & W. Barthlott (Eds.): *Epiphytes and canopy fauna of the Otonga rain forest (Ecuador). Results of the Bonn - Quito epiphyte project, funded by the Volkswagen Foundation (Vol. 2 of 2)*. ISBN: 3-8311-1858-2: 275-300. (in Spanish, with English summary). ["Ten rivers were selected at similar altitudes: six located within the Otonga Reserve and four in agricultural areas. One semi-quantitative sampling of aquatic macro-invertebrates, in winter and summer, was undertaken, and physical and chemical parameters were measured for each river. A qualitative sampling of Odonata nymphs and adults was carried out for each river. All adult specimens were captured. Six nymphs genera and five adults genera were collected in or close the rivers studied. No correlation among the river characteristics, aquatic macro-invertebrates, and species and families of Odonata found in the rivers was observed. Although human activity exists around the rivers, this study demonstrated that those in agricultural regions were not sources of contamination that affect the macro-invertebrate fauna. The paucity of taxa in the rivers is probably due to a low percentage of organic matter." (Authors)] Address: Torres, Leticia, Museo QCAZ, Departamento de Ciencias Biológicas; Pontificia Universidad Católica del Ecuador; Avenida 12 de Octubre y Veintimilla; Apartado 17-01-2184; Quito, Ecuador

6109. Wheeler, W. (2001): Homology and the optimization of DNA sequence data. *Cladistics* 17: S3-S11. (in English). ["Three methods of nucleotide character analysis are discussed. Their implications for molecular sequence homology and phylogenetic analysis are compared. The criterion of inter-data set congruence, both character based and topological, are applied to two data sets to elucidate and potentially discriminate among these parsimony-based ideas." The study includes *Libellula pulchella* and *Dorocordulia lepida*.] Address: Wheeler, W., Division of Invertebrate Zoology,

American Museum of Natural History, Central Park West at 79th Street, New York, New York 10024-5192

2002

6110. Armbruster, P.; Hutchinson, R. A.; Cotgreave, P. (2002): Factors influencing community structure in a South American tank bromeliad fauna. *Oikos* 96: 225-234. (in English). ["We examined factors influencing the structure of naturally replicated, taxonomically unrestricted communities inhabiting South American tank bromeliads. We measured aspects of plant physical structure and collected the entire macroscopic fauna of 209 bromeliads from the Yasuní Scientific Reserve in lowland eastern Ecuador. We collected a total of 11 219 individuals of 354 morphospecies. The morphospecies abundance distribution of our sample was approximated by a log-series distribution dominated by rare morphospecies (57% of the morphospecies were represented by a single individual). Six methods for estimating the total number of bromeliad associated morphospecies in our study area gave results which varied by a factor of three, illustrating that caution should be exercised in interpreting the results of any single estimator. Variation in plant volume, number of leaves, detritus content, and water volume explained 62% of the variation in morphospecies richness among plants. Finally, there was a quadratic relationship between body mass and both individual abundance and morphospecies richness in our sample. These results illustrate an important role of both biotic and abiotic factors influencing the structure of taxonomically unrestricted, ecologically defined natural communities." (Authors) 16 Odonata specimens from 8 morphospecies have been collected.] Address: Armbruster, P., Dept of Biology, 321 Marsh Life Sciences Bldg., Uni of Vermont, Burlington, VT 05405-0086, USA. E-mail: parnbrus@zoo.uvm.edu

6111. Ido, T.; Goto, H. (2002): A study on the establishment and use about a school biotope - a case study on the eco-up enterprise by Dragonfly pool at Yokohama city. *J. Arch. Plann. environ. engineering* 554: 213-218. (in Japanese, with English summary). [Proposals for the improvement of environmental education on schools by dragonfly ponds are outlined.] Address: Ido, T., Dept of Architecture (Prof. Dr. Eng), Faculty of Engineering, Waseda University, Japan

6112. Raab, R.; (2002): Quelljungfern - Österreichs Insektenarten des Jahres 2002. *Entomologica Austriaca* 6: 3-4. (in German). ["The dragonflies of the genus *Cordulegaster* have been chosen as Austrian "Insects of the Year 2002". They are indicator species for clear springs and brooks. These animals are especially noticed because of their remarkable size and the longevity of their larvae." (Authors)] Address: Raab, R., Anton Bruckner-Gasse 2/2, A-2232 Deutsch-Wagram, Austria. E-mail: rainer.raab@gmx.at

6113. Sauseng, M.; Pabst, M.-A.; Kral, K. (2002): Das Lauerverhalten von *Libellula quadrimaculata* (Linnaeus, 1758) (Libellulidae, Odonata). *Entomologica Austriaca* 6: 14-15. (in German, with English summary). [The visually controlled ambush behaviour of *Libellula quadrimaculata* (Linnaeus, 1758) (Libellulidae, Odonata): *L. quadrimaculata* belongs to a group of dragonflies which

"employ a special hunting strategy, exhibiting the so-called „perching" behaviour. The males perch in the sun on vegetation near the shore, waiting in ambush for potential mates or items of prey. Initial findings indicated that males settling on the perch in the morning oriented the longitudinal axes of their bodies in such a way as to have the sun behind them, and accordingly were looking away from the sun. This also happened in the afternoon. A central topic of the investigation were visual factors significant for the dragonfly when perching. In order to ascertain this, the dragonfly's line of vision relative to the sun and to the visual environment was investigated." (Authors)] Address: Sauseng, Manuela Institut für Zoologie und Institut für Histologie und Embryologie, Karl-Franzens—Universität Graz, Universitätsplatz 2, 8010 Graz, Austria. E-mail: manuela.sauseng@kfunigraz.ac.at

6114. Tsuyuki, K.; Sudo, S. (2002): Three-dimensional structure of a wing and flow field around a flapping dragonfly with the PIV system. Transactions of the Japan Society of Mechanical Engineers. B 68 (No.676) : 3392-3399. ["In the present paper, studies of dragonfly wing revealed the structural morphology and the aerodynamic characteristics. Some experimental studies on dragonfly wings were performed with a scanning electron micrograph, a three-dimensional curved shape measuring system and a Particle Image Velocimetry (PIV) system. Firstly, the scanning electron micrograph observed the cross section shape of a dragonfly wing. Secondly, the system for the measurement of surface shape measured the surface roughness of a dragonfly wing with μm order accuracy. The results of surface shape measurement revealed there are three regions on a dragonfly wing, which had different function for a wing. Lastly, the PIV system measured the flow characteristics around the dragonfly wing and the flapping dragonfly. The analysis of two-dimensional velocity fields with the PIV system clarified the existence of the large velocity areas over a dragonfly wing and the specific flows around a flapping dragonfly." (Authors)] Address: Tsuyuki, K. Department of Mechanical Engineering, IWaki Meisei University, Japan

2003

6115. Clausnitzer, V. (2003): Ecology and biogeography of the dendrolimnetic *Coryphagrion grandis*. 2. Symposium der A. F. W. Schimper-Stiftung: 1-13. (in English). ["A study on the ecology of the dendrolimnetic damselfly *C. grandis* was undertaken in coastal forests of East Africa. The results are compared with other dragonfly species, known to breed in phytotelmata as well. These ecological and additional morphological and genetic results of this study show, that the monotypic *Coryphagrion grandis*, which was placed for conveniences within the Megapodagriidae, belongs to the otherwise South and Central American Pseudostigmatidae. Although the separation from the neotropical Pseudostigmatidae occurred at least 100 million years ago, the morphology and biology *Coryphagrion grandis* is still very similar to the former. These findings support biogeographical considerations about historical forest distribution in Africa, stability of East African coastal forests and the species loss due to extinctions in West and Central Africa. Since the future of *Coryphagrion*

grandis depends on the survival of the last coastal and lower Eastern Arc forests in East Africa, a short conservation chapter is added in the end." (Author)] Address: Clausnitzer, Viola, Graefestr. 17, D-06110 Halle/Saale, Germany. E-mail: violacl@t-online.de

6116. Davis, S.; Golladay, S.W.; Vellidis, G.; Pringle, C.M. (2003): Macroinvertebrate biomonitoring in intermittent coastal plain streams impacted by animal agriculture. J. Environ. Qual. 32: 1036-1043. (in English). ["Little attention has been given to the ecology of intermittent coastal plain streams in the southeastern United States, and it is not known whether available macroinvertebrate biomonitoring methods reliably detect degradation in these streams. This study compared differences in biomonitoring metrics between reference and agricultural streams, and between the flow period (January–April) and the intermittent flow period (May–December). Percentages of crustaceans, isopods, and Ephemeroptera–Plecoptera–Trichoptera (EPT) were significantly higher at the reference site than the two most impacted sites during the flow period, probably resulting from the abundance of leaf litter and lower temperatures. During this same period, the agriculturally impacted sites had a significantly higher percentage of dipterans—a group that thrives in the silty, nutrient-rich waters. Four metrics (percent Crustacea, Isopoda, Diptera, and EPT) had no overlap between values for the most impacted and the least impacted sites during the flow period, but no metrics were able to detect more discrete differences among sites. Sites were physically and biologically similar during the intermittent period when natural stresses (i.e., stagnant water, high temperatures, low dissolved oxygen) were high, with many metrics such as percentages of dominant family, burrowers, chironomids and dipterans becoming similar at all sites. Our findings indicate that development of a better understanding of invertebrate fauna in reference conditions and of the natural variation in intermittent streams is necessary to develop effective biomonitoring programs for these systems." (Authors) The study includes a passing reference to "Odonata".] Address: S.W. Golladay, J.W. Jones Ecological Research Center, Route 2, Box 2324, Newton, GA 31770, USA. E-mail: sgollada@jonesctr.org

6117. Donnelly, T.W.; Parr, M.J. (2003): Odonata, Dragonflies and Damselflies. In: Goodman, S.M. & J.P. Benstead (Eds): The Natural history of Madagascar. ISBN 0-226-30306-3: 645-654. (in English). [12 of the 52 genera, and 132 of the 181 species currently known from Madagascar are endemic. The authors give a brief introduction into the regional fauna, checklist the species, and discuss them on the family level. *Ceriatagrion suave*, *Parazyxomm flavicans*, *Urothemis edwardsi*, *Trithemis haematima*, *Orthetrum austeni*, and *Pantala flavescens* are added as new to the regional checklist. Also *O. chrysostigma* (page 653) is assessed as new to Madagascar, but not checklisted. In addition, a checklist of the Odonata from the Comoro Islands is included.] Address: Donnelly, T., 2091 Partridge Lane, Binghamton, NY 13903, USA. E-mail: tdonnel@binghamton.edu

6118. Enomoto, H.; Hamamoto, M.; Hisada, T.; Hara, K.; Ohta, Y. (2003): Free-flight simulation of *Sympetrum frequens* hovering. The Computational Mechanics Conference 2003, No.16: 83-84. (in Japanese, with English translation of the title and key words). [flapping flight,

free-flight hovering, fluid-structure, interaction analysis, shell element] Address: not transliterated

6119. Gusenleitner, F. (2003): Die Entwicklung der Entomologischen Sammlungen am Biologiezentrum Linz im Zeitraum 1993 bis 2002. Beitr. Naturk. Oberösterreichs 12: 89-128. (in German, with English summary). [The Biology Centre of the Upper Austrian Museums started in 1993. Since this time 1,5 million specimens have been added to the entomological collections. The most important persons, related to the collections in this period are mentioned in short biographies. The collection also harbours Odonata.] Address: Gusenleitner, F., Biologiezentrum der Oberösterreichischen Landesmuseen, J.-W.-Klein-Str. 73, A-4040 Linz /Dornach, Austria. E-mail: f.gusenleitner@landesmuseum-linz.ac.at

6120. Gusenleitner, F.; Aeschl, E. (2003): Bibliographie der Wirbellosen Tiere (Vertebrata) Oberösterreichs (1991-2002). Beitr. Naturk. Oberösterreichs 12: 521-618. (in German). [Austria; 66 papers with odonatalogical content are compiled.] Address: Gusenleitner, F., Biologiezentrum der Oberösterreichischen Landesmuseen, J.-W.-Klein-Str. 73, A-4040 Linz/Dornach, Austria. E-mail: f.gusenleitner@landesmuseum-linz.ac.at

6121. Gusenleitner, F.; Aeschl, E. (2003): Neu beschriebene Taxa in den Publikationen des Biologiezentrums Linz (1993–2002). Beitr. Naturk. Oberösterreichs 12: 299-345. (in German, with English summary). [2236 new taxa, including 1 order, 1 suborder, 4 families, 1 subfamily, 7 tribes, 8 sections, 7 subsections, 96 genera, and 22 subgenera, have been established in four journals of the Biology Centre of the Upper Austrian Museums, the "Linzer biologische Beiträge" (= LBB), "Stapfia", "Beiträge zur Naturkunde Oberösterreichs" (= BNO) and "Denisia". This number is composed of 119 botanical, 223 ciliate, 1 nemertine, 3 annelid, 24 arachnid, and 1866 insect names." (Authors) Some of the Odonata described as new to science have been published in the LBB.] Address: Gusenleitner, F., Biologiezentrum der Oberösterreichischen Landesmuseen, J.-W.-Klein-Str. 73, A-4040 Linz/Dornach, Austria. E-mail: f.gusenleitner@landesmuseum-linz.ac.at

6122. Osawa, S.; Katsuno, K. (2003): The relationship between the distribution of a vulnerable species *Ludwigia peploides* ssp. *stipulacea* and an inhabitation of Coenagrionidae in urban river. Journal of the Japanese society of revegetation technology 29(2): 343-351. (in Japanese with English summary). [The importance of *Ludwigia peploidea*. *Raven* ssp. *stipulacea* *Raven*, a vulnerable species locally distributed along the Kashio River in east Kana-gawa (Japan), as habitat for *Ischnura senegalensis*, *I. asiatica*, and *Cercion hieroglyphicum* was surveyed. *C. hieroglyphicum* and *I. asiatica* developed high abundances over *L. peploidea* ssp. *stipulacea*. Larvae density was high in sites on the slower running stream stretches with *Ludwigia*. The authors conclude that *Ludwigia* stands are of significant importance as microhabitat for the larvae. Mark-recapture investigations indicated that the max. distance of immigration was about 700 m, and nearly all of recapture individuals stayed on the identical sandbar; it is not possible to get any information from the summary which species are referred to. It is proposed to "design an arrangement of *L. peploidea* ssp. *stipulacea* community at

intervals of some hundred meters" along the Kashio River with the function as an ecological corridor for Coenagrionidae in urban areas.] Address: Osawa, S., Coll. of Bioresource Sci., Nihon Univ., Japan

6123. Schwarz-Waubke, M.; Schwarz, M.; Gusenleitner, F.; Gusenleitner, J.; Malicky, M.; Malicky-Ruzicka, H.; Vogtenhuber, P. (2003): Insekten-Typen am Biologiezentrum Linz. Teil I. Beitr. Naturk. Oberösterreichs 12: 407-450. (in German, with English summary). [The insect types deposited in the Biology Centre Linz (Austria) represent 1765 taxa, of which 11 taxa belong to the Odonata, all described by Günther Theischinger, some in cooperation with J.A. Watson.] Address: Schwarz-Waubke, Maria, Eben 21, A-4202 Kirchsschlag, Austria. E-Mail: schwarz-entomologie@utanet.at

6124. Tsuda, K., Watanabe, M.; Tominaga, S., Onjo, M.; Ichitani, K. (2003): The biogeography of the insect fauna of the Ulithi Islands, Micronesia. Kagoshima University Research Center for the Pacific Islands Occasional Papers No.39, Section 2, Report 7. The Progress Report of the 2000 and 2001 Survey of the Research Project "Social Homeostasis of Small Islands in an Island-zone": 73-75. (in English). ["Ulithi Atoll in Yap State is located in the western zone of the Federated States of Micronesia and comprises 49 islets. In a survey of Ulithi Atoll, we visited its four inhabited islands, Asor, Falalop, Fassarai, and Mogmog. Insects were collected both by day and night, and 262 species of insects from nine orders were recorded. In order to estimate the species richness and natural environment of each island, the number of species in each taxonomic order was considered. Fassarai had the greatest species richness of the four islands, while Mogmog had the least. This suggests that human inhabitation affects insect species richness, because most of Mogmog Island was used as living space." (Authors) A total of 6 odonate taxa are labelled but without any details with the exception of the number of taxa recorded on each island.] Address: Tsuda, K., Faculty of Agriculture, Kagoshima University, Kagoshima 890-0065, Japan

2004

6125. Bechev, D.N.; Stojanova, A.M. (2004): Geographic localities of invertebrates of conservation importance in the Rhodopes (Bulgaria). Trav. Sci. Univ. Plovdiv, Animalia 40(6): 19-25. (in Bulgarian, with English summary). ["Information about 21 invertebrates of conservation importance is presented. Some of the distributional data are recorded herein for the first time, while some others confirmed published localities before. The faunistic data concerned invertebrate species from the lists of: IUCN Red List, Habitat Directive DCE 92/44/EEC, Bern Convention, ESC Red List, CORINE biotopes Check-list and Law for Biodiversity of Bulgaria." (Authors) Four odonate species are considered: *Somatochlora flavomaculata*, *Coenagrion hastulatum*, *Lestes dryas*, *Cordulegaster heros*.] Address: Bechev, D.N., Department of Zoology, University of Plovdiv, 24 Tzar Assen Str., BG-4000 Plovdiv, Bulgaria. E-mail: bechev@pu.acad.bg, stanelia@pu.acad.bg

6126. Gentilini, G.; Bagli, L. (2004): Fossil Zygoptera and Anisoptera from the Upper Miocene of Monte

Castellaro (Pesaro, Marches, Central Italy) (Insecta Odonata Coenagrionidae, Lestidae, Sieblosiidae, Calopterygidae, Libellulidae). *Quaderno di studi e notizie di storia naturale della Romagna* 19: 17-44. (in English, with Italian language). [Seven fossil wings of zygopteran Odonata from the Upper Miocene of Monte Castellaro, Pesaro, Italy, are discussed and figured. *Deiella sarae* and *Trapezostigma barbaresii* are described as new.] Address: Gentilini, G., via Adriatica 78, I-47843 Misano Adriatico (RN), Italy. E-mail: ggentilini.adsl2003@libero.it

6127. Glendinning, P. (2004): The mathematics of motion camouflage. *Proc. R. Soc. Lond. B* 271(1538): 477-481. (in English). ["Motion camouflage is a strategy whereby an aggressor moves towards a target while appearing stationary to the target except for the inevitable change in perceived size of the aggressor as it approaches. The strategy has been observed in insects (including Odonata), and mathematical models using discrete time or neural-network control have been used to simulate the behaviour. Here, the differential equations for motion camouflage are derived and some simple cases are analysed. These equations are easy to simulate numerically, and simulations indicate that motion camouflage is more efficient than the classical pursuit strategy ('move directly towards the target')."] (Author)] Address: Glendinning, P., Department of Mathematics, UMIST, PO Box 88, Manchester M60 1QD, UK. E-mail: p.a.glendinning@umist.ac.uk

6128. Kvacek, Z.; Rajchl, M.; Böhme, M.; Dvorák, Z.; Mach, K.; Prokop, J.; Konzalová, M. (2004): Early Miocene freshwater and swamp ecosystems of the Most Basin (northern Bohemia) with particular reference to the Bilina Mine section. *Journal of the Czech Geological Society* 59(1-2): 1-40. (in English). [Czech Republic; the paper includes information to fossil Odonata] Address: Prokop, J.; Department of Zoology, Charles University, Vinicna 7, CZ-128 44, Praha, 2, Czech Republic; E-Mail: jprokop@natur.cuni.cz

6129. Matsui, A.; Satoh, M. (2004): Distribution of aquatic animals in the drainage systems created by paddy farmland consolidation in Shimodate City, Ibaraki Prefecture, Japan. *Japanese journal of conservation ecology* 9: 153-163. (in Japanese, with English summary). ["Conventional paddy farmland consolidation in Japan, which aims to increase farming efficiency by improving the drainage conditions of paddy fields and independently creating irrigation and drainage canals, is thought to have negative impacts on biodiversity in rural areas. The Land Improvement Act of Japan was amended in June 2001 and requires agricultural and rural development projects to be harmonized with the environment. It is widely recognized that transforming concrete irrigation and drainage canals into earthen canals and minimizing the differences in elevation between paddy plots and drainage canals aid in the preservation of aquatic animals. However, most paddy fields that have been consolidated using conventional standards will inevitably remain intact, thus continuing to have a substantial influence on the regional environment. Therefore, at least the minimum environmental measures should be effectively implemented in consolidated paddy fields. To this end, the distribution of the aquatic animals associated with these fields requires clarification. In addition, this knowledge will be useful in determining how to effectively distribute water during the non-

irrigation season. The purpose of this study was to clarify the distribution of aquatic animals in the canal systems of main, lateral, and farm drains in the consolidated paddy fields, with a special focus on canal structure and year-round water flow in the canals. A field survey at six sites, which were selected for their different canal levels, was carried out in Shimodate City, Ibaraki Prefecture, Japan (36°21'N, 139°59'E). Sampling was conducted at monthly intervals from April 2001 to March 2002. A survey of fishes revealed that *Zacco platypus* (Oikawa) was concentrated in the main drains, while *Misgurnus anguillicaudatus* (Dojou) was found mainly in the lateral and farm drains. Among aquatic insects, *Calopteryx atlata* (Hagurotombo) was concentrated in the lateral drains, while *Onhetrum albistylum speciosum* (Shiokaratombo) was observed primarily in the farm drains. *Z. platypus* preferred gravel-bottom main drains to those made of concrete. *C. atlata* and *O. albistylum speciosum* preferred year-round water flow to seasonal flow in lateral and farm drains, respectively. In contrast, *Sympetrum infuscatum* (Noshimetombo) preferred seasonal water flow to year-round flow in farm drains. The drainage systems in the consolidated paddy fields are clearly composed of different levels of drains with peculiar physical conditions, e.g., water depth and flow velocity, each of which attracts certain aquatic animals. To enrich the biodiversity of the paddy fields, our results suggest the importance of year-round water flow and natural materials for canal beds." (Authors)] Address: Masayoshi Satoh, M., Graduate School of Life and Environmental Sciences, University of Tsukuba, I-1-I, Tennodai, Tsukuba City, Ibaraki 305-8572, Japan. E-mail: massa@sakura.cc.tsukubii.ac.jp

6130. Matsu'ura, S.; Watanabe, M. (2004): Dynamics of reed community artificially established for conservation of the endangered damselfly *Mortonagrion hirosei* and odonate larvae inhabiting the community. *Japanese Journal of Conservation Ecology* 9: 165-172. (in Japanese, with English summary). ["To conserve the brackish water damselfly *Mortonagrion hirosei*, a reed community was artificially established adjacent to a small natural habitat in Mie Prefecture, Japan, in 2003. From April to November, we measured the dynamics of the reed community as well as the changes in abiotic factors in the understory of the community in which *M. hirosei* adults were active. Reeds that emerged in the artificial community were thinner and shorter than those in the natural habitat, however reed density did not differ between the two habitats. Therefore, the established reed community provided a more open habitat for *M. hirosei* adults compared to the natural habitat. Although adults of many odonate species were observed flying over both reed communities, only larvae of *Ischnura senegalensis* were collected in November in addition to those of *M. hirosei*. Because a predator of *M. hirosei* is *I. senegalensis* that should be excluded from the community, maintaining a dense reed community must be important for the conservation of *M. hirosei*." (Authors)] Address: Matsu'ura, S., Graduate School of Environmental Sciences, University of Tsukuba, Tsukuba, Ibaraki 305-8572, Japan. E-mail: s0323562@ipe.tsukuba.ac.jp

6131. Nadobnik, J.; Agapow, L.; Korościński, B. (2004): The importance of the "Santockie Zakole" nature Reserve for preservation of biological diversity and tourism. *Teka Kom. Ochr. Kszt. Srod. Przyn.* 2004(1): 157-161. (in Polish, with English summary). [Poland, ri-

ver Warta, river Noteć; 5 species of odonata are listed.] Address: Nadobnik, J., Katedra Przyrodniczych Podstaw Kultury Fizycznej, Akademia Wychowania Fizycznego w Poznaniu, Zamiejskowy Wydział Kultury Fizycznej w Gorzowie Wlkp., ul. Biskowskiego 13, Poland. E-mail: nadobnik@ncostrada.pl

6132. Palot, M.J.; Radhakrishnan, C. (2004): A note on the mock-mating behaviour in damselflies (Odonata: Insecta). *Zoos' Print Journal* 19: 1431. (in English). [India; 6-IX-2001, a male *Coperia marginipes* and a female *Ceriatagrion cerinorubellum* were found in the wheel position for about 40 minutes before freeing themselves.] Address: Palot, M.J., Zoological Survey of India, Western Ghats Field Research Station, Kozhikode, Kerala 673002, India.

6133. Relyea, R.A. (2004): Fine-tuned phenotypes: tadpole plasticity under 16 combinations of predators and competitors. *Ecology* 85(1): 172-179. (in English) ["It is now well appreciated that most organisms can alter their phenotypes when faced with environmental variation. Decades of empirical investigations have documented hundreds of examples of phenotypic plasticity, yet most studies have focused on the presence or absence of a single environmental factor. As a result, we know little about how organisms respond to gradients of environmental factors (i.e., threshold responses vs. continuous responses), nor do we understand how organisms respond to combinations of environmental variables. I examined how larval wood frogs (*Rana sylvatica*) altered their behavior, morphology, and growth in response to combined gradients of predation and competition. Increased predation risk induced lower activity, deeper tails, and shorter bodies, which collectively caused slower growth. Increased competition caused slower growth which induced higher activity, shallower tails, and longer bodies. For both environmental gradients, the responses were frequently continuous rather than threshold responses. Moreover, predation and competition had interactive effects. Responses to predators were always larger under low competition than under high competition. Responses to competition were larger under low predation risk when predation and competition induced traits in the same direction, but larger under high predation risk when predation and competition induced traits in opposite directions. The results demonstrate that responses to phenotypically plastic traits can be fine-tuned to a wide variety of environmental combinations." (Author) *Anax junius* is a classic predator in anurans and test organism in laboratory.] Address: Relyea, R.A., Dept Biol. Sciences, University of Pittsburgh, Pittsburgh, Pennsylvania 15260, USA. E-mail: rarelyea@pitt.edu

6134. Saito, Y.; Owada, M. (2004): Dragonflies (Odonata) of the Toikiwamatsu Imperial Villa, Tokyo, Central Japan. *Mem. natn. Sci. Mus.*, Tokyo 39: 431-438. (in Japanese, with English summary). [Between 2002 and 2004, the Odonata fauna of the garden pond of the villa was surveyed. A total of 18 species including *Anaciaeschna martini*, *Anax nigrofasciatus*, and *Rhyothemis fuliginosa* was recorded.] Address: Owada, M., Dept Zool., Natn. Sci. Mus., 3-23-1 Hyakunincho, Shinjuku-ku, Tokyo, 169-0073, Japan. E-mail: owada@kahaku.go.jp

6135. Sato, M. (2004): Relationship between the life cycle of dragonfly (*Usubakitombo*, *Pantala flavescens*)

and the paddy field of early-season rice culture in south Kyushu. *Rep. Kyushu Br. Crop Sci. Soc.* 70: 111-113. (in Japanese, with English translation of the title). [no abstract available] Address: Sato, M., Kagoshima Pref. Agric. Res. Cent., Okinawa Subtrop. Stn., Jpn. Int. Res. Center for Agric. Sci.

6136. Schindler, H. (2004): Bewertung der Auswirkungen von Umweltfaktoren auf die Struktur und Lebensgemeinschaften von Quellen in Rheinland-Pfalz. Dissertation am Institut für Naturwissenschaften der Universität Koblenz-Landau, Abt. Biologie: 266 pp. (in German). [Rheinland-Pfalz, Germany; a few records of *Thecagaster bidentata*, *C. boltonii*, and *Pyrrhosoma nymphula* are documented. see: http://deposit.d-nb.de/cgi-bin/dokserv?idn=978166191&dokvar=d1&dokext=pdf&filename=97_8166191.pdf] Address: not stated

6137. Schulz, R. (2004): Field studies on exposure, effects, and risk mitigation of aquatic nonpoint-source insecticide pollution: a review. *J. Environ. Qual.* 33: 419-448. (in English). ["Recently, much attention has been focused on insecticides as a group of chemicals combining high toxicity to invertebrates and fishes with low application rates, which complicates detection in the field. Assessment of these chemicals is greatly facilitated by the description and understanding of exposure, resulting biological effects, and risk mitigation strategies in natural surface waters under field conditions due to normal farming practice. More than 60 reports of insecticide-compound detection in surface waters due to agricultural nonpoint-source pollution have been published in the open literature during the past 20 years, about one-third of them having been undertaken in the past 3.5 years. Recent reports tend to concentrate on specific routes of pesticide entry, such as runoff, but there are very few studies on spray drift-borne contamination. Reported aqueous-phase insecticide concentrations are negatively correlated with the catchment size and all concentrations of 10 g/L (19 out of 133) were found in smaller-scale catchments (100 km²). Field studies on effects of insecticide contamination often lack appropriate exposure characterization. About 15 of the 42 effect studies reviewed here revealed a clear relationship between quantified, non-experimental exposure and observed effects in situ, on abundance, drift, community structure, or dynamics. Azinphos-methyl, chlorpyrifos, and endosulfan were frequently detected at levels above those reported to reveal effects in the field; however, knowledge about effects of insecticides in the field is still sparse. Following a short overview of various risk mitigation or best management practices, constructed wetlands and vegetated ditches are described as a risk mitigation strategy that have only recently been established for agricultural insecticides. Although only 11 studies are available, the results in terms of pesticide retention and toxicity reduction are very promising. Based on the reviewed literature recommendations are made for future research activities." (Author) The study also refers to some studies of insecticide exposures on Odonata in rice fields, but they are said to have not provided clear evidence for a relationship between population parameters and insecticide exposures.] Address: Schulz, R., Zoological Institute, Technical University, Fasanenstrasse 3, D-38092, Germany. E-mail: R.Schulz@tu-bs.de

6138. Abbott, J.C.; Broglie, D. (2005): *OdonataCentral.com*: A model for the web-based delivery of natural

history information and citizen science. *American Entomologist* 51(4): 240-243. (in English). [Presentation and introduction into an internet page which aims to focus the North American odonatological activities.] Address: Abbott, J.C., Patterson Labs 219, School of Bio. Sci., University of Texas, Austin TX 78712, USA. E-mail: jcabbott@mail.utexas.edu

2005

- 6139.** Abro, A. (2005): The accessory glands of the female genital tract in *Aeshna juncea* (L.) and *A. grandis* (L.) (Anisoptera: Aeshnidae). *Odonatologica* 34(2): 103-110. (in English). ["The micro-anatomy of the female accessory glands in adult *A. juncea* and *A. grandis* is similar but the size of the *A. grandis* glands is clearly larger than that of *A. juncea*. The secretory cells constitute a simple columnar epithelium surrounding a cuticle-lined lumen. The glandular epithelium is provided with a peculiar system of deep, narrow, intercellular crypts bordered with microvillar cell membranes. Lipids released to the crypt lumen are presumably forced into the central gland lumen by contractions of the muscular network attached to the outside of the gland. The efferent duct of each gland that opens to the distal part of the vagina has a complicated muscular apparatus, probably serving as a pump. The secreted substances accumulate in the central gland cavity mainly during the pre-reproductive phase, which the dragonflies spend away from water. The secretion contains substances with wax-like properties and becomes darkened by osmication. Secretory cells appear to possess a limited life span; scattered cells in process of dying occur already during the early reproductive phase. In the late reproductive phase most of the glandular epithelium presents a disintegrated appearance. There is no cell renewal in the gland in the course of adult life. The pattern of cell death indicates a decomposition by apoptosis. Besides contributing to investment of the eggs, the glands presumably intervene also in other aspects of the reproductive processes." (Author)] Address: Abro, A., Division of Anatomy, Departments of Biomedicine, University of Bergen, Jonas Lies vei 91, N-5009 Bergen, Norway
- 6140.** Bauer, S. (2005): Das Zielartenkonzept im Landkreis Ravensburg. *mercuriale* 5: 9-13. (in German). [Odonata are an important factor to identify targets of nature conservation tasks and to operationalise these. The Landkreis Ravensburg, Germany has developed a key stone species concept which will guide future nature conservation measures.] Address: Bauer, S., Im Tobel, 88353 Immenried, Germany. E-mail: Josef.Bauer@Landkreis-Ravensburg.de
- 6141.** Boy, G (2005): Maathai's Clubtail. SWARA October-December 2005: 8-9. (in English). [This is an extensive report on the discovery of *Notogomphus maathaiae* in Kenya in 2000, and the succeeding work to describe and name the species.] Address: via Clausnitzer, Viola, Graefestr. 17, D-06110 Halle/Saale, Germany. E-mail: violacl@t-online.de
- 6142.** Bried, J.T.; Bennett, L.W.; Ervin, G.N. (2005): Live mass and length-mass allometry of adult odonates collected in east-central Mississippi, United States. *Odonatologica* 34(2): 111-122. (in English). ["Live mass was recorded for over 290 adult Odonata during peak flight season in Mississippi. Total live mass is reported for 19 species, along with a quantitative species subset analysis of inter- and intraspecific sex partitioned mass. Fresh mass was significantly correlated with species and sex in Anisoptera ($p = 0.021$) and Zygoptera ($p = 0.001$), based on separate species-level analyses of the Libellulidae ($n = 6$ species) and Coenagrionidae ($n = 4$ species), respectively. Total live mass also was correlated with total body length in the libellulid dragonflies ($r^2 = 0.59-0.94$, $p < 0.0001-0.03$) and length-mass slopes were not significantly different among species. Limitations and cautions of mass prediction via proportionate size dimension(s) are discussed, some advantages of working with adults as opposed to larvae and measuring fresh mass as opposed to dry mass are described, and further study of length-mass relationships in adult Odonata is encouraged." (Authors)] Address: Bried, J., Mississippi State University, Dept Biol. Sciences, Rm 130 Harned, PO Box GY, Mississippi State, MS 39762, USA. E-mail: jasonbried@hotmail.com
- 6143.** Canales-Lazcano, J.; Contreras-Garduno, J.; Cordoba-Aguilar, A. (2005): Fitness-related attributes and gregarine burden in a non-territorial damselfly *Enallagma praevarum* Hagen (Zygoptera: Coenagrionidae). *Odonatologica* 34(2): 123-130. (in English). ["Odonata are usually infected with intestinal gregarines. Using *E. praevarum* adults, it was investigated whether: (a) both sexes differed in the degree of parasitism and immune ability (as shown by melanization of artificial, nylon-based implants in the thoracic region); and, (b) gamete production, survival and fat reserves correlated with gregarine burden. 2 sets of in-copula (to control for age) animals were used. One was used for estimation of egg and sperm, and the other for fat reserves. Survival was monitored as the time that field-captured insects survived under laboratory conditions in the absence of food. Gregarines were counted by dissection of the gut. Despite the case that females had more parasites than males, both sexes did not differ in immune ability. Eggs, but neither sperm nor fat reserves in both sexes, correlated negatively with parasite number. Survival in both sexes also correlated inversely with gregarine burden. This, however, held only for males when the analysis was performed by sex. These results are discussed in terms of the detrimental effects of gregarine on Zygoptera hosts." (Authors)] Address: Cordoba-Aguilar, A., Centro de Investigaciones Biologicas, Universidad Autonoma del Estado de Hidalgo, Apdo. P. 69-1, Plaza Juarez, Pachuca, Hidalgo 42001, Mexico E-mail: acordoba@uaeh.reduaeh.mx
- 6144.** Clausnitzer, V. (2005): An updated checklist of the dragonflies (Odonata) of the Kakamega Forest, Kenya. *Journal of East African Natural History* 94(2): 239-246. (in English). ["A comprehensive checklist of dragonflies occurring in the Kakamega Forest, Kenya is given and shortly discussed. A total of 72 dragonfly species, representing 42 % of Kenya's dragonfly fauna, has been recorded from the forest. Three of these are based on literature records only. The habitat preference and affiliation with other African regions is listed for all species. Twenty species are of national importance for Kenya, since they are only found at this site within the country. For these species habitat affiliations in the Kakamega Forest are given more in detail. The dragonfly fauna of the Kakamega Forest is impoverished compa-

red to more western Guineo-Congolian rain forest areas. The effects of forest fragmentation and isolation hindering any immigration from western rain forest patches is shortly Addressed." (Author)] Address: Clausnitzer, Viola, Graefestr. 17, D-06110 Halle/Saale, Germany. E-mail: violacl@t-online.de

6145. Contreras Garduño, J.; Córdoba Aguilar, A.; Peretti, A.V. (2005): La elección femenina. *Ciencias* 77: 40-47. (in Spanish). [Review paper on female mate choice.] Address: Córdoba-Aguilar, A., Centro de Investigaciones Biológicas, Universidad Autónoma del Estado de Hidalgo, Apdo. P. 69-1, Plaza Juárez, Pachuca, Hidalgo 42001, Mexico E-mail: acordoba@uah.reduaeh.mx

6146. Costa, J.M.; Regis, L.P.R.B. (2005): Description of the last instar larva of *Perithemis lais* (Perty) and comparison with other species in the genus (Anisoptera: Libellulidae). *Odonatologica* 34(1): 51-57. (in English). [The external morphology is described, illustrated and compared with that of the congeners. A note on the habitat of *P. lais* and a list of co-occurring odonate species is appended.] Address: Costa, J.M., Departamento de Entomologia, Museu Nacional, Universidade Federal do Rio de Janeiro, Quinta da Boa Vista, São Cristóvão, BR-20942-040 Rio de Janeiro, Brazil. E-mail: jcosta@acd.ufrj.br

6147. Daigle, J.J. (2005): *Heteragrion bickorum* spec. nov. from Ecuador (Zygoptera: Megapodagrionidae). *Odonatologica* 34(2): 165-168. (in English). ["The new species is described and illustrated (holotype male and allotype female [pair in tandem]: Ecuador, Napo province, Limoncocha, 28-VIII-1980). The holotype and allotype are deposited in the Florida State Collection of Arthropods, Gainesville, Florida, USA." (Author)] Address: Daigle, J., 2166 Kimberley Lane, Tallahassee, FL 32311, USA. E-mail: jdaigle@nettally.com

6148. Dijkstra, K.-D.B. (2005): The identity of some widespread and variable *Phyllomacromia* species, with a revised grouping of the genus (Anisoptera: Corduliidae). *Odonatologica* 34(1): 11-26. (in English). ["Many *Phyllomacromia* species appear to be more variable than was hitherto realised. This has led to the description of paler and darker forms as distinct species. Fortunately, the genus is rich in morphological characters in both sexes. *P. melania* and *P. overlaeti* were described from females and both have been allied with non-conspecific males, leading to great confusion. *P. melania* is the female of the species known as *P. funicularia* rather than that of *P. contumax*, while *P. overlaeti* matches and not *P. subtropicalis* and not *P. schoutedeni*. With the identity of these females clarified and the variation considered, many synonyms arise: *R. funicularia*, *P. bredoi* and *P. martorelli* are synonyms of *P. melania*; *P. biflava*, *P. nyanzana*, *P. bifasciata*, *P. reginae*, *P. halei* and *P. leoni* of *P. contumax*; and *P. onerata* and *P. clymene* of *P. monoceros*; and *P. subtropicalis*, *P. paludosa* and *P. royi* of *P. overlaeti*. *P. paludis* is not synonymous with *P. contumax* but with *P. paula*. The taxonomy of this large genus is briefly discussed and a new species grouping is proposed." (Author)] Address: Dijkstra, K.D., Gortestraat 11, NL-2311 MS Leiden, The Netherlands. E-mail: Dijkstra@naturalis.nnm.nl

6149. Dumont, H.J.; Haritonov, A.Yu.; Kosterin, O.E.; Malikova, E.I.; Popova, O. (2005): A review of the Odonata of Kamchatka Peninsula, Russia. *Odonatologica*

