1997


7575. Liebherr, J.K.; Polhemus, D.A. (1997): R.C.L. Perkins: 100 years of Hawaiian entomology. Pacif. Sci. 51(4): 343-355, 1 pl. (in English) [*R. C. L. Perkins comprehensively surveyed the insect fauna of the Hawaiian Islands one century ago, initially as the collector for the Fauna Hawaiensiis survey project and subsequently as an entomologist with the Hawaiian Sugar Planters’ Association. The Hawai’i he observed was in a period of rapid transformation. Thus, he has the unique distinction of being the first and last person to record the habits of many native Hawaiian species. The islands on which he collected were already heavily impacted by exotic herbivores-including goats, cattle, sheep, and pigs-yet he was able to sample remnant pockets of native vegetation that are now lost in a jungle of exotic herbivores, including Ictinogomphus pertinax, Sinictinogomphus clavatus, Gomphidia confluens, and Gomphidia kruegeri fukienensis. They can be distinguished by their large size, venation and structure of caudal appendages. The structural features, distribution, habitat, behaviour and flight period of each species are described. A key to the larvae is also provided. (Translation of the original Chinese summary thanks to Haomiao Zhang)] Address: http://www.fs.fed.us/psw/publications/documents/pswgtr167/pswgtr167.pdf

7577. Yeh, W.-c. (1997): The Lindeninae dragonflies of Taiwan. Conservation Quarterly, summer quarterly, June, 1997, 18: 32-36. (in Chinese) [Four species in three genera of Lindeninae are known from Taiwan, including Ictinogomphus pertinax, Sinictinogomphus clavatus, Gomphidia confluens, and Gomphidia kruegeri fukienensis. They can be distinguished by their large size, venation and structure of caudal appendages. The structural features, distribution, habitat, behaviour and flight period of each species are described. A key to the larvae is also provided. (Translation of the original Chinese summary thanks to Haomiao Zhang)] Address: Yeh, Wen-Chi, Division of Forest Protection, Taiwan Forestry Research Institute, 53 Nanhai Road, Taipei 100, Taiwan. E-mail: wcyeh@tfri.gov.tw

1998

7578. Bennett, B.L. (1998): Land use influences on benthic invertebrate assemblages in southern Appalachian agricultural streams. MSc Thesis, Dept Biology, Faculty of the Virginia Polytechnic Institute and State University Blacksburg; VIII, 98 pp. (in English) [*I investigated the role of land use in structuring benthic invertebrate assemblages in agricultural streams in the French Broad River drainage in western North Carolina. I sampled six agricultural streams (3 with cleared headwaters and 3 with forested headwaters) at three points along a gradient (headwaters, a midpoint, and a downstream site). At each site, I measured a variety of physico-chemical parameters, including temperature, chlorophyll a, discharge, nutrients, and suspended solids. More than 500 taxa below the family level were inventoried, and each listing includes relative frequency of encounter, life stages collected, and dominant role in the greenleaf manzanita community. Specific host relationships are included for some predators and parasitoids. Herbivores, predators, and parasitoids comprised the majority (80 percent) of identified insects and related taxa.” (Authors) The list of Odonata includes the following taxa: Aeshna palmarata, Anax junius, Cordulegaster dorsalis, Libellula sp., Pantala hymenaea, Tarnetrum corruptum, Lestidae species undet., and Coenagrionidae species undet.] Address: http://www.fs.fed.us/psw/publications/documents/pswgtr167/pswgtr167.pdf
Invertebrates were sampled at all sites in October 1996 and April 1997. Riparian vegetation was assessed for each site at multiple spatial scales using GIS data from the 1950s, 1970s, and 1990s. Forested agricultural (FA) streams had more riparian vegetation than cleared agricultural (CA) streams in both the 1950s and the 1970s. Cleared agricultural streams had less organic matter, more primary production, higher nitrates, and warmer temperatures than FA streams. Total and EPT taxa richness was greater in FA streams. Pollution-sensitive Plecoptera were relatively more abundant in FA streams, while tolerant Diptera were more abundant in CA streams. High diversity and Plecoptera abundance was related to high habitat quality, more riparian vegetation, low nitrates, and low summer temperatures. Higher invertebrate diversity was related to the land use 25-50 years as well as the current land use (forested, moderate agriculture, or heavy cattle impact). These results indicate a long-term legacy of agricultural influences on stream invertebrate assemblages. 

Boyeria grajiana, B. vinosa, Gomphus lividus, Lanthus parvulus, and Ophiogomphus mainensis are listed.

Address: Bennett, Barbara Loraine, Dept Biology, Virginia Polytechnic Institute and State University Blacksburg, VA 24061-0406, USA

1999

7579. Riaz, H.; Riaz, M. (1999): The naiads of Acisoma panorpoides panorpoides and Brachythemis contaminata [Libellulidae: Odonata]. Int. J. Agriculture & Biology 1(3): 147-148. (in English) [Description of the two taxa and documentation of localities the specimens were sampled.] Address: Riaz H., Pest Warning and Quality Control of Pesticides, Pakpattan, Pakistan. E-mail: riazhuissain37@hotmail.com

7580. Riaz, H.; Riaz, M. (1999): Description of last instar naiads of Rhythishemis variegata variegata Limnaeus and Pantala flavescens (Fabricius) (Anisoptera: Odonata). Int. Jour. Agriculture & Biology 1(3): 145-146. (in English) [The larvae of R. variegata and P. flavescens collected from various localities in the Sindh Province, Pakistan are described and illustrated.] Address: Riaz H., Pest Warning and Quality Control of Pesticides, Pakpattan, Pakistan. E-mail: riazhuissain37@hotmail.com


2000

7582. Chae, J.-S.; Pusterla, N.; Johnson, E.; Derock, E.; Lawler, S.P.; Madigan, J.E. (2000): Infection of a quatic insects with nematode metacercariae carrying Ehrlichia risticii, the cause of Potomac Horse Fever. J. Med. Entomol. 37(4): 619-625. (in English) ["We provide evidence of Ehrlichia risticii in FA streams, while tolerant Diptera were more abundant in CA streams. High diversity and Plecoptera abundance is related to high habitat quality, more riparian vegetation, low nitrates, and low summer temperatures."

E. risticii was detected in metacercariae found in the immatures and adults of the following in- sects: Trichoptera, Ephemeroptera, Odonata (Zygoptera and Anisoptera), and Plecoptera. The prevalence of E. risticii was 31.9% (n 5 454 individuals) in aquatic in- sects (13 of 47 species were positive). Prevalence with- in orders was as follows: 43.5% (n 5 207) in caddisflies, 15.2% (n592) in mayflies, 13.9% (n5115) in damselflies, 10.0% (n510) in dragonflies, and 80.0% (n 5 30) in stoneflies. This study demonstrates a broad intermedia- te host range for trematodes that act as vector for E. risticii. Insects are likely to play an important role in the epidemiology of this disease." [Authors] Address: Chae, J.-S., College of Veterinary Medicine, Chonbuk National University, Chonju, Chonbuk 561-756, Korea