34(2): 131-153. (in English). ["All knowledge of the odonate fauna of Kamchatka Peninsula (NE Asia) is reviewed, using literature data, miscellaneous collections and the results of an expedition by the authors in July 2003. In total, 27 species have become known, with *Lestes dryas*, *Coenagrion hastulatum*, *Aeshna serrata*, *Epithea bimaculata*, *Somatochlora exuberata*, *S. alpestris*, and *Leucorrhinia intermedia* here reported for the first time. *Aeshna palmata* is dismissed; *Anax junius*, twice reported in the 19th century is an American migrant that rarely reaches Kamchatka; the southern migrants. *Pantala flavescens* and *Sympetrum frequens*, are represented by one old record each, with specimens still preserved in Zool. Inst., St Petersburg. Very few more species may be expected in future, and it is concluded that the fauna is of an impoverished boreal extraction. This lack of endemism is understandable, since dragonflies could only begin reinvading the peninsula around 13,000 BP 7 species are Holarctic, 1 is SE Palaearctic, 5 are NE Palaearctic, 1 is an American vagrant, 1 is a sub-cosmopolitan migrant, and the remainder are transpalaearctic." (Authors)] Address: Dumont, H.J., Univ. Gent, Inst. Animal Ecology, K.L. Ledeganckstraat 35, B-9000 Gent, Belgium. E-mail: Henri.Dumont@rug.ac.be

6150. Dumont, H.J.; Verschuren, D. (2005): Odonata from the Ennedi and Ounianga regions of northern Chad, with a note on the status of *Orthetrum kollmannspergeri* Buchholz, and a checklist of species currently known from the Republic of Chad. *Odonatologica* 34(3): 291-297. (in English). ["A hydrobiological survey of scarce permanent aquatic environments in the Ennedi and Ounianga regions of northern Chad yielded a small collection of 7 odonate species. It adds 3 new species to the known fauna of Chad: *Ischnura senegalensis*, *Pseudagrion hamoni*, and *Orthetrum sabina*. The presence of *O. sabina* at Ounianga represents the westernmost record of this oriental species in N. Africa. Another oriental element, *O. taeniolum*, may not exist in Africa W of the Nile, possibly being replaced there by the closely related *O. kollmannspergeri* Buchholz. The 44 species hitherto reported from the Republic of Chad likely represent only a third or less of those to be expected in the country." (Authors)] Address: Dumont, H.J., Univ. Gent, Inst. Animal Ecology, K.L. Ledeganckstraat 35, B-9000 Gent, Belgium. E-mail: Henri.Dumont@rug.ac.be

6151. Dyatlova, E.S. (2005): Novye svedeniya o faune strekoz (Odonata) Odessy i ee okrestnostey [New data on Odonata fauna of Odessa and its environs]. *Zagal'na i prykladna entomologiya v Ukraini. Tezy dopovidey naukovoi entomologichnoi konferentsii prysvyachenoj pam'yati chlenacorrespondenta NAN Ukrainy professora V. G. Dolina* [General and applied entomology in Ukraine. Transactions of the scientific entomological conference devoted to the memory of Prof. V. G. Dolin] L'viv: 79-81. (in Russian). ["A short historic review of the odonatological investigation of Odessa and its surroundings (SW Ukraine) was presented. An annotated list of 37 species collected by the author in this region during 2003-2004 contained 14 that were newly discovered for Odessa and its surroundings: *Lestes dryas* first for the Odessa region, *Coenagrion scitulum* and *Orthetrum coerulescens* concepts for the SE Ukraine. (Khrokalo L. (2005): Annotated bibliography of the odonatological papers of Ukraine. IDF-Report 8:1-51)"] Address: Dyatlova, Elena Sergeevna, Institute of Zoo-

logy, Faculty of Biology, I.I. Mechnikov University of Odessa, Odessa, Ukraine. E-mail: lena.dyatlova@gmail.com

6152. Dyatlova, E.S. (2005): Novye svedeniya o faune strekoz (Odonata) Odessy i ee okrestnostey [New data on Odonata fauna of Odessa and its environs]. Zagal'na i prykladna entomologiya v Ukraini. Tezy dopovidey naukovoi entomologichnoi konferentsii prysvyachenoj pam'yati chlenacorrespondenta NAN Ukraynu professora V. G. Dolina (General and applied entomology in Ukraine. Transactions of the scientific entomological conference devoted to the memory of Prof. V. G. Dolin) L'viv: 79-81. (in Russian). ["A short historic review of the odonatological investigation of Odessa and its surroundings (SW Ukraine) was presented. An annotated list of 37 species collected by the author in this region during 2003-2004 contained 14 that were newly discovered for Odessa and its surroundings: *Lestes dryas* first for the Odessa region, *Coenagrion scitulum* and *Orthetrum coerulescens* aneeps for the SE Ukraine." (Khrokalo L.)] Address: Dyatlova, Elena Sergeyevna, Institute of Zoology, Faculty of Biology, I.I. Mechnikov University of Odessa, Odessa, Ukraine. E-mail: lena.dyatlova@gmail.com

6153. Emiliyamma, K.G. (2005): On the Odonata (Insecta) fauna of Kottayam district, Kerala, India. *Zoos' Print Journal* 20(12): 2108-2110. (in English). [31 species from 12 localities are documented] Address: Emiliyamma, K.G., Western Ghats Field Research Station, Zoological Survey of India, Annie Hall Road, Kozhikode, Kerala 670002, India

6154. Faucheux, M. J. (2005): Vibrorécepteurs et osmorécepteurs sur les lamelles caudales de la larve de *Lestes sponsa* (Hansemann, 1823) (Odonata, Zygoptera, Lestidae). *Bulletin de la Société des Sciences naturelles de l'Ouest de la France* 27(4): 203-206. (in French, with English summary). [The caudal lamellae in the larva of *Lestes sponsa* (Odonata, Zygoptera) bear sensilla filiformia and sensilla campaniformia, which are described by means of scanning electron microscope. These sensillar types are observed for the first time on the larval caudal appendages of Odonata. The sensilla filiformia, which are stimulated by the vibrations in the water, are mecanoreceptors which detect the presence and position of predators in the space surrounding each of caudal lamellae. The sensilla campaniformia, whose function is proprioceptive, are true osmoreceptors which allow to larva to be adapted for live in waters with suitable osmotic pression." (Author)] Address: Faucheux, M.J., Laboratoire d'Endocrinologie des Insectes Sociaux, Université de Nantes, 2 rue de la Houssinière, B.P. 92208, F-44322 Nantes Cedex 03, France. E-mail: faucheux.michel@free.fr

6155. Faucheux, M.J.; Meurgey, F. (2005): Ontogenèse de l'appareil stridulant des larves d'*Epiophlebia superstes* (Sélys, 1889) (Odonata: Anisozygoptera: Epiophlebiidae). *Bull. Soc. Sc. Nat. Ouest de la France, nouvelle série* 27(4): 183-195. (in French, with English summary). ["The development of the stridulatory apparatus has been studied in three larval stages of *Epiophlebia superstes* (Odonata, Zygoptera), using scanning electron microscopy. The pars stridens is made up of triangular zones consisting of a transverse series of ridges placed on each of the abdominal tergites 3-5 (stage A), 3-6 (stage B), 3-7 (stage C). The inner edge of the

femur of the metathoracic legs serves as a plectrum. Contrary to the general case in Insects, it is the pars stridens (abdomen) which rubs against the plectrum (femur). The stridulation has been observed in the 3 larval stages when they outside the aquatic element and are in a state of catalepsy. One may suppose that the sound emission serves an agonistic and spacing function among conspecifics." (Authors) Address: Meurgey, F., Muséum d'Histoire naturelle de Nantes, 12, rue Voltaire, F-44000 Nantes, France. E-mail: Francois.Meurgey@mairie-nantes.fr

6156. Faucheux, M.J.; Meurgey, F.; El Wahbi, Y. (2005): Odonates des environs d'Essaouira (Maroc méridional). *Bull. Soc. Sc. Nat. Ouest de la France, nouvelle série* 27(3): 122-130. (in French, with English summary). ["11 species of Odonata in the region of Essaouira (Morocco) are presented together with a few related ecological elements. The presence of *Sympetrum méridionale* (Sélys, 1841) has been pointed out for the first time in South-Western Morocco." (Authors)] Address: Meurgey, F., Muséum d'Histoire naturelle de Nantes, 12, rue Voltaire, F-44000 Nantes, France. E-mail: Francois.Meurgey@mairie-nantes.fr

6157. Fenoglio, S.; Bo, T.; Cucco, M. (2005): Winter prey preference of *Perlodes microcephalus* (Pictet, 1833) (Plecoptera, Perlodidae) nymphs in an Apenninic creek, northwestern Italy. *Entomological news* 116(4): 245-252. (in English). [The feeding habits of *P. microcephalus* nymphs have been investigated in Caramagna. "This large species is one of the most representative carnivorous stonefly nymphs in this area, where it is a top-bottom predator in many fishless creeks. Despite its ecological importance, little is known about its trophic ecology. In this study, we examined the gut contents of 35 nymphs during the winter of February 2005. We detected an evident trophic preference for the following taxa: Chironomidae (Diptera) as well as Psychomidae, Glossosomatidae, Hyporhyacophila sp., and other Trichoptera. This preference appears to be independent of the prey's availability in the substratum. Rheostenic taxa, also abundant and widespread in the substratum, were almost absent or seldom found in the diet of *P. microcephalus*. These results suggest that the trophic preferences of *P. microcephalus* are more dependent on prey microhabitat preference than on prey abundance." (Authors) Odonata are not represented as prey while they ("*Calopteryx* sp., *Onychogomphus* sp., *Orthetrum* sp.") are co-occurring with *P. microcephalus*.] Address: Fenoglio, S., University of Piemonte Orientale, Dipartimento di Scienze dell'Ambiente e della Vita, Via Bellini n. 25, 15100 Alessandria, Italy. E-mails: fenoglio@unipmn.it

6158. Ferreira, S.; Grosso-Silva, J.M.; Sousa, P. (2005): A contribution to the knowledge of the odonata of Montesinho Natural Park (NE Portugal). *Boletín Sociedad Entomológica Aragonesa* 37: 249-250. (in English, with Portuguese summary). [14 Odonata species are documented including *Coenagrion mercuriale*.] Address: Ferreira, Sónia, CIBIO/UP - Centre de Investigate) em Biodiversidade e Recursos Geneticos, Universidade do Porto, Campus Agrário de Vairao, P-4485 -661 Vairão, Portugal. E-mail: hiporame@gmail.com

6159. Ferreira, S.,; Grosso-Silva, J. M.; Soares-Vieira, P. (2005): Miscellaneous records of dragonflies and damselflies (Insecta, Odonata) from Continental Portu-

gal. Boln. S.E.A., 36: 275-277. (in English, with Portuguese summary). [Knowledge on the distribution of twenty Odonata species in continental Portugal is broadened. Five species are recorded for the first time from the Peneda-Gerês National Park.] Address: Ferreira, Sónia, CIBIO/UP - Centre de Investigate) em Biodiversidade e Recursos Geneticos, Universidade do Porto, Campus Agrário de Vairao, P-4485-661 Vairão, Portugal. E-mail: hiporame@gmail.com

6160. Frank, K.-S. (2005): Juwel unserer Kulturlandschaft - der Mindelsee bei Radolfzell. *mercuriale* 5: 20-25. (in German). [The fauna and flora of lake Mindelsee situated near Lake Konstanz, Baden-Württemberg, Germany, is briefly characterised. Dragonflies currently account to 49 species; these are listed.] Address: Frank, K.-S., Naturschutzzentrum Möggingen, Mühlbachstr. 2, D-78315 Radolfzell-Möggingen, Germany. E-mail: kai-steffen.frank@bund.net

6161. Gonzalez-Soriano, E.; Cordoba-Aguilar, A. (2005): Male behaviour in the male dimorphic damselfly *Paraphlebia quinta* Calvert (Zygoptera: Megapodagrionidae). *Odonatologica* 34(4): 379-385. (in English). ["*P. quinta* is a tropical species with 2 male morphs: the black-winged (BW) male and the hyaline-winged (HW) male; here their sexual behaviour is described. In general, males seem to spend relatively little time in flying activities. This may be explained either by the inability to recognise conspecifics and, hence, engage in social interactions, or by the reduced energetic reserves that prevent them from engaging in expensive activities. BW males were more aggressive and site-faithful than HW males. BW defended spaces containing debris (plant and wood) against conspecifics while HW did not. BW-BW, BW-HW and HW-HW aggressive encounters were common. Despite their non-aggressive nature toward BW males, HW males behaved aggressively when faced by HW males. The distance flown by each morph from male grasping of the male until she started oviposition was measured: HW flew longer distances than BW. These differences between male morphs are compared to those found in *Mnais p. pruinosa*, another male dimorphic zygopteran. Similar to what happens in that species, both tactics in *P. quinta* are possibly maintained due to the similar reproductive and energetic costs accrued by and benefits paid to each morph." (Authors)] Address: Gonzalez-Soriano, E., Depto Zoología, Inst. Biol., Universidad Autonoma, Apartado Postal 70-153, 04510 Mexico, D.F., Mexico. E-mail: e-soriano@mail.ibiologia.unam.mx

6162. Hermans, J. (2005): Review: Askew, R.R. (2004): *The Dragonflies of Europe*, revised & second edition. *Natuurhistorisch Maandblad* 94: 142. (in Dutch). [Review of the second edition of the classic book of Askew (see OAS 4113).] Address: Hermans, J.T.; Herestraat 21, NL-6067 ER Linne, The Netherlands

6163. Hofmann, T.A.; Mason, C.F. (2005): Competition, predation and microhabitat selection of zygoptera larvae in a lowland river. *Odonatologica* 34(1): 27-36. (in English). ["The microdistribution of 4 lotic species was investigated in the field. Microhabitat selection of *Calopteryx splendens* and *Erythromnia najas* was further examined in the laboratory, individually at different larval densities and in the presence of the other species and a predator. *E. najas*, *Ischnura elegans* and *Platycnemis pennipes* showed significant preferences

for particular aquatic macrophytes compared to others in the field, whereas *C. splendens* did not discriminate between the investigated plant species. Only limited spatial separation was apparent between the larvae of different species, as preferences for the same macrophyte species were found. When kept separate and at low densities, larvae of *C. splendens* and *E. najas* inhabited significantly different microhabitats in the laboratory. At high intraspecific abundances, spatial overlap between the two species became apparent as both increasingly occupied less preferred substrata, which is in concurrence with the ideal free distribution model of habitat selection. *E. najas* showed no change in perch selection in the presence of *C. splendens* at high densities. In this instance, intraspecific competition therefore appeared to be more important than interspecific competition with other Zygoptera in determining the microdistribution of *E. najas*. In the field, the niches of the two species may be more adequately separated on the basis of prey selection or hunting behaviour. *E. najas* also actively reacted to the presence of a predator, indicating some flexibility of response regarding perch selection." (Aurhors)] Address: Hoffmann, T.A., Dept Biol. Sci., Univ. Essex, Wivenhoe Park, Colchester, Essex, C04 3SQ, UK. E-mail: tahofmp@essex.ac.uk

6164. Hunger, H. (2005): Von Versuchung, Bruchlandung und eisenhaltigem Schlupfsubstrat. *mercuriale* 5: 45. (in German). [Baden-Württemberg, Germany; (1) 01-VI-2005: a male *Brachytron pratense* tried to copulate with a female *Cordulia aenea*. (2) A female *Sympetrum vulgatum* was accidentally "caught" by the strings of algae, which winded around the caput of the female. (3) *A. imperator* was found emerging 10 m away from the shore towards the open water of a lake, which suggests that larvae also can exist among the submerse vegetation in the centre of a lake.] Address: Hunger, H., Institut für Naturschutz und Landschaftsanalyse (INULA), August-Ganther-Straße 16, D-79117 Freiburg, Germany. E-mail: holger.hunger@inula.de

6165. Hunger, H. (2005): Langstreckenmarsch schlüpfbereiter *Orthetrum cancellatum*-Larven. *mercuriale* 5: 40-41. (in German). [Baden-Württemberg, Germany; a long distance emergence of *O. cancellatum* is described in detail. Measured from the shore line the distance was app. 15-16 m.] Address: Hunger, H., Institut für Naturschutz und Landschaftsanalyse (INULA), August-Ganther-Straße 16, D-79117 Freiburg, Germany. E-mail: holger.hunger@inula.de

6166. Ishida, K. (2005): Reclassification of *Rhipidolestes okinawanus* Asahina, 1951, Occurring in the Ryukyus (Odonata, Megapodagrionidae). *Japanese journal of systematic entomology* 11: 167-181. (in English). ["*Rhipidolestes okinawanus* Asahina, 1951 is reclassified into 3 species, *R. okinawanus*, *R. shozoi* sp. nov., and *R. amamiensis* sp. nov.. *R. amamiensis* inhabiting the Amami Islands is divided into 2 subspecies, *R. amamiensis amamiensis* occurring in Amami-Oshima and *R. amamiensis tokunoshimensis* subsp. nov. in Tokunoshima." (Author)] Address: Ishida, K., Seisho High-school, Gifu, Japan

6167. Jaletzke, M.; Walter, B. (2005): Zur Flora, Vegetation und Fauna von Karpfenzuchtanstalten in Westfalen. *Abhandlungen aus dem Westfälischen Museum für Naturkunde* 67(3): 75-90. (in German, with English summary). [A total of 27 odonate species is said to oc-

cur at two carp breeding water body complexes in Westfalia, Germany, but no details are given (for details see: Schmidt, E. (1993): Die ökologische Nische von *Sympetrum depressiusculum* (Selys) im Münsterland (Naturschutzgebiet Heubachwiesen). *Libellula* 12(3/4): 175-198.] Address: Jaletzke, Martina, Klinkenhagen 52, D-48653 Coesfeld, Deutschland

6168. Kandibane, M.; Raguraman, S.; Ganapathy, N. (2005): Relative abundance and diversity of Odonata in an irrigated rice field of Madurai, Tamil Nadu. *Zoos' Print Journal* 20(11): 2051-2052. (in English). [Nine Anisoptera and three Zygoptera were recorded during 2000 in an irrigated rice field of Madurai India. *Pantala flavescens*, *Diplocodes trivialis*, *Crocothemis servilia*, *Tramea limbata*, and *Agriocnemis femina femina* were the dominant species recorded in weeded and partially weeded ecosystems. They were more abundant in partially weeded rice ecosystem than in weeded rice ecosystem. Rare species like *Orthetrum sabina*, *Rhyothemis variegata*, *Neurothemis tullia*, *Anax guttatus*, and *Trithemis* sp. occurred only at the tillering stage of crop growth.] Address: Kandibane, M., Krishi Vigyan Kendra, Vriddhachalam, Tamil Nadu 606001, India

6169. Kikuchi, R.M.; Uieda, V.S. (2005): Composition and distribution of macroinvertebrates in different types of substrate of a stream in the Municipal District of Itatinga, São Paulo, Brazil. *Entomol. Vect.* 12(2): 193-231. (in Portuguese, with English summary). [Relationships between habit, physical conditions of the habitat (substrate, flow, turbulence) and food availability of the fauna of a tropical stream were surveyed in a tributary of the Basin of Paranapanema, located in the municipal district of Itatinga, São Paulo. Comparing substrates dominated by vegetation, rocky and sandy structures the authors found a larger density of fauna in the rocky substrate and larger diversity in the vegetation substrate. In all substrates, Insecta, and mainly Diptera, prevailed in abundance and diversity of species. In most cases, Odonata are treated on the family level.] Address: Kikuchi, Regina Mayumi, Programa de Pós-graduação em Ecologia e Recursos Naturais, Universidade Federal de São Carlos, Caixa postal 676, Rodovia Washington Luís, Km 235, CEP: 13565-905, São Carlos, SP, Brasil. E-mail: rmkikuchi@yahoo.com.br

6170. Koch, H.-M. (2005): Herbstschlupf von *Lestes sponsa*. *mercuriale* 5: 41-42. (in German). [A record of late emergence at *L. sponsa* near Reutlingen, Baden-Württemberg, Germany is documented. The possibility of a bivoltine development in 2005 is discussed] Address: Koch, H.-M., Krämerstr. 40, D-72764 Reutlingen, Germany. E-mail: koch.druckerei@t-online.de

6171. Konogaya, S.; Kobayshi, H (2005): An effect of irrigation and cultivation system on food chain in paddy water environment. *Journal of rural planning association* 24(special issue): S49-S54. (in Japanese, with English summary). ["For the purpose of examining on role of irrigation and cultivation system to paddy ecosystem, we study species and number of Odonata larvae and analyze the stable isotope ratios of the Odonata larvae and the plankton/detritus in water of paddy fields and irrigation ponds. As a results, cultivation system clearly effects to composition of species and number of Odonata larvae. $\delta^{13}C$ indicates that *Orthetrum albistylum speciosum* larvae and *Coenagrionidae* spp. larvae which are dominant species in paddy water, de-

pend on specified food sources, each other. $\delta^{15}N$ shows that the trophic level of Odonata larvae is higher than that of the plankton/detritus in paddy water. It is considered that analyze the stable isotope ratios application is effective to examine water ecosystem and food web in paddy." (Authors)] Address: Konogaya, S., Graduate School of Agriculture, IBARAKI Univ., Japan

6172. Kosterin, O.E. (2005): Western range limits and isolates of eastern odonate species in Siberia and their putative origins. *Odonatologica* 34(3): 219-242. (in English). ["*Macromia amphigena*, *Shaogomphus postocularis*, and *Sympetrum croceolum*, ranging in NE China, Korea and Japan, have isolates at the NE margins of the Altai-Sayan mountain system: all 3 in SE West Siberia, *M. amphigena* and *S. postocularis* also in southern Central Siberia and *M. amphigena* in E Kazakhstan and W Mongolia. *Ophiogomphus obscurus*, *Nihonogomphus ruptus*, and *Calopteryx japonica* have continuous ranges protruding to the West from E. Asia to the Ob ' River basin and to 60 degrees N latitude. *Coenagrion ecornutum* has a similar range but extends N in Siberia to 65 degrees N and has an isolate in the S Ural Mts. *C. lanceolatum*, *C. hylas* and *Somatochlora graeseri* reach 70 degrees N and also extend westward to the Ob ' River basin, but *C. hylas* has isolates in the Polar Urals and Bavaria, while *S. graeseri* is probably isolated in the Ural Mts. Of 4 other eastern spp. in Siberia, 2 reach 70 degrees N, but *Somatochlora exuberata* extends westwards only to the sources of the Yenisey River and *Coenagrion glaciale* to Lake Baikal, while *Cercion v-nigrum* and *Anisogomphus maacki* just penetrate into SE Transbaikalia. Thus, 11 eastern odonate species have their western limits in Siberia (defined in a narrow sense, not including the Far East). In addition, 4 have more westerly isolates, 3 in the Urals and 1 in Bavaria. Siberia also includes the eastern limits of 21 western species 24 transpalaeartic species spread far to the N and 10 species occupy S Siberia only (or just occur locally), 2 Central Asian species barely penetrate into S. Siberia. *Aeshna viridis* is a doubtful amphipalaeartic species. Numerous palaeopalaeontological reconstructions suggest that during the Holocene climatic optimum, a continuous belt of broad-leaved forest was restored in Siberia, providing conditions for a recolonization of Siberia by Odonata. Westward migrations of eastern species were favoured by the optimum occurring earlier in the east than in the west. Hence, many western species had no time to occupy all of Siberia and today the eastern limits of their ranges lie within the region. *M. amphigena*, *S. postocularis* and *S. croceolum* perhaps were the most stenotopic of those E. Asian species that colonized Siberia during the Holocene, and after the optimum, their ranges shrank to the peri-Altaian refugium. Their isolates there should be dated no earlier than 5-6 thousand yrs ago. *C. v-nigrum* and *A. maacki* are perhaps the least mobile of the eastern species in Siberia." (Author)] Address: Kosterin, O.E., Institute of Cytology and Genetics, Siberian Branch, Russian Academy of Sciences, Lavrentiev Ave 10, RUS-630090 Novosibirsk, Russia. E-mail: kosterin@bionet.nsc.ru

6173. Kunz, B. (2005): *Überschätzt. mercuriale* 5: 43. (in German). [Baden-Württemberg, Germany, 15-VI-2005; a male *Ischnura pumilio* tried to copulate with a male *Platycnemis pennipes*.] Address: Kunz, B., Hauptstr. 111, D-74595 Langenburg, Germany. E-mail: kunzFOTOGRAFIE@t-online.de

- 6174.** Kunz, B. (2005): Entwurf eines Metapopulationsmodells anhand zahlreicher aktueller Funde von *Sympetrum flaveolum* in der Region Hohenlohe im Jahr 2005. *mercuriale* 5: 26-32. (in German). [Baden-Württemberg, Germany; a metapopulation model for *S. flaveolum* based on an intensive survey of the local dragonfly fauna in the past two decades and including 22 localities is presented and discussed.] Address: Kunz, B., Hauptstr. 111, D-74595 Langenburg, Germany. E-mail: kunzFOTOGRAFIE@t-online.de
- 6175.** Kunz, B. (2005): Guten Appetit!. *mercuriale* 5: 42. (in German). [Baden-Württemberg, Germany, 31-VII-2005; a female *Enallagma cyathigerum* was devouring a male *Coenagrion puella*.] Address: Kunz, B., Hauptstr. 111, D-74595 Langenburg, Germany. E-mail: kunzFOTOGRAFIE@t-online.de
- 6176.** Machado, A.B.M. (2005): *Neocordulia matuensis* spec. nov. from Brazil (Anisoptera: Corduliidae). *Odonatologica* 34(3): 299-302. (in English). ["The new species (male holotype: Aiuruoca, Minas Gerais, Brazil, 30-XII-1999; deposited in A.B.M. Machado collection) is described. It differs from all the congeners by having the sternal protuberance of segment 8 conical whereas in other species it is either absent or biconical." (Author)] Address: Machado, A.B.M., Departamento de Zoologia, Inst. Cienc. Biol., Universidade Federale de Minas Gerais, Caixa Postal 486, 31270-901 Belo Horizonte, Minas Gerais, Brazil
- 6177.** Machado, A.B.M. (2005): *Forcepsioneura grossorum* spec. nov. from Brazil (Zygoptera: Protoneuridae). *Odonatologica* 34(2): 169-172. (in English). ["The new species (holotype male: Nova Friburgo, Rio de Janeiro, Brasil, 25-VII-2002; deposited in the author's collection in Belo Horizonte) is described, illustrated and compared with its congeners. It differs from all congeners by the unique structure of the posterior prothoracic lobe." (Author)] Address: Machado, A.B.M., Departamento de Zoologia, Inst. Cienc. Biol., Universidade Federale de Minas Gerais, Caixa Postal 486, 31270-901 Belo Horizonte, Minas Gerais, Brazil
- 6178.** Machado, A.B.M. (2005): *Peruviogomphus bellei* spec. nov. from the Amazonian region of Brazil (Anisoptera: Gomphidae). *Odonatologica* 34(1): 59-63. (in English). ["The new species is described and illustrated (holotype male: Brazil, Amazonas, Tefé, I-1958, A.L. Carvalho leg., deposited in collection A.B.M. Machado). By its size, colour and structure of the anal appendages, *P. bellei* sp. n. is closest to *P. moyobambus* Klots, 1944, but it can be separated mainly by the presence of a well-developed expansion on abdominal segment 8. It differs from the other 2 congeners by the presence of a denticulated area in the mid-part of the inner hindwing margin. The significance of this character for gomphid taxonomy is discussed." (Author)] Address: Machado, A.B.M., Departamento de Zoologia, Inst. Cienc. Biol., Universidade Federale de Minas Gerais, Caixa Postal 486, 31270-901 Belo Horizonte, Minas Gerais, Brazil
- 6179.** Mancî, C.O. (2005): Studiu preliminar asupra distributiei libelulelor (Insecta: Odonata) în Padurea Verde (Timisoara) si zona imediat apropiata. *Bul. inf. Entomol.* 16: 83-88. (in Romanian, with English summary). [Romania; 35 species of Odonata have been recorded in 1999, and some in 2000 and 2005.] Address: Mancî, C.O., Acad. Remus Radulet 13, bl. 119, ap. 7, Timisoara 300281, Timis County, Romania. E-mail: cosminovidiu@yahoo.com
- 6180.** Matsubara, K.; Hironaka, M. (2005): Postcopulatory guarding behaviour in a territorial damselfly, *Pseudagrion p. pilidorsum* (Brauer), for submerged ovipositing females (Zygoptera: Coenagrionidae). *Odonatologica* 34(4): 387-396. (in English). ["The postcopulatory mate guarding behaviours by territorial and non-territorial males for submerged ovipositing females were investigated in the field. After copulations, females in tandem began to oviposit at the water surface and thereafter they usually submerged completely underwater. The female often repeated the submergence and emergence at several oviposition sites. When the female submerged completely, the male released her without submergence and rested above the water surface during oviposition (non-submerged guarding), or the male submerged completely and remained in tandem, whether only at first or for the duration of the oviposition (submerged guarding). Territorial males always performed non-submerged guarding when the female oviposited inside their territories. The non-submerged guarding inside the territory might allow the territorial male both to guard the ovipositing female and to maintain his territory. On the other hand, when the female oviposited inside another male's territories, territorial and non-territorial males exhibited both non-submerged guarding and submerged guarding. Thus, *P. p. pilidorsum* males may adopt either submerged guarding or non-submerged guarding in response to change in the probability of a takeover of the emerged female by rival males inside another male's territory." (Authors)] Address: Matsubara, K., Department of Applied Biological Sciences, Faculty of Agriculture, Saga University, Honjo 1, Saga, 840-8502, Japan
- 6181.** McBean, M.C.; White, S.A.; MacGregor, J.A. (2005): Foraging behaviour of the damselfly larva *Pyrrosoma nymphula* (Sulzer) in response to predator presence (Zygoptera: Coenagrionidae). *Odonatologica* 34(2): 155-164. (in English). ["The trade of between foraging and predator avoidance was studied. In the presence of a larva of the predatory *Aeshna juncea*, *P. nymphula* was found to reduce foraging activity significantly reduced foraging activity in response to chemical stimuli from *P. nymphula*. *A. juncea* but not in response to visual stimuli. Foraging activity was further reduced when the diet of *A. juncea* was changed from chironomid larvae to *P. nymphula*. This suggests that predators are detected chemically and are chemically labelled by their diet. Foraging activity was found to increase with starvation level after 48 h without access to food, with a further increase after 72 h of starvation. The presence of chemical stimuli from conspecific fed predators delayed the increase in foraging activity until 72 h of starvation. These results have implications for larval survival and adult reproductive fitness." (Authors)] Address: White, S.A., Division of Environmental and Evolutionary Biology, Inst. Biomed. & Life Sciences, Univ. Glasgow, Glasgow G12 8QQ, Scotland. E-mail: s.white@bio.gla.ac.uk
- 6182.** McKee, D.; Harvey, I.F.; Thompson, D.J.; Sherratt, T.N. (2005): Frequency of female colour morphs in populations of four coenagrionid damselflies (Zygoptera: Coenagrionidae). *Odonatologica* 34(1): 37-49. (in English). ["Knowledge of naturally occurring andromorph and gynomorph frequencies in populations of

coenagrionid damselflies is important for understanding the evolution of female-limited polymorphism. Here are reported the frequencies of andromorphs and gynomorphs in populations of *Coenagrion puella*, *C. mercuriale*, *Xanthocnemis zealandica* and *Ischnura fluviatilis* and a review is presented of the literature for other coenagrionid spp. It is shown that ratios of andromorphs to gynomorphs are often unequal with andromorphs generally being the uncommon morph. Significant inter- and intra-population variation in morph frequency sometimes occurs but is of low magnitude. No evidence was found for spatial segregation of andromorphs and gynomorphs. Andromorph frequency could not be significantly related with sex ratio or male density.] Address: Thompson, D.J., Population Biology Research Group, School of Biological Sciences (Nicholson Building), University of Liverpool, P.O. Box 147, Liverpool, L69 3BX, UK. E-mail: d.j.thompson@liv.ac.uk

6183. Mitchell, A.; Samways, M.J. (2005): The morphological 'forms' of *Palpopleura lucia* (Drury) are separate species as evidenced by DNA sequencing (Anisoptera: Libellulidae). *Odonatologica* 34(2): 173-178. (in English). ["*P. lucia* is a widespread African species with a checkered taxonomic history. Currently 2 'forms' or subspecies, *P.l. lucia* and *P.l. portia* are recognized, although debate over the taxonomic status of these taxa has hardly let up over the last 230 years. The 2 'forms' show distinctive wing pattern differences although other aspects of their morphology are very similar. They can occur highly sympatrically at some localities in southern Africa, as well as elsewhere, thus raising the question of whether they are two species or one perhaps with balanced polymorphism. DNA sequence data from the ITS2 and COI genes were collected from specimens of both these 'forms' to assess more rigorously the taxonomic status of these taxa. The closely related *P. deceptor* (Calvert) and *P. jucunda* (Rambur) were included in the data set to provide a baseline for comparisons. Specimens from all 4 taxa were from pools of the flood plain of the Sabie R., Kruger National Park, South Africa, and were potentially able to interbreed. Both phylogenetic analyses and comparisons of sequence divergence levels strongly support the hypothesis that the 2 'forms' of *P. lucia* are reproductively isolated and should be accorded full species status as *P. lucia* (Drury, 1773) and *P. portia* (Drury, 1773)."] (Authors)] Address: Samways, M.J., Dept Entomol. & Nematol., Univ. Stellenbosch, Private Bag X1, ZA-7602, Matieland, South Africa. E-mail: samways@sun.ac.za

6184. Miyata, T.; Kojo, T. (2005): 419 Flight characteristics of *Pantala flavescens*. JSME Bioengineering Conference and Seminar Vol. 2004, No.17: 169-170. (in Japanese, with English translation of the title). [*Pantala flavescens* aspect ratio flight characteristics distortion of wings] Address: not transliteration into English

6185. Muzon, J.; Pessacq, P. (2005): Description of the last larval instar of *Ischnura ultima* Ris (Zygoptera: Coenagrionidae). *Odonatologica* 34(3): 303-306. (in English). ["The description is based on a female specimen from Argentina (Mendoza prov.) and the morphology is compared with the other *Ischnura* larvae known from Argentina, viz. *I. capreola* and *I. fluviatilis*. In addition *I. ultima* is reported here for the first time from Chile."] (Authors)] Address: Muzón, J., Inst. Limnol. "Dr.

R.A. Ringuelet", C.C. 712, AR-1900 La Plata, Argentina. E-mail: muzon@ilpla.edu.ar

6186. Muzon, J.; Lozano, F. (2005): *Acanthagrion hartei* spec. nov. from Ecuador (Zygoptera: Coenagrionidae). *Odonatologica* 34(2): 179-182. (in English). ["The new species is described and illustrated. Holotype male: Ecuador, Morona, Santiago prov., Bomboiza, 20-IX-1990, deposited in USNM, Washington. It is assigned to the apicale-group, and differs from the other species of that group by characters of the male terminalia and genital ligula."] (Authors)] Address: Muzón, J., Inst. Limnol. "Dr. R.A. Ringuelet", C.C. 712, AR-1900 La Plata, Argentina. E-mail: muzon@ilpla.edu.ar

6187. Naraoka, H. (2005): Larval development of *Coenagrion terue* (Asahina) (Odonata: Coenagrionidae) at a lowland in Aomori Prefecture, Japan. *New Entomol.* 54(1/2): 11-16. (in Japanese, with English summary). ["Larval development of *C. terue* was investigated at a lowland marsh (23m, a. s. l.) in Aomori Prefecture, Japan, during 2003 and 2004. The larvae were sampled 2-4 weeks periodically at a marsh. The rearing also was done from egg stage. *C. terue* has 10 larval instars. The larvae wintered at 7-9 instars, and the final instar appeared at next April. The duration of life cycle was 1 year (univoltine)."] (Author)] Address: Hirozi, N., 36-71 Motoizumi, Fukunoda, Itayanagi-cho, Kitatsugurugun, Aomori Pref., 038-3661, Japan

6188. Novelo-Gutiérrez, R. (2005): Five new *Erpetogomphus* Hagen in Selys larvae from Mexico, with a key to the known species (Anisoptera: Gomphidae). *Odonatologica* 34(3): 243-257. (in English). ["The final instars of *Erpetogomphus* bothrops *E. elaps*, *E. eutainia*, *E. liopeltis*, and *E. viperinus* are described and illustrated. Most of these are similar in many features, except *E. eutainia* which is notoriously different. A key for the separation of all known *Erpetogomphus* larvae is included."] (Author) Additional figures are provided for *E. compositus*, *E. crotalinus*, *E. lampropeltis* *matrix*, *E. agkistrodon*, *E. erici*, *E. tristani*, *E. constrictor*, *E. boa*, *E. cophias*, *E. sabaeticus*, and *E. elaps*.] Address: Novelo-Gutiérrez, R., Departamento de Entomología, Instituto de Ecología A.C., Km 2.5. antigua carretera a Coatepec, Aparato Postal 63, 91000 Xalapa, Veracruz, Mexico. E-mail: novelor@ecologia.edu.mx

6189. Obolewski, K. (2005): Epiphytic macrofauna on water soldiers (*Stratiotes aloides* L.) in *Slupia* river oxbows. *Oceanological and Hydrobiological Studies* 34(2): 37-54. (in English). ["The taxonomic composition and biomass of phytophilous macrofauna dwelling on water soldiers in two *Slupia* River oxbows, Konski Staw (KS) and Osokowy Staw (OS), were determined in two periods (April 1 - July 23, 1981; April 20 - July 20, 2001). The KS water soldier macrofauna studied in the 1980s was comprised of 22 invertebrate taxa, while 25 to 28 taxa were recorded in 2001. The macrofauna of the two periods was dominated by gastropods and mining chironomid larvae (1981) and hirudineans (2001). The OS macrofauna studied in the spring/summer of 2001 consisted of 25 taxa. The OS macrofauna was dominated in both periods by gastropods, and trichopterans were the subdominants." The list of species contains four Odonata taxa, only *Aeshna grandis* on the species level.] Address: Obolewski, K., Department of Ecology and Protection of the Sea, Pomeranian Peda-

gological University, ul. Arciszewskiego 22b, 76-200 Stupsk, Poland. E-mail: Obolewsk@pap.edu.pl

6190. Pardey, A.; Conze, K.-J.; Rauers, H.; Schwartz, M. (2005): Flora, Vegetation und Fauna ausgewählter Kleingewässer in der Westfälischen Bucht. Abhandlungen aus dem Westfälischen Museum für Naturkunde 67(3): 163-190. (in German, with English summary). ["Since the end of the 1970s in the Westphalian Bay (in the north of North Rhine-Westphalia, Germany) a lot of ponds had been built or reconstructed mainly for biotope and species protection purposes. In the years between 1989 and 2003 hydrochemistry, flora and vegetation of 14 ponds were examined to estimate biotope development of man made ponds and the efficiency of biotope management measures. Furthermore one or two times amphibians, dragonflies, water beetles, water bugs, mussels and water snails were recorded to get a better idea of biotope qualities. The results clarify, that every pond is an individual habitat with its special species inventory and nature protection importance, which needs individual concepts for management. On the other hand some general guidelines for management and building of ponds as nature protection areas were deduced. The comparison of data of different years makes clear, that eutrophication leads to an acceleration of succession and therefore to decreasing numbers of plant species and species of the red data list. Because of these facts the management of ponds will be a permanent task of nature protection activities." (Authors) A total of 24 odonate species was observed.] Address: Conze, K.-J., Listerstr. 13, D-45147 Essen, Germany. E-mail: Klaus-Juergen.Conze@t-online.de

6191. Paulson, D.R.; Von Ellenrieder, N. (2005): Synonymy of *Subaeschna* Martin, 1908 with *Gynacantha* Rambur, 1842, and a new species of *Gynacantha* from Peru (Anisoptera: Aeshnidae). *Odonatologica* 34(1): 65-72. (in English) ["*Subaeschna* Martin, 1908, is synonymized with *Gynacantha* Rambur, 1842, and its only sp., *S. francesca* Martin, 1909, becomes *Gynacantha francesca* (Martin). *G. bartai* sp. n. is described from 5 specimens (holotype male and allotype female; Peru, Madre de Dios, Explorer's Inn; deposited in the NMNH, Washington, DC, USA) from southern Peru. It is characterized by very small size, unmarked thorax, straight cerci, and abdomen constricted in male and unconstricted in female." (Authors)] Address: Paulson, D.R., Slater Museum, Univ. of Puget Sound, Tacoma, WA 98416, USA. E-mail: dpaulson@ups.edu.

6192. Pessacq, P.; Muzon, J.; Von Ellenrieder, N. (2005): Description of the last larval instar of *Acanthagrion ablutum* Calvert (Zygoptera: Coenagrionidae). *Odonatologica* 34(1): 73-76. (in English). ["The final larval instar is here described for the first time and it is compared with the other known *Acanthagrion* larvae. It differs from them mainly in the number of palpal and premental setae and shape of head posterolateral margin." (Authors)] Address: Ellenrieder, Natalie von, Museo de Ciencias Naturales, Universidad Nacional de Salta, Mendoza 2, Salta 4400, Argentina. E-mail: odonata@hotmail.com

6193. Rackow, H., (2005): Beobachtungen zum Paarungs- und Eiablageverhalten von *Ophiogomphus cecilia* an der Lauter (Rheinland Pfalz). *mercuriale* 5: 5-8. (in German). [Rheinland-Pfalz, Germany, Alsace, France; the phenology of oviposition (bias in the afternoon)

and the mating of *O. cecilia* are described and discussed.] Address: Rackow, H., Hohenstoffelstraße 73, D-78224 Singen, Germany. E-mail: HartmutRackow@web.de

6194. Relyea, R.A (2005): The heritability of inducible defenses in tadpoles. *J. Evol. Biol.* 18: 856-866. (in English) ["The evolution of plastic traits requires phenotypic trade-offs and heritable traits, yet the latter requirement has received little attention, especially for predator-induced traits. Using a half-sib design, I examined the narrow-sense heritability of predator-induced behavior, morphology, and life history in larval wood frogs (*Rana sylvatica*). Many of the traits had significant additive genetic variation in predator (caged *Anax longipes*) and no-predator environments. Whereas most traits had moderate to high heritability across environments, tail depth exhibited high heritability with predators but low heritability without predators. In addition, several traits had significant heritability for plasticity, suggesting a potential for selection to act on plasticity per se. Genetic correlations confirmed known phenotypic relationships across environments and identified novel relationships within each environment. This appears to be the first investigation of narrow-sense heritabilities for predator-induced traits and confirms that inducible traits previously shown to be under selection also have a genetic basis and should be capable of exhibiting evolutionary responses." (Author)] Address: Relyea, R.A., Dept Biol. Sciences, University of Pittsburg, Pittsburgh, Pennsylvania 15260, USA. E-mail: rarelyea@pitt.edu

6195. Saito, Y.; Owada, M.; Kato, S. (2005): Dragonflies (Odonata) of the Akasaka Imperial Gardens, Tokyo, Central Japan. *Mem. natn. Sci. Mus.*, Tokyo 39: 419-429. (in Japanese, with English summary). [Between 2002 and 2004, a total of 24 Odonata species was recorded.] Address: Owada, M., Dept Zool., Natn. Sci. Mus., 3-23-1 Hyakunincho, Shinjuku-ku, Tokyo, 169-0073, Japan. E-mail: owada@kahaku.go.jp

6196. Schlüpmann, M.; Feldmann, R.; Belz, A. (2005): Stehende Kleingewässer im südwestfälischen Bergland: Charakteristik und Fauna am Beispiel der Libellen und der Wirbeltiere. *Abhandlungen aus dem Westfälischen Museum für Naturkunde* 67(3): 201-222. (in German, with English summary). [M. Schlüpmann provides a condensed account on some general distribution patterns of the Odonata in the middle mountain ranges of Nordrhein-Westfalen, Germany. Distribution maps of *Aeshna cyanea*, *A. mixta*, and *A. juncea* highlight some ecological/climatic factors responsible for the distribution patterns.] Address: Schlüpmann, M., Hierseier Weg 18, D-58119 Hagen, German. E-mail: martin-schlupe-mann@t-online.de

6197. Schmidt, B. (2005): Gartenfreuden mit blauen Drachen. *mercuriale* 5: 42-43. (in German). [Baden-Württemberg, Germany; (1) a tandem between a male *Aeshna cyanea* and an recently emerged male *A. affinis* is described. Attempting to get the latter into the wheel position for 30 minutes, the abdomen of *A. cyanea* finally broke between the 7th and 8th abdominal segment. (2) Catching *A. affinis* by a cat is described in detail. (3) A female *A. cyanea* tried to oviposit into the back of a *Bombina variegata* male (Amphibia).] Address: Schmidt, B., Amt für Umwelt und Naturschutz, Eckenerstr. 11, 88046 Friedrichshafen. E-Mail: b.schmidt@friedrichshafen

- 6198.** Schmidt, E. (2005): Libellen als Nutznießer von Laubfrosch-Schutzgewässern im Kreis Coesfeld/Westmünsterland. *Abhandlungen aus dem Westfälischen Museum für Naturkunde* 67(3): 223-240. (in German, with English summary). [Habitat creating and management measures directed to the tree-frog (*Hyla arborea*) in Westphalia (Nordrhein-Westfalen, Germany) also favoured dragonflies. A total of 34 species was recorded at six habitats including several rare species, and species of an early succession stage in vegetation development.] Address: Schmidt, E., Coesfelder Str. 230, D-48249 Dülmen, Germany
- 6199.** Schneider, B. (2005): Wenn das Ende naht: Schwarz vs Groß. *mercuriale* 5: 44. (in German). [Switzerland, 16-X-, 15-XI-2005; interspecific copulations between a male *Sympetrum danae* and a female *S. striolatum* resp. *S. vulgatum* are described.] Address: Schneider, B.; Wolfbühlstr. 34a, CH-8408 Winterthur, Germany. E-mail: b.schneider@libellen.li
- 6200.** Schoeppner, N.A.; Relyea, R.A. (2005): Damage, digestion, and defence: the roles of alarm cues and kairomones for inducing prey defences. *Ecology Letters* 8: 505-512. (in English). ["Inducible defences are widely used for studying phenotypic plasticity, yet frequently we know little about the cues that induce these defences. For aquatic prey, defences are induced by chemical cues from predators (kairomones) and injured prey (alarm cues). Rarely has anyone determined the separate and combined effects of these cues, particularly across phylogenetically diverse prey types. We examined how tadpoles (*Hyla versicolor*) altered their defences when 10 different prey were either crushed by hand or consumed by predators. Across all prey types, crushing induced only a subset of the defences induced by consumption. Consuming vs. crushing produced additive responses for behaviour but synergistic responses for morphology and growth. Moreover, we discovered the first extensive evidence that prey responses to different alarm cues depends on prey phylogeny. These results suggest that the amount of information available to the prey affects both the quantitative and qualitative nature of the defended phenotype." (Authors) The laboratory study involves experiments with *Abax* sp., *Sympetrum* sp., and *Lestes* sp..] Address: Schoeppner, Nancy, Department of Biological Sciences, University of Pittsburgh, Pittsburgh, PA 15260, USA. E-mail: nschoepp@pitt.edu
- 6201.** Sipkay, C.S.; Hufnagel, L.; Gaal, M. (2005): Zoocoenological state of microhabitats and its seasonal dynamics in an aquatic macroinvertebrate assembly (Hydrobiological case studies on Lake Balaton No. 1). *Applied ecology and environmental research* 3(2): 107-137. (in English). ["In the years 2002, 2003 and 2004 we collected samples of macroinvertebrates on a total of 36 occasions in Badacsony bay, in areas of open water (in the years 2003 and 2004 reed-grassy) as well as populated by reed (*Phragmites australis*) and cattail (*Typha angustifolia*). Samples were taken using a stiff hand net. The sampling site includes three microhabitats differentiated only by the aquatic plants inhabiting these areas. Our data was gathered from processing 208 individual samples. The quantity of macroinvertebrates is represented by biovolume value based on volume estimates. We can identify taxa in abundant numbers found in all water types and ooze; as well as groups associated with individual microhabitats with various aquatic plants. We can observe a notable difference between the years in the volume of invertebrate macrofauna caused by the drop of water level, and the multiplication of submerged macrophytes. There are smaller differences between the samples taken in reeds and cattail stands. In the second half of 2003 – which was a year of drought – the *Najas marina* appeared in open waters and allowed to support larger quantities of macroinvertebrates. In 2004 with higher water levels, the *Potamogeton perfoliatus* occurring in the same area has had an even more significant effect. This type of reed-grass may support the most macroinvertebrates during the summer. From the aspect of diversity relations we may suspect different characteristics. The reeds sampling site proved to be the richest, while the cattail microhabitat is close behind, open water (with submerged macrophytes) is the least diverse microhabitat." (Authors)] Address: Sipkay, C.S., Dept of Systematic Zoology and Ecology, Eötvös Loránd University, H-1117 Budapest, Pázmány P. sétány 1/c, Hungary. E-mail: cssipkay@yahoo.com
- 6202.** Sonnenburg, H.; Hannig, K. (2005): Die Libellen (Insecta, Odonata) des Truppenübungsplatzes Haltern-Platzteil Lavesum (Kreis Recklinghausen und Kreis Borken). *Abhandlungen aus dem Westfälischen Museum für Naturkunde* 67(3): 65-75. (in German). [Nordrhein-Westfalen, Germany; the odonate fauna of the military training area totals in 31 species. Each species is briefly commented on.] Address: Sonnenburg, H., Am Gollung 100, D-37671 Hötter, Germany
- 6203.** Sonntag, H. (2005): Schlupfbiologische Freilanduntersuchungen an *Sympetma paedisca*. *mercuriale* 5: 2-5. (in German). [Tirol, Austria; emergence phenology, sex ratio, and emergence habitat of 2729 exuviae of *S. paedisca* are figured or briefly discussed. Emergence and oviposition habitat vary clearly, therefore it is supposed that the larvae must be mobile and must have dispersed by themselves.] Address: Sonntag, H., Tagwalterstr. 8/4, A-6111 Volders, Austria. E-mail: hermann.sonntag@chello.at
- 6204.** Switzer, P.V. (2005): Possible settlement benefits related to site fidelity for the territorial dragonfly, *Perrithemis tenera* (Say) (Anisoptera: Libellulidae). *Odonatologica* 34(4): 397-405. (in English). ["Site fidelity, the tendency to return to a previously occupied breeding location, is commonly observed in animals and yet often the benefit to such behavior is unclear. In this study, possible settlement benefits to site fidelity for *P. tenera* are examined. Males defend small mating territories on ponds and lakes to which they typically, but not always, return the following day. In an observational study, it was found that males did not become territorial earlier in the day when site-faithful than when switching territories. However, males switching territories were more likely to be seen examining oviposition sites (other than the site they ultimately defended) prior to becoming territorial than site-faithful males. In an experimental study, it was controlled for differences in territory and oviposition site structure, time of day, evictions and disturbance, and found that site-faithful males spent significantly less time settling on a territory prior to defending that territory than males settling at a site for the first time. Because males examining sites are probably more at risk from predators, this study suggests that site-faithful males may experience lowered settlement costs than males returning to their original territory." (Author)]

Address: Switzer, P.V., Eastern Illinois Univ., Dept Biol, Sci., Charleston IL 61920; USA. E-mail: cfpvs@eiu.edu

6205. Taketo, A. (2005): Discovery of *Sympetrum vulgatum imitans* Selys from the Noto Peninsula, Japan. *Memoirs of the Fukui Institute of Technology* 35: 205-207. (in English). [Mature males of *S. vulgatum imitans* were recorded for the first time in the Noto Peninsula, Central Japan, on 29 September, 2002.] Address: not stated

6206. Theischinger, G.; Richards, S.J. (2005): Two new species of *Drepanosticta* Laidlaw from Papua New Guinea (Zygoptera: Platystictidae). *Odonatologica* 34 (3): 307-312. (in English). ["*D. antilope* sp. n. (holotype male: East New Britain, Wanui Camp, 17-III-2000) and *D. taurulus* sp. n. (holotype male: Eastern Highlands prov., Herowana, 13-XI-2001) are described. The holotypes are deposited in South Australian Museum, Adelaide. Diagnostic characters of the adults are illustrated and the affinities of both species are discussed." (Author)] Address: Theischinger G., 2A Hammerley Road, Grays Point, NSW 2232, Australia

6207. Tynkkynen, K. (2005): Interspecific interactions and selection on secondary sexual characters in damselflies. *Jyväskylä Studies in Biological and Environmental Science* 151: 26 pp. (in English). ["Interspecific interactions related to species recognition can cause selection and affect the evolution of secondary sexual characters. Such interactions include for example avoidance of maladaptive hybridization and interspecific aggression. In this thesis, I focus especially on interspecific aggression and on selection which it may cause on sexual characters of the damselfly, *Calopteryx splendens*. Males of *C. splendens* have pigmented wing spot as a sexual character in the middle of their wings. Large-spotted *C. splendens* males resemble another species *Calopteryx virgo*, males of which have almost completely pigmented wings. I observed character displacement in *C. splendens* males such that the wing spot size decreased with increasing relative abundance of *C. virgo*. Territorial *C. virgo* males reacted more aggressively and from greater distance towards larger than small-spotted *C. splendens* males. This suggests that the character displacement may have evolved because of the interspecific aggression arising from mistaken species recognition. Interspecific aggression causes negative survival selection on wing spot size of *C. splendens* males. In addition, interspecific aggression leads to interspecific territoriality in which large-spotted *C. splendens* males seem to have reduced ability to obtain or keep a territory. Reduced territory holding ability may have negative effects on mating success of large-spotted *C. splendens* males. This is because in contrast to other studies with *Calopteryx* species, in wild sympatric populations females did not mate with large-spotted males. My results clearly show that interspecific aggression is able to cause selection on sexual characters and thus has potential to affect the evolution of secondary sexual characters." (Author)] Address: Tynkkynen, Katja, Department of Biological and Environmental Science, P.O. Box 35, FI-40014 University of Jyväskylä, Finland

6208. Vanappelghem, C. (2005): Statut de *Sympetrum flaveolum* (L., 1758) (*Sympète* jaune) dans la région Nord-Pas-de-Calais. *Le Héron* 38(1-2): 107-113. (in French). [Detailed presentation of data and maps on

the distribution of *S. flaveolum* in north-western France.] Address: Vanappelghem, C., 14, rue Brûle Maison, F-59000 Lille, France. E-mail: cedvana@free.fr

6209. Villanueva, R.J. (2005): *Amphicnemis braulitae* spec. nov. from Camiguin Island, the Philippines (Zygoptera: Coenagrionidae). *Odonatologica* 34(1): 77-81. (in English). ["The new species is described, illustrated and compared with the other 3 species of the *Amphicnemis forcipata* Brauer-group. Holotype male: Philippines, Camiguin, Guinsiliban, Lilob, 30-IV-2003; deposited in RMNH, Leiden. A few notes on the ecology are provided." (Author)] Address: Villanueva, R.J., Biology Department, Ateneo de Davao University, 8000 Davao City, Philippines. E-mail: reaganjoseph@lycos.com

6210. Wahizatul Afzan, A.; Che Salmah, M.R. (2005): Adult dragonfly communities (Odonata: Insecta) in a tropical rivers of the northern peninsular Malaysia: species composition, biotope and host plant preferences. *Wetland Science* 3(3): 167-175. (in English). [A collection of Odonata in the catchment of the rivers Saleh, Setul and Serdan (district Bandar Baru, Kedah, Malaysia) resulted in 29 species. The communities are dominated by Libellulidae. The families of Coenagrionidae, Platycnemididae, and Calopterygidae were also common while Gomphidae and Chlorocyphidae were rather rare. *Neurothemis fluctuans*, *Trithemis aurora*, *Crocothemis servilia*, *T. festiva*, and *Orthetrum chrysis* were widely distributed in shaded, muddy areas, and among the Zygopteran, *Pseudagrion pruinatum* was the most dominant species in such habitats *Agriocnemis femina*, *Ictinogomphus rapax*, *Crutilla lineata*, *Lathrecista asiatica*, *Neurothemis tullia*, *Tholymis tillarga*, and *Copera ciliata* were exclusively found at Saleh River implying their preference for smaller, slow moving and polluted river with floating microphytes and a poor border vegetation. *Neurobasis chinensis* and *Vestalis gracilis* were only found in open, undisturbed, fast flowing waters of Setul and Serdang rivers.] Address: She Salmah, M.R., School of Biological Sciences, University Sains Malaysia, 11800 Minden, Penang, Malaysia. E-mail: csalmh@usm.my

6211. Watanabe, M.; Matsuoka, H.; Susa, K.; Taguchi, M. (2005): Thoracic temperature in *Sympetrum infuscatum* (Selys) in relation to habitat and activity (Anisoptera: Libellulidae). *Odonatologica* 34(3): 271-283. (in English). ["The thoracic temperature of adults in a forest-paddy field complex in the cool temperate zone of Japan was measured. After emergence, individuals moved into the forest gaps, where all sexually immature adults remained on perches. Both males and females controlled their thoracic temperatures against a radiant heat load in a similar manner. After maturation, some of the individuals were seen to fly in tandem over the rice paddy fields under direct sunlight for oviposition. This study evaluated the impact of the thermal environment on the perching behaviour in the forest gaps and flying behaviour in tandem in the rice paddy fields. Mean thoracic temperatures of adults were consistently higher than ambient temperatures. The difference between the high thoracic and low ambient temperature was lower among flying individuals in the rice paddy fields than in perching individuals living in the forest gaps. The control of thoracic temperature in response to ambient and radiant temperature in perching mature adults was similar to that in immature adults. In the rice paddy fields, the flying in tandem resulted in a smaller differ-

rence between thoracic over radiation temperature in females than in males in tandem. The high degree of thermoregulation clearly allowed mature adults to be active under direct sunlight. The role of perching in the forest gaps is discussed with regard to thermoregulation." (Authors)] Address: Watanabe, M., Department of Biology, Faculty of Education, Mie University, Tsu, Mie 514-8507, Japan. E-mail: watanabe@edu.mie-u.ac.jp

6212. Westermann, K.; Westermann, E. (2005): Künstliche Flutmulden im NSG "Elzwiesen" als Habitat seltener Libellen. *mercuriale* 5: 33-35. (in German). [Baden-Württemberg, Germany; Groundwater fed temporary water bodies have a specialized dragonfly fauna, which became rare in the past decades due to melioration of floodplains and meadows. In the framework of high-flood protection measures, some newly created water bodies helped to retain higher portions of discharge from the running waters. In most years they dried out due to high evaporation, but in 2005 a rainy summer season provided suitable habitats for specialized dragonflies. Records and/or evidence of reproduction were given for *Ischnura pumilio*, *Aeshna affinis*, *Sympetrum danae*, *S. flaveolum*, *S. fonscolombii*, and *S. pedemontanum* and discussed.] Address: Westermann, K., Buchenweg 2, D-79365 Rheinhausen, Germany. E-mail: fosor@t-online.de

6213. Wildermuth, H. (2005): Beobachtungen zur Spätherbst- und Winteraktivität der Gemeinen Winterlibelle (*Sympecma fusca*). *mercuriale* 5: 35-39. (in German). [Switzerland; several records of *S. fusca* between 2002 and 2005 are documented with special emphasis on the microdistribution of temperatures on hibernation habitat compared with air temperatures.] Address: Wildermuth, H., Haltbergstr. 43, CH-8630 Rüti, Switzerland. E-mail: hansruedi@wildermuth.ch

6214. Zessin, W. (2005): Hund als Eiablageplatz einer Edellibelle (Insecta, Odonata, Aeshnidae). *Virgo*, Mitteilungsblatt des Entomologischen Vereins Mecklenburg, 8(1): 67. (in German). [Mecklenburg-Vorpommern, Germany; in July 2004, a female *Aeshna cyanea* (unsuccessfully) tried to oviposit into the black shining fleece of a dog.] Address: Zessin, W., Lange Str. 9, D-19230 Jasnitz, Germany. E-mail: zessin@zoo-schwerin.de

6215. Paunovic, M.; Simic, V.; Jakovcev-Todorovic, D.; Stojanovic, B. (2005.): Results of investigating the macroinvertebrate community of the Danube river on the sector upstream from the Iron Gate (km 1083-1071). *Arch. Biol. Sci.*, Belgrade, 57(1): 57-63. (in English, with Serbian summary). ["The present work cites results of investigating aquatic macroinvertebrates of the Danube River on the sector upstream from the Iron Gate (KM 1083-1071). The investigated part is interesting from the hydrobiological standpoint above all due to differences of faunal composition in relation to higher sections that could be expected in view of differences in overall characteristics of the river. A rich macroinvertebrate community (84 taxa) was observed. The diversity of taxa is primarily a result of habitat diversity within the given stretch. Oligochaeta and Mollusca were the principal components." (Authors) *Pyrhosoma nymphla*, *Stylurus flavipes*, and *Onychogomphus forcipatus* are listed.] Address: Paunovic, M., Siniša Stankovic Institute for Biological Research, 11000 Belgrade, Serbia and Montenegro

6216. Baker, R.A. (2006): Mites on Odonates: Some early accounts and records (to 1950) from Britain. *J. Br. Dragonfly Society* 22(2): 54-57. (in English). ["Parasitic larval mites are found on the wings and bodies of odonates and exploit their hosts for food and dispersal. This has been known for over 250 years although early records show that the true relationship was misunderstood. Dragonfly and damselfly hosts are recorded from early records." (Author) This paper also contains some very interesting notes on the biography of Robert McLachlan and Robert John Tillyard] Address: Baker, R.A., Faculty of Biological Sciences, University of Leeds, Leeds, West Yorkshire LS2 9JT, UK

6217. Barrera Escorcia, H.; Villeda-Callejas, M.P.; Lara-Vázquez, J.A. (2006): El vuelo de las libéllulas y su utilización en la tecnología. *Revista Chapingo Serie Ciencias Forestales y del Ambiente* 12(1): 31-37. (in Spanish, with English summary). ["Dragonflies' flight, characterized by its peculiar pace and strength, has developed a particular interest in the study of their thoracic muscular structure and its wings' constitution and shape. Due to these features, the advances in the analysis of their flight have significantly contributed to aeronautical and robotic technology." (Authors)] Address: Villeda-Callejas, M.P., Laboratorio de Zoología2; FES-Iztacala, UNAM. Av. de los Barrios Núm. 1, Los Reyes Iztacala. C. P. 54090

6218. Barreto, A.P.; Aranha, J.M.R. (2006): Diet of four species of Characiforms in an Atlantic Forest stream, Guaraqueçaba, Paraná, Brazil. *Rev. Bras. Zool.* 23(3): 779-788. (in Portuguese, with English summary). ["In the present study we analyzed seasonal changes in the diet, feeding behavior and food resource partitioning between juveniles and adults of four characiform species in an Atlantic Rainforest stream of the northern coast of the State of Paraná, Brazil. Samples were collected monthly between September, 1999 and August, 2000 using a variety of capture techniques and underwater observations. In general, full stomach contents were more common in juveniles than in adults. *Deuterodon langei* Travassos, 1957 was classified as an omnivorous species, with a tendency toward herbivory, *Characidium lanei* Travassos 1967 was classified as an insectivore, with a tendency toward larvophagy, *Hyphessobrycon griemi* Hoedeman, 1957 was classified as an omnivore, and *Mimagoniates microlepis* Steindachner, 1876 was classified as an insectivore, with a predominance of allochthonous insects. Juveniles and adults of all studied species showed low selectivity and high opportunism in their food selection. The high frequency of allochthonous food items in stomach contents underscores the importance of marginal vegetation in their diets, being essential for the integrity of these environments and for the preservation of coastal stream fish communities." (Authors) *C. lanei* and *M. microlepis* also feed on Odonata larvae.] Address: Barreto, A., Pontifícia Universidade Católica do Paraná, Campus Toledo, Avenida da Uniao 500, Jardim Coopagro, 85902-532 Toledo, Paraná, Brasil. E-mail: almirbarreto@pucpr.br

6219. Beutel, R.G.; Gorb, S.N. (2006): A revised interpretation of attachment structures in Hexapoda with special emphasis on Mantophasmatodea. *Arthropod*

Systematics and Phylogeny 64(1): 3-35. (in English). [Characters of hexapod attachment structures were analysed cladistically together with 110 additional morphological characters of immatures and adults. The results suggest the monophyly of Hexapoda, Ellipura, Diplura + Ectognatha, and Dicondylia. Lepidothrichidae is either the sister group of the remaining Dicondylia or part of a clade Zygentoma. Odonata is the sister group of Neoptera, and Plecoptera possibly the sister group of the remaining neopteran orders. [...]] (Authors)] Address: Gorb, S., Max-Planck-Institut für Entwicklungsbiologie, Spemannstr. 35, D-72076 Tübingen, Germany. E-mail: stas.gorb@tuebingen.mpg.de

6220. Bond, J. G.; Novelo-Gutiérrez, R.; Ulloa, A.; Rojas, J. C.; Quiroz-Martínez, H.; Williams, T. (2006): Diversity, abundance, and disturbance response of Odonata associated with breeding sites of *Anopheles pseudopunctipennis* (Diptera: Culicidae) in southern Mexico. *Environmental Entomology* 35 (6): 1561-1568. (in English). ["Odonate nymphs are important predators of the immature aquatic stages of mosquitoes. Populations of the malaria vector *Anopheles pseudopunctipennis* Theobald (Diptera: Culicidae) can be efficiently reduced by extraction of filamentous algae from river pools in southern Mexico. Here, we examined the influence of this intervention on the diversity of odonates associated with mosquito breeding pools after annual extractions of algae from river pools in a 3-km section of the Coatán River, over a period of 2 yr. Odonate sampling was performed at monthly intervals in control and treated sections of the river for 4-5 mo after extraction in both years and before extraction in 1 yr. In total, 16 species, 10 genera, and 6 families of odonates were collected. Shannon diversity index values declined significantly during a period of 1 mo in 2001 and >5 mo in 2002. However, the abundance of odonates captured was not affected by algal extraction. In contrast, year-to-year variation in the diversity and abundance of the odonate community was strongly influenced by precipitation and river volume. Despite the importance of algae in river ecology, we conclude that the mosquito control intervention resulted in minimal impact on the odonate community in southern Mexico." (Authors)] Address: Novelo-Gutiérrez, R., Departamento de Entomología, Instituto de Ecología A.C., Km 2.5. antigua carretera a Coatepec, Aparato Postal 63, 91000 Xalapa, Veracruz, Mexico. E-mail: novelor@ecologia.edu.mx

6221. Boudot, J.-P. (2006): Mise au point concernant la publication de François Meurgey sur la faune des Odonates du département des Pyrénées-Orientales. *Martinia* 22(4): 191-193. (in French, with English summary). [France; the author rectifies and completes, on the basis of data already published, the informations presented by F. Meurgey in an article mentioning new species in Pyrénées-Orientales department (*Martinia* 22(2) : 64). This refers to *Sympetma fusca* and *Libellula fulva*.] Address: Boudot, J.-P., Centre de Pédologie Biologique, 17, rue Notre-Dame de Pauvres, B.P. 5, F-54501 Vandoeuvre-lès-Nancy, France. e-mail: boudot@cpb.cnrs-nancy.fr

6222. Buczyńska, E.; Buczyński, P. (2006): Aquatic insects (Odonata, Coleoptera, Trichoptera) of the central part of the "Krowie Bagno" marsh: the state before restoration. *Annales Universitatis Mariae Curie-Skłodowska Lublin - Polonia LXI, 2 Sectio C*: 71-88. (in English, with Polish summary). ["In 2003 the assemblages

of selected aquatic insects (dragonflies, beetles, caddisflies) were studied within two lakes surrounded by a transitional peat bog» and a canal and ditches situated in the meliorated fen» The influence of melioration and peat bog degradation on entomofauna, its present status and the role of "Krowie Bagno" as a refugium of special care species were analysed. Thirty-seven dragonfly species, 75 beetle species, 21 caddisfly species were found. 12 special care and 8 indicator species were recorded. The fauna of lakes was typical of polyhumic ones, however, the changes associated with drying out and early stage of eutrophication were clearly seen in case of caddisfly assemblages. Melioration ditches turned out to be a refuge for the species connected with completely vanished at the study area sedge bogs. Deep and rich in vegetation canal was the main habitat for lacustrine caddisfly species. Such fauna is the result of natural water recession» transformation of the remaining ones as well as creating anthropogenic waters. "Krowie Bagno" is still the refuge of many valuable species and assemblages typical of dystrophic waters. Nevertheless, they are still endangered, some of them are partially on the wane. The aim of the «naturalization activities like free cutting, raising the level of irrpoundage conducted after 2003 is to prevent the fauna, In several years, the next planned inventory of entomofauna will discover whether such activities improve ecological relationships of the studied area or not." (Authors)] Address: Buczyński, P., Dept of Zool., Maria Curie-Skłodowska University, Akademicka 19, PL-20-033 Lublin, Poland. E-mail: pbuczyns@biotop.umcs.lublin.pl

6223. Buczyński, P.; Dijkstra, K.D.; Mauersberger, R.; Moroz, M.D. (2006): Review of the Odonata of Belarus. *Odonatologica* 35(1): 1-13. (in English) ["The literature on the Belarussian Odonata is summarised and a checklist of 60 species is provided. The record of *Coenagrion mercuriale* is not accepted as it probably pertains to a misidentified larva. The occurrence of the listed species is specified for the 6 provinces of the state. The fauna contains 3 boreal elements, *Coenagrion johanssoni*, *Aeshna caerulea* and *A. crenata*. 14 species are listed as potential additions, some of these, almost exclusively southern species, have been recorded so close to the border that their presence in Belarus is almost certain. Belarus is expected to be a stronghold for many species, which are threatened in western Europe." (Authors) Address: Buczyński, P., Dept Zool., Maria Curie-Skłodowska University, Akademicka 19, PL-20-033 Lublin, Poland. E-mail: pbuczyns@biotop.umcs.lublin.pl

6224. Cham, S. (2006): Aspects of dragonfly flight behaviour revealed by digital still photography. *J. Br. Dragonfly Society* 22(2): 41-53. (in English). ["Photography of free flying dragonflies reveals aspects of their behaviour that are not possible under controlled conditions. By using modern digital still cameras, with high resolution and rapid autofocusing, new opportunities for flight photography can be realised in the field." (Author)] Address: Cham, S., 24 Bedford Avenue, Silsoe, Bedford, MK45 4ER UK. E-mail: SteveCham1@compuserve.com

6225. Cham, S. (2006): In-flight cleaning behaviour by male Migrant Hawkers, *Aeshna mixta* Latreille. *J. Br. Dragonfly Society* 22(2): 33-35. (in English). [The author describes the use of the abdomen and legs as

part of a sequence of cleaning behaviour performed by male *A. mixta* while flying.] Address: Cham, S., 24 Bedford Avenue, Silsoe, Bedford, MK45 4ER UK. E-mail: SteveCham1@compuserve.com

6226. Cham, S. (2006): Development and hatching of eggs of the Common Darter, *Sympetrum striolatum* (Charpentier). *J. Br. Dragonfly Society* 22(2): 36-40. (in English). ["Eggs of *S. striolatum* develop and hatch in less than two weeks. During this time they are protected by a gel-like mass that surrounds them. Differences in the process of hatching are described." (Author)] Address: Cham, S., 24 Bedford Avenue, Silsoe, Bedford, MK45 4ER UK. E-mail: SteveCham1@compuserve.com

6227. Chang, J.-p.; Sun, Z.-s. (2006): New taxa of Gomphidae (Insecta: Odonata) in Jehol Biota from western Liaoning, China. *Global geology* 25(2): 105-111, 1 plate. (in Chinese, with English summary). [The authors describe and figure a new genus and species *Liaoningianthis latus* gen. et sp. nov., and *Liaoninglanthus* sp.. In addition, *Liogomphus yixianensis* Ren et Gao, 1996 is described in detail. All the insect fossils are collected from the lower part of the Yixian Formation (uppermost Jurassic" lower Cretaceous) in Huangbanjigou of Beipiao, western Liaoning, China.] Address: Chang, J.-p., College of Earth Sciences, Jilin University, Changchun 130061, Jilin, China

6228. Clausnitzer, V. (2006): Dragonflies (Odonata) of Rufiji district, Tanzania with new records for Tanzania. *Journal of East African Natural History* 95(2): 139-162. (in English) ["The dragonfly fauna of the Rufiji District was studied during several field trips in 2001–2003 covering the rainy and the dry season. A total of 73 species was recorded by capture with net and visual identification of imagos. *Ceriagrion mourae* was seen for the first time since its description from Mozambique in 1969. *Ceriagrion mourae*, *Teinobasis alluaudi*, *Gynacantha immaculifrons*, *Paragomphus magnus* and *Paragomphus sabcicus* are first records for Tanzania. *Coryphagrion grandis*, *Ceriagrion mourae*, *Teinobasis alluaudi* and *Hadrothemis scabrifrons* are globally endangered habitat specialists confined to coastal forests of Eastern Africa. The majority of the species are common and widespread and inhabits the Rufiji River and its floodplains, while a smaller proportion are only found in permanent streams draining into the Rufiji or in forest habitats. The high overall species richness is a result of the variety of habitats and their connectivity, combined with the dynamics of the floods. The habitat specialists found in Ngumburuni forest and in the forests of the Kichi and Kiwengoma Hills are globally endangered species and require special attention with regard to conservation." (Author)] Address: Clausnitzer, Viola, Graefestr. 17, D-06110 Halle/Saale, Germany. E-mail: violacl@t-online.de

6229. Corbet, P.S. (2006): Forests as habitats for dragonflies (Odonata). In: Rivera, AC (Ed). 2006. Forests and Dragonflies. 4th WDA Symposium of Odonatology, Pontevedra, Spain, July 2005. Pensoft Series Faunistica 61: 13-36. (in English). ["The ways in which forests can be inferred, or shown, to meet the habitat requirements of dragonflies are reviewed globally. The relationship between dragonflies and forests is examined along a latitude spectrum in the Northern Hemisphere, from the Arctic Circle to the equator, a tran-

sect along which species diversity progressively increases, and the microclimate within forest becomes steadily more permissive for occupancy by the several stages in the dragonfly life history. In mid-temperate latitudes dragonflies use forests mainly for aestivation as pre-reproductive adults, a strategy functionally similar to the siccation exhibited by tropical dragonflies in seasonal-rainfall regions. Tropical rainforest is the planet's most diverse terrestrial ecosystem, with regard to species and habitats. It provides habitats for many species of dragonflies, for some or all of their life- history stages. Many such species, and their behaviour and ecology, remain undescribed. For biologists, including odonatologists, the foremost challenge of our time is that this irreplaceable storehouse of biological information faces imminent threat of destruction before its contents can be placed on record." (Author)] Address: Corbet, P.S., Crean Mill, Crean, St Buryan, Cornwall, TR19 6HA, UK. E-mail: philipcorbet@yahoo.co.uk

6230. Cordero Rivera, A. (Ed.) (2006): Forest and Dragonflies, 4th WDA Symposium of Odonatology, Pontevedra, Spain, July 2005. ISBN: 9546422789. Faunistica 60: 300 pp. [Contents: Cordero Rivera, A.: Introduction - Corbet, P.S.: Forests as habitats for dragonflies (Odonata) - Graca, M.: Allochthonous organic matter as a food resource for aquatic invertebrates in forested streams. The importance of forests for dragonflies in different continents - Orr, A.G.: Odonata in Bornean tropical rain forest formations: diversity, endemicity and implications for conservation management - Paulson, D.: The importance of forests to neotropical dragonflies - Fincke, O.M.: Use of forest and tree species, and dispersal by giant damselflies (Pseudostigmatidae): future prospects in fragmented forests - Dijkstra, K.-D. & Clausnitzer, V.: Thoughts from Africa: how can forest influence species composition, diversity and speciation in tropical Odonata? - Sahlen, G.: Specialists vs. generalists among dragonflies - the importance of forest environments in the formation of diverse species pools - Tsubaki, Y. & N. Tsuji: Dragonfly habitat maps based on landcover and habitat relation models. Conservation and behavioral issues - Samways, M.: Threat levels to odonate assemblages from invasive alien tree canopies - Taylor, Ph.: Movement behaviours of a forest odonate in two heterogeneous landscapes - Thompson, D.J. & Watts, Ph.C.: The structure of the *Coenagrion mercuriale* populations in the New Forest, southern England - Watanabe, M.: Mate location and competition for mates in relation to sunflecks of forest floors - Cordoba-Aguilar, A. & Contreras-Garduno, J.: Differences in immune ability in forest habitats of varying quality: dragonflies as study models - Hadrys, H. The present role and future promise of conservation genetics for forest Odonates.] Address: Pensoft Publishers, Geo Milev Str. No. 13a, 1111 Sofia, Bulgaria. <http://www.pensoft.net>

6231. Dijkstra, K.D.; Clausnitzer, V. (2006): Thoughts from Africa: how can forest influence species composition, diversity and speciation in tropical Odonata?. Forests and Dragonflies. Fourth WDA International Symposium of Odonatology, Pontevedra (Spain), July 2005: 127-151. (in English). ["We introduce tropical African forests and their Odonata, and speculate how climatic oscillations and associated large-scale habitat shifts may have governed speciation across the forest-savanna ecotone, presenting several hypothetical scenarios. Ecological traits of forest species and possible reasons for their disappearance when forest is opened up are

discussed. We believe that low insolation in forest habitats and interspecific competition are key factors segregating forest and non-forest species. While openland species cannot cope with low insolation inside the forest, forest species have evolved a slow lifestyle to cope with the forest environment, but are out-competed by more aggressive non-forest species beyond forest borders. Casual field observations support this hypothesis, although the reality is likely to be more complex. Phylogenetic reconstruction of groups that straddle the habitat divide, linked to ecological observations, may elucidate evolutionary reactions to landscape change. The reaction of odonate assemblages to forest loss is studied easily in Africa's imperilled forests. Because many of these forests are believed to be relatively young and highly forest-adapted species may have very low dispersal capacities, comparative ecological research of 'forest-dependent' odonate assemblages inside and outside ancient forest refugia is recommended." (Authors)] Address: Dijkstra, K.D., Gortestraat 11, NL-2311 MS Leiden, The Netherlands. E-mail: Dijkstra@naturalis.nnm.nl

6232. Dommanget, J.-L. (2006): Rubrique bibliographique. *Martinia* 22(4): 194-196. (in French). [Titles from 2004 to 2006 on French odonatology are considered.] Address: Dommanget, J.-L., 7, rue Lamartine, F-78390 Bois-d'Arcy, France

6233. Dyatlova, E.S. (2006): The Odonata of southwestern Ukraine. *Opusc. zool. flumin.* 221: 1-15. (in English). ["Based on literature and on the 2002-2005 surveys, 54 species are listed from 43 localities. New records are provided for 43 species. *Coenagrion scitulum* and *Sympetrum pedemontanum* are new to the region. The occurrence of *Calopteryx splendens ancilla* on the lower Danube (cf. A.N. Bartenev, 1912, *Ezhegod. zool. muz. imp. Akad. Nauk* 17: 281-288) is confirmed. *Erythromma lindenii*, hitherto known from the lower Danube, is recorded also from the Dnieper and Dniester basins. The SW Ukrainian populations of *Orthetrum coerulescens* are referable to *O. c. anceps*." (Author)] Address: Dyatlova, Elena, Department of Zoology, Faculty of Biology, Odessa National University, Dvoryanskaya 2, UKR-65026 Odessa, The Ukraine. E-mail: odonata@ukr.net

6234. Ellenrieder, N. von; Garrison, R.W. (2006): Rediscovery of *Oxyagrion bruchi* Navás from Argentina, with a description of its larva (Odonata: Zygoptera: Coenagrionidae). *The Pan-Pacific Entomologist* 83(3/4): 362-374. (in English, with Spanish and French summaries). ["*O. bruchi* is redescribed, illustrated, and diagnosed. A neotype is designated. The larva is described and compared with other known sympatric species of the genus." (Authors)] Address: Ellenrieder, Natalie von, Museo de Ciencias Naturales, Universidad Nacional de Salta, Mendoza 2, Salta 4400, Argentina. E-mail: odonata@hotmail.com

6235. Faucheux, M.J. (2006): Les organes sensoriels des antennes larvaires de Libellules: les propriocepteurs et les vibrorécepteurs d'*Erythromma lindenii* (Sélys, 1840) (Odonata Zygoptera: Coenagrionidae). *Bull. Soc. Sc. Nat. Ouest de la France, nouvelle série* 28(3): 153-159. (in French, with English summary). ["The larval antennae of *E. lindenii* are short and made up of a scape, a pedicel and a fourth-segmented flagellum. They bear four types of aporous and exclusively

mechanoreceptive sensilla: spatula-shaped sensilla chaetica, curved sensilla chaetica, sensilla filiformia and sensilla campaniformia. The curved sensilla chaetica are proprioceptors which monitor the relative position of the 3rd and 4th flagellomeres. Sensilla filiformia are vibration receptors which play the major role in prey detection. The unique sensillum campaniformium on the pedicel is a proprioceptor which informs the larva of the position of the flagellum relative to the pedicel. Spatula-shaped sensilla chaetica are tactile receptors distributed on the scape and the pedicel. No chemoreceptive sensilla has been observed on the antennae." (Author) Address: Faucheux, M.J., Laboratoire d'Endocrinologie des Insectes Sociaux, Université de Nantes, 2 rue de la Houssinière, B.P. 92208, F-44322 Nantes Cedex 03, France. E-mail: faucheux.michel@free.fr

6236. Faucheux, M.J.; Meurgey, F. (2006): L'antenne larvaire de *Chalcolestes viridis* Van der Linden, 1825 (Insecta: Odonata: Zygoptera: Lestidae): morphologie et sensilles, comparaison avec les autres Zygoptères. *Bull. Soc. Sc. Nat. Ouest de la France, nouvelle série* 28(3): 160-167. (in French, with English summary). ["The larval antenna of *C. viridis* is made up of a scape, a pedicel and a flagellum comprising 5 segments. It bears two types of aporous sensilla: the sensilla filiformia and the curved sensilla chaetica. The sensilla filiformia appear with the scape; they are numerous on the two surfaces of the pedicel and the 5 flagellomeres. These mechanoreceptive sensilla, of different lengths, react to the slightest vibrations produced in the water by the appearance of prey; they are vibrorécepteurs. It is the second time that the curved sensilla chaetica, whose role is proprioceptive, are observed in the zygopteran larvae, these sensilla being unknown in other insects, whether larvae or adults. In *C. viridis*, they are located on the distal parts of flagellomères 1,2,3 and 4, and they record the relative position of the flagellomere with regard to one another. A comparison is carried out with the larval sensory equipment of *Erythromma lindenii* which has been previously studied." (Authors)] Address: Meurgey, F., Muséum d'Histoire naturelle de Nantes, 12, rue Voltaire, F-44000 Nantes, France. E-mail: Francois.Meurgey@mairie-nantes.fr

6237. Ferreira, S.; Grosso-Silva, J.M.; Sousa, P. (2006): Miscellaneous records of dragonflies (Odonata) from continental Portugal - II. *Boletín Sociedad Entomológica Aragonesa* 38: 321-322. (in English, with Spanish summary). ["The known distribution of 34 dragonfly species is extended in continental Portugal. Six species are recorded for the first time from Alvão Natural Park, *Diplacodes lefebvrei* is recorded for the first time from Sudoeste Alentejano and Costa Vicentina Natural Park, and *Coenagrion mercuriale* from Douro Internacional Natural Park." (Authors)] Address: Ferreira, Sónia, CIBIO/UP - Centre de Investigate) em Biodiversidade e Recursos Genéticos, Universidade do Porto, Campus Agrário de Vairão, P-4485-661 Vairão, Portugal. E-mail: hiporame@gmail.com

6238. Ferreira, S.; Grosso-Silva, J.M. (2006): On the dragonflies of Portugal - Study of a collection from the 1980s (Insecta, Odonata). *Boln. Asoc. esp. Ent.* 30 (3-4): 11-23. (in English, with Spanish summary). ["This work presents data regarding 42 species of dragonflies collected in various regions of Portugal in the 1980s. Comments are given on the relevance of the records based on current knowledge of the country's Odonata."]