7583. Triapitsyn, S.V.; Beardsley, J.W. (2000): A review of the Hawaiian species of Anagrus (Hymenoptera: Mymaridae). Proc. Hawaiian Entomol. Soc. 34: 23-48. (in English) ["A brief historical account of the use of Anagrus Haliday (Hymenoptera: Mymaridae) in biological control in the Hawaiian Islands is given. Twelve species of Anagrus, ten of them named, are keyed and descriptive notes are provided. [..] Two of the named Anagrus species, A. insularis Dozier and A. oahuensis n. sp., are not known outside the Hawaiian Islands. The former species has been reared from eggs of Odonata and the host is an endemic Megalagrion species (Coe- nagnionidae). This species of Anagrus may be endemic to the Hawaiian Islands although it is morphologically close to the European species Anagrus brocheri Schulz. Possibly a complex of Anagrus species is asso- ciated with the eggs of Megalagrion, but additional re- search is needed to demonstrate this." [Authors] Ad- dress: Triapitsyn, S.V., Department of Entomology, Uni- versity of California, Riverside, California 92521, USA

2001

7584. Alvarez, M.; Pardo, I.; Moya, G.; Ramon, G.; Martinez-Taberner, A. (2001): Invertebrate communities in Temporary streams of the island of Majorca: a comparison of catchments with different land use. Limnetica 20(2): 255-266. (in English, with Spanish summary) ["This study compares the invertebrate communities in two catchments in the Mediterranean island of Majorca, Spain. The Soller catchment is highly urbanised, with areas of intensive agriculture. The catchment of stream Sant Jordi is covered in a large part by a mature forest of Mediterranean Quercus. Upper and middle reaches of the latter were chosen as reference sites of well-pre- served environmental conditions. Diptera was the richest in both catchments, followed by Cole- optera and Trichoptera in the Sant Jordi catchment, and by Mollusca in Soller. Overall, invertebrate species rich- ness was similar in the two catchments. Species composition and representation differed and Crustacea were proportionally more abundant in the Sant Jordi catchment sites than in Soller. In the latter catchment, Diptera (mainly Chironomidae) and Oligochaeta were more abundant than in the Sant Jordi catchment. Main factors influencing community structure in both catch- ments were identified, i.e. allochthonous organic inputs.
from riparian vegetation and land use effects on this, local wastewater discharge, length of the dry period, saltwater intrusion and watertable lowering due to increasing groundwater extraction at downstream sites."

(Authors) Odonata are also treated on the family level."

Address: Moya, G., Departament de Biologia Ambiental, Universitat de les Illes Balears, 0707 1 Palma de Mallorca, Spain

7585. Boix, D.; Sala, J.; Moreno-Amich, R. (2001): The faunal composition of Espolla pond (NE Iberian Peninsula): the neglected biodiversity of temporary waters. Wetlands 21(4): 577-592. (in English) "[The faunal composition, richness, and their determinant factors were analyzed in a Mediterranean temporary pond located in NE Spain. The aquatic community was sampled weekly over 7 periods of flooding during 4 years (1996–1999). Composition of the pond community was found to be influenced by duration of the hydroperiod and, secondarily, by seasonality. Insects and crustaceans were the most well-represented types of fauna. The small numbers of species captured over all hydroperiods spend the dry periods in situ or have an important dispersal capacity. Comparison of the faunal composition of several temporary ponds of temperate latitudes confirms the great diversity of faunal groups found in temporary aquatic environments, and this richness is comparable to that found in permanent water bodies. The richness of these temporary ponds is related to flooded surface and to hydroperiod duration. The peculiarity of the fauna of temporary waters, together the deteriorating condition of those habitats, make it necessary for more active policies of preservation to be pursued." (Authors) In tab. 2 larval records of Chalcolestes viridiflavus and Anax imperator are listed.] Address: Boix, D., Institute of Aquatic Ecology and Dept. of Environmental Sciences, University of Girona, Campus de Montilivi, Faculty of Sciences, 17071—Girona, Catalunya, Spain

7586. Malikova, E.I.; Ivanov, P.Yu. (2001): Fauna strekoz (Insecta, Odonata) Primorskogo kraya. - [Dragonfly (Odonata) fauna of the Primorye region]. Chitenniya V.L Levanidov bienn. mem. Meetings 1: 131-143. (in Russian) "Far East, Russia; the Odonata fauna of the region is critically reviewed and a checklist (with 80 species) is provided. The regional occurrence of Enallagma cyathigerum, Aeshna viridis, Trigomphus anormolobatus, and Neurothemis fluctuans requires confirmation."

Address: Malikova, E.I., Studencheskaya 25/1-5, RUSSIA-675027 Blagoveschensk, Amur Region, Russia


2002

7588. Abbott, J.; Beckemeyer, R.J.; Donnelly, T.W.; Gonzalez-Soriano, E.; Harp, G.L. (2002): Odonata collected in Nicaragua. Notul. Odonatol. 5: 125-128. (in English) [ During 29 July through 3 Aug. 2001, 71 species were collected and 4 additional species were positively identified, from 12 localities in Jinotega and Mata-galpa Departments. 25 species are new records for Nicaragua, raising the total number of species for this country to 124." (Authors)]

7589. Antipova, L.F.; Baikova, T. V. (2002): Invertebrates of the Pskov District. Pskov State University Press: (in Russian) [A list of invertebrates from the Pskov Oblast is provided. For the Odonata this includes general remarks on the biology (mostly restricted to the family or genus level) and the list of 46 species of Odonata. Aeshna viridis and Anax imperator are very rare. Photographs of some species are presented.] Address: not stated


7591. Bree, D. (2002): Notes on the Odonata of Prince Edward County, Ontario - 2001. In: Catling, P.M., C.D. Jones & P. Pratt (Eds): Ontario Odonata, vol. 3. Toronto Entomologist's Association, Toronto, Ontario: 14-15. (in English) "[Three new county records are reported for Prince Edward County bringing the county list to 73 species. Additions reported are Aeshna deepsydra, Cordulia shuttleoffii, and Perithemis tenera. The latter represents a significant northeastern range extension. In addition county late and early flight dates are reported, as are records of the uncommonly encountered Aeshna canadensis, A. umbrosa, A. verticalis, and Basiaeschna janata. Included is an update on the Sandbanks Pannes wetland and the disappearance of Ischnura hastata from that habitat. The annual autumn build-up of darners (Aeshnidae) was again noted and may be associated with the unusually warm weather experienced in 2001."

Address: Bree, D., Box 123, Bloomfield, ON, K0K 1G0, Canada; E-Mail: dbree@post.kosone.com

7592. Bree, D. (2002): Summary of the Odonata of Petroglyphs Provincial Park in 2001. In: Catling, P.M., C.D. Jones & P. Pratt (Eds): Ontario Odonata, vol. 3. Toronto Entomologist's Association, Toronto, Ontario: 5-10. (in English) ["An annotated list is presented including 60 species of Odonata found in 2001 at Petroglyphs Provincial Park located on the extreme southern edge of the Canadian Shield at 44° 37'N, 78° 03'W. Progomphus obscurus is reported for the third time in Canada. A number of uncommon species are also reported including; Macromia illinoiensis, Cordulegaster maculata, Gomphaeschna furciillata, G. lividus, So-mathochlora williamsoni, Stylogomphus albiystlus, and Stylurus scudderii. Gomphus adelphi and Somatochlorella kidneyi are added to the Peterborough County list bringing the total to 101 and late and early flight dates for die county are noted. Recommendations are made to provide special conservation status to Jack's..." (Authors)]
7593. Catling, P.M.; Brownell, V.R. (2002): Additions to the Odonata of Lanark County, Ontario. In: Catling, P.M., C.D. Jones & P. Pratt (Eds): Ontario Odonata, vol. 3. Toronto Entomologist’s Association, Toronto, Ontario: 4:5. (in English) [Notes were provided on seven species which are additions to the reported fauna of Lanark County, Ontario. Included are Enallagma vernale, Gomphaeschna furcillata, Gomphus quadricollaris, Ophiogomphus rupinsulensis, Williamsonia fletcheri, Nannothemis bella, and Pantala flavescens bringing the county list to 87 species.] (Authors) Address: Catling, P.M., 2326 Scrivens Drive, R.R. 3, Metcalfe, ON, K0A 2P0, Canada; E-Mail: brownell@achilles.net