(Authors)] Address: Ferreira, Sónia, CIBIO/UP - Centre de Investigate) em Biodiversidade e Recursos Genéticos, Universidade do Porto, Campus Agrário de Vairao, P-4485-661 Vairão, Portugal. E-mail: hiporame@gmail.com

6239. Ferreira, S.; Grosso-Silva, J.M.; Lohr, M.; Weihrauch, F.; Jödicke, R. (2006): A critical checklist of the Odonata of Portugal. *International Journal of Odonatology* 9(2): 133-150. (in English). ["The Odonata checklist of continental Portugal, Madeira and the Azores includes 65 species. Besides *Sympetrum nigrifemur*, an endemic of Madeira and the Canary Islands, and the unique population of the Nearctic *Ischnura hastata* in the Azores, the species composition reflects a higher proportion of western Mediterranean and Ethiopian elements than any other European country. An isolated occurrence of *Coenagrion pulchellum* was confirmed. Due to obvious misidentifications and to the loss of voucher specimens of questionable species, 22 taxa were rejected. Future records of additional species are predicted." (Authors)] Address: Ferreira, Sónia, CIBIO/UP - Centre de Investigate) em Biodiversidade e Recursos Genéticos, Universidade do Porto, Campus Agrário de Vairao, P-4485-661 Vairão, Portugal. E-mail: hiporame@gmail.com

6240. Fincke, O.M. (2006): Use of forest and tree species, and dispersal by giant damselflies (*Pseudostigmatia*): future prospects in fragmented forests. In: Rivera, AC (ED). 2006. *Forests and Dragonflies*. 4th WDA Symposium of Odonatology, Pontevedra, Spain, July 2005. *Pensoft Series Faunistica* 61: 103-125. (in English). ["Phytotelmata, or water-filled plant containers, provide an important aquatic habitat in tropical forests typically depauperate of permanent ponds and lakes. As top predators in these microhabitats, species of *Pseudostigmatidae* offer a rare opportunity to measure the effects of forest plant species on the abundance and distribution of their aquatic occupants. Like the specialists of bromeliads, which depend on the presence of a small group of epiphytic plants, odonates ovipositing in water-filled tree holes and fruit husks require a non-random assortment of tree sizes and species. The size and density of microhabitats ultimately affect larval abundance, although, for most species, it remains unclear how closely adult recruitment tracks larval survivorship. Within its geographic range, *Megaloprepus* relies more heavily on primary forests than do species of *Mecistogaster* that are adapted to dryer conditions and hence are more tolerant of secondary and highly disturbed forests. An experiment with *Megaloprepus* revealed that it exhibited relatively low flight endurance, particularly in females, which rarely dispersed across open areas. Recent comparative work challenges the status of *Megaloprepus* as a monospecific genus, and suggests that many *pseudostigmatid* populations may be highly structured genetically. The larval ecology and adult behavior of *Megaloprepus* suggest that its populations should be more highly structured than those of the more vagile tree-hole aeshnids. Collectively, the data reviewed here suggest that forest fragmentation, exacerbated by less predictable threats from global warming, may pose a greater threat to *Megaloprepus* and similar species such as *Microstigma rotundatum*, than to species of *Mecistogaster*. The fate of all *pseudostigmatids* is intimately tied to that of the plant species harboring them. As predators of phytotelm mosquito larvae, some of which are disease vectors, the demise of pseudo-

stigmatids may affect not only forest food chains, but also human health." (Author)] Address: Fincke, O.M., Dept Zool., Univ. Oklahoma, 730 Van Vleet Oval, Room 314, Norman, OK 73019, USA. E-mail: fincke@ou.edu

6241. Guerbaa, K.; Lolive, N. (2006): Redécouverte de *Libellula fulva* Müller, 1764 en Limousin (Odonata, Anisoptera, Libellulidae). *Martinia* 22(4): 172. (in French). [France; 4 VI 2005 Cromac; 9 VI 2005 Razès] Address: Guerbaa, K., Société Limousine d'Odonatologie, 11, rue Jauvion, F-87000 Limoges, France

6242. Hämäläinen, M. (2006): *Vestalaria vinnula* spec. nov. from southern Vietnam (Odonata: Calopterygidae). *Zool. Med. Leiden* 80(4): 87-90. (in English). ["*Vestalaria vinnula* spec. nov.; holotype male, southern Vietnam, Lam Dong province, Blao, 1962) is described in both sexes and compared with other species of *Vestalaria* May, 1935 (= *Vestalis smaragdina*-group), which is ranked as valid genus." (Author)] Address: Hämäläinen M., Dept Applied Zool., P.O.Box 27, FIN-00014 University of Helsinki, Finland; E-mail: matti.hamalainen@helsinki.fi

6243. Hämäläinen, M. (2006): Suppusiipisestää pikkutyöstäkö uusi liito-orava? *Luonnon Tutkija* 110(3): 101-104. (in Finnish). [A critical discussion of the status of *Sympecma paedisca* as a species listed in the EU's Habitats Directive, given its widespread occurrence in Eastern Europe and recent northward dispersal in the Baltic States. In Finland migrant specimens, being able to overwinter successfully, have been recorded frequently along the southern coastline since 2004. The first confirmed record was made in August 2002. Most likely *S. paedisca* will become established in southern Finland in the near future. The controversy of the EU Habitat Directive requirements and the local 'non-redlisted' status of some other Finnish dragonfly species is pointed out. The absence of *Nehaeniina speciosa* from the listed EU's Habitats Directive species is queried. The text and illustrations of this article are available at <http://korento.net/Suppusiipisesta.pdf>. Matti Hämäläinen] Address: Hämäläinen M., Dept Applied Zool., P.O.Box 27, FIN-00014 University of Helsinki, Finland; E-mail: matti.hamalainen@helsinki.fi

6244. Honcu, M.; Roztocil, O. (2006): Faunistic finds of dragonflies (Odonata) made during the excursions of the VIII. allstate meeting of odonatologists in Juni 2005 in the Žďárské vrchy – hills (Czech Republic). *Vážky 2005 : sborník referátu VIII. celostátního semináře odonatologu ve Žďárských vrších: seminár usporádaly ve dnech 23.-26.6.2005 Správa CHKO Žďárské vrchy, ZO CSOP Vlašim a Vlastivedné muzeum a galerie v České Lípe / editor sborníku Lubomír Hanel. - Vyd. 1. - Vlašim: ZO CSOP Vlašim, 2006. ISBN 80-86327-52-3: 7-14. (in Czech, with English summary). [Records of 26 species including *Leucorrhinia pectoralis*, *Somatochlora arctica*, *Leucorrhinia rubicunda*, and *Coenagrion hastulatum* are documented.] Address: Honcu, M., Vlastivedné muzeum v České Lípe, náměstí Osvobození 297, 470 01 Česká Lípa, Czech republic. E-mail: honcu@muzeum.clnet.cz*

6245. Hooper, R.E.; Plaistow, S.J.; Tsubaki Y. (2006): Signal function of wing colour in a polymorphic damselfly, *Mnais costalis*. *Odonatologica* 35(1): 15-22. (in English). ["*Mnais costalis* males exist in 2 forms specialised for the demands of 2 distinct strategies, territorial fighters and non-territorial sneaks, which give approxi-

mately equal fitness payoffs. Territorial males have orange wings, whereas typical non-territorial males are clear-winged. By simulating agonistic encounters between males it is shown that the 2 morphs showed distinct responses to the signal from orange wings: territorial orange-winged males always tried to enter contests, while clear-winged males always avoided them. On the other hand, the 2 morphs showed similar responses to the signal from clear wings: both morphs tried to attack models. Also presented are 'painted clear models' which were clear-winged males whose wings had been painted orange, and both morphs responded as if they were orange-winged models. These observations indicate that males discriminate between fighter and sneaker morphs using the colour of wings, and shows different styles of agonistic responses toward fighter and sneaker morphs. It is likely that non-territorial sneaks may gain an advantage from non-signalling because clear wings increase crypsis on another male territory, increasing their success in stealing copulations. No indication was found that clear-winged males are female mimics, or that having clear wings reduced the level of aggression directed towards them by territorial orange-winged males.] Address: Tsubaki, Y., Biodiversity Conservation Research Group, National Institute for Environmental Studies, Tsukuba 305-0053, Japan. E-mail: tsubaki@nies.go.jp

6246. Ishizawa, N. (2006): Changes of body temperatures in *Sympetrum frequens* (Selys) reproductive pairs (Anisoptera: Libellulidae). *Odonatologica* 35(1): 23-29 (in English) [The reproductive behaviour was divided into four phases: perching (phase I), less than 1 min from the start of copulation (phase II), more than 3 min from the start of copulation (Phase III) and more than 1 min from the start of oviposition (phase IV). The body temperature (Tb) of the male was highest in phase III, while in the female Tb was not significantly different among phases. The changes of Tb are different between the sexes, however, they are both influenced largely by the wind as well as by the air temperature, and particularly in the male the effect seems to be larger than in the ♀, possibly because of its smaller body size."(Author). Address: Ishizawa, N., 1644-15, Yamaguchi, Tokorozava City, Saitama Pref., Japan. E-mail: isizawa7@rivo.mediatti.net

6247. Jacquemin, G. (2006): The use of binoculars to identify adult Odonata. *J. Br. Dragonfly Society* 22(1): 29-32. (in English). ["Many current odonatological surveys are carried out by naturalists with a background in ornithology who employ the same visual identification methods as used by many birdwatchers. Identifications based solely on observation through binoculars must be treated cautiously and, whenever possible, should be supported by checking diagnostic features on captured specimens, which subsequently can be released. Identification keys designed for use with binoculars are of limited value and, considering the risk of misidentification, records based solely on binocular observation by inexperienced observers cannot be relied upon." (Author)] Address: Jacquemin, G., Biologie des Insectes, Université H. Poincaré, Nancy 1, BP 239, F-54506 Vandoeuvre-lès-Nancy, France

6248. Johannson, F.; Strasevicius, D. (2006): Trollsländor i helgolandsfällan på Stora Fjäderägg hösten 2005. *Natur i Norr* 25(1): 25-26. (in Swedish). [Sweden; in September 2005, *Aeshna juncea*, *A. caerulea*, *A.*

grandis, *Sympetrum vulgatum*, and *S. danae* were caught in Heligoland traps.] Address: Johannsson, F., Department of Ecology and Environmental Science, Animal Ecology Group, Umea University, 90187 Umea, Sweden. E-mail: frank.johansson@eg.umu.se

6249. Jourde, P.; Lалуque, O. (2006): Comportement territorial et ponte en milieu lentique chez *Macromia splendens* (Pictet, 1843) dans le centre-ouest de la France (Odonata, Anisoptera, Macromiidae). *Martinia* 22(4): 187-190. (in French, with English summary). ["*M. splendens* is a recent discovery in Charente-Maritime. Its breeding habitats are currently under investigation in the central west region of France, which appears to be the most northerly limit for the species. During the study, a breeding site in lentic conditions was identified, whereas the species is generally considered only to reproduce in lotic environments." (Authors)] Address: Jourde, P., LPO, La Corderie Royale, BP 90263, F-17305 Rochefort, France. E-mail: philippe.jourde@lpo.fr

6250. Jovic, A.; Paunovic, M.; Stojanovic, B.; Milosevic, S.; Nikolic, V. (2006): Aquatic invertebrates of the Ribnica and Lepenica rivers: composition of the community and water quality. *Arch. Biol. Sci., Belgrade* 58 (2): 115-119. (in English). ["Results of investigating the community of aquatic invertebrates in the Ribnica and Lepenica Rivers (Kolubara River drainage area) are given in the present work. Forty-three taxa are recorded. In relation to other studied streams in Serbia, the investigated rivers are characterized by high diversity of macroinvertebrates. Cluster analysis indicates that the locality on the Lepenica stands apart from those on the Ribnica, which is a consequence of the difference of habitats found at them. Results of saprobiological analysis of the macrozoobenthos in the given rivers indicate that their waters belong to quality classes I and II." (Authors) Three odonate taxa are listed: *Gomphus vulgatisimus*, *Calopteryx virgo*, and *Calopteryx* sp.] Address: Jovic, A., Siniša Stankovic Institute for Biological Research, 11060 Belgrade, Serbia and Montenegro

6251. Knijf, G. de (2006): Libellen in België. Nieuwe kennis voor een beter beheer van hun leefgebieden. *Natuur.focus* 5(4): 129-134. (in Dutch). ["In this contribution we report on some results of the recently published book on Belgian Odonata, which is based on >65.000 observations. After setting the historical context, we first present some general results for the 69 Belgian species, e.g. the overall coverage and some changes in species composition. Especially the strong increase in several southern species is striking. The Campine region is the area with the highest species density and the only region in Flanders where nearly all Red List species occur. This list contains 17 species (or 26%) which fit into the categories 'endangered by extinction', 'endangered', and 'vulnerable'. Most Red list species live either in moderately base-rich or mesoeutrophic waters and in poor or oligotrophic fens. In a next part we give some recommendations for a better proper management of aquatic habitats. Finally we stress on the urgent necessity to start with a monitoring scheme for dragonflies in Flanders." (Authors)] Address: Knijf, G. de, Instituut voor Natuurbehoud, Kliniekstraat 25, B-1070 Brussel, Belgium. E-mail: geert.deknijf@inbo.be

6252. Kognitzki, S.; Westermann, K. (2006): Erste Bodenständigkeitsnachweise der Fledermaus-Azur-

jungfer (*Coenagrion pulchellum*) im höheren Schwarzwald. *Naturschutz am südlichen Oberrhein* 4(2): 227-228. (in German, with English summary). ["At two ponds situated in the southeastern Black Forest at elevations of 730 resp. 830 m a.s.l., we discovered the first evidence of reproduction of *C. pulchellum* in higher elevations of the Black Forest. These are also the highest known occurrences in Baden-Württemberg, Germany." (Authors)] Address: Westermann, K., Buchenweg 2, D-79365 Rheinhausen, Germany. E-mail: fosor@t-online.de

6253. Kosterin, O.E.; Vikhrev, N.E. (2006): Odonata seen for three days in a populated lowland part of Cambodia. *Malangpo* 21: 212-217. (in English). ["A report about Odonata met during three day long trips to the Siem Reap area of Cambodia on January 7-9, 2006 is given in a form of field notes. 24 species were met with, of which *Heliocypha biforata* (Selys, 1859), *Lestes concinnus* Hagen in Selys, 1862, *Aciagrion borneense* Ris, 1911, *Agriocnemis minima* Selys, 1877, *A. nana* (Laidlaw, 1914), *Ceriagrion praetermissum* Lieftink, 1929, *Diplacodes trivialis* (Rambur, 1842), *Brachydiplax chalybea* Brauer, 1868, *Brachythemis contaminata* (Fabricius, 1793), *Crocothemis servilia* (Drury, 1770), *Neurothemis tullia* (Drury, 1773), *Rhodothemis rufa* (Rambur, 1842) have not been reported for Cambodia in literature (although the published records are very scarce per se)."] Address: Kosterin, O.E., Institute of Cytology and Genetics, Siberian Branch, Russian Academy of Sciences, Lavrentiev Ave 10, RUS-630090 Novosibirsk, Russia. E-mail: kosterin@bionet.nsc.ru

6254. Kriska, G.; Csabai, Z.; Boda, P.; Malik, P.; Horvath, G. (2006): Why do red and dark-coloured cars lure aquatic insects? The attraction of water insects to car paintwork explained by reflection-polarization signals. *Proc. R. Soc. B* (2006) 273: 1667-1671. (in English). ["We reveal here the visual ecological reasons for the phenomenon that aquatic insects often land on red, black and dark-coloured cars. Monitoring the numbers of aquatic beetles and bugs attracted to shiny black, white, red and yellow horizontal plastic sheets, we found that red and black reflectors are equally highly attractive to water insects, while yellow and white reflectors are unattractive. The reflection-polarization patterns of black, white, red and yellow cars were measured in the red, green and blue parts of the spectrum. In the blue and green, the degree of linear polarization p of light reflected from red and black cars is high and the direction of polarization of light reflected from red and black car roofs, bonnets and boots is nearly horizontal. Thus, the horizontal surfaces of red and black cars are highly attractive to redblind polarotactic water insects. The p of light reflected from the horizontal surfaces of yellow and white cars is low and its direction of polarization is usually not horizontal. Consequently, yellow and white cars are unattractive to polarotactic water insects. The visual deception of aquatic insects by cars can be explained solely by the reflection-polarizational characteristics of the car paintwork." (Authors) The paper includes references to Odonata.] Address: Horvath, G., Biooptics Laboratory, Department of Biological Physics, Loránd Eötvös University, 1117 Budapest, Pázmány Péter sétány 1, Hungary. E-mail: gh@arago.elte.hu

6255. Leroy, T. (2006): *Coenagrion lunulatum* (Charpentier, 1825) en France: répartition, abondance, élé-

ments d'écologie et de conservation (Odonata, Zygoptera, Coenagrionidae). *Martinia* 22(4): 151-166. (in French, with English summary). ["Based on a bibliographical analysis and field work realized between 2000 and 2005, this article describes what we know about *C. lunulatum* in France. This mountaneous, shy and rare species is mostly present in Auvergne region, with a short and precocious flight period. The conservation state of these populations, which are of European importance, seems reasonable, although this is a very fragile species and a number of threats remain." (Author)] Address: Leroy, T., Le Bourg, F-63210 Heumeil-Eglise, France. E-mail: thierry-leroy@caramail.com

6256. Levasseur, M. (2006): Découverte d'un Paragomphus sp. sur l'île d'Anjouan Archipel des Comores (Odonata, Anisoptera, Gomphidae). *Martinia* 22(4): 183-186. (in French, with English summary). ["During a short consulting mission on behalf of the Comorian government (form. Islamic Federal Republic, now Comorian Union), the author had the opportunity to prospect several communal water intakes. One of them located at a small dam on a "mro" (little stream) in Anjouan, supported 3 exuviae, 2 of them being immediately attributable to gomphids. After bibliographical search and inquiry to dragonfly specialists of the region, it appears that these exuviae belong to a *Paragomphus* sp. and are the first data concerning gomphids in the Comorian archipelago. To date, these exuviae are still not identified and could be those of a new species for science." (Author)] Address: Levasseur, M., 11 rue du Pont Colbert, F-78000 Versailles, France. E-mail: levasseur@magic.fr

6257. Lingenfelder, U. (2006): Beobachtung der Arktischen Smaragdlibelle - *Somatochlora arctica* (ZETTERSTEDT, 1840) - im südlichen Pfälzerwald (Odonata: Corduliidae). *Fauna Flora Rheinland-Pfalz* 10(4): 1211-1218. (in German, with English summary). ["In 2003, *S. arctica* has been recorded in the southern part of the Palatinate Forest for the first time. Two males of the species could be observed at a valleycomplex southwest of Eppenbrunn near the border to France. The observation is described and locality and date of the observation are briefly discussed." (Author)] Address: Lingenfelder, U., Seebergstraße 1, D-67716 Heltersberg, Germany. E-mail: u.lingenfelder@vr-web.de

6258. Lingenfelder, U. (2006): Nachweise des Zweifelflecks - *Epiheca bimaculata* (CHARPENTIER, 1825) - im Pfälzerwald (Odonata: Corduliidae). *Fauna Flora Rheinland-Pfalz* 10(4): 1219-1247. (in German, with English summary). ["*E. bimaculata* [...] has been recorded at six localities in the Palatinate Forest since 2001. Reproduction evidences were provided at two waters. At one of these localities *E. bimaculata* is established for at least six years. Additional observations of the species in the Palatinate were reported recently from the natural areas „Nördliche Oberrheinebene“ and „Kaiserslauterner Senke“. All known recordings in Rhineland-Palatinate are compiled, findings in the Palatinate region are shown in a distribution map. A short survey of the distribution of the species in adjoining regions is also given here. In conclusion, habitats, distribution and status in the Palatinate Forest are discussed shortly as well as problems in recording the species, of dispersal and threats." (Author)] Address: Lingenfelder, U., Seebergstraße 1, D-67716 Heltersberg, Germany. E-mail: u.lingenfelder@vr-web.de

- 6259.** Lolive, P., Kleefstra, V (2006): Découverte d'une nouvelle population à *Epitheca bimaculata* (Charpentier, 1825) en Limousin (Odonata, Anisoptera, Corduliidae). *Martinia* 22(4): 166. (in French). [21 V 2006, near Thouron (87), France, 4 exuviae; the next known locality is situated 34 km north of Thouron.] Address: Lolive, P., Société Limousine d'Odonatologie, 11 rue Jauvion, F-87000 Limoges, France.
- 6260.** Machado, A.B.M. (2006): Three new species of Heteragrion Selys, from Brazil with redescription of the holotype of *H. dorsale* Selys (Odonata, Megapodagrionidae). *Revista Brasileira de Zoologia* 23(4): 1062-1070. (in English, with Portuguese summary). [*Heteragrion luizfelipei* sp. nov. from Santa Catarina, *H. gracile* sp. nov. from Minas Gerais, and *H. mantiqueira* sp. nov. from São Paulo are described and illustrated. The color and structural characters that distinguish these species from those of Selys group 2 are discussed. The holotype of *H. dorsale* Selys, 1862 is redescribed and illustrated." (Author)] Address: Machado, A.B.M., Departamento de Zoologia, Inst. Cienc. Biol., Universidade Federal de Minas Gerais, Caixa Postal 486, 31270-901 Belo Horizonte, Minas Gerais, Brazil. E-mail: angelo@icb.ufmg.br
- 6261.** Machado, A.B.M.; Bede, L.C. (2006): *Heteragrion tiradentense* spec. nov. from the state of Minas Gerais, Brazil (Zygoptera: Megapodagrionidae). *Odonatologica* 35(1): 47-54. (in English) ["The new species (holotype male: Brazil, Minas Gerais, Tiradentes, 1-XI-1999) is described and illustrated. It belongs in the group 1 of *E. de Selys-Longchamps* (1862, *Bull. Acad. Belg.* [II] 14: 5-44) and differs from the other species of the group by its small size and by the color, shape and size of its mesepisternal spot." (Authors)] Address: Machado, A.B.M., Departamento de Zoologia, Inst. Cienc. Biol., Universidade Federal de Minas Gerais, Caixa Postal 486, 31270-901 Belo Horizonte, Minas Gerais, Brazil. E-mail: angelo@icb.ufmg.br
- 6262.** Mancu, C.O. (2006): Investigations on the dragonflies (Insecta: Odonata) occurring in Mures Floodplain Natural Park. *Scientific annals of the Danube delta institute, Tulcea - Romania*, 2006: 69-74. (in English, with Romanian summary). [Romania; in 2004 and 2005, the distribution of Odonata (n=36 species) in the Mures Floodplain Natural Park was mapped. Each species is presented on 2x2 km UTM-squares. *Coenagrion ornatum*, *Ophiogomphus cecilia* and *Stylurus flavipes* are of special interest as they are listed in the Habitat Directive 92/43/EEC] Address: Mancu, C.O., Acad. Remus Radulet 13, bl. 119, ap. 7, Timisoara 300281, Timis County, Romania. E-mail: cosminovidiu@yahoo.com
- 6263.** Meurgey, F. (2006): *Protoneura romanae* spec. nov. from Guadeloupe, French West Indies (Zygoptera: Protoneuridae). *Odonatologica* 35(4): 369-373. (in English). ["The new sp. is described and compared with its closest relative, *P. ailsa* Donnelly. Holotype male and allotype female: Guadeloupe, Basse-Terre, Rivière Salee, Source Sul-fureuse de Sofaïa, 1 -11-2006; both deposited in Museum of Natural History, Nantes, France." (Author)] Address: Meurgey, F., Muséum d'Histoire naturelle de Nantes, 12, rue Voltaire, F-44000 Nantes, France. E-mail: Francois.Meurgey@mairie-nantes.fr
- 6264.** Meurgey, F.; Fauchaux, M.J. (2006): Vibroreceptors and proprioceptors on the larval antennae of *Erythromma lindenii* (Selys) (Zygoptera: Coenagrionidae). *Odonatologica* 35(3): 255-264. (in English). ["The larval antennae of *E. lindenii* are short and made up of a scape, a pedicel and a fourth-segmented flagellum. They bear four types of aporous and exclusively mechanoreceptive sensilla: spatula-shaped sensilla chaetica, curved sensilla chaetica, sensilla filiformia and sensilla campaniformia. The curved sensilla chaetica are proprioceptors which monitor the relative position of the 3rd and 4th flagellomeres. Sensilla filiformia are vibration receptors which play the major role in prey detection. The unique sensillum campaniformium on the pedicel is a proprioceptor which informs the larva of the position of the flagellum relative to the pedicel. Spatula-shaped sensilla chaetica are tactile receptors distributed on the scape and the pedicel. No chemoreceptive sensilla has been observed on the antennae." (Authors)] Address: Fauchaux, M.J., Laboratoire d'Endocrinologie des Insectes Sociaux, Université de Nantes, 2 rue de la Houssinière, B.P. 92208, F-44322 Nantes Cedex 03, France. E-mail: fauchaux.michel@free.fr
- 6265.** Meurgey, F.; Fauchaux, M. (2006): Organes sensoriels des antennes de la larve de *Chalcolestes viridis* (Van der Linden, 1825) (Odonata, Zygoptera, Lestidae). *Martinia* 22(4): 167-171. (in French, with English summary). ["The larval antenna of *Chalcolestes viridis* bears two types of mechanoreceptive sensilla: sensilla filiformia and curved sensilla chaetica. Sensilla filiformia play a major role in prey detection, as vibration receptors. Curved sensilla chaetica are proprioceptors which monitor the relative position of the flagellomere which follows the one that bears them, and permit antennal positioning. The sensory equipment of *C. viridis* is compared to that of *Erythromma lindenii* (Selys, 1840) previously studied." (Authors)] Address: Meurgey, F., Muséum d'Histoire naturelle de Nantes, 12, rue Voltaire, F-44000 Nantes, France. E-mail: Francois.Meurgey@mairie-nantes.fr
- 6266.** Meurgey, F. (2006): La collection d'Odonates de Monsieur Max Thibault. *Martinia* 22(4): 173-182. (in French, with English summary). ["The author presents the inventory of Max Thibault's collection of Odonata, recently acquired by the Natural history museum of Nantes. A list is given with, if necessary, some brief comments about the status of some species." (Author)] Records result from the following French Départements: Finistère (29), Île-et-Vilaine (35), Maine-et-Loire (49), Morbihan (56), Sarthe (72), Île-de-France (78), Hérault (34), Alpes Maritimes (06), Rhône-et-Loire (71), Haute-Savoie (74), and haute-Corse.] Address: Meurgey, F., Muséum d'Histoire naturelle de Nantes, 12, rue Voltaire, F-44000 Nantes, France. E-mail: Francois.Meurgey@mairie-nantes.fr
- 6267.** Mocek, B.; Mikat, M.; Cip, D. (2006): Significant and interesting findings of dragonflies (Insecta, Odonata) in East Bohemian Region (Czech Republic). *Vážky 2005 : sborník referátu VIII. celostátního semináře odonatologu ve Žďárských vrších : seminár usporádaly ve dnech 23.-26.6.2005 Správa CHKO Žďárské vrchy, ZO CSOP Vlašim a Vlastivedné muzeum a galerie v České Lípě / editor sborníku Lubomír Hanel. - Vyd. 1. - Vlašim: ZO CSOP Vlašim, 2006. ISBN 80-86327-52-3: 15-48.* (in Czech, with English summary). [280 new faunistic data obtained mostly by the authors' entomological research during the past 5 years are presented. Data from 102 localities of East Bohemia refer to 24 species of Odonata. Of special interest are the findings of *Leu-*

corrhinia rubicunda, Orthetrum albistylum, and Sympetrum meridionale which have been recorded for the first time in the region of East Bohemia. Records of Coenagrion ornatum, Stylurus flavipes, Ophiogomphus cecilia, and Leucorrhinia pectoralis are also noteworthy. Special emphasis is given to recent range extensions of species in East Bohemia.] Address: Mocek, B., Muzeum východních Čech v Hradci Králové, Eliščinův nábreží 465, 500 01 Hradec Králové, Czech Republic. E-mail: b.mocek@muzeumhk.cz

6268. Moroz, M.D.; Czachorowski, S.; Lewandowski, K.; Buczyński, P. (2006): Aquatic Insects (Insecta: Plecoptera, Ephemeroptera, Odonata, and Trichoptera) of the Rivers in the Berezinskii Biosphere Reserve. Entomological Review 86(9): 987-994. (in English). ["The fauna of aquatic insects was studied in the rivers of the Berezinskii Biosphere Reserve. A total of 108 species of 4 orders were found: Plecoptera (10 species), Ephemeroptera (24), Odonata (25), and Trichoptera (49). The aquatic fauna is abundant and includes some species rare in Belarus and Europe." (Authors) [English Translation of Entomologicheskoe Obozrenie 85(4): 749-757.]] Address: Buczynski, P., Dept of Zool., Maria Curie-Skłodowska University, Akademicka 19, PL-20-033 Lublin, Poland. E-mail: pbuczynski@biotop.umcs.lublin.pl

6269. Müller, J.; Lotzing, J.; Steglich, R.; (2006): Zu Nahrungsökologie und Brutbiologie der Rauchschwalbe *Hirundo rustica*. Ornith. Ner. Mus. Heineanum 24: 101-108. (in German, with English summary). [Unseburg, Sachsen-Anhalt, Germany; the food for nestling of *Hirundo rustica* (Aves) included also Odonata. Food analysis was a quite good method to detect rare regional odonate species including *Ophiogomphus cecilia* and *Crocothemis erythraea*.] Address: Müller, J., Frankfurterstr. 3, 39116 Magdeburg, Germany. E-mail: FaunOek.JMueller@t-online.de

6270. Ott, J. (2006): Die Auswirkungen der Klimaänderung auf die Libellenfauna - aktuelle Ergebnisse aus Untersuchungen in Deutschland und Italien. BfN-Skripten 180: 45. (in German). [This is a brief summary on activities to document and analyze climate change effects on the odonate fauna including some studies lasting more than 10 years. In general, bog dwellers are effected by drying out of their habitats, while species as *Crocothemis erythraea* and *Orthetrum cancellatum* benefit from alterations of the water tables of the ponds induced by climate change.] Address: Ott, J., Friedhofstr. 28, D-67705 Trippstadt, Germany. E-mail: L.U.P.O.GmbH@t-online.de

6271. Parr, A. (2006): Odonata attracted to artificial light. Atropos 29: 29-38. (in English). [The author compiles records of 15 odonate species found at light sources or attracted by light with focus on UK. Species most attracted in UK seem to be *Aeshna mixta*, *Sympetrum sanguineum*, and *S. striolatum*. The possible migration of these species is discussed.] Address: Parr, A.J., 10 Orchard Way, Barrow, Bury St. Edmunds, Suffolk IP29 5BX, UK. E-mail: Adrian.parr@bbsrc.ac.uk

6272. Parr, A. (2006): Dragonfly news, summer 2006. Atropos 29: 45-47. (in English). [The brief report highlights some migrant species and range extensions (e.g. *Erythromma viridulum*, *Orthetrum cancellatum*). *Aeshna affinis* was found for the second and third time in the UK.] Address: Parr, A.J., 10 Orchard Way, Barrow, Bu-

ry St. Edmunds, Suffolk IP29 5BX, UK. E-mail: Adrian.parr@bbsrc.ac.uk

6273. Parr, A.J. (2006): Migrant and dispersive dragonflies in Britain during 2005. J. Br. Dragonfly Society 22(1): 13-18. (in English). ["The 2005 season was a rather mixed one for migrant and dispersive dragonflies, with the autumn in particular being relatively uneventful. There were, however, several highlights during the main part of the year. Most notably, *Anax parthenope* appeared in record numbers and, with ovipositing reported from at least three sites in England (as well as one in Ireland), the species is perhaps now starting to reliably colonize our area. Following a quiet season in 2004, *Sympetrum fonscolombii* was once again recorded quite widely and a limited amount of oviposition was observed, although no observations of the autumn emergence of locally-bred individuals following rapid larval development took place. In addition to sightings of unusual species, there was also evidence of the continuing range expansion of a number of our resident species such as *Aeshna mixta*, *Libellula depressa*, *L. fulva*, and *Orthetrum cancellatum*. On the negative side, following sightings during 2002—2004, there were no reports of the *Lestes barbarus* during the season, suggesting that the possible colonization of Britain by this species has been temporarily halted." (Author)] Address: Parr, A.J., 10 Orchard Way, Barrow, Bury St. Edmunds, Suffolk IP29 5BX, UK. E-mail: Adrian.parr@bbsrc.ac.uk

6274. Perotti, M.G.; Fitzgerald, L.A.; Moreno, L.; Puenta, M. (2006): Behavioral responses of *Bufo arenarum* tadpoles to odonate naiad predation. Herpetological Conservation and Biology 1(2): 117-120. (in English). ["In the presence of predators (*Pantala* sp.), anuran tadpoles often exhibit behavioral plasticity, which in turn reduces predation risk. We evaluated indirect effects of odonate larva predation on activity of *Bufo arenarum* tadpoles. We reared intact and tail-damaged larvae in three different predator treatments: (1) caged predators fed tadpoles; (2) caged predators that were starved; and (3) no predators. Both intact and damaged tadpoles were significantly less active when exposed to predator cues. There were no differences in activity between tadpoles with damaged and intact tails, however significant differences were observed between fed and starved predator treatments. Our results are consistent with other studies that have shown bufonid tadpoles reduce activity when exposed to predator cues and Address a novel contribution of southern-hemisphere bufonid, expanding the knowledge of that family in ecological experiments." (Authors)] Address: Perotti, Maria, Laboratorio de Fotobiología, Centro Regional Universitario Bariloche, Universidad Nacional del Comahue-CONICET, Quintral 1250, (8400) San Carlos de Bariloche, Río Negro, Argentina. E-mail: perottigaby@yahoo.com

6275. Phillips, J., (2006): Dragonflies in the Forest of Dean 1996—2005. J. Br. Dragonfly Society 22(1): 19-28. (in English). [Between 1996 and 2005, 27 Odonata species were recorded at 27 sites in and around of the Forest of Dean, West Gloucestershire (Vice County 34), UK. The result are briefly discussed. Emphasis is given to the odonatological diversity of the site.] Address: Phillips, J., Yorkleigh Cottage, Pope's Hill, Newnham, Gloucestershire GL14 1LD, UK