7594. Catling, P.M. (2002): A new identification problem in field surveys: Tramea lacerata and Epitheca princesps.. In: Catling, P.M., C.D. Jones & P. Pratt (Eds): Ontario Odonata, vol. 3. Toronto Entomologist’s Association, Toronto, Ontario: 58-61. (in English) [Field identification characters are outlined to discriminate Tramea lacerata and Epitheca princesps.] Address: Catling, P.M., 2326 Scrivens Drive, R.R. 3, Metcalfe, ON, K0A 2P0, Canada; E-Mail: brownell@achilles.net

7595. Catling, P.M.; Brownell, V.R. (2002): Observations of Odonata in Ontario made in 1996, 1997 and 1998. In: Catling, P.M., C.D. Jones & P. Pratt (Eds): Ontario Odonata, vol. 3. Toronto Entomologist’s Association, Toronto, Ontario: 83-190. (in English) [The observations in the following table totaling 1937, were recorded prior to the concept of a major Odonata survey in Ontario. Many were collected during a study of the ecology of gravel pit ponds. Others were collected during floristic surveys. In general the emphasis was on Zygoptera in connection with ecological studies. Very few records of larvae are included. The lack of data on numbers and sexes, and the way in which the data was collected places some limitations on its use in the analysis of trends. It is useful in contributing to an understanding of geographic occurrence, flight periods and in connection with regional studies. Many of the observations are supported by voucher specimens in the collection of the observers and/or in the Ontario Survey collection at CNC (Agriculture and Agri-Food Canada, Ottawa). As with the summary data produced in volumes 1-3 of Ontario Odonata, these observations are part of a limited access database maintained by the Toronto Entomologists Association and the Natural Heritage Information Center (NHIC) in Peterborough. Among the noteworthy species listed in the following summary is Hetaerina titia originally discovered in Ontario by P. Pratt and Jo Barton in 1985 (see Great Lakes Entomologist 31 (3-4); 205-208. 1998). The male of H. titia is longer, more slender and darker than the male of H. americana and has conspicuous dark colouration at the wing tips especially the hindwing.] (Authors) Address: Catling, P.M., 2326 Scrivens Drive, R.R. 3, Metcalfe, ON, K0A 2P0, Canada; E-Mail: brownell@achilles.net

7596. Catling, P.M.; Brownell, V.R. (2002): Notes on the Odonata of Murphys Point Provincial Park, Lanark County, Ontario. In: Catling, P.M., C.D. Jones & P. Pratt (Eds): Ontario Odonata, vol. 3. Toronto Entomologist’s Association, Toronto, Ontario: 20-23. (in English) [Forty-six species of Odonata are reported for Murphys Point Provincial Park in Lanark County, on the Frontenac Axis of the Canadian Shield, approx. 50 km NNE of Kingston, Ontario. Less common Ontario species present included Enallagma geminatum, E. vesperum, Lestes forcipatus, L. vigilax, and Celithemis eponina. Pachydiplax longipennis, and Celithemis eponina reach their northern limit in the general region of the park, and provide an example of the pattern of disjunction from the Carolinian zone of extreme southwestern Ontario into the Frontenac Axis. (Authors) Address: Catling, P.M., 2326 Scrivens Drive, R.R. 3, Metcalfe, ON, K0A 2P0, Canada; E-Mail: brownell@achilles.net

7597. Catling, P.M. (2002): An evaluation of some characters separating male Lestes disjunctus and Lestes forcipatus in Ontario. In: Catling, P.M., C.D. Jones & P. Pratt (Eds): Ontario Odonata, vol. 3. Toronto Entomologist’s Association, Toronto, Ontario: 51-58. (in English) [Using scatter diagrams and analysis of variance, five characters were evaluated in ninety-three males of L. forcipatus and L. disjunctus disjunctus from throughout Ontario. The analysis included the morphological characters: (1) relative length of abdominal segments 2 and 3; (2) shape of the penis vesicle; (3) relative size of distal tooth of superiorappendage; (4) length of the anterior lamina; and (5) proximity of basal swelling to basal tooth of the superior appendage. Also included were the scale pattern characters: (1) extent of dark colour on side of thorax above metapleural suture; and (2) colour of ventral surface of abdominal segment 10. The length of the anterior lamina discriminated groups well but is a difficult field character. Size of distal tooth on superior appendage along with coloration are recommended to distinguish the two species since both are highly correlated with length of anterior lamina and are also easy to use.] (Author) Address: Catling, P.M., 2326 Scrivens Drive, R.R. 3, Metcalfe, ON, K0A 2P0, Canada; E-Mail: brownell@achilles.net

7598. Catling, P.M.; Brownell, V.R. (2002): A preliminary assessment of changes in status of Ontario dragonflies since Walker’s published survey in 1941. In: Catling, P.M., C.D. Jones & P. Pratt (Eds): Ontario Odonata, vol. 3. Toronto Entomologist’s Association, Toronto, Ontario: 36-48. (in English) [To elucidate changes in status of Ontario Odonata, the number of records for each of 164 species in Walker’s published survey was compared with the number of records for the same species in the year 1999 and year 2000 seasonal summaries. Based on criteria established for reasonable evidence, 29 species have declined and 14 have increased. The result of a greater number of declining species suggests that the threat to dragonfly biodiversity has increased. Species for which there was particularly good evidence of decline, based on meeting 2 of the 3 numeric subcriteria, included Somatochlora minor, Epiaeschna heros, Aeshna verticalis, and Somatochlora kennedyi. Species for which there was particularly good evidence of increase (based on meeting 2 of the 3 numeric subcriteria) included Tramea lacerata, Argia apicalis, Erythemis simplicicollis, Celithemis elisa and Enallagma civile. Significantly more than expected of the declining species were...
associated with good water quality while significantly more of the increasing species are associated with poor water quality. Thus deteriorating water quality over me past 50 years is implicated as a factor in status change. Species for which mere was significant evidence of in-
crease were more often than expected associated with ponds and lakes, than with rivers and streams. A signi-
ficantly larger than expected proportion of the increas-
ing species had a southern Carolinian or Carolinian Subunit distribution pattern, and a significantly smaller man expected proportion of the decreasing species had such a pattern. This provides further evidence for an in-
crease in "southern" species associated with climate warming. An increase in me numbers of most migratory and/or wandering species is correlated with the recent northward extension of this group, also likely attribut-
able to climatic warming." (Authors) Address: Catling, P.M., 2326 Scrivens Drive, R.R. 3, Metcalfe, ON, K0A 2P0, Canada; E-Mail: brownell@achilles.net