- 6276.** Reimer, B. (2006): Notes on distribution of Odonata at A'Subaitah. Emirates Natural History Group Al Ain Chapter Newsletter December 2006: 5-6. (in English). [UAE; 17-XI-2006; records of *Paragomphus sinaiticus*, *Trithemis kirbyi ardens*, *T. arteriosa*, *Orthetrum sabina*, *Crocothemis erythraea*, *Arabicnemis caerulea*, and probably *Arabineura khalidi* are briefly reported] Address: not stated
- 6277.** Reinhardt, R. (2006): Nachtrag der sächsischen entomofaunistischen (odonatologischen) Bibliographie (bis zum Jahre 1999) nach Erscheinen der Libellenfauna Sachsens. Mitt. Sächs. Entomol. 73: 41-42. (in German). [Additions to the Saxonian odonatological bibliography.] Address: Reinhardt, R., Burgstätter Str. 80a, D-09648 Mittweida, Germany. E-mail: Reinhardt-Mittw@t-online.de
- 6278.** Renshaw, C.E.; Bostick, B.C.; Feng, X.; Wong, C.K.; Winston, E.S.; Karimi, R.; Folt, C.L.; Chen, C.Y. (2006): Impact of land disturbance on the fate of arsenical pesticides. J. Environ. Qual. 35: 61-67. (in English). ["Increasing development of historic farmlands raises questions regarding the fate of pesticides applied when these land were in cultivation. We quantified As and Pb budgets in field soils in two orchards where arsenical pesticides were applied in the early 20th century and a third uncontaminated control field. Sequential extractions and X-ray analyses also were used to determine mineral phases. In addition, we measured metal loads in drainages adjacent to the fields and in two common macroinvertebrate (Chironomidae, Libellulidae) taxa within the wetland at the outlet of the drainages. We find that the applied As and Pb have undergone little vertical redistribution; concentrations of As and Pb in the top 25 cm of contaminated orchard soils are higher than in the uncontaminated control field. However, none of the applied lead arsenate (PbHAsO₄) remains in its original mineral phase. Instead, the metals are now primarily adsorbed onto fine silt and clay-sized amorphous oxides and organic matter. Further, physical erosion associated with tilling and replanting appears to have mobilized the fine-particulate-bound As and Pb in one orchard. The remobilized metals are found in sediments in the stream channel draining the tilled orchard. It is unclear if the As and Pb transported sediments are biologically active; average macroinvertebrate metal burdens in the wetland are not elevated above those observed elsewhere in the region. However, little of the mobilized metals may have reached the wetland. These results demonstrate that land use change can significantly impact the retention of arsenical pesticides." (Authors)] Address: Renshaw, C.E., Dep. of Earth Sciences, Dartmouth College, Hanover, NH 03755, USA. E-mail: Carl.Renshaw@Dartmouth.edu
- 6279.** Robb, T.; van Gossum, H.; Forbes, M.R. (2006): Colour variation in female *Lestes disjunctus* Selys: a second example of a polymorphic lestid (Zygoptera: Lestidae). Odonatologica 35(1): 31-39. (in English) ["Coexistence of discrete female colour morphs is a common characteristic of many odon. species. Surveys have found that for some North American and European genera, half or more of the spp. show female-limited polymorphism, while in other genera, female polymorphism appears far less common among spp. One such genus is *Lestes* with reportedly only one species (*L. sponsa*) being polymorphic. Here are described andromorphs and heteromorphs for *L. disjunctus*. Female-limited polymorphism might be more common, even in this genus, than is perceived currently. female morph frequencies were estimated for 4 consecutive years: andromorphs constitute approximately 16% of mature females sampled and this proportion is fairly consistent between years. Similar to other published reports on other species, andromorphs and heteromorphs in this study population did not differ in wing length or mass. Seasonal patterns in representation of different morphs suggest that further research should be done on timing of emergence of andromorphs versus heteromorphs in this and perhaps other species." (Authors) Address: Robb, Tonia, Department of Biology, Carleton University, 1125 Colonel By Drive, Ottawa, Ontario, K1S 5B6, Canada. E-mail: trobb@connect.carleton.ca
- 6280.** Šácha, D. (2006): Results of the dragonflies (Odonata) occurrence mapping in mountains of the Liptov and Spiš regions during years 2000-2004. Folia faunistica Slovaca 11(8): 43-48. (in English). ["A research of 25 wetland localities was carried out in mountain ranges surrounding the Podtatranská kotlina valley in years 2000–2004. There were 27 species of dragonflies reported, among them 6 are protected and 12 are listed in the Slovak Red List. *Coenagrion hastulatum*, *Aeshna grandis*, *A. juncea*, *A. subarctica*, *Cordulegaster bidentata*, *Somatochlora alpestris*, *S. arctica*, *Sympetrum danae*, *Leucorrhinia dubia*, and *L. rubicunda* are among the most interesting findings. Exuvium of *L. rubicunda* is the first record of this species in the Tatra Mts." (Author)] Address: Šácha, D., Podtatranského 31, 031 01 Liptovský Mikuláš, Slovakia. E-mail: dusan.sacha@pobox.sk
- 6281.** Šácha, D. (2006): Contribution to the knowledge of dragonflies (Odonata) at the lower Liptov region. Folia faunistica Slovaca 11(8): 69-73. (in English). ["A research of 12 wetland localities was carried out in surroundings of Ružomberok in years 2001-2005. 22 species of dragonflies are reported, among them 4 are protected and 7 appear in Slovak Red List. *Sympetma fusca*, *Aeshna juncea*, *Cordulegaster bidentata*, *Orthetrum brunneum*, *O. coerulescens* and *Sympetrum danae* are among the most interesting findings. *Sympetma fusca*, *Orthetrum brunneum* and *O. coerulescens* are first time reported from Liptov. *Calopteryx splendens* is documented from surroundings of Ružomberok after more than 100 years." (Author)] Address: Šácha, D., Podtatranského 31, 031 01 Liptovský Mikuláš, Slovakia. E-mail: dusan.sacha@pobox.sk
- 6282.** Šácha, D. (2006): New data on dragonflies (Odonata) in the Poprad region. Folia faunistica Slovaca 11(8): 49-54. (in English). ["A research of 10 wetland localities was carried out in surroundings of Poprad in years 1999-2004. There were 31 species of dragonflies reported, 5 of them are protected and 12 listed in the Slovak Red List. *Coenagrion hastulatum*, *Somatochlora alpestris*, *S. arctica*, *Aeshna juncea*, *A. grandis*, *Crocothemis erythraea*, *Orthetrum brunneum*, *Sympetrum danae*, *S. fonscolombii*, and *S. pedemontanum* are among the most interesting findings. The study is bringing the first data on the occurrence of larva of *S. fonscolombii* in the Podtatranská kotlina valley. *Lestes virens*, *O. brunneum* and *S. fonscolombii* are first time reported from the Popradská kotlina valley." (Author)] Address: Šácha, D., Podtatranského 31, 031 01 Liptovský Mikuláš, Slovakia. E-mail: dusan.sacha@pobox.sk

- 6283.** Šácha, D. (2006): Results of the investigation on dragonflies (Odonata) at the region of upper and central Liptov (Slovakia). *Folia faunistica Slovaca* 11(8): 75-80. (in English). [A research of 31 wetland localities was carried out in Liptovský Mikuláš district in years 1998-2004. 31 species of dragonflies are reported, 5 of them are protected and 11 appear in Slovak Red List. *Erythromma viridulum*, *Somatochlora alpestris*, *S. arctica*, *Aeshna juncea*, *A. grandis*, *Anax parthenope* (not collected), *Crocothemis erythraea*, *Sympetrum danae* and *S. pedemontanum* are among the most interesting findings. These are brings the first data on *Lestes virens*, *Erythromma najas*, *E. viridulum* and *Anax parthenope* in Podtatranská kotlina.] Address: Šácha, D., Podtatranského 31, 031 01 Liptovský Mikuláš, Slovakia. E-mail: dusan.sacha@pobox.sk
- 6284.** Saito, Y.; Owada, M.; Kato, S.; Inoue, S. (2006): Monitoring Survey (2001-2005) of Dragonflies (Odonata) of the Imperial Palace, Tokyo, Central Japan. *Memoirs of the National Science Museum* 43: 383-406. (in Japanese, with English summary). ["Monitoring investigations on the fauna of Odonata were made at the gardens of the Imperial Palace, Tokyo, ca. 115 ha, central Tokyo, from 2001 to 2005. A total of 33 species belonging to 8 families were recorded. Similar research were carried out at the same place from 1996 to 2000, and 27 species in 8 families were recorded (Tomokuni & Saito, 2000). The following six species are recorded from the Imperial Place for the first time: *Aeschnophlebia anisoptera* Selys, *Polycanthagyna melanictera* (Selys), *Anaciaeschna martini* (Selys) (Fig. 30) and *Anax nigrofasdatus nigrofasciatus* Oguma (Fig. 31), *Libellula quadrimaculata asahinai* Schmidt (Fig. 35) and *Sympetrum kunckeli* (Selys). Three endangered species in Tokyo urban areas, *Ceriagrion nipponicum* Asahina (Figs. 9-10), *Trigomphus melampus* (Selys) (Figs. 19-21) and *Aeschnophlebia longistigma* Selys (Figs. 27-29) were discovered by the former study (Tomokuni & Saito, 2000), and they are still abundant in the Palace. *Rhyothemis fuliginosa* Selys (Fig. 41), which had also been very scarce in the urban Tokyo, was gradually increase its number from 2002-2004, and we were able to observe its outbreak in the summer of 2005." (Authors)] Address: Owada, M., Dept Zool., Natn. Sci. Mus., 3-23-1 Hyakunincho, Shinjuku-ku, Tokyo, 169-0073, Japan. E-mail: owada@kahaku.go.jp
- 6285.** Schneider, K. (2006): Hermann Burmeister (1807-1892). *Hallescher Gelehrter von Weltrang. Ent. Nachr. Ber.* 50: 248-253. (in German). [This is a concised compilation on vita and work of Hermann Burmeister from Halle, Germany, author of the "Handbuch der Entomologie", 1832, and also significantly engaged in Odonata.] Address: Schneider, Karla, Inst. Biol., Zool. Samml., Domplatz 4, D-06099 Halle (Saale), Germany. E-mail: karla.schneider@zoologie.uni-halle.de
- 6286.** Sears, J. (2006): Dragonfly conservation from the BDS. RSPB and Southern Damselfly *Coenagrion mercuriale* Conservation. *Atropos* 29: 70-71. [The author reports on activities to preserve populations of *C. mercuriale* in the UK by means of habitat management. The success of conservation efforts is monitored.] Address: not stated
- 6287.** Sinu, P.A.; Nasser, M.; Rajan, P.D. (2006): Feeding fauna and foraging habits of Tiger beetles found in agro-ecosystems in western Ghats, India. *Biotropica* 38(4): 500-507. (in English). ["Libellulidae" were found as natural enemies of *Cicindela* (*Calochroa*) *whithilli* (Hope) and *Cicindela* (*Calochroa*) *flavomaculata* Hope (Cicindelidae: Coleoptera).] Address: Sinu, P. A., Ashoka Trust for Research in Ecology and the Environment (ATREE), # 659, 5 A Main, Hebbal, Bangalore 24, India. E-mail: sinu@atree.org
- 6288.** Stoks, R.; McPeck, M.A. (2006): A tale of two diversifications: Reciprocal habitat shifts to fill ecological space along the pond permanence gradient. *The American Naturalist* 168: 50-72. (in English). ["The *Enallagma* and *Lestes* damselflies have both diversified and adapted over the past 1015 million years to the various ecological milieus found along the pond permanence gradient among North American ponds and lakes. Previous articles have explored this diversification process for *Enallagma*. In this article, we present a phylogenetic hypothesis for the North American *Lestes*, use this hypothesis to reconstruct *Lestes* diversification, and compare the diversification processes inferred for *Lestes* and *Enallagma*. The results of this study suggest that *Lestes* began in temporary ponds where large dragonflies are the top predators, while *Enallagma* began in permanent lakes where fish are the top predators. Starting from these different ancestral habitats, both genera have invaded and adapted to habitats already occupied by the other genus. Moreover, these adaptive habitat shifts involved substantial convergence on the behaviors used to deal with fish and dragonfly predation in both genera and a major life-history shift from diapausing to directly developing eggs in *Lestes*. However, in *Lestes* lineages invading fish lakes, swimming speed and morphology did not change to match those of *Enallagma* species, illustrating that reciprocal shifts between alternative selection regimes are not necessarily evolutionary opposites. Also, the greater sizes and growth rates of *Lestes* species compared to *Enallagma* species, which should impart substantial ecological advantages in competition between the genera, were shown to result from phylogenetic inheritance and not from adaptive diversification. This historical analysis of diversification raises new questions about the relationship between the macroevolutionary mechanisms driving lineage diversification and the ecological mechanisms structuring local food webs and regional species assemblages." (Authors)] Address: Stoks, R., Laboratorium voor Aquatische Ecologie, K.U.Leuven, De Beriotstraat 32, B-3000 Leuven, Belgium. E-mail: robby.stoks@bio.kuleuven.ac.be
- 6289.** Takahara, T.; Kohmatsu, Y.; Maruyama, A.; Yamaoka, R. (2006): Specific behavioral responses of *Hyla japonica* tadpoles to chemical cues released by two predator species. *Current Herpetology* 25(2): 65-70. (in English). ["We experimentally examined the anti-predator behaviors of tadpoles of the Japanese tree frog, *Hyla japonica*, to chemical cues released by a cyprinid fish, *Gnathopogon elongatus*, and a dragonfly nymph, *Anax parthenope julius*. Tadpoles exposed to these chemical cues exhibited a similar reduction in activity level. In the presence of the fish chemical cues, however, the tadpoles spent more time in the bottom water layer compared to controls, but did not change their microhabitat choice in the presence of dragonfly nymph chemical cues. These findings suggest that tadpoles of *H. japonica* have predator-specific behaviors in response to chemical cues from different predators with differential foraging strategies." (Authors)]

Address: Takahara, T., Graduate School of Science and Technology, Kyoto Institute of Technology, Sakyo, Kyoto 606-8585, Japan. E-mail: taka02@kit.ac.jp

6290. Takemon, Y.; Yamamoto, A.; Nakashima, M.; Tanida, K.; Kishi, M.; Kato, M. (2006): Isolation of sperm vesicles from adult male mayflies and other insects to prepare high molecular weight genomic DNA samples. *Molecular Biology Reports*, Volume 33, Number 1: 65-70. (in English). ["We describe here a simple and efficient protocol for genomic DNA isolation from adult males of insects: e.g., Ephemeroptera, Odonata, Orthoptera and Dictyoptera. To minimize contamination of external DNA source, the sperm vesicles were isolated from male individuals from which high molecular weight genomic DNA was extracted. According to this protocol, the genomic DNA samples obtained were high quality (intact), and abundant enough for genotyping analyses and molecular cloning. The protocol reported here enables us to process a huge number of individuals at a time with escaping from cross-contamination, and thus it is quite useful for conducting genetic studies at least in some species of insects. The large yield of high molecular weight DNA from single individual may be advantageous for non PCR-based experiments. As a case study of the protocol, partial coding sequences of histone H3 and EF-1a genes are determined for some insects with PCR-amplified DNA fragments." (Authors) *Mnais costalis* *Pantala flavescens*] Address: Kata, M., Department of Biological Science, Osaka Prefecture University Graduate School of Science, Sakai 599-8531, Japan. E-mail: mkato@b.s.osakafu-u.ac.jp

6291. Taylor, P. (2006): Vagrant Emperor Anax (*Hemianax*) *ephippiger* (Burmeister, 1839) - a new breeding species for Bulgaria. *J. Br. Dragonfly Society* 22 (2): 64-68. (in English). ["In July 2004 the first British Dragonfly Society trip to Bulgaria took place, led by Dave Smallshire. The trip was hosted by Bulgarian dragonfly expert Milen Marinov and Stoyan Beshkov. On the last day, at the last site visited (a complex of river, streams and ponds near Novo Konopladi in the southwest of the country) I collected several exuviae, one of which was later identified as *Anax* (*Hemianax*) *ephippiger*. This represents the first proof of breeding for this species in Bulgaria. The history of *A. ephippiger*, with particular reference to Bulgaria, is discussed." (Author)] Address: Taylor, Pam, Decoy Farm, Decoy Road, Potter Heigham, Norfolk NR29 5LX, UK

6292. Thorne, A.D.; Pexton, J.J.; Dytham, C.; Mayhew, P.J. (2006): Small body size in an insect shifts development, prior to adult eclosion, towards early reproduction. *Proc. R. Soc. B* 273: 1099-1103. (in English). ["Life-history theory has suggested that individual body size can strongly affect the allocation of resources to reproduction and away from other traits such as survival. In many insects, adults eclose with a proportion of their potential lifetime egg production that is already mature (the ovigeny index). We establish for the solitary parasitoid wasp *Aphaereta genevensis* that the ovigeny index decreases with adult body size, despite both initial egg load and potential lifetime fecundity increasing with body size. This outcome is predicted by adaptive models and is the first unequivocal intraspecific demonstration. Evidence suggests that a high ovigeny index carries a cost of reduced longevity in insects. Our results therefore contribute to the emerging evidence that small body size can favour a developmental shift in

juveniles that favours early reproduction, but which has adverse late-life consequences. These findings are likely to have important implications for developmental biologists and population biologists." (Authors) The paper also refers to *Coenagrion puella*.] Address: Mayhew, P.J., Department of Biology (Area 18), University of York, PO Box 373, York YO10 5YW, UK. E-mail: pjm19@york.ac.uk

6293. Tsubaki, Y.; Tsuji, N. (2006): Dragonfly habitat maps based on landcover and habitat relation models. In: Rivera, AC (ED). 2006. *Forests and Dragonflies*. 4th WDA Symposium of Odonatology, Pontevedra, Spain, July 2005. *Pensoft Series Faunistica* 61: (in English). ["We constructed dragonfly distributional models (logistic regression models) based on occurrence records collected in the national recording scheme of Japan. Such occurrence records have several shortcomings in that they only record what is present and not what is absent, and sampling efforts are highly variable among recording grid-squares (about 10x10 km). Moreover, the accuracy of logistic regression models is strongly influenced by the presence/absence prevalence. We developed two data screening methods to select 'reliable' species presence/absence data sets from presence-only species assemblage records: exclusion of grid-squares without enough survey efforts, and exclusion of grid-squares out of temperature range in each species. Then we tried to find out landcover-occurrence relationships within the temperature range based on logistic regression models. We obtained statistically significant models for 98 species among all dragonflies inhabiting the main four islands of Japan (128 species). Goodness-of-fit tests showed that some landcover types significantly affected the occurrence of each species. Area of broad-leaved forests within a grid-square (10x10 km) had positive effects on the occurrence of 57 species, indicating that at least 50% of dragonflies depend on forests. Our analysis also showed that landcover heterogeneity (Shannon-Wiener's H') had positive effects on the occurrence of most species (73 among 98 species). We showed three examples of habitat maps generated by the logistic model together with actual occurrence records. We discussed how the model performance might change in relevance to the data screenings we applied." (Authors)] Address: Tsubaki, Y., National Institute for Environmental Studies, Tsukuba, 305-8506 Japan

6294. Van Gossum, H.; Beatty, C.; Sherratt, T. (2006): The Zygoptera of Viti Levu and Vanua Levu, the two larger islands in the Fiji archipelago. *IDF-Report* 9: 1-14. (in English). ["In 2005 we started a study of the ecology and evolutionary history of damselflies of the genus *Nesobasis*, endemic to Fiji. In addition we made account of the species of Zygoptera present at our study sites, and made notes on the Anisoptera. In general, the odonate fauna of the Fiji archipelago is poorly studied. Here, we provide an historical overview of the knowledge on this fauna and give details of the species we encountered in August - September 2005. We made observations and collected voucher specimens for 2 species of the genus *Ischnura*, 2 of the genus *Agriocnemis*, 1 of the genus *Austrolestes*, 7 of the genus *Melanesobasis* and 25 of the genus *Nesobasis*. For *Melanesobasis* we also made account of an additional subspecies. Further, we discovered 2 species of damselfly new to science, 1 on Viti Levu and 1 on Vanua Levu, both belonging to the genus *Nesobasis*." (Au-

thors)] Address: Gossum, H. van, Evolutionary Biology Group, University of Antwerp (RUCA), Groenenborgerlaan 171, B-2020 Antwerp, Belgium. E-mail: hvgossum@ruca.ua.ac.be

6295. Van Swaay, C.A.M., Groenendijk, D. & Plate, C. (2006): Vlinders en libellen geteld. Jaarverslag 2005. Rapport VS2006.020, De Vlinderstichting, Wageningen.: 31 pp. (in Dutch). [Monitoring butterflies and dragonflies in the Netherlands in 2005 De Vlinderstichting (Dutch Butterfly Conservation) and CBS (Statistics Netherlands) coordinate the monitoring schemes for butterflies and dragonflies in the Netherlands. The butterfly scheme started in 1990, the dragonfly scheme in 1997. Method: Butterflies and dragonflies are counted using a line-transect method. Butterfly transects are visited every week, dragonfly transects once every fortnight. The length of the transects is variable and depends on habitat quality and availability. In addition, single species transects are exclusively counted for a specific threatened butterfly or dragonfly. Indices were calculated using the computer program TRIM (Trends and Indices for Monitoring Schemes). This program was developed by CBS for the analysis of time series of counts with missing observations. The butterfly indices are calculated using a weighting procedure and 1992 is now used as the first year in the trend calculation and set to a reference value of 100. The dragonfly indices are not weighted yet and 1999 is used as the first year in the trend calculation and, therefore, set to a reference value of 100. Results of 2005: [...] Again, also in 2005 dragonflies were counted every fortnight between May and September at 328 sites (figure 5). The average number of dragonflies per transect was a bit higher than in most previous years (table 2; figure 10). Like in most other years *Enallagma cyathigerum* was the most common species (over 70,000 individuals). *Ischnura elegans*, with nearly 20,000 individuals, was the most widespread species. It was seen on about 90% of the plots (table 2). For some species indices are presented (chapter 8). Again, an alarming decreasing trend was detected for *Aeshna viridis* and *Coenagrion hastulatum*. Another Red List species, *Calopteryx virgo*, still shows a positive trend. Scientific names and the Dutch vernacular names for all dragonfly species are given in chapter 10." (Authors)] Address: De Vlinderstichting, Postbus 506, 6700 AM Wageningen, Niederlande. Email: info@vlinderstichting.nl

6296. Wahizatul-Afzan, A.; Julia, J.; Amirrudun, A. (2006): Diversity and distribution of dragonflies (Insecta: Odonata) in Sekayu Recreational Forest, Terengganu. *Journal of Sustainability Science and Management* 1(2): 97-106. (in English). ["A rich collection of 593 individuals belonging to 44 species from 11 families of Odonata were successfully identified at Sekayu Recreational Forest, Terengganu from September until December 2005. Zygopterans (393 individuals) were found to be more abundant than anisopterans (200 individuals). However, Libellulidae (suborder Anisoptera) made up the most dominant family collected with 31.9% of total individuals recorded. *Euphaea ochracea* and *Rhincocypha limbata* were found to be the most abundant species recorded in this study. More individuals were collected from middle stream (MS) of Sungai Sekayu followed by lower stream (LS) and upper stream (US). However, ANOVA does not show significant difference among the individuals represented at each study sites as all the study areas consist of similar microhabitats."

(Authors)] Address: Wahizatul-Afzan, A., Department of Biological Science, Faculty of Science and Technology, Kolej Universiti Sains dan Teknologi Malaysia, Terengganu D. I. Malaysia

6297. Ward, L.; Mill, P.J. (2006): Diel activity patterns in the adult Banded Demoiselle, *Calopteryx splendens* (Harris), and the effect of weather variables. *J. Br. Dragonfly Society* 22(2): 58-63. (in English). ["Diel activity patterns of the territorial zygopteran *C. splendens* were studied in a well-established breeding population on the River Wharfe in northeast England. The effect of weather on the activity of the species was investigated. A bimodal activity curve was observed in both males and females, albeit rather more pronounced in the males. Male activity was largely influenced by reproductive behaviour, more specifically territory selection and defence, with short feeding flights within the immediate vicinity of the perch. Conversely, the activity patterns of the females incorporated more defined periods of foraging activity, quite distinct from periods of reproductive activity. The activity of the species significantly increased with increase in ambient air temperature and solar energy, whereas a significant negative relationship was found between the number of *C. splendens* in flight and increase in cloud cover, rainfall and wind speed. The observed activity patterns are discussed with reference to maximum profitability of specific activities, the physical condition of an individual and the recorded weather variables. There are implications for the long-term reproductive success of individuals where weather conditions suppress activity." (Authors)] Address: Mill, P.J., Fac. Biol. Sciences, University of Leeds, Leeds, West Yorkshire LS2 9JT, UK. E-mail: p.j.mill@leeds.ac.uk

6298. Westermann, K.; Westermann, E. (2006): Zum Status der Blauen Federlibelle (*Platycnemis pennipes*) im höheren Schwarzwald. *Naturschutz am südlichen Oberrhein* 4(2): 229-234. (in German, with English summary). [Baden-Württemberg, Germany; "In the higher elevations of the Black Forest, there exists an autochthonous population of *P. pennipes*, which consists of at least three large subpopulations that have been discovered so far: near Hinterzarten at 880 m a.s.l., near Titisee at 859 m a.s.l. and near Lenzkirch at 832 m a.s.l. Most waters of the southern and central Black Forest at elevations above 800 m a.s.l. are not colonized by the species. From the Upper Hotzenwald and the southeastern Black Forest, no records of the species have come to our notice." (Authors)] Address: Westermann, K., Buchenweg 2, D-79365 Rheinhausen, Germany. E-mail: fosor@t-online.de

6299. Westermann, K. (2006): Auswirkungen des winterlichen Abbaus von drei Teichen des höheren Schwarzwaldes auf Libellenbestände und Makrophyten. *Naturschutz am südlichen Oberrhein* 4(2): 219-226. (in German, with English summary). [Baden-Württemberg, Germany; "In three ponds of the southern and southeastern Black Forest, the effects of partial or complete winter water discharge on the dragonfly and aquatic plant populations were studied. The fact that many species cannot tolerate regular annual discharge was confirmed. The ecological function of the nature reserve "Schluchtsee" is profoundly disturbed by the partial winter discharge, which has been conducted for several years." (Authors)] Address: Westermann, K., Buchenweg 2, D-79365 Rheinhausen, Germany. E-mail: fosor@t-online.de

6300. White, D. (2006): The Keeled Skimmer *Orthetrum coerulescens* (Fabricius) at Holt Lowes, Norfolk: History and habitat use. *J. Br. Dragonfly Society* 22(1): 1-12. (in English). [The paper presents detailed results of a mark-recapture study on *O. coerulescens*, outlining flight season, fate of marked males, maturation period, non-reproductive adults, territoriality of males, size of territory, and habitat characters. Suggestions of conservation suitable habitats for the species are also outlined.] Address: White, D., 48 Caernarvon Road, Norwich, Norfolk NR2 3HX, UK

6301. Yanoviak, S.P.; Lounibos, L.P., Weaver, S.C. (2006): Land use affects macroinvertebrate community composition in phytotelmata in the Peruvian Amazon. 1172: 1181. (in English, with Spanish summary). ["Patches of forest in the western Amazon often are converted to small-scale subsistence plantations (chacras), which become early successional forest (purma) when abandoned. Differences in abiotic conditions and phytotelm characteristics among chacras, purmas, and adjacent forest likely influence the distribution of phytotelm colonists. We sampled the contents of natural water-filled tree holes in the three habitat types and quantified differences in the abundance, species richness and composition of their macroinvertebrate communities. We additionally placed experimental tree-hole analogs (water-filled bamboo [*Guadua* sp.] internodes) in each of the habitat types and sampled their macroinvertebrate communities over 110 d. The species composition of macroinvertebrates in both tree holes and bamboo sections differed among habitats. Larvae of damselflies and crane flies, both important predators of mosquitoes, were replaced by larvae of the predatory mosquito *Toxorhynchites* spp. in chacras. Several mosquito species were relatively more abundant in chacra habitat. Macroinvertebrate abundance and species richness were correlated with water volume in tree holes and varied over time in bamboo sections. Species richness in bamboo did not differ among the three focal habitat types, but forest tree holes contained more species than tree holes in chacras. Differences in species composition between the two types of phytotelmata largely were attributed to the short duration of the bamboo experiment." (Authors)] Address: Yanoviak, S.P., Center for Biodefense and Emerging Infectious Diseases, University of Texas Medical Branch, 301 University Blvd., Galveston, TX 77555. USA.

6302. Yu, X.; Bu, W. (2006): A study on Odonata from Tianjin. *Acta scientiarum Naturalium Universitas Nankaiensis* 39(4): 83-90. (in Chinese, with English summary). [Records of 30 species resulting from 17 localities in Tianjin, China are documented. The study includes more recent studies and museum specimens.] Address: Yu, X., Inst. Entomol., Nankai Univ., Tianjin 300071, China

6303. Zawal A., Dyatlova E.S. (2006): Preliminary data for parasitizing on *Ischnura elegans* (Vander Linden, 1820) (Odonata, Coenagrionidae) by *Arrenurus* (Acari: Hydrachnidia) larvae from Odessa province (southwestern Ukraine). II International Symposium of Ecologists of Montenegro – Proceedings of the Symposium : 17-20. (in English). ["Of 256 specimens (160 males and 96 females) of *Ischnura elegans* from the Odessa province, 37 specimens were found with two parasitic water mite species: *Arrenurus claviger* and *A. papillator*. The prevalence (7.4%) and the intensity of infestation (1-6)

was smaller than in *Ischnura elegans* collected in Poland. The parasites preferred the metathorax and mesothorax of their hosts. In Odessa, the largest number of parasitizing larvae were collected in September, later than in Poland [...]" (Authors)] Address: Zawal, A., Uniwersytet Szczeciński, Wydział Nauk Przyrodniczych, Katedra Zoologii Bezkręgowców i Limnologii, ul. Wąska 13, PL-71-415 Szczecin, Poland. E-mail: zawal@univ.szczecin.pl

6304. Zhang, D.; Yang G.; Zheng, Z. (2006): Phylogenetic relationship of some species of Libellulinae inferred from sequences of mitochondrial cytochrome b gene (Odonata: Libellulidae). *Journal of Ningxia University (Natural Science Edition)* 27(3): 255-259. (in Chinese, with English summary). ["Partial nucleotide sequences of mitochondrial DNA cytochrome b gene from 7 species of 3 genera of Libellulinae in China were amplified by PCR and directly sequenced by silver-staining sequencing technique. The sequences were parts of Cyt b gene of mtDNA (576 base pairs in length), and in the obtained sequences, the average of A + T was about 70.2%. From every amino acid codon, the average of A + T in the third site was higher (85.4%) than the other two sites. The sequence data revealed considerable variation in 180 nucleotide sites (about 31.25%) among the analyzed individuals from 3 genera, *Orthetrum*, *Lyriothemis* and *Libellula*. We obtained homologous nuclear sequence of *Mnais maclachlani* for outgroup. The phylogenetic trees were constructed with neighbour-joining method, maximum parsimony method and Bayesian inference. The confidence of nodes in the trees was evaluated by 1 000 replicates bootstrap. The phylogenetic relationship of mitochondrial DNA suggested that *Orthetrum* was more evolutionary than *Lyriothemis* and *Libellula*. The phylogenetic relationships of the 3 genera was *Libellula* -> *Lyriothemis* -> *Orthetrum*." (Authors)] Address: Zhang, Dazhi, School of Life Science, Ningxia University, Yinchuan 750021, China

6305. Zhang, D.-z.; Dai, J.-x.; Zheng, Z.-m. (2006): Phylogeny of Libellulidae based on mitochondrial cytochrome b nucleotide sequences (Odonata: Anisoptera). *Sichuan Journal of zoology* 25(4): 695-699. (in Chinese, with English summary). ["In this study, fragments of mitochondrial DNA cytochrome b gene (each 576 base pairs in length) have been characterized from twenty individuals belong to 9 species from 6 genera of Libellulidae in China. These sequences were parts of Cyt b gene of mtDNA, and in the obtained sequences, A % + T % was about 69.12 %. From every amino acid codon, A % + T % in the third site was higher (86.15 %) than the other two sites. The sequence data revealed considerable variation in 216 nucleotide sites (about 37.15 %) among the analyzed individuals from 6 genera. We obtained homologous nuclear sequence of *Megalestes m aai* (damselfly) for outgroup. The phylogenetic trees were constructed with neighbour-joining method, maximum likelihood method and maximum parsimony method. The confidence of nodes in the trees was evaluated by 1000 replicates bootstrap. The phylogenetic relationship of mitochondrial DNA suggested that the Libellulidae was a monophyletic group. *Orthetrum* was more evolutionary than other genera. The phylogenetic relationships of the 6 genera was : *Pantala* and *Sympetrum* -> *Lyriothemis* -> *Acisoma* and *Crocothemis* -> *Orthetrum*." (Authors)] Address: Zhang, Dazhi, School of Life Science, Ningxia University, Yinchuan 750021, China

6306. Abbott, J.C. (Ed.) (2007): Dragonflies and Damselflies (Odonata) of Texas. Vol. 2. ISBN 978-0-6151-4063-6: 311 pp. (in English). [The book is a reference to the 223 species of odonates distributed in Texas, USA. Included in Volume 2 are updated and detailed species distribution and seasonality accounts arranged so that users can search by scientific name, county name, or flight season. A variety of articles are also included on the natural history, collection and preservation, and diversity of Texas odonates. Lasley, G.W.: Digital odonate photography: My personal techniques ■ Behrstock, R.A., Rose, J.S. Abbott, J.C.: First Texas record and second U.S. occurrence of the Pale-green Darner, *Tricentragyna septima* (Selys in Sagra, 1857) (Odonata: Aeshnidae) ■ Thomas, B.: Williamson County Gold: Chandler Creek ■ Matthews, J.: What do we know about dragonfly migration on the Texas coast? ■ Hatfield, I.: The dragonflies and damselflies of the Llano Estacado: In search of new species records on the Panhandle South Plains ■ Schappert, P.: New Odonata for Bastrop County and the Stengl "Lost Pines" Biological Station ■ Statistical Summary of Odonata in Texas ■ Abundance & Distribution of Texas Odonata, J.C. Abbott ■ Diversity of Texas Odonata by County ■ Checklist of Dragonflies & Damselflies of Texas, J.C. Abbott ■ Seasonality of Odonata in Texas, J.C. Abbott ■ Dragonflies & Damselflies of Texas Listed by County; Distribution Maps of Texas Odonata ■ Appendix: Collection Guidelines for the Odonata Survey of Texas, J.C. Abbott ■ The Dragonfly Society of the Americas Guidelines for Collecting; Specific Collecting & Preservation Instructions, J.C. Abbott ■ Guidelines for Field Notes & Data Recording, J.C. Abbott ■ Odonata Field Guides, Resources, Societies, & Suppliers ■ Glossary of Terms Relating to Odonata, J.C. Abbott ■ Index to Maps] Address: Abbott, J.C., Patterson Labs 219, School of Bio. Sci., University of Texas, Austin TX 78712, USA. E-mail: jcabott@mail.utexas.edu

6307. Baker, R.L.; McGuffin, M.A. (2007): Technique and observer presence affect reporting of behavior of damselfly larvae. *Journal of the North American Benthological Society* 26(1): 145-151. (in English). ["We experimentally tested for systematic biases in techniques commonly used to study behavior of larval aquatic insects. We determined whether larval Zygoptera responded to the presence of an observer and whether live observation missed some behaviors. We found significant differences between behaviors recorded during live observations and behaviors videotaped in the absence of an observer. All behaviors, except Rotate, were exhibited less frequently in the presence of an observer. These results suggest that larvae respond to the presence of observers as if they were predators. Live observation also missed some behaviors. The duration of Crawl Forward, which can be very subtle, and the frequency of Rotate, which can be very rapid and is easily missed, were greater when recorded from the videotape than by a live observer. Wherever possible, use of video recording systems is preferable over reliance on live observations." (Authors)] Address: Baker, R.L., Dept Zoo], Erindale Coll., Univ. Toronto, Mississauga, ON, L6L 2C6. Canada. e-mail: rbaker@credit.erin.utoronto.ca

6308. Baptista, D.F.; Buss, D.F.; Egler, M.; Giovanelli, A.; Silveira, M.P.; Nessimian, J.L. (2007): A multimetric index based on benthic macroinvertebrates for evaluation of Atlantic Forest streams at Rio de Janeiro State, Brazil. *Hydrobiologia* 575: 83-94. (in English). ["This study describes the application of a protocol for biological assessment of water quality at first to third order streams at Serra dos Órgãos, an area covered by Atlantic Forest in Rio de Janeiro State, Brazil. Major impacts in the region are domestic effluents and deforestation. Our main objective is to establish biocriteria for the establishment of the Serra dos Órgãos Multimetric Index (SOMI) based on benthic macroinvertebrates. We used data from previous studies, sampled by experienced biologists, from 1999 through 2002. The benthic macroinvertebrate community was sampled in 12 reference sites and seven impaired sites in three river basins: Guapimirim, Macaé and Grande, all from the same bioregion. From the 22 tested metrics, 6 were included in the SOMI (% Diptera, % Coleoptera, Family Taxa, EPT Taxa, BMWP-CETEC and % Shredders). Scores (5, 3 or 1) were developed for these metrics to allow for aggregation into the index. Seven intermediately impaired sites were used for evaluating the applicability of the multimetric index. We concluded that the SOMI is a robust easy-to-apply tool for biomonitoring programs in the Serra dos Órgãos region, south-east Brazil." (Authors) Odonata are included into the study at several parts.] Address: D. F. Baptista, D.F., Laboratório de Avaliação e Promoção da Saúde, Ambiental – FIOCRUZ/IOC, Av. Brasil, 4365, Manguinhos, Rio de Janeiro, RJ, Brasil. E-mail: darcilio@ioc.fiocruz.br

6309. Barta, D. (2007): Discovering the dragonfly wealth of Kerala - the God's own land - in South India: a travelogue. In: Tyagi, B.K. (Ed.): *Odonata : Biology of Dragonflies*. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: 363-366. (in English). [Brief narrative report on a trip through Kerala, India in December 2004 aiming to photograph Odonata.] Address: Barta, D., Havanska 8, Prague -7, 170 00, Czech Republic. E-mail: dnlbrt@seznam.cz

6310. Beattie, R. (2007): The geological setting and palaeoenvironmental and palaeoecological reconstructions of the Upper Permian insect beds at Belmont, New South Wales, Australia. *African Invertebrates* 48 (1): 41-57. (in English). ["The entomofauna of the Tatarian insect beds within the Newcastle Coal Measures at Belmont, north of Sydney, was described many years ago. A new collection contains some undescribed species, particularly beetles; a new exposure of the fossiliferous deposits is now documented. The Newcastle Coal Measures consist of sandstones, conglomerates, shales, coal and tuffs, which were deposited in the Hunter Trough. The depositional environment consisted of a series of very shallow, stagnant freshwater pools along a gravel river channel system within a regional coal swamp. A volcanic event produced a volcanic ash dump, causing a "snapshot" kill of insects, validating possible interpretation of percentages of insect fossils in ecological modelling. The pool community included Conchostraca, Permosyne beetles and extremely rare insect larvae. A community on swamp banks adjacent to the water courses was comprised of Glossopteris-dominated flora and Phyllothea, with an insect-dominated, first-level consumer community of phloeem-feeding Hemiptera and possibly pollenivorous Mecoptera. A leaf-litter and bark-dwelling community included Pro-

telytroptera, Psocoptera and archostematan Coleoptera. Neuroptera, extremely rare Trichoptera, and ancestors of the Orthoptera were also present in small numbers. Adult Neuroptera fossils suggest the presence of their predatory larvae and this group, along with the Odonata, are considered to have been the predatory components within this environment. No chelicerates, tetrapods or other potential top predators have been found in this, or proximal, facies. Disruptive colour patterns in some of the insects may indicate predator-prey relationships. Of interest also is the identification of a number of Glossopteris leaves with chewed margins. If these observations are correct, they would represent one of the earliest records of this kind of ichnofossil in Australia." (Author)] Address: Beattie, R., Dept of Earth & Marine Sciences, The Australian National University, Canberra, ACT 0200 Australia, P.O. Box 320, Berry, NSW 2535 Australia. E-mail: Robert.beattie@anu.edu.au

6311. Beckemeyer, R.J.; Hall, J.D. (2007): The entomofauna of the Lower Permian fossil insect beds of Kansas and Oklahoma, USA. *African Invertebrates* 48(1): 23-39. (in English). ["The Lower Permian Wellington Formation fossil beds of mid-continent North America are known best for the famous Elmo, Kansas locality. The Elmo site has produced tens of thousands of specimens from which more than 150 species of insects have been described. Equally productive and more widespread geographically, but less well-known, are the Midco, Oklahoma beds located some 270 km south of Elmo. The Midco beds have also yielded tens of thousands of specimens, but the material has been less well studied, and only half as many species have been identified from there. Renewed attention has been given in recent years to both the geology and palaeontology of the Wellington Formation. The history of these insect beds is recounted and the insect faunal composition is briefly reviewed. There are nearly 200 species in 106 genera, 53 families and 21 orders. Sizes (as measured by mean forewing length) range from 1.9 mm to 330 mm, with a mean of 22 mm and a median of 12 mm. Ten of 13 species with fore wings greater than 50 mm in length are Protodonata. Most species are known from one or a few specimens (abundance ranges from 1 to just under 400 specimens per species). Of ten species for which 50 or more specimens are known, eight are Grylloblattida (and six of these Grylloblattida: Lemmatophorina), indicating that these taxa were either quite abundant or were preferentially preserved, or both. When reviewing the holotype/neotype specimens used to describe the Wellington Formation species, we find that 62% consist of fore wings, while 9% are complete specimens. However, when considering all known specimens, 48% of the species are known only by their fore wings, while 13% are now represented by complete specimens, indicating the importance of continued collecting and review of Wellington Formation insect fossils." (Authors)] Address: Beckemeyer, R.J., 957 Perry Ave., Wichita, KS 67203-3141, USA. E-mail: royb@southwind.net

6312. Beukema, J. (2007): Are the observed dispersal capacities in damselfly species sufficient to cope with the ongoing rapid shift of climate zones?. In: Tyagi, B.K. (Ed.): *Odonata: Biology of Dragonflies*. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: 175-182. (in English). ["To keep up with present polewards shifts in climate zones, species have

to expand their distribution areas in polewards direction with an average speed of several kilometers per year. Therefore, their dispersal capacities and the use they make of these deserve special interest. Both results of mark-recapture studies as well as records of the time course of colonization of new water bodies would point to remarkably small proportions of populations of Zygopteran species actually moving over such distances within a flying season. Reasons are given why these observations may underestimate true dispersal capacities. Records of range shifts reveal that most Odonate species appear to be able to the present speed of polewards climate shift." (Author)] Address: Beukema, J., Royal Netherlands Institute for Sea Research, P. O. Box 59, 1790AB Den Burg, Texel, The Netherlands. E-mail: janb@nioz.nl

6313. Blaustein, L.; Chase, J. (2007): Interactions between mosquito larvae and species that share the same trophic level. *Annual Review of Entomology* 52: 489-507. (in English). [Ecological theory predicts, and empirical research shows, that species sharing the same trophic level as a target species (hereafter controphic species) can have large direct and indirect effects on the target species by sharing resources and/or by serving as alternative prey to predators. Yet, the roles of controphic species of mosquito larvae in affecting mosquito populations have received little attention. Published empirical evidence, although scarce, suggests that controphic species such as zooplankton and anuran larvae compete with mosquito larvae, can positively affect mosquito larvae by consuming bacteria that are pathogenic to mosquito larvae, reduce predation on mosquito larvae by serving as alternative prey, and ultimately cause increased predation on mosquito larvae by causing a numerical response in the predator. We conclude that more extensive theoretical and empirical studies in elucidating the roles of controphic species will better allow us to predict mosquito population dynamics and allow for better management of mosquitoes." (Author) The review includes data on Odonata.] Address: Blaustein, L., Community Ecology Laboratory, Institute of Evolution, Faculty of Sciences, University of Haifa, Haifa 31905, Israel. E-mail: leon@research.haifa.ac.il

6314. Boano, G.; Sindaco, R.; Riservato, E.; Fasano, S.; Barbero, R. (2007): *Atlante degli odonati del Piemonte e della Valle d'Aosta*. Memorie della Associazione Naturalistica Piemontese 6: 160 pp. (in Italian, with English summary). [Italy; "Atlas of the Odonata of Piedmont and Valle d'Aosta. Based on an exhaustive review of the literature, the study of several local entomological collections, and extensive unpublished data, we have written an atlas of the Odonata of Piedmont and Valle d'Aosta which presents up-to-date information on the geographic (using a 10km UTM grid) and altitudinal distribution, ecological preferences, and phenology of these insects in the two regions in question. We have analysed and mapped over 6200 records, of which about 2000 were already published in approximately fifty different sources, while the remaining 4200 (87.5%) were unpublished; these were for the most part gathered by the authors over the last 15 years. Bibliographical data is quite scattered: only 6 publications contain more than 50 records, and of these only 3 were published after Capra and Galletti's (1978) fundamental reference work. We confirmed the presence of 63 species (72 % of the national total), all of which have been recorded in the last 15 years except for *Erythromma na-*

jas. We report the first records of *Coenagrion coerulescens* for the well-investigated region of Piedmont, along with 14 new records for Valle d'Aosta: *Calopteryx splendens*, *Ischnura pumilio*, *Erythromma lindenii*, *Coenagrion tenellum*, *Aeshna mixta*, *Anax parthenope*, *Cordulia aenea*, *Libellula depressa*, *Orthetrum cancellatum*, *Crocothemys erythraea*, *Sympetrum fonscolombii*, *S. sanguineum*, *S. striolatum* and *S. vulgatum*. The rarest species (< 10 UTM squares) are (in parenthesis we indicate the ratio of total UTM squares / post-1990 UTM squares): *Erythromma najas* (1/0), *Coenagrion caerulescens* (2/2), *Leucorrhinia dubia* (3/3), *Sympetrum flavolum* (4/2), *Brachytron pratense* (4/1), *Somatochlora meridionalis* (5/3), *Aeshna grandis* (4/4), *Sympetrum vulgatum* (5/2), *Coenagrion mercuriale* (5/5), *Gomphus flavipes* (8/6), *Sympecma paedisca* (8/1), *Somatochlora alpestris* (9/9), *Oxygastra curtisii* (10/6), *Onychogomphus uncatatus* (9/9). Given the importance of protecting suitable habitats for the conservation of Odonates, we have felt it useful to provide an overview of the knowledge related to the Odonates present in Sites of Community Interest and in the protected areas of Piedmont and Valle d'Aosta." (Authors)] Address: Riservato, Elisa, Dipartimento di Biologia Animale, Università di Pavia, Piazza Botta 9, 27100 Pavia, Italy. E-mail: elisa.riservato@unipv.it

6315. Bogliani, G.; Hardersen, S.; Riservato E. (ed.) (2007): Riassunti delle comunicazioni presentate al "Convegno: Le libellule in Italia. Ricerche e conservazione". Cascina Picchetta, Cameri. 11 e 11 febbraio 2007: 25 pp. [Abstracts of the meeting "Dragonflies in Italy. Research and conservation" held on February 11 and 11, 2007 in Cascina Picchetta, Cameri, Italy: Saluti delle autorità; Bogliani, G., Hardersen, S., Riservato, E. (Organizzatori): Saluti e obiettivi del convegno; Panella, M.: Il monitoraggio di habitat e specie nelle aree protette gestite dal Corpo Forestale dello Stato] ■ Balestrazzi, E.: Tributo a E. Bucciarelli ■ Utzeri, C.: L'odonatologia italiana: breve storia, situazione e prospettive ■ Ott, J.: Odonati e odonatologia in Germania ■ Kalkmann, V.: The European Atlas Project ■ Boano, G., Fasano, S., Riservato E., Sindaco, R.: Gli Odonati del Piemonte e della Valle d'Aosta: lo stato dell'arte ■ Balestrazzi, E., Pavesi, M.: Gli Odonati in Lombardia ■ Caroioli, M., Maiolini, B.: Odonati in Trentino ■ Festi A.: Gruppo studi odonatologici LIBELLA: storia, esperienze e risultati di 3 anni d'attività in Provincia di Bolzano ■ Terzani, F., Carletti, B.: Lo stato attuale delle conoscenze odonatologiche in Toscana ■ Hardersen, S.: Attuali conoscenze sulle libellule della Direttiva Habitat - Proposta per una collaborazione ■ Maddalena, T., Mattei-Roesli, M., Patocch, N., Pierallini, R.: La protezione degli Odonati nel Cantone Ticino (Svizzera): scelta delle specie prioritarie e elaborazione di programmi d'azione specifici ■ Riservato, E.: Ecologia degli Odonati del Parco Regionale della Valle del Ticino ■ Bogliani, G., Garavaglia, R.: Evoluzione e fenologia della comunità odonatologica in un ambiente ripristinato; APERITIVO E CENA: Con presentazione: Foto (Peès, F.) e Filmati (Rore, M.) ■ Salamun, A., Bedjanic, M.: *Cordulegaster heros* Theischinger 1979, specie nuova per la fauna d'Italia; Carchini, G.: Colonizzazione di uno stagno per acquacoltura da parte degli Odonati ■ Fabbri, R.: Modificazioni nella comunità odonatologica nell'oasi di Punte Albere, Parco del Delta del Po ■ Di Già, I.: Risultati del monitoraggio degli odonati e dei culicidi adulti (check-list delle specie) in due zone umide della Provincia di Cuneo (Oasi di Crava Morozzo e Oasi La Madonna) - anno

2006 ■ Ferri, V., Soccini, C.: La comunità di Odonati presenti nella Riserva naturale Monticchie di Somaglia: quindici anni di monitoraggio e di iniziative di conservazione (Lombardia, provincia di Lodi) ■ Macagno, A.L.M.: Demografia di *Libellula fulva* nel Parco fluviale del Po - Tratto Torinese ■ Buchwald, R.: Le relazioni fra libellule e vegetazione - esempi di ricerche biocenologiche ■ Hardersen, S.: Telemetria di Libellule neofarfallate (Odonata: Anisoptera) ■ Terzani, F., Zinetti, F.: Odonati raccolti in alcune aree protette della provincia di Arezzo (Toscana) ■ Riservato, E.: Le libellule in Provincia di Novara. For details see: <http://www.odonata.it/pages/Abstract.pdf>

6316. Bots, J.; De Bruyn, L.; Adriaens, T.; Dumont, H.; Stoks, R.; Van Gossum, H. (2007): Seasonal and diurnal variation in the proportions of female morphs of the damselfly *Enallagma cyathigerum*. *Animal Biology* 57(2): 217-230. (in English). ["In many damselfly species a female-limited colour polymorphism is encountered which is assumed to be the result of sexual conflict. Typically, one morph resembles the male's body colouration (andromorph), while the other is dissimilar (heteromorph). Little is known about the extent of temporal variation in female morph proportions at the water where mating occurs. Knowledge about such variation should help to identify the factors that affect female morph proportion and the scales at which these factors operate. The objective of this study is to assess the occurrence of diurnal and seasonal variation in female morph proportions at the water for the damselfly *Enallagma cyathigerum*. Diurnal variation was evaluated at six nearby populations, while seasonal variation was examined at one of these populations. Furthermore, we considered temporal variation in female morph proportion in relation to proxies of male harassment (i.e., male density and operational sex ratio). Our findings indicate that female morph proportion varies throughout a day but is uniform on a seasonal scale. Variation in female morph proportions could not be explained by concomitant variation in male density or operational sex ratio. We suggest future study of male mate choice may consider temporal variation in female morph proportions at the water." (Authors)] Address: Stoks, R., Laboratorium voor Aquatische Ecologie, K.U.Leuven, De Beriotstraat 32, B-3000 Leuven, Belgium. E-mail: robby.stoks@bio.kuleuven.ac.be

6317. Brockhaus, T.; Butler, S.G.; Kemp, R.G.; Vick, G.S. (2007): The dragonfly fauna of the Shivapuri Hills, Nepal (Odonata: zygoptera, Anisozygoptera, anisoptera). In: Tyagi, B.K. (Ed.): *Odonata : Biology of Dragonflies*. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: 63-72. (in English, with German summary). [26 species of Odonata are placed on record from the Shivapuri mountains, Kathmandu, Nepal, nine of them are briefly discussed with notes on habitats.] Address: Brockhaus, T., An der Morgenstern 5, D-09387 Jahnsdorf, Germany. E-mail: T.Brockhaus@t-online.de

6318. Buczyńska, E.; Buczyński, P.; Lechowski, L. (2007): Selected aquatic insects (Odonata, Heteroptera, Coleoptera, Trichoptera) of Narwiański National Park - results of preliminary studies. *Parki nar. Rez. Przyr.* 26(1): 25-40. (in Polish, with English summary). [Poland; in July 2002, 172 aquatic insect species were recorded, among them 36 Odonata species. Drought is discussed as a factor responsible for reduced regional

species diversity and abundance in 2002.] Address: Buczynski, P., Dept of Zool., Maria Curie-Skłodowska University, Akademicka 19, PL-20-033 Lublin, Poland. E-mail: pbuczyns@biotop.umcs.lublin.pl

6319. Buczyński, P.; Ciechanowski, M.; Kowalczyk, J.K.; Kukwa, M. (2007): Walory przyrodnicze projektowanego rezerwatu „Torfowiska źródłkowe nad Jeziorom Jaczno”. – [Nature values of the projected nature reserve „Spring peat bogs at the Lake Jaczno”]. In: W. Fałtynowicz, M. Rant-Tanajewska, T. Świerubska (Eds), Kraina Hańczy. XXXV lat Suwalskiego Parku Krajobrazowego. Materiały konferencyjne „Parki krajobrazowe w krajowym systemie ochrony obszarowej” (Szczegół 28-29 września 2006). Stowarzyszenie Miłośników Suwalskiego Parku Krajobrazowego, Malesowizna-Turtul: 41-48. (in Polish). [For odonatological details of the paper see OAS 2357.] Address: Buczyński, P., Dept of Zool., Maria Curie-Skłodowska University, Akademicka 19, PL-20-033 Lublin, Poland. E-mail: pbuczyns@biotop.umcs.lublin.pl

6320. Buden, D.W.; Paulson, D.R. (2007): Odonata of Yap, Western Caroline Islands, Micronesia. *Pacific Science* 61(2): 267-277. (in English). [“Fifteen species of Odonata are recorded from Yap, Micronesia—two Zygoptera and 13 Anisoptera. None is endemic to Yap. *Hemicordulia lulico* occurs elsewhere only in Palau, whereas most of the other species are widespread in the western Pacific and Indo-Australian regions. *Macrodiplox cora* and *Tramea loewi*, both recorded by Lief-tinck in 1962, were the only species not encountered during this study; *Tramea loewi* remains known in Micronesia only from a single male collected in Yap by R. J. Goss in 1950. Six of the breeding species in Yap that are widespread in Indo-Australia occur no farther east in the Caroline Islands except possibly as unusual extralimital records in the cases of *Agriocnemis femina* and *Neurothemis terminata*; the four other species reaching only as far east as Yap are *Anaciaeschna jaspidia*, *Agrionoptera insignis*, *Orthetrum serapia*, and *Rhyothemis phyllis*. *Orthetrum serapia* is reported from Micronesia for the first time, although a very old single specimen record of *O. sabina* from Tobi Island may possibly pertain to *O. serapia*. The odonate fauna of the outer islands of Yap State is poorly known; only six species have been recorded from among four of the 15 island groups. In addition, *Tramea transmarina euryale* rather than *T. t. propinqua* was found to be the subspecies occurring in the Chuuk Islands, contrary to earlier publications.” (Authors)] Address: Paulson, D.R., Slater Museum, Univ. of Puget Sound, Tacoma, WA 98416, USA. E-mail: dpaulson@ups.edu

6321. Cannings, R.A.; Ramsay, L.R.; Cannings, S.G. (2007): Odonata inventories in British Columbia, Canada: determining the conservation status of odonata species. In: Tyagi, B.K. (Ed.): *Odonata : Biology of Dragonflies*. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: 137-151. (in English). [“The Order Odonata in British Columbia, Canada, is reasonably well known but, before 1996, systematic inventories were confined to small areas or even single localities. From 1996 to 2006, concentrated surveys were conducted annually throughout much of the province. The main goals of these surveys were to determine the status and habitat needs of Odonata, with an emphasis on the species considered to be at risk; to increase public awareness of dragonflies, their ecology

and conservation; and to encourage interest in dragonfly monitoring and research in the various regions. Each year, public lectures about dragonflies were given in local communities around the province and volunteer collectors from these places participated in the project. To demonstrate how such inventory provides information for assigning conservation status ranks to dragonfly species, the changes in these ranks over a nine-year period were examined. Preliminary conservation status ranks were assigned to British Columbia's Odonata species in 1993. Subsequently, inventory efforts focused on those species considered rare or at risk in order to determine more accurately their status and habitat requirements. During these surveys, the geographical distributions of many species were expanded, our knowledge of habitat preferences increased and five species were added to the provincial list. Many of the targeted species were found to be more abundant than previously thought and their conservation ranks were changed accordingly. Others were recorded only rarely or not at all. Accurately ranking poorly known species is challenging, particularly if samples are small or if much of their range is inaccessible. By increasing our knowledge of these dragonflies and their habitats, we can assign species ranks more with more confidence, thus ensuring that conservation efforts will target the species and habitats that truly require them.” (Authors)] Address: Cannings, R.A., Royal British Columbia Museum, 675 Belleville Street Victoria, British Columbia V8W 9W2. Canada. E-mail: rcannings@royalbcmuseum.bc.ca

6322. Cannings, R.A. (2007): Book review: Garrison, R.W., von Ellenrieder, N. & J.A. Louton (2006): *Dragonfly Genera of the New World. An Illustrated and Annotated Key to the Anisoptera*. Johns Hopkins Univ. Press, Baltimore, MD. xi+368 ppp. Hardback, ISBN 0-8018-8446-2, \$99.00. *Florida Entomologist* 90(1): 270-271. (in English). [Extensive book review.] Address: Cannings, R.A., Royal British Columbia Museum, 675 Belleville Street, Victoria, BC, Canada V8W 9W2

6323. Carballa, O.L.; Giere, S.; Cordero, A.; Hadrys, H. (2007): Isolation and characterization of microsatellite loci to study parthenogenesis in the citrine forktail, *Ischnura hastata* (Odonata: Coenagrionidae). *Molecular Ecology Notes (OnlineEarly Articles)*. : (in English). [“The citrine forktail, *Ischnura hastata*, is an American damselfly species, widely distributed, with only-female populations also found at the Azores islands. Here we report the development of nine microsatellite loci for this species. The number of alleles per locus ranged from six to 11, with an observed heterozygosity ranging from 0.245 to 0.737. Eight of the nine loci successfully amplified in a sample of parthenogenetic females from the Azores. The developed microsatellite system will be a useful tool to investigate population structure, as well as the number of clones, the type of parthenogenesis and the origin of the parthenogenetic populations of this species.” (Authors)] Address: Carballa, Olalla Lorenzo, Evolutionary Ecology Group, Department of Ecology and Animal Biology, Universidad de Vigo, EUIT Forestal, Campus Universitario, 36005, Pontevedra, Spain. E-mail: olalla.lorenzo@uvigo.es

6324. Chang, X.; Zhai, B.; Liu, X.; Wang, M. (2007): Effects of temperature stress and pesticide exposure on fluctuating asymmetry and mortality of *Copera annulata* (Slys) (Odonata: Zygoptera) larvae. *Ecotoxicology and*

Environmental Safety 67(1): 120-127. (in English). ["Although there have been some investigations into the effects of insecticide on the level of fluctuating asymmetry (FA) of adult damselflies, the cooperative effects of environmental factors on FA of larval damselflies were known little. This paper explored effects of exposure to temperature and pesticide on larval development of the damselfly *Coperla annulata* (Selys). A conventional life history trait (mortality) and developmental instability (estimated by calculating fluctuating asymmetry of bilaterally symmetrical structures) were used to measure stresses in this paper. The results showed that temperature and different concentrations of pesticide produced significant effects only on developmental stability of some characters. The FA values of three traits decreased at lower concentrations, then increased slowly with increased insecticide doses. The FA values of four traits decreased slowly with increased temperatures. However, the interaction between different concentrations of insecticide and temperature was complicated and only produced significant effects on five traits. Insecticide treatment did not significantly affect mortality of the larvae of damselfly. However, mortality was significantly positively associated with temperature. There were significantly negative associations between mortality and the FA values of three traits. These results may be caused by higher mortality and short rearing time although we did not find the significant effects of concentrations on mortality. Therefore, we speculate FA may be induced if larval damselflies were treated during longer term and FA has potential as a more specific bioindicator of stresses if we guarantee enough longer rearing time without higher mortality under stressful environment." (Authors) Address: ZHAI Baoping, PhD, Professor, Department of Entomology, Nanjing Agricultural University, Weigang, Nanjing 210095, P.R. China. E-mail: bpzhai@njau.edu.cn

6325. Crick, K. (2007): Observations on final instar damselfly caudal lamellae with little or no evidence of secondary tracheae. *J. Br. Dragonfly Society* 23(1): 10-13. (in English). ["In the summer of 2006, 457 exuviae were collected from localities in Hampshire, and they produced an anomaly that occurred in four species, *Enallagma cyathigerum*, *Coenagrion puella*, *Erythromma najas* and *Pyrrhosoma nymphula*. Thus samples collected from three sites before the first week in June produced 29 exuviae that exhibited little or no evidence of secondary tracheae in their caudal lamellae. [...] One of the sites did suffer a significant increase in phosphate, which caused a dropping of dissolved oxygen level. "The apparent cause of the phosphate increase was due to slurry from cows entering the water. The cows are used as a grassland management tool and had remained on site longer than planned, resulting in the need to import feed. This feed was laid out adjacent to the polluted area of water, resulting in a prolonged concentration of cattle in a confined area of the reserve." (Author)] Address: Crick, K., 29 Village Way, Yateley, Hampshire GU46 7SE, UK

6326. Cuffney, T.F.; M. D. Bilger, M.D.; Haigler, A.M. (2007): Ambiguous taxa: effects on the characterization and interpretation of invertebrate assemblages. *J. N. Am. Benthol. Soc.* 26(2): 286-307. (in English). ["Damaged and immature specimens often result in macroinvertebrate data that contain ambiguous parent-child pairs (i.e., abundances associated with multiple related levels of the taxonomic hierarchy such as *Baetis pluto*

and the associated ambiguous parent *Baetis* sp.). The choice of method used to resolve ambiguous parent-child pairs may have a very large effect on the characterization of invertebrate assemblages and the interpretation of responses to environmental change because very large proportions of taxa richness (73–78%) and abundance (79–91%) can be associated with ambiguous parents. To Address this issue, we examined 16 variations of 4 basic methods for resolving ambiguous taxa: RPKC (remove parent, keep child), MCWP (merge child with parent), RPMC (remove parent or merge child with parent depending on their abundances), and DPAC (distribute parents among children). The choice of method strongly affected assemblage structure, assemblage characteristics (e.g., metrics), and the ability to detect responses along environmental (urbanization) gradients. All methods except MCWP produced acceptable results when used consistently within a study. However, the assemblage characteristics (e.g., values of assemblage metrics) differed widely depending on the method used, and data should not be combined unless the methods used to resolve ambiguous taxa are well documented and are known to be comparable. The suitability of the methods was evaluated and compared on the basis of 13 criteria that considered conservation of taxa richness and abundance, consistency among samples, methods, and studies, and effects on the interpretation of the data. Methods RPMC and DPAC had the highest suitability scores regardless of whether ambiguous taxa were resolved for each sample separately or for a group of samples. Method MCWP gave consistently poor results. Methods MCWP and DPAC approximate the use of family-level identifications and operational taxonomic units (OTU), respectively. Our results suggest that restricting identifications to the family level is not a good method of resolving ambiguous taxa, whereas generating OTUs works well provided that documentation issues are Addressed." (Authors) The analysis contains some data on "*Argia* sp.".] Address: Cuffney, T.F., US Geological Survey, 3916 Sunset Ridge Rd., Raleigh, North Carolina 27607 USA. E-mail: tcuffney@usgs.gov

6327. Cuong, D.M. (2007): *Coeliccia hoanglienensis* spec. nov., a new platynemid damselfly from Hoang Lien mountains in the North of Vietnam (Zygoptera: platinemididae). In: Tyagi, B.K. (Ed.): *Odonata: Biology of Dragonflies*. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: 343-348. (in English). ["The new species (male holotype: Vietnam, Lao Cai Prov., Sa Pa, Cong Troi, Hoang Lien National Park, 1945 m alt., 15.VII.2005; deposited in Do M. Cuong Collection) of genus *Coeliccia* is described with illustrations and a photo in nature." (Author)] Address: Cuong, D.M., Horn thu so 16, Buu Dien 10210 - 35 Thai Thinh, Ha Noi, Vietnam. E-mail: cuongdm@hotmail.com

6328. Czerniawska-Kusza, I. (Ed.) (2007): XIV Ogólnopolskie Warsztaty Bentologiczne "Hydromorfologiczna ocena ekosystemów wodnych", Opole - Turawa 2007. ISBN 83-920464-1-2. Lanko, Opole: 74 pp.- (in Polish). [The following papers/abstracts contain some passing references on "Odonata": DOMEK P., DONDAJEWSKA R., GOŁDYN R.: Makrozoobentos zbiornika Antoninek narzece Cybinie. - [Macrozoobenthos of the dam reservoir 'Antoninek' on the River Cybinia]. Pp. 15-16. - KOPERSKI, P.: Obecność i presja ryb jako czynnik decydujący o składzie fauny bezkręgowców. -

[The presence and pressure of fish as factor determining the composition of invertebrate fauna]. Pp. 39-40. - KRZYŻANOWSKA, I.: Roznorodność biologiczna rzeki Pelcz na podstawie makrobentosu. - [Biodiversity in the River Pelcz basing on macrobenthos]. P. 46. - NUCKOWSKA, K.: Ocena jakości wód rzeki Santocznej a różnorodność organizmów występujących w jej wodach. - [The evaluation of the water quality of the River Santoczna and the diversity of organisms occurring in its waters]. Pp. 52-53.] Address: Czerniawska-Kusza, Izabela, Uniwersytet Opolski, Katedra Ochrony Powierzchni Ziemi, ul. Oleska 22, PL-45-052 Opole, Poland

6329. Dijkstra, K.-D.; Groeneveld, L.F.; Clausnitzer, V.; Hadrys, H. (2007): The Pseudagrion split: molecular phylogeny confirms the morphological and ecological dichotomy of Africa's most diverse genus of Odonata (Coenagrionidae). *International Journal of Odonatology* 10(1): 31-41. (in English) ["The continental African representatives of the genus *Pseudagrion* fall into two groups (A and B) based on their ecology and larval and adult morphology. While the B-group species are found in generally warmer habitats, which are more sunny, lentic or low-lying, the A-group representatives occur more in cooler habitats. We compared molecular genetic and ecological data of twelve species representing both groups. Mitochondrial DNA sequence analyses strongly support their segregation into two major clades and suggest the monophyly of each. High bootstrap support confirms the deep phylogenetic split. Overall, only a minority of species have been studied for each group. However, genetic distances of the species within each clade indicate that they are significantly more closely related to each other than to species of the opposite clade. We conclude that the observed ecological and morphological similarities are due to common ancestry, suggesting two independent radiations within the continental African *Pseudagrion* species. The biogeographic and palaeoecological history of the two clades remains unresolved." (Authors)] Address: Clausnitzer, Viola, Graefestr. 17, D-06110 Halle/Saale, Germany. E-mail: violacl@t-online.de

6330. Dijkstra, K.D.; Samways, M.J.; Simaika, J.P. (2007): Two new relict *Syncordulia* species found during museum and field studies of threatened dragonflies in the Cape Floristic Region (Odonata: Corduliidae). *Zootaxa* 1467: 19-34. (in English). ["Red List assessments often require the verification of records and taxonomy in museum collections and the field. Such research during an assessment of threatened dragonflies in the Cape Floristic Region (CFR) biodiversity hotspot, led to the discovery of two new narrow-range endemic *Syncordulia* species, bringing the known total to four in the genus. The new species, *Syncordulia legator* and *S. serendipator*, are described with emphasis on their identification, ecology and biogeography. Morphological diversity within the genus and the absence of obvious close relatives suggest an ancient and isolated presence in the CFR, emphasizing the uniqueness and conservation importance of the region's endemic odonate fauna." (Authors)] Address: Simaika, J.P., Centre for Invasion Biology, Dept of Conservation Ecology and Entomology, Stellenbosch University, P Bag X1, Matieland 7602, South Africa. E-mail: simaika@sun.ac.za

6331. Dijkstra, K.D.; Clausnitzer, V.; Martens, A. (2007): Tropical African *Platycnemis* damselflies (Odonata: Platycnemididae) and the biogeographical signifi-

cance of a new species from Pemba Island, Tanzania. *Systematics and Biodiversity* 5(2): 187-198. (in English). ["The damselfly, *Platycnemis pembipes* sp. nov., is described from Pemba Island (Ngezi Forest, Tanzania) and its affinities with Guineo-Congolian and Malagasy congeners are examined. For this purpose the identity and distribution of Afrotropical *Platycnemis* is reviewed, especially the taxonomically confused continental species. The Pemba species is nearly identical to some species of the Malagasy radiation of *Platycnemis*, but distant from the Guineo-Congolian species that have tropical Asian affinities. It is argued that the species is a long-distance wind-borne arrival from Madagascar, which survived due to favourable climatic conditions on Pemba. Habitats on the mainland, only 50 km further, are or have been drier and therefore seem unsuitable. The new species, living proof of a remarkable colonisation event, is under immediate threat, confined to a single stream in an imperilled forest, over 1000 km from its nearest relatives. The holotype of the enigmatic *P. mauriciana*, not recorded on Mauritius after its description, cannot originate from the island as it pertains to the European *P. latipes*. Five species recalling the Asian genus *Copera* are known in the male sex from central and western Africa; all were confused to some degree with *P. congolensis* and a key is given. The lectotype of *P. congolensis* is designated and its identity is clarified. *Platycnemis flavipes* and *P. xanthopus* are junior synonyms of *P. nyansana*. Discovery of the *P. rufipes* female showed that *P. escherichi*, known only from the female holotype, is a junior synonym of it. The generic classification of *Platycnemis* and *Copera* is not resolved, but data and hypotheses that should aid future analysis are provided." (Authors)] Address: Dijkstra, K.D., Gortestraat 11, NL-2311 MS Leiden, The Netherlands. E-mail: Dijkstra@naturalis.nnm.

6332. Dijkstra, K.-D. (2007): The name-bearing types of Odonata held in the Natural History Museum of Zimbabwe, with systematic notes on Afrotropical taxa. Part 1: introduction and Anisoptera. *International Journal of Odonatology* 10(1): 1-29. (in English). ["Orthographic details of 118 name-bearing types of Odonata are provided in two parts: the first and present paper deals with Anisoptera, the second with Zygoptera. 58 types pertain to good species, although the taxonomy of at least four is problematic. The details of 11 'holotypes' of forms are also provided, although these and their names have no nomenclatory status. The taxonomy of the Afrotropical members of *Microgomphus* is discussed, as are the supinus-group of *Onychogomphus*, the fritillarius-group of *Paragomphus*, the genus *Tragomomphus*, and the basitinctagroup of *Trithemis*. *Microgomphus bivittatus* is transferred to *Lestinogomphus*, and *Tragomomphus seydeli* to *Onychogomphus*. *Heliaeschna longfieldae* is a junior synonym of *H. sembe*; *Microgomphus mozambicensis* and probably *M. schoutedeni* of *M. nyassicus*; *Onychogomphus quirikii* and *O. septemflavum* of *O. seydeli*; *Paragomphus dicksoni* of *P. cognatus*; *Aethiothemis watulikii* of *A. basilewskyi*; *Eleuthemis quadrigutta* of *E. buettikoferi*; *Malgassophlebia aequatoris*, *M. longistipes* and *M. nigeriae* of *M. bispina*; *Tetrathemis bifida* and *T. sulci* of *T. camerunensis*; *Trithemis jacksoni* of *T. arteriosa*. It was confirmed that *Gynacantha ochraceipes* is a junior synonym of *G. vesiculata*; *Macromia paludosa* of *Phyllomacromia overlaeti*; *Trithemis falconis* of *T. aequalis*; *Zygonyx ikomae* of *Z. natalensis*." (Author)] Address: Dijkstra, K.D., Gortestraat 11,

NL-2311 MS Leiden, The Netherlands. E-mail: Dijkstra@naturalis.nnm.nl

6333. Dijkstra, K.D. (2007): Gone with the wind: westward dispersal across the Indian Ocean and island speciation in *Hemicordulia* dragonflies (Odonata: Corduliidae). *Zootaxa* 1438: 27-48. (in English). ["The taxonomy and biogeography of the western representatives of the largely Papuan-Australian genus *Hemicordulia* are discussed and compared with other alate fauna including butterflies, birds, bats and other dragonflies. Specimens from Malawi, Mozambique, Réunion, South Africa, Tanzania and Uganda were compared with Indian specimens of *H. asiatica*, with which they were previously regarded conspecific. They are found to be distinct and are described as the continental *H. africana* n. sp. and those from Réunion as *H. atrovirens* n. sp. The three species were compared with *H. similis* of Madagascar and *H. virens* of Mauritius. Insufficient material of the Seychelles taxon *H. similis delicata* was available; it may represent another insular endemic species. The distribution of *Hemicordulia* is discussed in the light of the dispersal capacity of Odonata and the biogeography of taxa with similar distributions in the region, with an emphasis on the survival of 'oceanic' species on the continent. Recent (i.e. in the last few million years) trans-oceanic airborne dispersal aided by westward storms, is the most likely explanation for the distribution of the genus in Africa and the Indian Ocean islands, as well as for other winged animals of Asian affinities in the region. The world range of *Hemicordulia* is largely insular, broadly excluding continents, and *H. africana* n.sp. demonstrates 'inverted insularity': all continental sites are in proximity to large water bodies, such as the great African lakes. This pattern may be related to the climatological instability of these sites, which offer suitable cool habitat where competition is (temporarily) reduced. *Hemicordulia* prefer cool conditions, but may be vulnerable to overheating and competition with more warm-adapted species." (Author)] Address: Dijkstra, K.D., Gortestraat 11, NL-2311 MS Leiden, The Netherlands. E-mail: Dijkstra@naturalis.nnm.nl

6334. Dijkstra, K.D.; Pilgrim, E.M. (2007): *Trithetrum*, a new genus of African dragonflies formerly placed in *Sympetrum* (Odonata, Libellulidae). *Journal of Afrotropical Zoology* 3: 77-81. (in English). ["Based on many morphological differences, the genus *Trithetrum* is described as distinct from *Sympetrum Newman*. The genus contains *Trithetrum congoense* (Aguesse) and *T. navasi* (Lacroix), both formerly placed in *Sympetrum*. Two males from Congo-Kinshasa constitute the first records of *T. congoense* since its description from Congo-Brazzaville." (Authors)] Address: Dijkstra, K.D., Gortestraat 11, NL-2311 MS Leiden, The Netherlands. E-mail: Dijkstra@naturalis.nnm.nl

6335. Dmitriew, C.; Cooray, M.; Rowe, L. (2007): Effects of early resource-limiting conditions on patterns of growth, growth efficiency, and immune function at emergence in a damselfly (Odonata: Coenagrionidae). *Can. J. Zool.* 85(3): 310-318. (in English, with French summary). ["Periods of restricted growth during early development are expected to have detrimental effects on subsequent metrics of fitness, most prominently increases in age and decreases in size at maturity. However, in some cases, animals may compensate by altering foraging effort, growth efficiency, or patterns of re-

source allocation between critical traits prior to maturation. Yet, even when compensation for age and size is complete, brief periods of restricted growth may carry costs persisting in the long term, and compensatory tactics may themselves be costly. We investigated the long-term costs of early growth restriction and mechanisms of compensatory growth in the damselfly *Ischnura verticalis* (Say, 1839). Larvae were temporarily exposed to one of three feeding regimes in the early stages of development, after which food levels were restored. In the period of unrestricted growth prior to emergence, partial compensation for structural size in the lowest food treatment was observed, while both resource-limited groups accelerated mass gain relative to controls. Changes in food consumption and food conversion efficiency were ruled out as mechanisms for accelerating growth following diet restriction. We tested for changes in resource allocation patterns that could explain the observed compensatory growth and found that adult body shape may depend on early growth conditions in females. There was no evidence of detrimental effects on immune function at emergence, although males tended to have higher phenoloxidase activity (a measure of immunocompetence) than females." (Authors)]

6336. Dumont, H.J. (2007): Dragonflies from the Okavango swamps (Botswana, Southern Africa) in winter. In: Tyagi, B.K. (Ed.): *Odonata : Biology of Dragonflies*. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: 45-50. (in English). ["Geographic situation and altitude of the Okavango swamps combine to create a distinctly seasonal climate, with an outspoken cool season. The local dragonfly fauna in winter is distinctly less species-rich than in summer. Although low abundances (rare species) may slightly complicate the situation, it is probably fair to estimate the faunal impoverishment at a factor 2 to 4 (17 species were censused in July 2006, against c. 70 known from all seasons combined). The composition of the winter fauna is dominated by wide-ranging species, tolerant of strong variations in environmental conditions, but at least two *Pseudagrion* species (*P. deningi*, *P. coelestis*) appear to have taken advantage of the void created by the austral winter, and have their adult population peak in winter." (Author)] Address: Dumont, H.J., Univ. Gent, Inst. Animal Ecology, K.L. Ledeganckstraat 35, B-9000 Gent, Belgium. E-mail: Henri.Dumont@rug.ac.be

6337. Fincke, O.M.; Fargevielle, A.; Schultz, T.D. (2007): Lack of innate preference for morph and species identity in mate-searching *Enallagma* damselflies. *Behav. Ecol. Sociobiol.* 61: 1121-1131. (in English). ["Insect mate recognition is often viewed as stereotypic, innate, and species-specific. However, male damselflies can learn to identify female-specific color morphs as potential mates. A suite of male mimicry hypotheses assume that heteromorphic females, which differ from males in color pattern, are more easily recognized as "female" and thus lack the inherent, anti-harassment advantage that the more male-like signal provides for andromorphs. Using two measures of male preference, we investigated whether naïve males have a preexisting sensory bias for a given morph color in *Enallagma civile*, a species that appeared to exhibit extreme plasticity in morph expression across generations within a breeding season. *E. civile* males raised in the absence of females exhibited no preference for either morph, whereas males raised with one female type ex-

hibited a learned sensory bias for that morph. Male *Enallagma* also lacked a bias toward conspecific females over a congeneric sister species. In a naturally naïve population of *Enallagma ebrium*, males reacted sexually to both morphs of *Enallagma hageni* as often as they did to conspecific females, whose thoracic spectra were nearly identical with those of *E. hageni*. Moreover, despite the similar thoracic spectra of males and andromorphs, both of which reflected UV, males rarely reacted sexually to other males. Our results falsified implicit assumptions of male mimicry hypotheses, supported learned mate recognition, and suggested a scenario for speciation via sexual conflict." (Authors)] Address: Finke, O.M., Dept Zool., Univ. Oklahoma, 730 Van Vleet Oval, Room 314, Norman, OK 73019, USA. E-mail: fincke@ou.edu

6338. Fleck, G.; Grand, D.; Boudot, J.-P. (2007): Description of the last stadium larva of *Somatochlora borisi*, with comparison to that of *Somatochlora metallica meridionalis* (Odonata: Corduliidae). *International Journal of Odonatology* 10(1): 43-52. (in English). ["The last instar larva of *S. borisi* is described and illustrated from a set of exuviae. It is compared to that of *S. metallica meridionalis*, which is morphologically close and syntopic. A key is provided which allows the determination of the exuviae of all West Palaearctic *Cordulia* and *Somatochlora* species." (Authors)] Address: Fleck, G., Lab. Ent.. Mus. Natn. Hist. Nat., 45 rue Buffon, F-75005 Paris, France. E-mail: fleck@mnhn.fr

6339. Gassmann, D. (2007): Wanderverhalten von Libellen. *Naturwissenschaftliche Rundschau* 60(1): 38-39. (in German). [On the basis of the paper of Wikelski, M. et al (2006): Simple rules guide dragonfly migration. *Biology letters* 3(2): 325-329 (see OAS 6048) the current knowledge on dragonfly migration is briefly reviewed.] Address: Gassmann, D., Institute of Evolutionary and Ecological Sciences, Leiden University, c/o National Museum of Natural History, P.O. Box 9517, 2300 RA Leiden, The Netherlands. E-mail: gassmann@naturalis.nnm.nl

6340. Gillingham, P.K.; Harvey, I.F.; Kay, S.M.; Lowe, C.D.; Narraway, C.L.; Moran, R.J.; Sudworth, S.; Watts, P.C.; Thompson, D.J. (2007): On the odonates of Queen Elizabeth Country Park, Hampshire, with emphasis on the Azure Damselfly, *Coenagrion puella* (L.). *J. Br. Dragonfly Society* 23(1): 14-19. (in English). ["13 species of odonate were recorded in the summers of 2005 and 2006 from an artificial pond at Queen Elizabeth Country Park, Hampshire, in an area of the South Downs considered to be odonatologically depauperate. Surprising visitors included both *Calopteryx* species (frequently) and a single *Sympetrum fonscolombii*. All individuals of *C. puella* were individually marked and details of their arrivals as mature individuals at the pond were recorded. The study is unique in providing, as near as possible, exact numbers of *C. puella* attempting to breed at the same site in consecutive years." (Authors)] Address: Thompson, D.J., Population Biology Research Group, School of Biological Sciences (Nicholson Building), University of Liverpool, P.O. Box 147, Liverpool, L69 3BX, UK. E-mail: d.j. thompson@liv.ac.uk