ing 166 species, one with 2 subspecies) (Catling and Brownell 2000; Damselflies and Dragonflies of Ontario: Resource Guide and Annotated List. ProResources, 2326 Scrivens Drive, Metcalfe, Ontario, Canada. 200 pp.). That list included additions made after 1975 to the list that could be generated from publications of Dr. E.M. Walker (Walker 1953, 1958, Walker and Corbet 1975). These additions included: Dromogomphus spli-
atus, Gomphaeschna fwcillata, Enallagma anna, E. basidens, E. traviatum westfalli, Hetaerina tilta, Macro-
mia taeniola, Ophiogomphus mainensis, Progomphns obscurus, Stylurus amnicola, and Stylurus laurae. The changes made in this edition of the checklist include the dropping of Sympetrum jannae which appears too indis-
tinct to warrant recognition (e.g Donnelly 2001, pp. 9-
10), the dropping of Sympetrum occidentale following the suggestion of Dr. N. Donnelly upon whose authority and collections it was originally included (see also Don-
nelly 2001, p. 10), the listing of Lestes australis as a species (Donnelly 2001) and the addition of Ichneuma kelicotti, discovered in 2001." (Author) Address: Cat-
ing, P.M., 2326 Scrivens Drive, R.R. 3, Metcalfe, ON, K0A 2P0, Canada; E-Mail: brownell@achilles.net

lata is reported from two locations in Kenora district of northwestern Ontario, representing a range extension from the nearest locations in southwestern Ontario, and is 340 km north of the nearest location in New York State. These sites represent the fourth and fifth locali-
ties for Ontario. This globally vulnerable species has not been seen since 1939 at two of the five Ontario sites. Only males were observed and only in the very restric-
ted areas of rapids along a relatively slow moving river. All of the known provincial records are summarized in an accompanying table." (Authors) Address: Catling, P.M., 2326 Scrivens Drive, R.R. 3, Metcalfe, ON, K0A 2P0, Canada; E-Mail: brownell@achilles.net

7602. Heideman, N.J.L. (2002): A comparison of the breeding and nonbreeding season diets of Agama acu-
leata and Agama planiceps (Reptilia: Agamidae) in Windhoek, Namibia. Journal of Herpetology 36(3): 515-
520. (in English) [Odonata contributed to the diet of these reptiles, but according an Index of relative import-
ance (IRI) of prey items in the diet of both species during the breeding and nonbreeding seasons, Odonata are assessed as quite irrelevant as diet.] Address: Heideman, N.J.L., School of Life Sciences, University of the North (Qwa-Qwa campus), Private Bag X13, Phuthaditjhaba 9866, South Africa. E-mail: heideman@uniqwa.ac.za

tomed stream, a seepage creek passing through a fen, and a rapid river bordering a seepage fen. The fact that it has now been recorded at two sites on the Credit River that have received relatively good coverage in the past suggests that it is a recent immigrant to Ontario." (Authors) Address: Jones, C.D., Natural Heritage In-
formation Centre, Ontario Ministry of Natural Res, 300 Water Street, P.O. Box 7000, Peterborough, ON, K9J 8M5, Canada. E-Mail: colin.jones@mnr.gov.on.ca

mea lacera. In addition, Macromia illinoiensis, for-
merly overlooked in earlier published lists, is "officially" added to the county list. The total species list for the county now stands at 101 species, among the highest counties for Odonata diversity in Ontario. Two of these species are considered provincially rare." (Authors) Ad-
dress: Jones, C.D., Natural Heritage Information Cen-
tre, Ontario Ministry of Natural Res, 300 Water Street, P.O. Box 7000, Peterborough, ON, K9J 8M5, Canada. E-Mail: colin.jones@mnr.gov.on.ca


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First, I tested whether hunting dragonflies react differently on solid black, black-and-yellow striped and solid yellow artificial prey items. In accordance with the wasp experiment dragonflies clearly avoided the black-and-yellow artificial prey items over the solid black or solid yellow ones. In the second experiment I used two artificial prey types (prey item soaked in mashed wasps and prey item soaked in mashed flies) to test if the smell of the prey alone causes different reactions against the prey. Cordulia ultls suggest that smell of the prey did not have any influence on the dragonfly hunting reactions. In the third experiment I offered artificial wasp shaped and a fly shaped prey item to free flying dragonflies. According to the results there was a slight but not significant difference suggesting that dragonflies were more reluctant in attacking the wasp shaped items than the fly shaped ones. My results suggest that most likely the typical black-and-yellow striping combined with shape makes wasps highly intimidating to dragonflies. Since black-and-yellow striping alone significantly decreased attack rate, even profitable prey species (e.g., dragonflies) are able to exploit the dragonflies' avoidance to certain colours and colour patterns. It is a task for future work to investigate whether these avoidances are learned or whether they have a genetic basis.

7606. Kauppinen, J. (2002): Relative importance of different coloration, smell and shape in the predation of wasps: field experiments on hunting dragonflies (Odonata: Aeshna grandis). Master of Science thesis, Dept Biological and Environmental Science Ecology and Environmental Management, University of Jyväsälä: 18 pp. (in English) "Aposematism is a phenomenon, where poisonous or acrid prey signal their unprofitability to potential predators with conspicuous colouration or some other feature. The mechanisms of aposematism have – excluding a small number of exceptions – been studied from the vertebrate predators' (especially birds) point of view. In contrast, the possible impact of invertebrate predators to the evolution of aposematism has gained only little interest. Dragonflies are a numerous group of invertebrate predators that feed mainly on flying insects and exercise prey selection by vision. Although it has been reported that colours do work as cues in the mating systems of dragonflies no studies have been carried out tackling the question whether dragonflies use their colour vision when exercising prey selection. In the present field experiments I investigated whether hunting Aeshna grandis avoid attacking on wasps (Hymenoptera: Vespula norwegica), that are a highly unprofitable group of prey for most predators. Further, I was interested in finding out which features of the wasp – colouration, smell and shape – affect the attack rates of hunting dragonflies. To tackle these questions I carried out four field experiments. In the wasp avoidance experiment I offered four different types of living prey (black flies, black-and-yellow flies, black wasps and black-and-yellow wasps) to the hunting dragonflies. I stunned the prey items with carbon dioxide and manipulated all of them either with black or yellow paint. According to the results, the dragonflies avoided the wasps over the flies. Within the flies the black-and-yellow coloured individuals were significantly avoided over the black ones suggesting that aposematic colouration on harmless fly provided a selective advantage against invertebrate predators. Interestingly, there was no significant difference in the reactions towards the black and the black-and-yellow wasps indicating that some other feature in wasps might work as well as an aposematic signal. In the next three experiments I studied the relative importance of the possible aposematic signals: coloration, shape and smell in wasps.
contrasts with the surrounding plaus. The analysis of 588 scats resulted in the identification of 1926 items among seven main food categories (mammals, birds, reptiles, arthropods, gastropods, fruits and carrion garbage), and also included one adult and odonate larva.] Address: Rosalino, L.M., Centra de Biologia Ambiental, Faculdade de Ciencias, Universidade de Lisbon, Ed. C2, 3°Piso, Campo Grande, 1749-016 Lisbon Portugal

7610. Taber, B. (2002): Spring dragonfly (Odonata) and butterfly (Lepidoptera) fallout at the Chesapeake Bay Bridge-tunnel. Banisteria 19: 26-27. (in English) [Virginia, Maryland, USA. Report from a "frontal boundary and radar visible migration" of dragonflies along the East Coast of USA in end of may and beginning June 3 June 2000. Nine odonata taxa were observed involved in the grounding to escape an approaching thunderstorm.] Address: Taber, B., Coastal Virginia Wildlife Observatory, P.O. Box 912, Eastville, Virginia 23347, USA