6341. Gonzalez Soriano, E.; Novelo Gutierrez, R. (2007): Odonata of Mexico revisited. In: Tyagi, B.K. (Ed.): *Odonata : Biology of Dragonflies*. Jodhpur, Scien-

tific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: 105-136. (in English). ["Odonata of Mexico, comprising one of the greatest biodiversity regions in the world, is discussed with as many as 19 species, including also one of the hitherto unrecorded genus *Ophiogomphus*, enlisted since 1996. A large number of taxonomic, geographic and other features associated with many of these species in different ecosystems are also elaborated." (Authors)] In an appendix, all taxa are listed according the Mexican states] Address: Gonzalez-Soriano, E., Depto Zoologia, Inst. Biol., Universidad Autonoma, Apartado Postal 70-153, 04510 Mexico, D.F., Mexico. E-mail: esoriano@mail.ibiologia.unam.mx

6342. Grand, D.; Boudot, J.-P. (2007): *Les Libellules de France, Belgique et Luxembourg*. ISBN : 2 - 914817 - 05 - 3: 480 pp. [This remarkable book presents in six chapters a sound introduction to the phylogeny, morphology, biology, and biogeography of Odonata, as well as information on predators, parasites, ecology, habitats and the relationship of Odonata to human beings and their culture. All these texts are illustrated with excellent photographs, which holds true also for the rest of the book. Chapter 5 deals with the identification of imagos and exuviae, presenting full keys for the 100 taxa treated in the book. These keys are remarkable from the didactical point of view: Important and significant morphological characters are highlighted in the drawings or photographs. The key to the imagines is definitively a genuine contribution and improvement to identification of European dragonflies and will, enable even beginners to make correct identifications. An important feature is the key to the exuviae of all species. In most cases morphological relevant structures are presented as black and white photographs, a few lacking contrast (due to poor printing quality?). Structures relevant for identification are marked with arrows, and structural/morphometric relationships ("ratios") are documented by bars. In some cases, drawings are added to help in identification. This new key will certainly improve and facilitate the identification of dragonfly exuviae. Chapter 6, providing monographs of all species treated, is the most voluminous of the book. All chapters include brilliant photographs, notes on morphological characters, possible confusions with related species, distribution maps (Europe; France on the basis of the Départements, and regions in Belgium and Luxembourg), as well information on ethology, habitat, and phenology. The appendix contains plates with the wings of the species, and a selected bibliography. This remarkable book is a must in the library of every European odonatologist. At the same time, being a concise introduction to one of Europe's most interesting faunal regions, it is of major importance to odonatologists worldwide. (Martin Schorr)] Address: Biotope SIEGE SOCIAL : 22, Boulevard Maréchal Foch - BP58 - 34140 Mèze, France. Email : siegesocial@biotope.fr

6343. Grant, P.B.C.; Samways, M.J. (2007): Montane refugia for endemic and red listed dragonflies in the Cape floristic region biodiversity hotspot. *Journal Biodiversity and Conservation* 16(3): 787-806. (in English). ["One of the features of many endemic organisms is that they are highly spatially restricted, and habitat specialists. The Kogelberg Biosphere Reserve (KBR) is a major centre of plant endemism within a global hotspot, the Cape Floristic Region (CFR). Dragonflies in this botanical hotspot have a range of habitat specialization from narrow-range specialists to widespread genera-

lists, with an unusually strong bias towards the specialists. A huge 53% of dragonfly individuals and 26% of taxa recorded are national endemics, and three species are Red Listed. Thus, a group of predatory insects, which are largely not dependent on plant composition, mirrors the level of habitat specialization and restricted distributions of the plants at the spatial scale of the whole reserve. Although some studies caution the use of one taxon as a surrogate for another, the results here show that at the reserve scale in this global hotspot there can be remarkable concordance, suggesting further studies on other taxa should be carried out to determine the full extent of taxonomic concordance in this irreplaceable area." (Authors)] Address: Samways, M.J., Dept Entomol. & Nematol., Univ. Stellenbosch, Private Bag X1, ZA-7602, Matieland, South Africa. E-mail: samways@sun.ac.za

6344. Grozeva, M.; Marinov, M. (2007): Cytogenetic study of *Somatochlora borisi* Marinov, 2001 (Odonata: Corduliidae), and three relative species. *Acta zool. bulg.* 59(1): 53-56. (in English, with Bulgarian summary). ["The recently described species *Somatochlora borisi* Marinov, 2001 (Odonata: Corduliidae), combines morphological characters of two relative corduliide genera, *Somatochlora* and *Cordulia*. In the present study its karyotype was studied for the first time. Routine and differential (C-banding and DNA binding fluorochrome staining) cytogenetic techniques were applied. The chromosome formula of *S. borisi* includes $2n=20+XX/XY$. For comparison, the male karyotype of *S. metallica* (from Finland), *S. meridionalis* and *C. aenea* (from Bulgaria) were also examined. In a larva of *S. meridionalis*, the spermatogonial metaphases showed 25 chromosomes confirming $2n=24+X$ reported earlier for the species. Some polymorphism of the chromosome size had been observed in the populations examined, but this problem needs a special study. For *S. metallica* and *C. aenea* previously reported for these species the karyotype $2n=24+X$ and the telomeric localization of C-heterochromatin were confirmed. All the data obtained are discussed in comparison to literature cytogenetic data on the genera *Somatochlora* and *Cordulia*. The cytogenetic data confirm that *S. borisi* deviates widely from the other *Somatochlora* and *Cordulia* species and provide an additional argument to separate it in a new genus." (Authors)] Address: Grozeva, Snezana M., Institute of Zoology, 1 Tsar Osvoboditel Blvd., BG-1000 Sofia, Bulgaria. E-mail: sgrozeva@yahoo.com

6345. Hannon, E.R.; Hafernik, J.E. (2007): Reintroduction of the rare damselfly *Ischnura gemina* (Odonata: Coenagrionidae) into an urban California park. *Jour. Insect. Conserv.* 11(2): 141-149. (in English). ["Habitat degradation led to local extinction of the San Francisco forktail damselfly (*Ischnura gemina*) in Glen Canyon Park, San Francisco, California. In this study, we reintroduced *I. gemina* into Glen Canyon after the damselfly's habitat was restored. Upon release, we carried out a mark-release-recapture study to monitor the damselfly's population dynamics. Our data were compared to two "baseline" studies on *I. gemina*, conducted in the park prior to the damselfly's demise. Our recapture rates were significantly lower than the prior studies due to a large initial decline in marked individuals upon release. Despite a lower recapture rate, the reintroduction was initially successful since the damselflies reproduced throughout the summer and the following year. However, the population failed to persist during the se-

cond year when the habitat became degraded with excess vegetation. Future success is contingent on the continual management and upkeep of the habitat." (Authors)] Address: Hannon, E.R., Dept of Entomology, Washington State University, P.O. Box 646382, Pullman, WA 99164, USA. E-mail: hannon@mail.wsu.edu

6346. Hardersen, S. (2007): *Le libellule di Bosco della Fontana*. Cierre Edizioni, Verona. ISBN 978-88-8314-396-0: 64 pp. (in Italian). [The book introduces in the 32 Odonata known from the "Bosco della Fontana", Italy, giving a brief introduction into ecology and ethology of the species. All species, with the exception of *Anax parthenope*, are shown in brilliant colour photographs. Of special interest is the chapter related to telemetry using harmonic radar to follow dispersing specimens.] Address: Hardersen, S., Centro Nazionale per lo Studio e la Conservazione della Biodiversità Forestale, Corpo Forestale dello Stato, Strada Mantova, 29, I-46045 Marmirolo (MN), Italy. E-mail: s.hardersen@libero.it

6347. Haritonov, A.Y. (2007): The composition and history of Siberian odonate fauna. In: Tyagi, B.K. (Ed.): *Odonata : Biology of Dragonflies*. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: 73-87. (in English). ["Based on literature analysis and the latest special researches the more precise list of dragonflies taxons of Asian part of Russia, counted 129 species, is presented. The species are distributed among 7 geographical regions: Ural and Transural, West-Siberian Plain, Altai and Sayan, North of East Siberia, South of East Siberia, North of Far East, South of Far East. The ancient autochthonous odonate fauna of south part of Russian Far East is the most rich of species and is a member of Subholarctic faunistic region. The rest of territory is a member of Holarctic faunistic region and to divide into two parts: Euro-Siberian and Siberian subregions. Their odonate fauna is not rich, young and allochthonous." (Author) The paper contains the results of several taxonomic studies (dissertations in Russian language) resulting in synonymies of several taxa.] Address: Haritonov, A.Y., Institute of Animal Systematics and Ecology, Siberian Division of Russian Academy of Sciences, Frunze str. 11, Novosibirsk 630091, Russia e. mail: pc@eco.nsc.ru

6348. Harris, W.; Parry, G.S.; Forman, D.W. (2007): Predation of odonate larvae by Otters (*Lutra lutra*). *J. Br. Dragonfly Society* 23(1): 20-24. (in English). ["The occurrence of odonate larval remains in the faeces (spraints) of Eurasian otters (*Lutra lutra*) was assessed between March and April 2006 in two Welsh rivers. Spraints were collected individually during detailed field surveys every two weeks. Odonate remains identified as *Aeshna mixta* and *Cordulegaster boltonii* were found in 61 % (11/18) of the spraints analysed and a minimum number of 66 individual larvae (45 *Aeshna mixta* and 21 *Cordulegaster boltonii*) were estimated in these spraints. This study clearly illustrates that vertebrate predators such as otters have the potential to consume large numbers of odonate larvae and highlights the need for applied research in this neglected area of odonate and otter ecology." (Authors)] Address: Harris, W., Institute of Environmental Sustainability, School of the Environment and Society, Swansea University, Singleton Park, Swansea SA2 8PP, UK

6349. Hartley, M.K.; Rogers, W.E.; Siemann, E. (2007): Responses of prairie arthropod communities to

fire and fertilizer: balancing plant and arthropod conservation. *Am. Midl. Nat.* 157: 92-105. (in English). ["Fire is an important tool for limiting woody plant invasions into prairies, but using fire management to maintain grassland plant communities may inadvertently reduce arthropod diversity. To test this, we established twenty-four 100 m² plots in a tallgrass prairie in Galveston County, Texas, in spring 2000. Plots were assigned a fire (no burn, one time burn [2000], two time burn [2000, 2001]) and fertilization treatment (none, NPK addition) in a full factorial design. Fertilization treatments allowed us to examine the effects of fire at a different level of productivity. We measured plant cover by species and sampled arthropods with sweep nets during the 2001 growing season. Path analysis indicated that fertilization reduced while annual fires increased arthropod diversity via increases and decreases in woody plant abundance, respectively. There was no direct effect of fire on arthropod diversity or abundance. Diptera and Homoptera exhibited particularly strong positive responses to fires. Lepidoptera had a negative response to nutrient enrichment. Overall, the negative effects of fire on the arthropod community were minor in contrast to the strong positive indirect effects of small-scale burning on arthropod diversity if conservation of particular taxa is not a priority. The same fire regime that minimized woody plant invasion also maximized arthropod diversity." (Authors) Odonata are represented, but have been excluded from analysis.] Address: Siemann, Eviann, Department of Ecology and Evolutionary Biology, Rice University, 6100 Main St., Houston, Texas 77005 USA. E-mail: siemann@rice.edu

6350. Hassall, C.; Thompson, D.J.; French, G.C.; Harvey, I.F. (2007): Historical changes in the phenology of British Odonata are related to climate. *Global Change Biology* 13(5): 933-941. (in English). ["Responses of biota to climate change take a number of forms including distributional shifts, behavioural changes and life history changes. This study examined an extensive set of biological records to investigate changes in the timing of life history transitions (specifically emergence) in British Odonata between 1960 and 2004. The results show that there has been a significant, consistent advance in phenology in the taxon as a whole over the period of warming that is mediated by life history traits. British odonates significantly advanced the leading edge (first quartile date) of the flight period by a mean of 1.51 ± 0.060 (SEM, $n = 17$) days per decade or 3.08 ± 1.16 (SEM, $n = 17$) days per degree rise in temperature when phylogeny is controlled for. This study represents the first review of changes in odonate phenology in relation to climate change. The results suggest that the damped temperature oscillations experienced by aquatic organisms compared with terrestrial organisms are sufficient to evoke phenological responses similar to those of purely terrestrial taxa." (Authors)] Address: Hassall, C., Population and Evolutionary Biology Research Group, The Biosciences Building, School of Biological Sciences, University of Liverpool, Crown Street, Liverpool L69 7ZB, UK. E-mail: c.hassall@liverpool.ac.uk

6351. Hedström, I.; Sahlen, G. (2007): The dry season governs the reproduction of three pseudostigmatid zygoptera in Costa Rica (Odonata: Pseudostigmatidae). *International Journal of Odonatology* 10(1): 53-63. (in English). [*Megaloprepus caerulatus*, *Mecistogaster linearis*, and *M. ornata* "were surveyed during five

years, and striking differences in their reproduction patterns were shown: (1) At two study sites in seasonal, tropical semi-dry forests in Pacific Costa Rica, adult *M. ornata* could be observed throughout the year, occasionally during the dry season up to 24 individuals at one time. Larvae were found from the middle to the end of the wet season suggesting a generation time of one year. (2) At two other study sites in aseasonal tropical wet forest in Caribbean Costa Rica, adults of *M. caerulatus* were observed year round, often in rather low numbers. Larvae of this species as well as *M. linearis* appeared throughout the year. While dry periods and rainfall certainly are key factors in governing the reproductive patterns of these species in relation to the climatic regimes of their preferred life zones, it is also concluded that competition from other container dwellers, including tadpoles of poison arrow frogs, may be additional factors in explaining their seasonal variation. It is also argued that all three species seem to have a high plasticity in their life cycles and hence are able to adapt to local conditions rather than displaying the same behaviour throughout their range." (Authors)] Address: Hedström, I., Nairi Foundation, Apdo. postal 150-4021 Orotina, Costa Rica. E-mail: ingemar.hedstrom@skutan.smf.se

6352. Hoess, R. (2007): *Prodasineura doisuthepensis* sp. nov. from Thailand (Odonata: Protoneuridae). *International Journal of Odonatology* 10(1): 65-69. (in English). ["*Prodasineura doisuthepensis* sp. nov. from Thailand is described and figured. The holotype and two paratypes were collected by the author on 11 May 2002 on the slopes of Doi Suthep, Chiang Mai Province, Thailand (18°48'N, 98°56'E). The material will be deposited at the Naturhistorisches Museum Basel (NHMB). The female is unknown. This is the only known species of the genus with the dorsum of the synthorax almost entirely azure-blue." (Author)] Address: Hoess, R., Normannenstr. 35, 3018 Bern, Switzerland. E-mail: ReneHoess@1st.ch

6353. Horrigan, N.; Dunlop, J.E.; Kefford, B.J.; Zava-hir, F. (2007): Acute toxicity largely reflects the salinity sensitivity of stream macroinvertebrates derived using field distributions. *Marine and Freshwater Research* 58(2): 178-186. (in English). ["Two types of salinity tolerance information are commonly used for assessing salinity risk to freshwater organisms. These are data from laboratory experiments, usually acute (=96-h LC50) values, and field distributions. Both approaches have advantages and limitations, and their applicability to the formation of guidelines and assessment of risks is not clear. In the present study, the acute lethal tolerances (72-h LC50) and acute tolerance scores (ATS) of 37 macroinvertebrate families from Queensland, Australia, were compared with maximum field conductivities and previously derived salinity sensitivity scores (SSS). LC50 values were significantly correlated with maximal field conductivities and SSS. To investigate this relationship further, the changes in community structure related to an increase in salinity were assessed. A salinity index (SI) (based on cumulative SSS) and acute salinity index (ASI) (based on cumulative ATS) were calculated using an independent data set from south-east Queensland (429 samples) and compared with each other and actual conductivity levels. Both indices were significantly correlated with each other and followed a similar trend when plotted against actual conductivity. These results support the notion that salinity sensitivity of mac-

roinvertebrates derived from acute toxicity experiments reflects sensitivities derived using field distributions. Definition of this relationship will allow the two sources of salinity sensitivity to be combined in a weight-of-evidence approach, resulting in a more robust data set with which to estimate safe salinity concentrations." (Authors) The paper also includes data on Odonata.] Address: Dunlop, J.E., Department of Natural Resources and Water, 120 Meiers Road, Indooroopilly, Qld 4068, Australia. E-mail: jason.dunlop@nrm.qld.gov.au

6354. Hursthouse, D. (2007): Red-veined Darters *Sympetrum fonscolombii* at Lound, Nottinghamshire in 2006. *J. Br. Dragonfly Society* 23(1): 1-9. (in English). ["684 *S. fonscolombii*, 94 mature adults and 590 second generation adults, were recorded at the Lound gravel pits complex, Nottinghamshire, from 25 June to 23 October 2006. All except 20 were recorded from around a shallow pit." (Author)] Address: Hursthouse, D., 22 Rose Avenue, Clowne, Derbyshire S43 4NU, UK

6355. Irusta, J.B.; Araujo, A. (2007): Adaptationist approach of reproductive behaviour in Libellulidae: a case report on *Diastatops obscura* Fabricius. In: Tyagi, B.K. (Ed.): *Odonata : Biology of Dragonflies*. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: 223-240. (in English). ["In this chapter we discuss three topics related to reproductive behaviour in Libellulidae, specifically theoretical aspects based on data obtained from the species *Diastatops obscura* (Fabricius, 1775) in its natural environment in Northeast Brazil. First, we studied reproductive strategies, with emphasis on intrasexual competition among males in territorial areas and the interconnection and synchronism of the behaviours of both sexes. Second, we analysed the females' choice of mate, a subject of lively discussion today among odonatologists throughout the world. Finally, we studied the possible relation between male body size and reproductive success. It was shown that males compete for areas of greatest access to sexually mature females, and that females select dominant males over the satellites. In competition among males, it was observed that larger individuals are more likely to achieve more copulations than smaller and medium-size males. It was also shown that larger individuals accomplish oviposition of the females inseminated by them more often and in greater numbers, and are territorial for more days than their smaller counterparts. Accordingly, we discuss aspects related to female choice and stabilizing selection." (Authors)] Address: Irusta, J.B., Programa de Pós-Graduação em Psicobiologia, Departamento de Fisiologia - Centro de Biociências, Universidade Federal do Rio Grande do Norte. Caixa Postal 1511 - Campus Universitário, 59078-970 Natal, RN, Brasil. E-mail: banuelos@ufrnet.br

6356. Irusta, J.B.; Araújo, A. (2007): Reproductive tactics of sexes and fitness in the dragonfly, *Diastatops obscura*. *Journal of Insect Science* 7:24, available online: insectscience.org/7.24: 10 pp. (in English). ["The sexual selection strategies of territorial Odonata that do not present courtship behavior is still not completely understood, especially the role of the females. *Diastatops obscura* Fabricius (Odonata: Libellulidae) females participate in mate selection in a passive manner, allowing copulation with the first male that captures them and afterwards choosing whether to oviposit or not. This study introduces the idea of female passive choice as an adaptative tactic in intersexual selection. Also

discussed is the adaptative value of this tactic and its flexibility according to environmental conditions and reproductive strategies adopted by the males. A natural population of *Diastatops obscura* was observed in the Pitimbu River of northeast Brazil. Focal continuous and ad libitum techniques were used to record attempted copulation, copulation, and oviposition behavior, in addition to registering male territoriality. An estimate of individual reproductive success (IRS) was obtained by recording 187 reproductive events. Territorial males, mainly occupying areas near the river margin, achieved greater copulation and oviposition success (IRS = 0.371) than did satellite males (IRS = 0.028). Females that copulated with territorial males experienced, for the most part, only one copulation and oviposition event, while those that copulated with satellite males fled or performed a second copulation with a territorial male. Thus, the best tactic adopted by the *D. obscura* males was to occupy a territory providing the greatest access to females, while the females used passive choice for fitness optimization." (Authors)] Address: Irusta, J.B., Sector of Psychobiology, Department of Physiology, Federal University of Rio Grande do Norte (UFRN), Caixa Postal 1511 – Campus Universitário, 59072-970, Natal-RN, Brazil

6357. Joop, G.; Gillen, A.; Mikolajewski, D.J. (2007): Colour polymorphism in female *Coenagrion puella*: differences in egg shape (Odonata: Coenagrionidae). *International Journal of Odonatology* 10(1): 71-80. (in English). ["The maintenance of female colour polymorphism in coenagrionids is still an open issue. Here we ask if the three different female morphs of *C. puella* represent different reproductive traits in terms of clutch and egg size. Therefore clutch size and egg morphometry of the three female colour morphs were examined. We found that female colour morphs did not differ in clutch or egg size. However, we also found that the female morphs differ in egg shape, with the intermediate morph having more elongated eggs compared to the hetero- and andromorphic females. Our results are discussed in terms of potential different preferences in oviposition substrate." (Authors)] Address: Joop, Gerrit, Institute of Integrative Biology, Experimental Ecology, ETH Zürich, Universitätsstraße 16, ETH Zentrum, CHN J 12.2, 8092 Zürich, Switzerland. E-mail: g.joop@env.ethz.ch

6358. Jovic, M. (2007): About the odonata ethnic names in the Serbian linguistic area. In: Tyagi, B.K. (Ed.): *Odonata : Biology of Dragonflies*. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: 357-362. (in English). ["Vernacular names of Odonata in Serbian linguistic area are given and discussed. There are only few known expressions for odonates in the central part of Balkans. These names generally correspond with Odonata names in other European languages but it is interesting that extremely frightful associations were absent. Small number of common names of dragonflies and damselflies in the named area might be result of poorly exploration of the area, small significance of odonates in everyday life of local communities or misplacing during time." (Author)] Address: Jovic, M., Natural History Museum Belgrade, 11000 Belgrade, Serbia. E-mail: milos.jovic@nhmbeo.org.yu

6359. Juen, L.; Ramos Cabette, H.S.; De Marco, P. (2007): Odonate assemblage structure in relation to ba-

sin and aquatic habitat structure in Pantanal wetlands. *Hydrobiologia* 579: 125-134. (in English). ["Structural properties of aquatic habitats are the basis of several theories produced to explain the functioning of aquatic environments. We predicted a longitudinal change of ecosystem properties along the river, and also that potamal areas of the river are similar to lakes. In rivers with periodic floods we also expect a high degree of similarity due to increased environmental similarity and increase dispersal of component species. Otherwise, rivers must be conceived as a landscape element with an intrinsic hierarchical nature and dispersal among its parts are constrained by this structure. Under this view, we also could expect that different basin or different "micro-basin" could present communities that are historically different in their general properties. Here, we aimed to describe odonate larval communities in the Pantanal Mortes-Araguaia river basin in Brazil comparing the composition, species richness and community structure between lakes and rivers, and also the possible differences among river basins. The field work was done in three rivers and three lakes chosen to conform to a paired experiment, each pair in a different river basin. An aggregated sampling unit was used based on Ekman dredge and D-nets replicated on each site. We sampled 936 individuals distributed in 30 genera and a total of 34 morphotypes. There was no difference in species richness among lakes and rivers, but a marked difference among basins. Samples from the same basin present a higher similarity of the species abundance relations than among river or lake samples. We also did not observed differences in composition and community structure between large rivers and lakes, in the same basin. The results supported the concept of structural similarity between large rivers and lakes and the differences observed among basins could indicate historical events in colonization that are shaping communities characteristics." (Authors)] Address: De Marco Jr., P., Laboratório de Ecologia Teórica e Síntese, Departamento de Biologia Geral, Universidade Federal de Goiás, 74001-970 Goiânia, Goiás, Brasil. E-mail: pdemarco@icb.ufg.br

6360. Khodabandeh, S. (2007): Ultrastructure and osmoregulatory function of the branchial chamber in the larvae of dragonfly, *Libellula lydia* (Odonata). *Journal of agricultural science and technology* 9(2): (in English). ["The ultrastructure of the cells, Na⁺, K⁺-ATPase activity and immunolocalization were examined in the branchial chamber of *L. lydia* larvae. Na⁺, K⁺-ATPase activity and localization were performed through biochemical techniques and immunofluorescence light microscopy using a mouse monoclonal antibody IgGa5, respectively. The branchial chamber possesses six pair gills lamellae that extend into the rectal lumen. A thickened epithelial layer and a modified fat body cells layer are present at the base of the each gill lamella. Epithelial cells covered by a thin cuticle and they possess apical microvilli and baso-lateral membrane infoldings associated with mitochondria. The cytoplasm of the modified fat body cells is filled with mitochondria, glycogen and a few lipid droplets. The Na⁺, K⁺-ATPase activity was significantly higher (15.36 μM Pi mg⁻¹ protein h⁻¹) in the branchial chamber. Na⁺, K⁺-ATPase immunofluorescence staining was observed in the epithelial layer cells of the basal pads of the rectal gill lamellae, with a consistently high immunoreactivity. These findings show that the epithelial cells present cytological features of the ionocytes, a high activity and concentration

of Na⁺, K⁺-ATPase, confirming their participation in osmoregulation through active ion exchanges." (Author)] Address: surp78@yahoo.com

6361. Kiran, C.G.; Kakkassery, F.K. (2007): Observations on mating and oviposition behaviour of *Tetratemis platyptera* Selys, 1878. In: Tyagi, B.K. (Ed.): *Odonata : Biology of Dragonflies*. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: 349-355. (in English). ["A detailed study was carried out of the mating and unusual oviposition behaviour of *T. platyptera* during October 2005. It was revealed that unlike other dragonflies, the female *T. platyptera* lays eggs on the twigs or leaves of plants hanging on to the water bodies, a special strategy for their larval development, and hatched nymphs were dropped into water for their further development. The total time of courtship, tandem position and wheel position are also discussed in this paper." (Authors)] Address: Kiran, C.G., Mayoaram, Pulari Nagar, Kodunganoor, P.O, Thiruvananthapuram, Kerala, India 695 013. E-mail: cgkiran@gmail.com

6362. Kononova, S.V.; Fursov, V.N. (2007): A Review of the Genera *Calotelea*, *Calliscelio*, and *Oxyscelio* (Scelioninae, Scelionidae, Proctotrupeoidea) from the Palaearctic Fauna. *Entomological Review* 87(1): 92-105. (in English). [*Calotelea shimurai* from Japan parasitizes eggs of *Aeshna nigroflava*, *Planaeschna milnei*, and *Boyeria maclachlani*.] Address: Fursov, V.N., Schmalhausen Institute of Zoology, National Academy of Sciences of Ukraine, Kiev, 01601 Ukraine. E-mail: root@iz.freenet.kiev.ua

6363. Krech, M. (2007): Reproduktionsnachweise der Asiatischen Keiljungfer (*Gomphus flavipes* Charpentier 1825) für den Unter- und Mittellauf der Unstrut in Sachsen-Anhalt und Thüringen (Odonata: Gomphidae). *Mitteilungen des Thüringer Entomologenverbandes* 14(1): 2-5. (in German). [Sachsen-Anhalt, Thüringen, Germany; a systematic survey of 20 stretches of the river Unstrut resulted in 8 new localities of the rare *Stylurus flavipes*. These records are discussed in the framework of current range extensions of this species. Some habitat characters are also discussed. In a table additional records of rheophilous species as *Calopteryx splendens*, *Gomphus vulgatissimus*, and *Ophiogomphus cecilia* are presented.] Address: Krech, M., Auf der Großen Mühle 7, D-99198 Erfurt, Germany

6364. Lasley, G.W. (2007): Digital odonate photography: My personal techniques. Abbott, J.C. (Ed.): *Dragonflies and Damselflies (Odonata) of Texas*. Vol. 2: 1-4. (in English). [Introduction into digital dragonfly photographing] Address: Lasley, G.W., 305 Loganberry Ct., Austin, Texas 78745, USA. E-mail: glasley@earthlink.net

6365. Lawniczak, M.K.N.; Barnes, A.I.; Linklater, J.R.; Boone, J.M.; Wigby, S.; Chapman, T. (2007): Mating and immunity in invertebrates. *Trends in Ecology and Evolution* 22(1): 48-55. (in English). ["Mating and immunity are intimately linked to fitness. In both vertebrates and invertebrates, recent investigations into mate choice for immunity, tradeoffs between reproduction and immunity, and the relationships between post-mating processes and immune function have revealed that mating and immunity are also intimately linked to each other. Here, we focus on invertebrates and critically examine the evidence that immunity is under se-

xual selection, both pre- and post-mating, and explore other hypotheses linking mating and immunity. We find little evidence for a consensus regarding which theories best account for the accumulating empirical data. However, we suggest that progress can quickly be made by exploiting the intrinsic strengths of invertebrate model systems." (Authors) The paper also refers to some recent odonatological papers.] Address: Lawniczak, Mara, Department of Biology, Darwin Building, University College London, London, WC1E 6BT, UK. E-mail: marakat@ucl.ac.uk

6366. Lin, Q.-B.; Huang, D.-Y.; Nel, A. (2007): A new family of Cavilabiata from the Lower Cretaceous Yixian Formation, China (Odonata: Anisoptera). *Zootaxa* 1469: 59-64. (in English). ["A new genus *Nodalula* gen. nov. and species *Nodalula dalinhensis* gen. et sp. nov. is described on the basis of a nearly complete specimen from the Lower Cretaceous of North-east China. Its special pattern of wing venation differs from those of the known Mesozoic Cavilabiata genera and allows us to include it in the new family Nodalulidae within the Neobrachystigmata." (Authors)] Address: Lin, Q.-B., State Key Laboratory of Palaeobiology and stratigraphy, Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, Nanjing, 210008, People's Republic of China

6367. Machado, A.B.M. (2007): Studies on neotropical Protoneuridae. 2. *Neoneura kiautai* spec. nov. from Southeastern Brazil (Zygoptera, Protoneuridae). In: Tyagi, B.K. (Ed.): *Odonata : Biology of Dragonflies*. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: 25-32. (in English). ["*Neoneura kiautai*, sp.n. is described and illustrated. It is close to *N. ethela* but differs mainly by the shape of the decumbent process of cercus and the colour of abdominal segments 7-10." (Author)] Address: Machado, A.B.M., Departamento de Zoologia, Inst. Cienc. Biol., Universidade Federal de Minas Gerais, Caixa Postal 486, 31270-901 Belo Horizonte, Minas Gerais, Brazil

6368. Malkmus, R. (2007): Libellen im Tangkoko-Reservat auf Sulawesi. *Natur und Museum* 137(1/2): 12-19. (in German). [Due to its geological surface with highly permeable volcanic soils, only very few water bodies exist in the nature reserve of Tangkoko, Sulawesi, Indonesia. With the exception of phytotelmatic species, the odonate fauna is said concentrating along the single permanently running brook, the Batupatik which is situated on the northern border of the reserve. In 2002, nine for Sulawesi endemic species were recorded at this stream; these are briefly discussed and some are depicted in colour photographs. A brief introduction into historical and current odonatological research activities is given, and the Sulawesi Odonata are compared with those of Borneo and Sumatra. The following species are shown: *Neurobasis kaupi*, *Libellago xanthocyana*, *Rhinocypha frontalis*, *Celebargiolestes cinctus*, *Nososticta flavipennis*, *Pseudagrion ustum*, *Protosticta simplicinervis*, *Diplacodes trivialis*, and *Celebothemis delectollei*.] Address: Malkmus, R., Schulstr. 4, D-97859 Wiesthal, Germany

6369. Marinov, M.; Grebe, B.; Kutsarov, Y. (2007): *Cordulegaster insignis* (Schneider, 1845) in Bulgaria with notes on its biology and ecology. In: Tyagi, B.K. (Ed.): *Odonata : Biology of Dragonflies*. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-

7233-482-6: 51-61. (in English). ["Bulgarian *C. insignis* finding places are summarized and mapped. Special attention on its biotope is given with emphasis on species' biology and ecology. New records from Bulgaria enlarge *C. insignis* distribution to the west. Its possible existence in even westernmost areas, like Serbia & Montenegro, is briefly discussed." (Authors)] Address: Marinov, M., P.O. Box 134, BG-1000 Sofia, Bulgaria. E-mail: mgmarinov@mail.bg

6370. Martens, A.; Sahlen, G.; Marais, E. (2007): Abstracts - 5th WDA International Symposium of Odonatology. 43 pp: (in English). [Contents: Beatty, C.D., J.A. Andrés & T.N. Sherratt: Conspicuous coloration in males of the damselfly *Nehalennia irene* (Zygoptera: Coenagrionidae): do males signal their unprofitability to other males? (Oral) ■ Bechly, G.: New fossil Odonata from the Lower Cretaceous Crato Formation of Brazil (Oral) ■ Bots, J., B. Van Den Brande, T. Snijders, L. De Bruyn, K. Van De Vijver, W. De Coen & H. Van Gossum: Impact evaluation of a chemical contaminant (PFOS) on the survival of damselfly larvae (Poster) ■ Bots, J., H., Van Gossum, R. Smolders, W. De Coen, L. de Bruyn & S. Van Dongen: Seasonal variation in energy storage compounds between female colour morphs of the damselfly, *Enallagma cyathigerum* (Oral) ■ Bouwman, J.: An overview of the present knowledge and protection of the isolated population of *Coenagrion armatum* in the Netherlands (Oral) ■ Cannings, R.A.: Odonata inventories in British Columbia, Canada: determining the conservation status of Odonata species (Oral) ■ Clausnitzer, V.: Global Dragonfly Assessment - What do we have already and what is needed? (Plenary Seminar) ■ Contreras-Garduño, J., B. Buzatto, M.A. Serrano-Meneses & A. Córdoba-Aguilar: The red wing spot of *Hetaerina americana* males as a heightening condition dependent ornament (Oral) ■ Conze, K.-J.: Odonata in North Rhine-Westphalia, Germany (Oral) ■ Cordero-Rivera, A. & R.A. Sánchez-Guillén: Androchrome females are not preferred by males of *Ischnura elegans* even when they are the majority morph (Oral) ■ Darwall, W.: Global Biodiversity Assessments: what is their purpose and what do they involve? (Plenary Seminar) ■ De Knijf, G. & A. Anselin: Predicting the distribution of *Calopteryx splendens* in Flanders (Belgium), based on a habitat (Oral) ■ Dijkstra, K.-D.B.: Demise and rise: the biogeography of the Odonata of tropical Africa (Oral) ■ Dolný, A., P. Drozd, P. Buczynski, M. Veselý & E. Bulánková: Distribution and habitat preferences of peat-bog and fen dragonfly species in Central Europe (Oral) ■ Dow, R.A. & G.T. Reels: Preliminary results of recent faunal survey work in Sarawak, Malaysian Borneo (Oral) ■ Flenner, I., K. Olne, G. Sahlén & F. Suhling: Predator induced spine length and cuticle thickness in *Leucorrhinia dubia* - a trade-off? (Poster) ■ Garrison, R.W.: Research on the Neotropical Odonata: current results and challenges ahead (WDA Award lecture) ■ Garrison, R.W. & N. von Ellenrieder: Will the real *Argia difficilis* please stand up? (Poster) ■ Gennard, D.E. & T. Winder: Conservation value for Odonata: an intra site investigation at Gibraltar Point NNR, Skegness, UK (Oral) ■ Gorb, S.N.: Dragonfly morphology revisited: its relevance for taxonomy, ecology and bionics (Plenary Talk) ■ Groenendijk, D. & J. Bouwman: From zero to full protection in five years: the case of *Somatochlora arctica* in the Netherlands (Oral) Groenendijk, D., C. Plate, J. Bouwman & T. Termaat: The use of dragonfly trends from the Dutch Monitoring Scheme in a broader context (Oral) ■ Günther, A.: The

ornaments are similar but something is different - threat display in Sulawesi Rhinocypha and Heliocypha perforata (Oral) ■ Hardersen, S.: Telemetry of freshly emerged dragonflies (Anisoptera) (Oral) ■ Hardersen, S., E. Riservato & G. Bogliani: The congress: Dragonflies in Italy - Research and Conservation (Poster) ■ Hawking, J.H.: Larval ecology and morphology as determinants of the spatial distribution of gomphids (Odonata) in streams of northern Victoria, Australia (Oral) ■ Hilfert-Rüppell, D. & G. Rüppell: Why do not males catch up with females in pursuing flight in *Calopteryx splendens*? (Oral) ■ Holuša, O.: Notes to the diurnal activity of adults of *Cordulegaster bidentata* (Oral) ■ Holuša, O.: Notes to the distribution of *Cordulegaster* spp. in Central Europe (Poster) ■ Holuša, O.: Shift of the northern limit of *Somatochlora meridionalis* (Odonata: Corduliidae) in the Central Europe? (Poster) ■ Honkanen, M.: The impact of area, productivity and forestry on dragonfly species richness in small boreal forest lakes (Poster) ■ Iwasaki, H. & M. Watanabe: Factors affecting egg load in relation to food intake for *Sympetrum infuscatum* females in forest gaps during interval oviposition (Poster) ■ Johansson, F.: Coping with stress: Strategies to deal with different conditions along environmental gradients (Plenary Talk) ■ Joop, G.: Stressed damselflies: Effects of natural enemies on immunity (Oral) Kalkman, V.: Mapping European dragonflies (Oral) ■ Kalkman, V.: Studies on Old World Megapodagrionidae (Poster) ■ Karlsson, M., K. Koch & G. Sahlén: Ovariole arrangements in Libellulidae (Poster) Kipping, J.: Long-term changes in dragonfly communities of the Okavango Delta, Botswana (Oral) ■ Kjer, K., F.L. Carle & M.L. May: Odonata phylogeny: update and prospects (Plenary Talk) ■ Koch, K.: Natural selection: a major impetus for the evolution of two reproductive strategies in Libellulidae? (Oral) ■ Malikova, E.: Odonata of the Amur River (Far East of Russia) and the problem of their conservation (Oral) ■ Martens, A.: Dragonfly larvae with scoop-shaped labium as effective predators of adult dytiscid beetles: from field data on strict habitat segregation on a tropical island to experimental evidence (Oral) ■ May, M.L. & P.S. Corbet: Fliers and perchers among Odonata: dichotomy or continuum? A reappraisal (Plenary Talk) ■ Mensing, V.: Increase of *Sympetrum pedemontanum* in the Netherlands: the knowledge of volunteers incorporated in local water board management (Oral) ■ Müller, O.: The use of digital techniques for providing scientific drawings in arthropod taxonomy (Poster) ■ Novelo-Gutiérrez, R. & J.A. Gómez-Anaya: Odonata diversity in western Mexico (Poster) ■ Odanga, J.J.: A preliminary study of impact of anthropogenic disturbance on dragonflies' habitats along Nairobi River (Poster) ■ Oertli, B.: Prediction of Odonata diversity: a tool for the assessment of freshwater biodiversity (Oral) ■ Osawa, H. & H. Ubukata: The influence of the change in the social environment of children on their recognition of dragonflies (Poster) ■ Ott, J.: Recent effects of climatic changes on the waters of the biosphere reserve "Palatinat Forest" and consequences for the web Natura 2000 (Oral) ■ Ott, J., M. Schorr, B. Trockur & U. Lingenfelder: Species protection programme for *Oxygastra curtisii* in Germany (Oral) ■ Pritchard, G.: The colonization of temperate latitudes by Neotropical Zygoptera (Oral) ■ Raatikainen, K., K. Tynkkynen, E. Haukilehto, M. Häkkinen & J.S. Kotiaho: Hybridization in *Calopteryx* damselflies: the role of male alternative mating tactics (Oral) ■ Sahlén, G., I. Flenner & K. Olne: Forestry and dragonfly diversity: the uncertain long-time survival of specialist species in Central Sweden (Oral) ■ Sánchez-Guillén, R. A. & A. Cordero-Rivera: Conspicuous sperm precedence in Odonata (Oral) ■ Schneider, W.: Odonata of the Arabian Peninsula (Oral) ■ Schütte, K.: Biogeography of Odonata in SE Madagascar (Poster) ■ Sherratt, T.N., H. Van Gossum, C.D. Beatty, A. Rashed & J. Skevington: Female-biased sex ratios and putative sex role reversal in an island community of damselflies (Oral) ■ Simaika, J.P.: What are they to us? Valuing dragonflies as service providers (Oral) ■ Suhling, F. & O. Richter: Predicting life cycle alterations due to climate change along thermal gradients: a case study on *Gomphus vulgatissimus* (Oral) ■ Svensson, E.I.: Selective predation on wing colouration and sexual isolation in calopterygid damselflies (Oral) ■ Tajima, Y. & M. Watanabe: Changes in the number of spermatozoa in sperm storage organs of *Ischnura asiatica* female during copulation (Oral) ■ Takahashi, Y. & M. Watanabe: Frequency-dependent mating attempt to female color dimorphism in *Ischnura senegalensis* during diurnal oviposition activity (Oral) ■ Teramoto, Y. & M. Watanabe: Population increase of the threatened damselfly, *Mortonagrion hirosei*, inhabiting an artificially established reed community (Oral) ■ Termaat, T., D. Groenendijk & J. Bouwman: How to protect endangered Red List species in the Netherlands: from ecological research to conservation (Oral) ■ Termaat, T., V. Kalkman & J. Bouwman: Trends in ranges of dragonflies in the Netherlands: does climate change play a role? (Poster) ■ Termaat, T., V. Mensing, D. Groenendijk & J. Bouwman: Dragonfly protection in the Netherlands: a stepwise approach (Poster) ■ Theischinger, G.: The Gondwanan aeshnids of Australia (Oral) ■ Thompson, D.J.: Movement in dragonflies (Plenary talk) ■ Ubukata, H.: Effectiveness of the evaluation of freshwater bodies using odonate assemblage in a management project of a wetland under the stress of regional development (Oral) ■ von Ellenrieder, N. & R.W. Garrison: Dragonfly guardians of the southern wing of the Yungas mountain rain forest (Poster) ■ von Ellenrieder, N. & J. Muzón: An updated checklist of the Odonata from Argentina (Poster) ■ Ware, J.L., M.L. May & K.M. Kjer: The most speciose group of dragonflies, Libelluloidea: phylogeny, dating and phylogeography (Oral) ■ Watanabe, M.: Changes in spatial distribution and species composition of larval dragonflies in the artificial reed community established as a habitat for *Mortonagrion hirosei*, an endangered brackish water damselfly (Oral) ■ Wikelski, M., D. Moskowitz & M.L. May: Tracking migratory Green Darner dragonflies with radiotelemetry (Poster) ■ Wildermuth, H.: Evolutionary traps for dragonflies in man-modified landscapes - old and new facts to polarization vision (Oral) Wilson, K.D.P.: Seasonal emergence observations of odonates in tropical forest streams at Endau-Rompin, Malaysia (Poster) ■ Zessin, W. Overview of the "giant dragonflies" of the Paleozoic (Oral) ■ Zessin, W. Some German Paleozoic Meganisoptera (Odonoptera) and their finding places (Poster)] Address: Suhling F., Inst. Geoökologie, TU Braunschweig, Langer Kamp 19c, D-38102 Braunschweig, Germany. E-mail: f.suhling@tu-bs.de