2003

7611. Cano Villegas, F.J. (2003): Aportacion al conocimiento de la fauna de odonatos (Insecta: Odonata) en una cuenca fluvial costera: rio Fuengirola (Malaga, Sur de Espana). Boletin de la Sociedad Andaluza de Entomologia 7: 7-15. (in Spanish, with English summary) [Spain; faunistic data about twenty species of Odonata observed in a Mediterranean coastal basin are shown. Zoogeographical analysis shows a high presence of African elements in this basin including Orthetrum trinacria, O. chrysostigma, Brachythemis leucocestica, Trithemis annulata, and Zygonyx torrida.] Address: Cano Villegas, F.J., Area de Zoologia. Departamento de Ciencias Ambientales, Universidad Pablo de Olavide, Ctra. de Utrera Km 1. 41013 Sevilla, Spain. E-mail: fcanovil@wanadoo.es

7612. Riaz, H.; Khawaja Basharat, A. (2003): Damselfly naids (Odonata: Zygoptera) of Sindh--Pakistan. International journal of agriculture & biology 5(1): 53-56. (in English) [Larvae belonging to the gend of Lestes, Pseudagrion, Ceriagrion and Ischnura are figured.] Address: Riaz, H., Pest Warning and Quality Control of Pesticides, Pakpattan, Pakistan. E-mail: riazhussain37@hotmail.com

7613. Wang, L.-p. (2003): Breeding habitat selection and breeding biology of Blue-tailed Bee-eaters (Merops philippinus) on Kinmen Island. Department of Forestry, National Taiwan University, Taipei. Adviser: Yuan Hsiao-Wei: 52 pp. (in Chinese, with English summary) [I studied habitat selection and breeding biology of blue-tailed bee-eaters (Merops philippinus) on Kinmen Island from 2000 to 2002. Blue-tailed bee-eaters were found to only build nest holes on Kinmen layer and sandy soils, which both had lower clay content. On the B22 Blue-tailed bee-eater individuals observed, 84% of them built nest holes on natural clifs and 16% used artificial habitats, and 92% built nest holes into one-side open colony and only 8% built radical colony. Scan observations revealed the major diet of Blue-tailed bee-eaters were insects that were mostly Odonata (49%), Homoptera (17%), Diptera (13%) and Lepidoptera (12%). I compared the water quality of nearest water bodies of six nest colonies, no significant difference in dissolved oxygen, BOD, pH value and some nutrients nutrients (PO4-3, NO3-, N, Cl-, SO4-2, NH4+, HCO3-, CO32-, Ca, Mg, Na, K), was found between retained and abandoned nest colonies. Nevertheless, the nearest water bodies of abandoned nest colonies had lower electro-conductivity, which positively correlated with abundance and species richness of dragonflies, the main diet of Blue-tailed bee-eaters. I found that Blue-tailed bee-eaters preferred to build nest holes on cliffs with lower vegetation. We suggested lower vegetation structure might increase their ability to detect nest predators and thus decrease the chance of nest predation. Blue-tailed bee-eaters were mainly colonial breeding and monogamy in Kinmen during the study period. In the breeding season of 2001, 83% of the chicks hatched within a period of nine days, suggesting Blue-tailed bee-eaters might be synchrony breeding. We also found 16 nests had more than two adults jointly feeding chicks, which suggests Blue-tailed bee-eaters might adapt cooperative breeding. (Author) Address: Wang, L.-p., Department of Forestry, National Taiwan University,Taipei. Adviser: Yuan Hsiao-Wei, P.O. Box 912, Eastville, Virginia 23347, USA]


2004

7615. Zhu, C.-j.; Muraoka, J.; Mizuno, H. (2003): Visual simulation of dragonflies based on aerodynamics. The Journal of the Society for Art and Science 2(4): 146-155. (in Japanese, with English summary) ["A dragonfly is a familiar insect by which the sense of season can be shown. The expression of a dragonfly by CG can be expected as an element improving the sense of season in landscape simulation, virtual reality, etc. This paper proposes the flight model of a dragonfly based on aerodynamics. In this model, a dragonfly can be made to fly in real time considering the force caused by the flapping of the wings, performing flight characteristics including steep rise, sudden stop, hover and rapid turn. Furthermore, the flight route of a dragonfly can be easily established depending on the control-points placed in the space." (Authors)] Address: Mizuno, H., hmizuno@tohtech.ac.jp

7616. Brown, T.G.; Winchell, P.; Postans, N. (2004): Benthic community of Shuswap Lake's foreshore. Can. Manuscr. Rep. Fish. Aquat. Sci. 2693: iv + 33 pp. (in English, with French summary) ["Substrate trays and a benthic pump were employed to collect samples of the benthic community from the foreshore of Shuswap Lake, British Columbia, Canada. The majority of samples were collected in June and July (1999-2001) from depths of less than two meters. The most numerous benthic invertebrates were: Cladocera, Chironomidae (larvae), Ostracods, Oligochaeta, Calanoida and Nematoda. [...]". The list of samples includes three Odonata taxa: Aeshna umbrata, Enallagma sp., and Enallagma cythigerum.] Address: Brown, T.G., Fisheries and Oceans Canada Science Branch, Pacific Region, Pa-
7617. Cano Villegas, F.J. (2004): Los odonatos del monumento natural de los Sotos de la Albolafia, rio Guadalquivir (Cordoba, Andalucia). Boletin de la Sociedad Andaluza de Entomologia 11: 7-13. (in Spanish, with English summary) [7 Odonata species were recorded from August of 2002 until August of 2004. Onychogomphus costae was found breeding in the area.] Address: Cano Villegas, F.J., Area de Zoologia. Departamento de Ciencias Ambientales, Universidad Pablo de Olavide, Ctra. de Utrera Km 1. 41013 Sevilla, Spain. E-mail: fcanovil@wanadoo.es

7618. Goncalves, J.F.; Santos, A.M.; Esteves, F.A. (2004): The influence of the chemical composition of Typha domingensis and Nymphaea ampla detritus on invertebrate colonization during decomposition in a Brazilian coastal lagoon. Hydrobiologia 527: 125-137. (in English) [The aims of this study were to investigate the structure and composition of the invertebrate community during the detritus decomposition (colonyization features) of the two most abundant aquatic macrophytes T. domingensis and N. ampla in Jurubatiba Lagoon and verify if the chemical composition of the substratum has any influence on invertebrate colonization and which are the functional groups possibly affected by these compounds. The substratum T. domingensis had higher percentages of cell wall fraction (F = 108.33; p < 0.0001) and organic matter (F = 225.77; p < 0.0001), while nitrogen (F = 408.61; p < 0.0001) and phosphorus (F = 224.59; p < 0.0001) contents were higher in N. ampla. These differences in the chemical composition of the substrata influenced the decomposition rate, and the detritus of N. ampla (4.37% DW day-1) decomposed approximately 26 times faster than the T. domingensis (0.17% DW day-1) detritus. The main groups of invertebrates that colonized both substrate were Chironomidae, with more than 50% of the total, followed by Oligochaeta, Nematoda, Colepoda and Cladocera. The results showed that the slow breakdown rate of T. domingensis detritus provided a higher probability for colonization and that the main driving force structuring the invertebrates’ community was degradative ecological succession (DES).] Authors: T. domingensis was colonized by odonate larvae after 9 days (Libellulidae, Aeshnidae) with a strong increase of days (Libellulidae, Aeshnidae) with a strong increase of detritus. The main groups of invertebrates that colonized both substrate were Chironomidae, with more than 50% of the total, followed by Oligochaeta, Nematoda, Colepoda and Cladocera. The results showed that the slow breakdown rate of T. domingensis detritus provided a higher probability for colonization and that the main driving force structuring the invertebrates’ community was degradative ecological succession (DES).


7620. Kuki, N.; Okubo, K. (2004): The relationship between dragonfly communities and environmental conditions in paddy field area on Kamiina district, Nagano prefecture. Abstracts of the Annual Meeting of the Ecological Society of Japan 51: 365. (in English) [The purpose of this study was to know relationship between dragonflies in paddy area and environmental condition. We selected five various condition study areas (two non-consolidated paddy areas in hilly and mountainous areas, one consolidated paddy area in hilly and mountainous area, one non-consolidated paddy area in urbanized area, one consolidated paddy area in urbanized area.) in the Kamiina district, Nagano Prefecture. The number and behaviour of dragonflies were recorded by route census method. The survey of land utilization was carried out on these areas. The number of all of the species was twenty-three. The number of species and individuals were higher in 3 hilly and mountainous areas than in 2 urban areas. Five study areas were classified into 3 hilly and mountainous area region and 2 urban areas by TWINSPAN. Dragonfly communities were classified to seven types. Each type corresponded different environment conditions of waterside, forest and others. It was confirmed that the environmental selection and behaviour of mature dragonflies corresponded to the each species character. The environmental selection of mature dragonflies were different between hilly and mountainous area and urban area. It was clear that dragonfly communities were affected by consolidation and urbanization.]


2005

7622. Béthoux, O.; Papier, F.; Nel, A. (2005): The Triassic radiation of the entomofauna. Comptes Rendus Palevol. 4(6-7): 609-621. (in English, with French summary) [Assessing the insect evolution around the Permian/Triassic boundary faces various pitfalls. The taxonomic and phylogenetic frames are not consensually established, and diverse evidences suggest that the record is incomplete. Nevertheless, extensive studies in progress on the super-ordinal clades Archaeorthoptera and Odonatoptera reveal common trends. Several important lineages get extinct, and groups underrepresented or absent in Late Permian became major components of the entomofauna in Middle Triassic. In addition, the radiation of the Diptera and the diversification of the Coleoptera in the Triassic also support the hypothesis of an important renewal of the entomofauna at the Permian/Triassic boundary.] Authors: Nel, A., Lab. Ent.. Mus. Natn. Hist. Nat., 45 rue Buffon, F-75005 Paris, France. E-mail: anel@cimrs1.mnhn.fr

7623. Bezmaternykh, D.M. (2005): Composition, structure and quantitative characteristic of zoobenthos of the Lake Chan'y in 2001. Siberian ecological esk shurnal 2: 249-254. (in Russian) [3 Odonata species were recorded (out of a total of 70 benthic invertebrate spe-


7624. Harman, W.N.; Hingula, L.P.; Macnamara, C.E. (2005): Does long-term macrophyte management in lakes affect biotic richness and diversity? J. Aquat. Plant Manage. 43: 57-64. (in English) "[We hypothesize that the richness and diversity of the biota in Lake Moraine (42°50′47″N, 75°31′39″W) in New York have been negatively impacted by 60 years of macrophyte and algal management to control Eurasian watermilfoil (Myriophyllum spicatum L.) and associated noxious plants. To test this hypothesis we compare water quality characteristics, richness and selected indicators of plant diversity, zooplankton, benthic macroinvertebrates and fish in Lake Moraine with those in nearby Hatch Lake (42°50′06″N, 75°40′67″W). The latter is of similar size and would be expected to have similar biota, but has not been subjected to management. Measurements of temperature, pH, oxygen, conductivity, Secchi transparency, calcium, total phosphorus and nitrates + nitrites are comparable. Taxa richness and the diversity indices applied to the aquatic macrophytes are similar in both lakes. The greatest disparity is the lack of Eurasian watermilfoil and Canadian waterweed (Elodea canadensis Michx.) in the main basin of Lake Moraine. The elimination of the former was the intent of a 2001 application of fluridone (1-methyl-3-phenyl-5-(3-(trifluromethyl) phenyl)-4(1H)-pyridinone[C19H14F3NO]) and the loss of the latter was a related consequence. Zooplankton richness is similar in both lakes. The diversity of benthic macroinvertebrates is similar; however, richness at the genus level is quite different. There is a paucity of species collected in Lake Moraine that are intolerant to winter lowering of water levels. Fish species richness in both lakes is similar, but there are differences in specific taxa and percent abundance directly related to stocking and the balance between forage fish populations and piscivorous fish populations in the two lakes. That phenomenon also appears responsible for some of the variation in the zooplankton communities in both lakes. Overall, taxonomic richness and diversity in Lake Moraine and Hatch Lake are remarkably similar. Annual winter drawdown of water levels is implicated as having greater effect on the biota than long-term herbicide utilization. The hypothesis is rejected." [Authors] Odonata accounted to app. 20% of genus-diversity, but to less then 1% of biomass. [Address] Harman, W.N., SUNY College at Oneonta, Biological Field Station (BFS), 5838 ST HWY 80, Cooperstown, NY 13326.

7625. Hua, Y.; Li, H. (2005): Food web and fluid in pitchers of Nepenthes mirabilis in Zhuhai, China. Acta Bot. Gallica 152(2): 165-175. (in English, with French summary) "[N. mirabilis "attracts ants and flying insects with floral and extrafloral nectaries, color of pitcher and flower, and possibly flower odor. Its slippery rim and collar trap preys, but some wasps can hold legs on the outside of the rim. Its preys include arthropods in four classes (with nine orders in insect class), plus very few snails and lizards. Fresh liquid sinks, kills, and digests preys (including lizards) quickly, but allows flogs to live in; while old fluid allows mosquitos to hatch in it. Fluid reaches its maximum amount at pitcher opening. Then, the pH decreases gradually from 6 to 1.9, as the color changes slowly from colorless to yellow, and finally both pH and color reverse as pitchers dying. Proteinase nepenthins could be resulted in these special conditions through long evolutionary adaptation." [Authors] The prey includes Coenagrionidae; regrettably it is not outlined if this records are by accident or occur regularly. [Address] Li, H., Biology Department, Frostburg State University, MD 21532, USA. E-mail: hli@frostburg.edu

7626. Johnson, K.E.; Eidietis, L. (2005): Tadpole body zones differ with regard to strike frequencies and kill rates by dragonfly naiads. Copeia 2005(4): 909-913. (in English) "[We assessed Anax junius dragonfly naiad strike frequencies and kill probabilities against Rana sylvatica (Wood Frog) tadpoles. Strikes fell into five categories according to their placement on the tadpole body: anterior head/body, posterior head/body, head/body-tail intersection, anterior tail, and posterior tail. The kill probability was calculated for each category as the number of kills divided by the number of contacts made in that category. These probabilities varied; a higher probability was found for both the anterior and posterior head/body, and values declined for successively posterior categories. Neither the kill probability nor the size of the body zone influenced the number of strikes to that zone. Surprisingly, the dragonfly naiads struck most frequently at the relatively narrow region of the head/body-tail intersection, suggesting that dragonfly naiads may aim at a specific target." [Authors] Address: Eidietis, Laura, Univ. michigan, Dept Ecology & Evolutionary Biology, Kraus Natural Science Cuilding, Ann Arbor, Michigan 48109-1048, USA. E-mail: leidieti @umich.edu.