6371. Matthews, J. (2007): What do we know about dragonfly migration on the Texas coast?. In: Abbott, J.C. (Ed.): Dragonflies and Damselflies (Odonata) of Texas. Vol. 2: 9-11. (in English). [The author reports in detail on several occurrences of dragonfly migration (in most cases *Anax junius*) in Texas, USA or the Gulf of Mexico, and outlines some basics for future study of dragonfly migration in Texas.] Address: Matthews, J.,

Section of Integrative Biology, 1 University Station #C0930, The University of Texas at Austin, Austin, Texas 78712, USA. E-mail: johoma@mail.utexas.edu

6372. Michalski, J.; Oppel, S. (2007): *Papuagrion carcharodon* sp. nov. from southern New Guinea (Odonata: Coenagrionidae). *International Journal of Odonatology* 10(1): 81-86. (in English). ["*Papuagrion carcharodon*, a new coenagrionid from the rainforest of Papua New Guinea's Simbu Province, is described (holotype: 06°43'S, 145°05'E; 900 m a.s.l., 27 March 2004, to be deposited at Naturalis, Leiden). This new species is similar to *P. ekari* and *P. pesechem* but may be distinguished from both by the tooth-shaped lower branch of the male cerci, and the position of the tubercles on the female pronotum." (Authors)] Address: Michalski, J., 223 Mount Kemble Avenue, Morristown New Jersey 07960, USA. E-mail: jmichalski@easthanoverschools.org

6373. Mikolajewski, D.J.; Joop, G.; Wohlfahrt, B. (2007): Coping with predators and food limitation: testing life history theory for sex-specific larval development. *Oikos* 116(4): 642-649. (in English). ["For animals with complex life cycles, recent models of sexual size-dimorphism at maturity assume three key variables to optimise larval life history: activity in the larval stage, development time, and size at maturation. However, model predictions remain largely untested. In the territorial dragonfly *Libellula depressa* (Odonata) exhibiting a flexible development time we tested for male-biased sexual size-dimorphism and sex differences in larval activity, development time, and growth rate. Based on models we predicted that males achieved their larger size compared to females by a longer development rather than being more active. Results revealed that males took longer to develop and achieved a larger size than females but were not more active. Compared to males, females exhibited a higher growth rate which was not achieved by an activity-mediated increased food intake. We conclude that sexual size-dimorphism in species with a flexible development time is mediated by differences in developmental length but not activity. Furthermore, sexes differ in their plastic responses to food availability and predator presence making it necessary to consider sex-specific differences in testing further life history responses." (Authors)] Address: E-mail: bwohlfah@ucalgary.ca

6374. Miller, P.L. (2007): Dragonflies of the Madurai Kamaraj University Campus (Tamil Nadu, India). In: Tyagi, B.K. (Ed.): *Odonata : Biology of Dragonflies*. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: 273-322. (in English). ["Twenty five odonate species were observed on the Madurai Kamaraj University campus during the periods September 1987 and February 1988. Of these, proof of breeding on the campus was obtained for sixteen species and there was strong, circumstantial evidence of breeding in at least a further two species. Five bred only in permanent habitats and seven only in temporary habitats, the remainder probably doing so in both types. Sixteen species were sexually active at the largest habitat, a seasonal lake. Five further species, although commonly present, showed no sexual activity at campus sites." (Author) Special emphasis is given to oviposition behaviour.] Address: author diseased

6375. Mitra, A. (2007): Larval and adult behavioural patterns of some odonata species from Dehradun Valley. In: Tyagi, B.K. (Ed.): *Odonata : Biology of Dragonflies*. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: 323-341. (in English). ["Different behavioural patterns of five odonata species have been studied in and around Asan reservoir, Dehradun, India from May 1995 to April 1997. The odonate imago feeds only on living prey and predominantly on flying insects. *Orthetrum s. sabina* has been seen to detect the perching prey more accurately. The mature males of all the five species arrive at the rendezvous earlier in the season during the day than females and form the territory. Only except *Brachythemis contaminata*, the males of other four species either show aggressive behaviour and chase display (in Anisoptera) or show threat display by 'abdomen raising' or 'wing opening' (in Zygoptera). Before wheel tandem lasts for a few seconds in *Crocothemis s. servilia* and *Brachythemis contaminata* while it lasts from 2-5 minutes in *Orthetrum s. sabina*. Comparatively, in zygoptera, before wheel tandem lasts longer and intramale sperm translocation occurs at that time. The copulatory wheel generally lasts for 6-22 seconds in *Crocothemis s. servilia*; 4-15 seconds in *Brachythemis contaminata*; 15-25 minutes in *Orthetrum s. sabina*; 10-15 minutes in *Ischnura a. aurora* and 35-45 minutes in *Ceriagrion coromandelianum*. All the three anisoptera oviposit by frequent dipping of their abdomen under water surface, whereas, the two zygopterans oviposit endophytically. Among the five species, only *Ceriagrion coromandelianum* oviposits in tandem. The duration of oviposition varies from 20-30 seconds in *Crocothemis s. servilia*; 3-6 minutes in *Orthetrum s. sabina*; 4-6 minutes in *Brachythemis contaminata*; 20-25 minutes in *Ischnura a. aurora* and 20-30 minutes in *Ceriagrion coromandelianum*. Odonata larvae are generalized predators and early instars prefer *Paramoecium* spp., *Daphnia* spp., diatoms etc., while later instars prey on chironomid larvae and pupae, mosquito larvae, ephemeropteran nymphs, *Branchiura* spp., *Limnodrilus* spp. and some nematodes. *Orthetrum s. sabina* larvae shows cannibalism. The last instar of all the five species stop feeding 2-3 days before emergence. Emergence occurs in *Crocothemis s. servilia* and *Orthetrum s. sabina* during 5.00 to 7.00 hours at a height of 6-25 cm and 10-30 cm from the water level, respectively. In *Brachythemis contaminata* emergence occurs during 12.30 to 2.00 hours at a height of 2.5-10 cm. Emergence occurs in *Ischnura a. aurora* during 12.00-2.00 hours and in *Ceriagrion coromandelianum* during 3.00-5.00 hours at a height of 8-12 cm and 10-15 cm from the water level, respectively." (Author)] Address: Mitra, A., Senior Lecturer, Sherubtse College, Kanglung, Bhutan. E-mail: amitodonata@yahoo.com

6376. Mola, L.M. (2007): Cytogenetics of American Odonata. In: Tyagi, B.K. (Ed.): *Odonata : Biology of Dragonflies*. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: 153-173. (in English). ["The current knowledge of the cytogenetics of American odonates is reviewed. Chromosome studies have been performed in nearly 830 species and subspecies of 9 Zygoptera and 6 Anisoptera families. The species analysed were collected in 15 countries: Canada, the US and Mexico from North America; Guatemala and Costa Rica from Central America; Dominica and Jamaica from the Caribbean; and Venezuela, Surinam, Brazil, Peru, Bolivia, Chile, Argentina and Uruguay from South America. The proportion of species ana-

lysed differs from one country to another. Although the most frequent haploid numbers are 12, 13 and 14, there is a wide variation from $n=3$ in *Macrothemis hemichlora* from Bolivia and Brazil to $n=21$ in *Orthemis nodiplaga* from Argentina. Two distinctive characters of the order are the presence of holokinetic chromosomes and the post-reductional type of meiosis. The most frequent sex chromosome mechanism is XX/XO (female/male), the derived neo-XY system occurs in approximately 5.5% of the species, and the X1X1X2X2/X1X2Y multiple system is only present in *Micrathyrina unguolata*. The presence of a small pair of chromosomes, the m-chromosomes, is found in nearly 80% of the species. Studies of the distribution and composition of the heterochromatin are scarce. C-banding showed that autosomes usually have heterochromatic blocks in the telomeric regions, and that, in general, the sex chromosome in males is completely expositive, or shows an intermediate staining. In the few species analysed with fluorochromes, the heterochromatin seems to have a heterogeneous molecular composition. Odonata shows a high degree of karyotypic constancy at both intra- and inter-specific levels. However, polytypisms for the number of autosomes, the sex chromosome mechanism, and the size of the m-chromosomes were described in some species. Inter-specific variation in the chromosome number and/or in the sex chromosome mechanism were seen in some genera. Fusions and, less frequently, fragmentations are the main chromosome rearrangements involved in karyotype evolution." (Author)] Address: Mola, Liliana, Laboratorio de Citogenética y Evolución; Depto Ecología, Genética y Evolución; Facultad de Ciencias Exactas y Naturales; Universidad de Buenos Aires. Int. Güiraldes 2620, Ciudad Universitaria, Pabellón II, 4° Piso. (C1428EHA) Ciudad Autónoma de Buenos Aires. E-mail: limola@ege.fcen.uba.ar

6377. Monroy, L.P.D.; Realpe, E. (2007): Local assemblage patterns of odonates in Central Choco, Colombian Pacific. In: Tyagi, B.K. (Ed.): Odonata : Biology of Dragonflies. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: 183-199. (in English). ["The dragonfly community in Central Chocó region was sampled with the aim of detecting patterns of local distribution and its relationship with the habitats' configuration. The Chocóan odonatofauna shows strong relationship with the presence of pluvial forest and it is postulated as a landscape condition for this ecological distribution pattern. The community shows relationship with variables like vegetation architecture associated to classified habitats, characteristics of aquatic environment, habitat's maturity and human impact. The species adaptability categorization is presented and features of specificity related to the habitats. Pluvial forest fragmentation, technified mining, the excessive logging constitute the main threats for the stenotopic species (*Archilestes nov. sp.*, *Leptobasis sp.*, *Metaleptobasis sp.*, *Philogenia cristallina*, *Palaemnema dentata*, *Heteragrion erythrogastrum*, *Perissolestes emotus*, *Neocordulia batesi*). These species were related with the presence of mature forest, and their abundances were always the lowest. The eurytopic species (*Erythrodiplax andagoya*, *E. famula lativittata*, *Micrathyrina dictynna*, *Zenithoptera americana*, *Ischnura hastata*) are related with lentic systems with strong anthropic intervention and their abundances showed to be much higher. For the first time, a preliminary list of 38 species for the odonatofauna of Central Chocó is presented." (Authors)] Address: Monroy, L. P.D. Zoology and Eco-

logy Aquatic Laboratory LAZOEA Biologie Sciences Department, Universidad de los Andes Bogota, Colombia. E-mail: le-perez@uniandes.edu.co

6378. Needham, K.; Kenner, R. (2007): Chapter 14: Aquatic Insects. In: Davis, Neil and Rose Klinkenberg (editors). 2007. A Biophysical Inventory and Evaluation of the Lulu Island Bog, Richmond, British Columbia. Ecology Committee, Richmond Nature Park Society, Richmond, BC. Available on-line at <http://www.geog.ubc.ca/richmond/city/inventory2002.htm>: 5 pp. (in English).

6379. Novelo-Gutiérrez, R. (2007): The larva of *Aeshna williamsoniana* (Odonata: Anisoptera: Aeshnidae). Canadian Entomologist 139: 195-200. (in English, with French summary). ["The larva of *A. williamsoniana* Calvert, 1905 is described in detail, illustrated, and compared with other larvae of the genus and family. It is distinguished from its congeners by its granular integument, body mostly lacking hairlike setae, cerci with a row of spiniform setae along the lateroexternal margins, and dorsomedial margin of female epiproct with a row of spiniform setae. It does not particularly resemble any other larva of *Aeshna* or related genera described to date. The larval habitat is described for the first time." (Author)] Address: Novelo-Gutiérrez, R., Departamento de Entomología, Instituto de Ecología A.C., Km 2.5. antigua carretera a Coatepec, Aparatdo Postal 63, 91000 Xalapa, Veracruz, Mexico. E-mail: novelor@ecologia.edu.mx

6380. Ott, J. (2007): The expansion of *Crocothemis erythraea* (Brulle, 1832) in Germany - an indicator for climatic changes. In: Tyagi, B.K. (Ed.): Odonata : Biology of Dragonflies. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: 201-222. (in English). [In this paper a detailed account of the northward expansion of *C. erythraea* in Germany is presented. While only a few decades ago the species was rare even in southern Germany, it is now found in nearly every federal state, in most of them autochthonous. The species conquered Germany from south to north, parallel to climatic changes in the country; similar expansions of this species are recorded in other European countries, as well as northward expansions of other southern species. The main reason for this range expansion are climatic changes, some consequences of which are discussed." (Author)] Address: Ott, J., Friedhofstr. 28, D-67705 Trippstadt, Germany. E-mail: L.U.P.O.GmbH@t-online.de

6381. Ott, J.; Schorr, M.; Trockur, B.; Lingenfelder, U. (2007): Artenschutzprogramm für die Gekielte Smaragdlibelle (*Oxygastra curtisii*) in Deutschland an der Our. Invertebrate Ecology and Conservation Monographs 3: 130 pp. (in German, extended (5 pp.) English & French summaries). [This is a detailed documentation of a two year study of the single German population of *O. curtisii* with special emphasis on data necessary to conserve and monitor the population.] Address: Pensoft Publishers, Geo Milev Str. No. 13a, 1111 Sofia, Bulgaria. <http://www.pensoft.net>

6382. Paillisson, J.-M.; Reeber, S.; Carpentier, A., Marion, L. (2007): Reproductive parameters in relation to food supply in the whiskered tern (*Chlidonias hybrida*). Journal of Ornithology 148(1): 69-77. (in English, with German summary). [France; dragonflies and beetles belong to the most commonly eaten invertebrate

prey of *C. hybrida*. Address: Paillisson, J.-M., UMR-CNRS 6553 Ecobio, Biologie des Populations et de la Conservation, Campus de Beaulieu, Université de Rennes 1, Av. du Général Leclerc, 35042 Rennes, France. Email: jean-marc.paillisson@univ-rennes1.fr

6383. Penalva, R.; Costa, J.M. (2007): *Garrisionia aurindae* gen. and spec. nov. from the State of Bahia, Brazil (Anisoptera: Libellulidae). *Zootaxa* 1453: 33-40. (in English). ["*Garrisionia* gen. nov. is established for *Garrisionia aurindae* sp. n. (type species, holotype male and allotype female : Brazil: Bahia, Salvador, in Museu Nacional, Rio de Janeiro). Diagnoses and illustrations are given for similar genera of the region."] Address: Costa, J.M., Departamento de Entomologia, Museu Nacional, Universidade Federal do Rio de Janeiro, Quinta da Boa Vista, São Cristóvão, BR-20942-040 Rio de Janeiro, Brazil. E-mail: jcosta@acd.ufrj.br

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butterflies were the major insect kills with higher casualties on Sunday, which is associated with increased traffic load. Butterfly road kills were represented by high species diversity. This study reveals severity of invertebrate/insect casualties on road, conservation needs and surprising new frontiers of road ecology." (Authors)] Address: R. Shyama Prasad Rao, Geen Club, No. 1456, E&F Block, Ramakrishna Nagar, Mysore 570 022, India. E-mail: rsprao101@yahoo.co.in

6387. Prokop, J.; Prikryl, T.; Dostal, O.; Nel, A. (2007): *Oligaeschna kvaceki* sp. nov., a new fossil dragonfly (Odonata: Aeshnidae) from the middle Oligocene sediments of northern Moravia (Western Carpathians). *Geologica Carpathica* 58(2): 181-184. (in English). ["A new species of fossil dragonfly *Oligaeschna Piton et Theobald, 1939* (*O. kvaceki* sp. nov.) is described from Middle Oligocene strata of northern Moravia and compared with all closely related species. The current record documents a rather broad distribution and probably also high abundance of *Oligaeschna* in Eurasia during the Oligocene and Miocene." (Authors)] Address: Prokop, J., Department of Zoology, Charles University in Prague, Vinicna 7, CZ-128 44 Praha 2, Czech Republic. E-mail: jprokop@natur.cuni.cz

6388. Querino, R.B.; Pinto, J.D. (2007): A new *Hydrophylita* (Hymenoptera: Trichogrammatidae) from the Neotropics, with a key to species. *Zootaxa* 1437: 47-54. (in English). ["*Hydrophylita neusae* n. sp. is described and illustrated. *Hydrophylita* is a small genus of Trichogrammatidae which now includes four species, all known to attack eggs of damselflies (Odonata: Zygoptera). A key to species is included and those known from the Neotropics are illustrated." (Authors)] Address: Querino, R.B., Embrapa Roraima, BR 174 Km 8, Distrito Industrial, 69301-970, Boa Vista, Roraima, Brasil. E-mail: ranyse@cpafrr.embrapa.br

6389. Raab, R.; Chovanec, A.; Pennerstorfer, J. (2007): *Libellen Österreichs*. X, 345 pp: ISBN: 978-3-211-33856-8. (in German). [The expensive hard cover version of this book was reviewed in OAS 5733. It was clear after its publication that the price of the book would limit its distribution among European odonatologists. With no change in contents, Springer Publishers have released a paper back edition of the book. The price was reduced to a third of the hard cover version, and there is now no longer a reason not to buy this book. (Martin Schorr)] Address: Springer Verlag GmbH, Sachsenplatz 4-6, A-1201 Wien, Austria. www.springer.at

6390. Röbbelen, F. (2007): *Libellen in Hamburg*. Rote Liste und Artenverzeichnis 2. Fassung. Herausgeber: Freie und Hansestadt Hamburg, Behörde für Stadtentwicklung und Umwelt, Hamburg: 23 pp. (in German). [Hamburg, Germany; red list of threatened Odonata.] Address: Herausgeber: Freie und Hansestadt Hamburg, Behörde für Stadtentwicklung und Umwelt, Stadthausbrücke 8, 20355 Hamburg. E-mail: www.bsu.hamburg.de

6391. Rouquette, J.R.; Thompson, D.J. (2007): Roosting site selection in the endangered damselfly, *Coenagrion mercuriale*, and implications for habitat design. *Jour. Insect. Conserv.* 11(2): 187-193. (in English). ["A successful conservation strategy for an insect species should Address the habitat requirements of all life stages and all activities performed by those life stages. In

this paper the night-time roosting habitat and behaviour of the endangered damselfly *C. mercuriale* was investigated by marking damselflies with UV fluorescent paint. Night-time observations revealed that individuals did not roost together and those that were recorded on more than one occasion did not return to the same spot each night. There was no apparent preference for roosting close to the watercourses. *C. mercuriale* roosted towards the top of the vegetation and this vegetation was considerably taller than the mean height of the vegetation in the study area. Adults were strongly associated with two tussock-forming monocots, *Juncus inflexus* and *Deschampsia cespitosa*. Differences in the abundance of these plants were shown to result in large differences in the numbers of *C. mercuriale* roosting in different parts of the site. The importance of providing these structural elements of habitat as part of a wider conservation strategy for this species is discussed." (Authors)] Address: Thompson, D.J., Population Biology Research Group, School of Biological Sciences (Nicholson Building), University of Liverpool, P.O. Box 147, Liverpool, L69 3BX, UK. E-mail: d.j.thompson@liv.ac.uk

6392. Rundle, S.D., Bilton, D.T.; Abbott, J.C.; Foggo, A. (2007): Range size in North American *Enallagma* damselflies correlates with wing size. *Freshwater Biology* 52(3): 471-477. (in English). ["(1.) Cross-species macroecological comparisons in freshwater invertebrates have been restricted by a lack of large-scale distributional data, and robust phylogenies. Here, we use data from the Odonata Central database to explore body length-range size and wing length-range size relationships in damselflies from the genus *Enallagma*; the recent publication of a phylogeny for this group meant that, as well as a cross-species analysis, we were able to assess relationships in a phylogenetically controlled manner. (2.) For cross-species comparisons, only wing length showed significant (positive) regression relationships with range size and occupancy, although the inclusion of body length in multiple regressions increased the fit of the models. Damselflies with larger wings relative to their body length had larger distributions, a result confirmed by a significant positive relationship between range size and residuals from the regression of wing size on body size. (3.) For the phylogenetically controlled analyses, only wing length contrast scores were significantly related to distribution patterns and entered into regression models; the significant positive relationships between wing length contrasts and both range size and occupancy contrasts suggested that evolutionary increases in wing length had occurred alongside range expansions. (4.) Together these results suggest that species of *Enallagma* with larger wings (both absolute and relative to body length) tend to be more widely distributed in North America and that the evolution of wing size may have played a role in range expansion. No such relationships were evident for body size. We discuss the potential importance of wing morphometrics for studying the evolutionary ecology of freshwater insects." (Authors)] Address: Rundle, S., Marine Biology and Ecology Research Centre, School of Biological Sciences, University of Plymouth, Plymouth, PL4 8AA, U.K. E-mail: srundle@plym.ac.uk

6393. Schappert, P. (2007): New Odonata for Bastrop County and the Stengl "Lost Pines" Biological Station. In: Abbott, J.C. (Ed.): *Dragonflies and Damselflies (Odonata) of Texas*. Vol. 2: 12-16. (in English). [Some an-

necdotal reports on dragonfly searching in times of the 2005/2006 drought in central Texas, USA, with emphasis on colonisation of ponds after heavy rainfall. E.g. 3 *Pachydiplax longipennis* were seen before rainfall, while only 4 hours after the rain had stopped, more the 600 specimens were observed at a pond filled again with water.] Address: Schappert, P., Stengl "Lost Pines" Biological Station, University of Texas, 401 Old Antioch Road, Smithville, TX 78957, USA. E-mail: philjs@mail.utexas.edu

6394. Schlotmann, F. (2007): Die Libellen (Insecta: Odonata) des Guntersblumer Unterfeldes. *Mainzer naturwiss. Archiv / Beiheft* 30: 76-87. (in German, with English summary). [Rheinland-Pfalz, Germany; "With the shift of drinking water wells in the "Unterfeld Guntersblum" by the Water Supply Rhinehesse GmbH the dragonflies of the area were monitored in the years 1994 and 1997 to 2001 as a check of compensation measures. Altogether 34 species were found under which numerous are endangered in Rhineland-Palatinate. The occurrence of *Lestes barbarus*, *Anax parthenope* and *Leucorrhinia caudalis* has to be especially pointed out. The installation of numerous small ponds as a compensation measure led to the stabilization of the dragonfly populations as well as to the new settlement of several species." (Author)] Address: Schlotmann, F., Weserstr. 11, D-55296 Harxheim, Germany. Email: frank.schlotmann@gmx.net

6395. Seidenbusch, R.; Heidemann, H. (2007): An experimental key for the differentiation of the exuviae of the Southern Darter *Sympetrum meridionale* (Sélys) and the Common Darter *S. striolatum* (Charpentier), with notes on the Ruddy Darter *S. sanguineum* (Müller). *J. Br. Dragonfly Society* 23(1): 25-32. (in English). ["A study was carried out to develop a diagnostic key for identification of the exuviae of [...] *S. meridionale* and *S. striolatum*. Until now, no reliable key has existed to differentiate the exuviae of these very similar species. Previous keys have suggested that they can be discriminated using dorsal and lateral spines, features which in our experience have proved to be very variable and unreliable. Therefore, we propose an experimental key which separates these species without reference to such spines. About two thirds of the exuviae of *S. meridionale* and *S. striolatum* can be separated by the ratio of the width of the submentum to the length of the mentum. The remaining third fall into an intermediate section but can be separated by using further ratios of morphological measurements. In our experience, using all the diagnostic features presented in this paper will allow exuviae of these species to be separated reliably." (Authors)] Address: Seidenbusch, R., Klenze Str. 5, D-92237 Sulzbach-Rosenberg, Germany. E-mail: seidenbusch@freenet.de

6396. Soldan, T.; Zeleny, J. (2007): Book Review: Wildermuth et al: *Odonata. Die Libellen der Schweiz*. *Fauna Helvetica* 12. *Eur. J. Entomol.* 104(2): 284. (in English). [Review of the book abstracted as OAS 5005.] Address: not stated

6397. Stav, G.; Kotler, B.P.; Blaustein, L. (2007): Direct and indirect effects of dragonfly (*Anax imperator*) nymphs on green toad (*Bufo viridis*) tadpoles. *Hydrobiologia* 579(1): 85-93. (in English). ["We conducted an artificial pond experiment to assess the direct and indirect effects of predation on *Bufo viridis* tadpoles. We ran

three treatments: free Anax (unrestrained predatory dragonfly nymph Anax imperator), caged Anax (non-consumptive effects), and control (no Anax). Anax showed both strong consumptive and non-consumptive effects on Bufo tadpoles. Free Anax eliminated all of the tadpoles within six days. Tadpoles preferred the shady side of the ponds. Caged Anax caused tadpoles to increase their spatial preferences. Tadpoles avoided the center of the pond, and in the presence of the caged predator, they were found in the center even less. Tadpoles also showed a strong preference for crowding together, and in the presence of a caged Anax, they tended to crowd more. Moreover, Bufo metamorphosed earlier and at a larger size in the caged Anax ponds, possibly by providing extra food resources due to the extra organic matter excreted by the predators." (Authors)] Address: Stav, G., Jacob Blaustein Institute for Desert Research, Mitrani Department of Desert Ecology, Ben-Gurion University of the Negev, Sede-Boqer Campus, 84990 Negev, Israel. Email: gstav@tulane.edu

6398. Stoks, R.; De Block, M. (2007): Causes and costs of lamellae autotomy in damselfly larvae: a review. In: Tyagi, B.K. (Ed.): Odonata : Biology of Dragonflies. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: 241-255. (in English). ["Autotomy, the amputation of a body part at a breakage plane, is a well-known escape mechanism when animals are caught by a predator. Here, we review the ecological causes, field occurrence, and costs of lamellae autotomy in damselfly larvae. Lamellae autotomy is widespread in nature and is an important escape mechanism when caught by invertebrate predators and small fish, but has no survival advantage against large fish. However, associated with the other functions of lamellae, autotomy carries short-term costs in the form of a reduced ability to withstand low oxygen levels and high temperatures, and an increased vulnerability to conspecific and heterospecific predation. To deal with the latter, larvae show threat-sensitive antipredator behaviour after autotomy. The resulting reduced food intake together with their increased predator-induced stress, may explain negative effects on mass and size at emergence and wing asymmetry. Based on the known short-term costs, long-term costs on adult fitness and a regulatory role of autotomy in population regulation are likely, but await experimental proof." (Authors)] Address: Stoks, R., Laboratorium voor Aquatische Ecologie, K.U.Leuven, De Beriotstraat 32, B-3000 Leuven, Belgium. E-mail: robby.stoks@bio.kuleuven.ac.be

6399. Subramanian, K.A. (2007): Endemic odonates of the Western Ghats: habitat distribution and conservation. In: Tyagi, B.K. (Ed.): Odonata : Biology of Dragonflies. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: 257-271. (in English). ["The habitat distribution of endemic odonates of Western Ghats is studied based on field work and published literature. One hundred and seventy six species of odonates with 68 endemics are reported from the Western Ghats. The breeding habitats of 50 endemic species are known. The current field survey discovered new populations of three monotypic species from the region. Most of the endemic species are restricted to riverine habitats as compared to non-endemics. Streams flowing through evergreen forests and Myristica swamps support high diversity of endemics. Draining of Myristica swamps, diversion of streams for agricultu-

re and structural alterations are major threats to the conservation of endemic species of the region. Long term conservation of endemic odonate fauna of region should focus on conservation of riverine habitats of the region." (Author)] Address: Subramanian, K.A., Centre for Ecological Sciences, Indian Institute of Science, Bangalore- 560 012, India. E-mail: subbu@ces.iisc.emet.in

6400. Theischinger, G.; Richards, S.J. (2007): Three new damselfly species from Papua New Guinea (Zygoptera: Megapodagrionidae, Coenagrionidae). In: Tyagi, B.K. (Ed.): Odonata : Biology of Dragonflies. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: 33-43. (in English). ["Three species of damselflies from Eastern Highland Province, Papua New Guinea are described as new. They are: Argiolestes angulatus sp. n. (Holotype male: Mamaifu, 21-XI-1997), Argiolestes fornicatus sp. n. (Holotype male: Mamaifu, 29-XI-1997) and Austroagrion kiautai sp. n. (Holotype male: montane lake behind Mamaifu, 27-XI-1997). Diagnostic characters of the adults are illustrated and the affinities of the species are discussed. All type material is deposited at the South Australian Museum, Adelaide." (Authors)] Address: Theischinger G., 2A Hammerley Road, Grays Point, NSW 2232, Australia

6401. Thomas, B. (2007): Williamson County Gold: Chandler Creek. Abbott, J.C. (Ed.): Dragonflies and Damselflies (Odonata) of Texas. Vol. 2: 7-8. (in English). [USA, Texas, checklist of odonate records resulting ongoing from 2004] Address: E-mail: Rthomas5@austin.rr.com

6402. Toms, R.B. (2007): Rooting the phylogenetic tree for winged insects: independent adaptations to terrestrial life. African Invertebrates 48(1): 203-211. (in English). ["Although numerous articles have been published on insect phylogeny using a great variety of techniques, there is no consensus on the nature of the first winged insects, the ancestors of holometabolous insects or the causes for the origin of metamorphosis. This discord has resulted in the lack of secure foundations within entomological theory. However, several recent articles provide key information which may help to resolve some of the long-standing disputes. Some biologists have argued that the first winged insects might have been amphibiotic rather than terrestrial and that metamorphosis might have originated as an adaptation to amphibiotic life. Thus entomological theory may now be passing through a paradigm shift where, for the first time, the phylogenetic tree for all insects may be firmly rooted." (Author) The paper includes references to the Odonata.] Address: Toms, R.B., Indigenous Knowledge Systems, Transvaal Museum, Northern Flagship Institution, P.O. Box 413, Pretoria, 0001 South Africa. E-mail: toms@nfi.co.za

6403. Tyagi, B.K.; Kiauta, M.A.J.E. (2007): Professor Bastiaan Kiauta - an extraordinary and outstanding odonatologist. In: Tyagi, B.K. (Ed.): Odonata : Biology of Dragonflies. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: 1-24. (in English). [(1) Brief account on the odonatological vita of B. Kiauta with emphasis to Indian odonatology. (2) Odonatological bibliography of B. Kiauta covering 1954 - 2006.] Address: Kiauta, M., P.O. Box 256, NL-3720 AG Bilthoven, The Netherlands. E-mail: mb.kiauta@12move.nl

6404. Tyagi, B.K. (2007): Odonata: Biology of Dragonflies. Jodhpur, Scientific Pub., 2007, xx, 368 pp., tables, figs., ISBN 81-7233-482-6: xx, 368 ppp. (in English). [Festschrift dedicated to Prof. Dr. B. Kiauta. Contents: Foreword/Preface by Norman Moore and Kiyoshi Inoue. Acknowledgements. 1. Professor Bastiaan Kiauta - an extraordinary and outstanding odonatologist/B.K. Tyagi and M.A.J.E. Kiauta. 2. Studies on neotropical protoneuridae. 2. *Neoneura Kiautai* spec. nov. from Southeastern Brazil (Zygoptera, Protoneuridae) /Angelo B.M. Machado. 3. Three new damselfly species from Papua New Guinea (Zygoptera: Megapodagrionidae, coenagrionidae)/G. Theischinger and S.J. Richards. 4. Dragonflies from the Okavango swamps (Botswana, Southern Africa) in winter/Henri J. Dumont. 5. *Cordulegaster insignis* (Schneider, 1845) in Bulgaria with notes on its biology and ecology/Milen Marinov, Burkhard Grebe and Yordan Kutsarov. 6. The dragonfly fauna of the Shivapuri Hills, Nepal (Odonata: Zygoptera, Anisozygoptera, Anisoptera)/T. Brockhaus, S.G. Butler, R.G. Kemp and G.S. Vick. 7. The composition and history of Siberian odonate fauna/A.Yu. Haritonov. 8. The dragonflies of forest-steppe in West Siberia: fauna, ecology and biology/O.N. Popova. 9. Odonata of Mexico revisited/E. Gonzalez Soriano and R. Novelo Gutierrez. 10. Odonata inventories in British Columbia, Canada: determining the conservation status of odonata species/Robert A. Cannings, Leah R. Ramsay and Sydney G. Cannings. 11. Cytogenetics of American Odonata/Liliana M. Mola. 12. Are the observed dispersal capacities in damselfly species sufficient to cope with the ongoing rapid shift of climate zones?/J. Beukema. 13. Local assemblage patterns of odonates in Central Choco, Colombian Pacific/L. Perez. D. Monroy and E. Realpe. 14. The expansion of *crocothemis erythraea* (Brulle, 1832) in Germany - an indicator for climatic changes/J. Ott. 15. Adaptationist approach of reproductive behaviour in Libellulidae: a case report on *Diastatops obscura* Fabricius/J.B. Irusta and A. Araujo. 16. Causes and costs of lamellae autotomy in damselfly larvae: a review/R. Stoks and M. De Block. 17. Endemic odonates of the Western Ghats: habitat distribution and conservation/K.A. Subramanian. 18. Dragonflies of the Madurai Kamaraj University Campus (Tamil Nadu, India)/P.L. Miller. 19. Larval and adult behavioural patterns of some odonata species from Dehradun Valley/Amit Mitra. 20. *Coellicia hoanglienensis* spec. nov., a new platynemid damselfly from Hoang Lien mountains in the North of Vietnam (Zygoptera: Platynemididae)/Do Manh Cuong. 21. Observations on mating and oviposition behaviour of *Tetrathemis platyptera* Selys, 1878/Kiran C.G. and F.K. Kakkassery. 22. About the odonata ethnic names in the Serbian linguistic area /Milos Jovic. 23. Discovering the dragonfly wealth of Kerala - the God's own land - in South India: a travelogue/Dan Barta.] Address: Tyagi, B.K., Centre for Research in Medical Entomology (ICMR), 4-Sarojini Street, Chinna Chokkikulam, Madurai 625005 (Tamil Nadu), India. E-mail: bkjyagi@sify.com

6405. Wagner, H.; Ott, J. (2007): Naturschützer: Insekten sind erste Opfer. Libellen bilden ein Frühwarnsystem für Klimaänderungen. Bestand im Pfälzerwald gefährdet. Rheinzeitung vom 7.3.2007: (in German). [Interview with Jürgen Ott on Odonata as indicators of climatic change in a German newspaper.] Address: Ott, J., Friedhofstr. 28, D-67705 Trippstadt, Germany. E-mail: L.U.P.O.GmbH@t-online.de

6406. Ward, L.; Mill, P.J. (2007): Long range movements by individuals as a vehicle for range expansion in *Calopteryx splendens* (Odonata: Zygoptera). Eur. J. Entomol. 104(2): 195-198. (in English). ["(1.) Flight activity in zygopterans is generally restricted to short-range movements associated with foraging, reproductive activity and escape. Indeed, previous studies have suggested that *Calopteryx* species, including *C. splendens*, are relatively sedentary species, with a low tendency for long distance movements. (2.) Recent observations suggest that *C. splendens* is expanding its northern range in the UK; in the northeast the species is now well established in Northumberland and, in the northwest, has recently spread into south-west Scotland. The current study aimed to investigate the mobility and dispersal tendency of *C. splendens* in a well-established breeding population in NE England. (3.) A mark-release-recapture study was carried out on a population of *C. splendens* along a section of the River Wharfe, West Yorkshire, UK. 831 adult *C. splendens* were marked uniquely for individual identification in order to monitor the day-to-day, and overall, distance and direction of movement for each individual. Of these 381 were recaptured at least once. (4.) The majority of males (85%) and females (88%) moved a distance of 100 m or less and only five of the recaptured individuals (1.3%) moved a minimum distance in excess of 500 m. Although the median distance moved by males was greater than that for females, this was not significant. In addition, there was no significant difference in the number of either males or females moving upstream as opposed to downstream. (5.) The results are compared with those from other studies on calopterygid movement. Although most individual *C. splendens* stay within a suggested home range of approximately 300 m, clearly individuals have the potential to cover relatively long distances, and it is these latter movements that play a fundamental role in increasing the range of the species." (Authors)] Address: Mill, P.J., Fac. Biological Sciences, L.C. Miall Building, University of Leeds, Leeds, LS2 9JT, UK. E-mail: p.j.mill@leeds.ac.uk

6407. Watts, P.C.; Rousset, F.; Saccheri, I.J.; Leblois, R.; Kemp, S.J.; Thompson, D.J. (2007): Compatible genetic and ecological estimates of dispersal rates in insect (*Coenagrion mercuriale*: Odonata: Zygoptera) populations: analysis of 'neighbourhood size' using a more precise estimator. *Molecular Ecology* 16(4): 737-751. (in English). ["Genetic and demographic estimates of dispersal are often thought to be inconsistent. In this study, we use *C. mercuriale* as a model to evaluate directly the relationship between estimates of dispersal rate measured during capture-mark-recapture fieldwork with those made from the spatial pattern of genetic markers in linear and two-dimensional habitats. We estimate the 'neighbourhood size' (N_b) - the product of the mean axial dispersal rate between parent and offspring and the population density - by a previously described technique, here called the regression method. Because *C. mercuriale* is less philopatric than species investigated previously by the regression method we evaluate a refined estimator that may be more applicable for relatively mobile species. Results from simulations and empirical data sets reveal that the new estimator performs better under most situations, except when dispersal is very localized relative to population density. Analysis of the *C. mercuriale* data extends previous results which demonstrated that demographic and genetic estimates of N_b by the regression method are

equivalent to within a factor of two at local scales where genetic estimates are less affected by habitat heterogeneity, stochastic processes and/or differential selective regimes. The corollary is that with a little insight into a species' ecology the pattern of spatial genetic structure provides quantitative information on dispersal rates and/or population densities that has real value for conservation management." (Authors)] Address: Watts, P. C.; School Biological Sciences, The Biosciences Building, Crown Street, University of Liverpool, Liverpool, L69 7ZB, UK. E-mail: p.c.watts@liv.ac.uk

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lopteryx atrocyana is confirmed from Chinese territory. Keys are provided for the identification of males of all known species of Rhipidolestes and Chinese Megalolestes." (Authors)] Address: Wilson, K.D.P., 118 Chatsworth Road, Brighton, BN1 5DB, UK. E-mail: kdpwilson@gmail.com

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