7627. Ketelaar, R.; Groenendijk, D.; Joop, P. (2005): Soortbeschermingsplan Hoogveenglanslibel - Species Protection Plan Somatochlora arctica 2006-2010. Directie Kennis, Ministerie van Landbouw, Natuur en Voedselkwaliteit, Rapport DK nr. 2005/033: 56 pp. (in Dutch, with English summary) "[Somatochlora arctica is a characteristic species of bogs and wet heaths. In the Netherlands, it declined during the last century, and at the moment, only four populations are left. These are situated in the eastern and southern parts of the country (figure 2). The Moorland Emerald can be characterised by its ability to survive in extreme environments. The female deposits her eggs in small, very shallow pools with an overgrowth of Sphagnum moss, and therefore hardly any visible water. The larvae are well able to survive prolonged drought and freezing. However, competition with larvae of other dragonfly species is a limiting factor. Adults display a leisurely flight in open woods, tree tops and at woodland edges, where they feed on small insects, and also copulate. As the adults only visit the aquatic breeding sites briefly, it is difficult to establish the species’ presence. Aims: During the time allotted to this Species Protection Plan, the aims are: • to know more about the ecology of the Moorland Emerald and the measures required for its conservation, • to convey this knowledge to those concerned with nature conservation in the field; • to integrate this new knowledge into hydrological parts of peat restoration projects and into scientific visions on the functioning of peat ecosystems. Bottleenecks: The future of the Moorland Emerald in the Netherlands is precarious. Important causes are: • desiccation of peatland habitat due to agricultural and forestry practices, excessive usage of ground water, and reduction of
slightly buffered water supply from seepage. • eutrophication of its habitats by nitrogen from agriculture and traffic. Shifts in plant communities may occur, in particular, Betula pubescens and Molinia caerulea dominance on peat bogs and wet heaths. • habitat loss and fragmentation, reducing population size and isolating populations. • lack of knowledge concerning the ecology of the Moorland Emerald and the hydrology of wet heaths and peat bogs. This lack of knowledge exists also at the level of practical management, illustrating the difficulty of assessing the probability and possibility of raised bog restoration in the Netherlands. • climate change may also affect this species negatively, but measures taken to minimise any of its effects are beyond the scope of this Species Protection Plan. Measures: To ensure that there are sustainable populations of the Moorland Emerald in the Netherlands, the following measures need to be taken: • counter desiccation on both small and large scales by preventing surface drainage and designating buffer zones. For at least two locations, agreements have to be made with nature conservation bodies in neighbouring countries. • reduce eutrophication by taking local measures; these measures should also be supported by national policy. • enlarge and improve present and potential habitats during the term of this Species Protection Plan. • set up research on the ecology of the Moorland Emerald, with particular attention to its breeding sites. At the same time, set up monitoring of all known populations in order to evaluate the effect of local measures. All appropriate measures for the Moorland Emerald in the Netherlands are summed up in an Action Plan. The main purpose of this Species Protection Plan is to increase the current knowledge and subsequently, to apply the new knowledge at the level of practical management, so that effective measures can be taken. The implementation of these measures is the responsibility of the Ministry of Agriculture, Nature and Food Quality, the provinces of Gelderland, Noord-Brabant, Limburg and Overijssel, together with the different owners of nature reserves where the Moorland Emerald occurs. Furthermore, local water boards should also play a crucial role when hydrology plays an important part in a peat restoration project. As these measures take the whole ecosystem into account, they fit into the framework of the so-called “Survival Plan for Forest and Nature”. In the case of at least two populations, the co-operation of German or Belgium local authorities needs to be sought.” (Authors) Address: Keteelaar, P., p/a De Vlinderstichting, Postbus 506, NL-6700 AM Wageningen, The Netherlands. E-mail: keteelaar@vlinderstichting.nl

7628. Kobyashi, H.; Toda, H. (2005): Life history of a water mite (Piona carnea) in Lake Shirakomaike. 11-15. (in Japanese, with English summary) “Life history of P. carnea was studied in a mountain humic lake (Lake Shirakomaike) in Nagano prefecture, Japan from May in 1999 to February in 2000. P. carnea appeared in plankton assemblage from late May to late October. Females having eggs were observed between late May and late July. They attached their eggs on aquatic plants in the west coast. New recruitments of adults appeared in late September. P. carnea disappeared from plankton assemblage until the end of October, and accumulated in the lake bottom from November to probably April. A dense population was found on 18 November (267 individuals nr2) and on 7 February (281 individuals nr2) in the bottom at the lake center. P. carnea completes its life history each year in Lake Shirakomaike.” (Authors) Address: Toda, H., Dept of Environmental sciences Faculty of Science, Shinshu University

7629. Mello, M.J. (2005): Inventory of macrolepidoptera and other insects in the Boston Harbor Islands National Park area. Northeastern Naturalist 12 (Special Issue 3): 99-144. (in English) Maine, USA; 10 Odonata species are reported from fourteen islands within the Boston Harbor Islands national park area. Although sampling was limited, the paucity of odonates may be related to the lack of fresh water within the park; however, feeding swarms of the larger, migratory odonates were expected over the fields of Worlds End. The taxa are documented in Appendix IV.] Address: Mello, M.J., Lloyd Center for Environmental Studies, 430 Potomskas Road, Dartmouth, MA 02748, USA E-mail: re-search@thelloydcenter.org.

7630. Nicoara, A.; Nicoara, M.; Bianchini, F. (2005): Diet composition during breeding period in populations of Bufo viridis, Pelobates fuscus and Rana esculenta complex from Citric river’s basin (Iasi, Romania). Analele Sintfice ale Universitatii “Al.I. Cuza” Iasi, s. Biologie animala, LI: 179-187. (in English) [In March-June 2004, 1263 prey specimens were identified in the 143 anuran individuals collected of three anuran species. In B. viridis, 95.25% of the preys were insects, 2% arachnids. In P. fuscus, insects represented 74.19% and arachnids 16.12%, while in R. esculenta complex, 82.52% were insects and 10.22% crustaceans. Odonata (one specimen) exclusively were represented in the diet of P. fuscus.] Address: not stated

7631. Nogami, K.; Takeyama, H. (2005): A study on relation between the appearance of butterflies and dragonflies, and the temperature environment of a big tree. Papers on Environmental Information Science, No.19 (The 19th Conference on Environmental Information Science): 19-24. (in Japanese, with English summary) [Verbatim: “In this research, it aimed at clarifying relation between the appearance of butterflies and dragonflies, and the temperature environment of a big tree. A result is shown in the following; 1) Even if it was one big tree, when meeting conditions with various temperature environments, it was able to observe that a big tree was important as a habitat of butterflies and dragonflies. 2) The big tree is functioning as a stepping stone for a butterfly or a dragonfly. 3) A big tree, water, wood, a vegetable garden, etc. are designed in one, and the appearance of a butterfly and a dragonfly increases by making temperature environment various.” (Authors) Address: Takeyama, H., The Museum of Nature and Human Activities, Hyogo, Japan

7632. Pennuto, C.M.; Lane, O.P.; Evers, D.C.; Taylor, R.T.; Loukmas, J. (2005): Mercury in the Northern Crayfish, Orconectes virilis (Hagen), in New England, USA: Ecotoxicology 14: 149-162. (in English) [Biologists and policy makers continue to seek environmental correlates of mercury bioavailability in aquatic ecosystems. In this study, we assessed the effects of drainage basin, habitat type, size class, and sex on mercury con-
centrations in O. virilis. Drainage basin, habitat type, and size class had significant effects on mercury concentration in crayfish tail muscle even though animals from roughly half the sites examined had mean mercury values at or below expected background levels. The low observed mercury values in crayfish tail muscle indicate a low consumptive risk. Contrary to expectations, crayfish from brooks had higher mercury concentrations than animals from other habitat types, possibly as a result of point source contamination or the stabilizing effect of high trophic levels. Our results support the expectation that crayfish are good indicators of mercury bioavailability in aquatic ecosystems and provide a synthesis for lower food webs. Our understanding of mercury dynamics in lower food webs has been hindered by an underappreciation of the complexity in foraging habits of macroinvertebrates. Further studies focusing on benthos with well-understood life histories and foraging behaviour are essential to improve our understanding of mercury transfer and bioavailability through aquatic systems.\footnote{Smith, M.J.; Drew, M.M.; Peebles, M.; Summers, K. (2005): Predator cues during the egg stage affect larval development in the Gray Treefrog, Hyla versicolor (Anura: Hylidae).\textit{Copeia} 2005(1): 169-173.} (in English) \footnote{"The presence of predators can induce changes in the morphology and behaviour of the potential prey. In this study, we examined the effects of different predator induced changes in water chemistry experienced during the egg stage on larval development in the Gray Treefrog. The potential predators of amphibian eggs and tadpoles used in this study included larval odonates (Aeshnidae), crayfish, and leeches. Tadpoles exposed to leech-induced changes in water chemistry were consistently smaller throughout their larval development than the tadpoles in the control and other potential predator treatments. Size at metamorphosis did not differ significantly among treatments, but the tadpoles in the leech treatment were significantly older at metamorphosis than tadpoles in the other treatments. These results highlight some of the potential fitness consequences for larval H. versicolor that received predator cues during the egg stage." (Authors) Nested analysis of variance showed a significant effect of predator treatment on age at metamorphosis.\footnote{Stoks, R.; Nystrom, J.L.; May, M.L.; McPeek, M.A. (2005): Parallel evolution of ecological and reproductive traits to produce cryptic damselfly species across the Holartic. Evolution 59(9): 1976-1988.} (in English) \footnote{"The damselfly genus Enallagma originated in the Nearctic, and two Nearctic lineages recently underwent radiations partly associated with multiple independent habitat shifts from lakes dominated by fish predators into lakes dominated by dragonfly predators. A previous molecular study of four Palearctic morphospecies and all representative Nearctic species identified the presence of two cryptic species sets, with each set having Palearctic and Nearctic representatives. However, the cryptic species within each set are not sibling species. Here, we present quantitative data on ecologically important larval morphologies and behaviours involved in predator avoidance and on adult male morphological structures involved in mate recognition to quantify the phenotypic relationships among these cryptic species sets. For the adult stage, our data indicate strong paral evolution of adult morphological structures involved in specific mate recognition - the male cerci.\footnote{Stolen, E.D. (2005): Great Egrets gleaning dragonflies. Florida Field Naturalist 33(1): 15-16.} (in English) \footnote{"Although mainly piscivorous, the Great Egret (Ardea alba) takes a variety of food items including dragonflies (McCrimmon et al. 2001, Hancock and Kushlan 1984, Palmer 1962). Clark (1980) described gleaning of dragonflies from low salt marsh vegetation by Tricolored Herons (Egretta tricolor) near a nesting colony. Gleaning of insects is noted as a foraging behaviour specific mate choice and larval traits that influence ecological performance underlie the striking similarity of Enallagma species across continents. This concurrent parallel evolution in both stages of a complex life cycle, especially when both stages do not share the same selective environment, may be a very unusual mechanism generating cryptic species." (Authors)] Address: Penuto, C.M., Dept of Biology & Center for Great Lakes Research, Buffalo State College, Buffalo, NY, USA,14222. E-mail: penuttcm@buffalostate.edu


7635. Stolen, E.D. (2005): Great Egrets gleaning dragonflies. Florida Field Naturalist 33(1): 15-16. (in English) \footnote{Although mainly piscivorous, the Great Egret (Ardea alba) takes a variety of food items including dragonflies (McCrimmon et al. 2001, Hancock and Kushlan 1984, Palmer 1962). Clark (1980) described gleaning of dragonflies from low salt marsh vegetation by Tricolored Herons (Egretta tricolor) near a nesting colony. Gleaning of insects is noted as a foraging behaviour specific mate choice and larval traits that influence ecological performance underlie the striking similarity of Enallagma species across continents. This concurrent parallel evolution in both stages of a complex life cycle, especially when both stages do not share the same selective environment, may be a very unusual mechanism generating cryptic species." (Authors)] Address: Stoks, R., Laboratorium voor Aquatische Ecologie, K.U. Leuven, De Beriotstraat 32, B-3000 Leuven, Belgium. E-mail: robbystoks@bio.kuleuven.ac.be

7634. Stoks, R.; Nystrom, J.L.; May, M.L.; McPeek, M.A. (2005): Parallel evolution of ecological and reproductive traits to produce cryptic damselfly species across the Holarctic. Evolution 59(9): 1976-1988. (in English) \footnote{The damselfly genus Enallagma originated in the Nearctic, and two Nearctic lineages recently underwent radiations partly associated with multiple independent habitat shifts from lakes dominated by fish predators into lakes dominated by dragonfly predators. A previous molecular study of four Palearctic morphospecies and all representative Nearctic species identified the presence of two cryptic species sets, with each set having Palearctic and Nearctic representatives. However, the cryptic species within each set are not sibling species. Here, we present quantitative data on ecologically important larval morphologies and behaviours involved in predator avoidance and on adult male morphological structures involved in mate recognition to quantify the phenotypic relationships among these cryptic species sets. For the adult stage, our data indicate strong paral evolution of adult morphological structures involved in specific mate recognition - the male cerci.\footnote{Stolen, E.D. (2005): Great Egrets gleaning dragonflies. Florida Field Naturalist 33(1): 15-16.} (in English) \footnote{Although mainly piscivorous, the Great Egret (Ardea alba) takes a variety of food items including dragonflies (McCrimmon et al. 2001, Hancock and Kushlan 1984, Palmer 1962). Clark (1980) described gleaning of dragonflies from low salt marsh vegetation by Tricolored Herons (Egretta tricolor) near a nesting colony. Gleaning of insects is noted as a foraging behaviour specific mate choice and larval traits that influence ecological performance underlie the striking similarity of Enallagma species across continents. This concurrent parallel evolution in both stages of a complex life cycle, especially when both stages do not share the same selective environment, may be a very unusual mechanism generating cryptic species." (Authors)] Address: Stoks, R., Laboratorium voor Aquatische Ecologie, K.U. Leuven, De Beriotstraat 32, B-3000 Leuven, Belgium. E-mail: robbystoks@bio.kuleuven.ac.be

7635. Stolen, E.D. (2005): Great Egrets gleaning dragonflies. Florida Field Naturalist 33(1): 15-16. (in English) \footnote{Although mainly piscivorous, the Great Egret (Ardea alba) takes a variety of food items including dragonflies (McCrimmon et al. 2001, Hancock and Kushlan 1984, Palmer 1962). Clark (1980) described gleaning of dragonflies from low salt marsh vegetation by Tricolored Herons (Egretta tricolor) near a nesting colony. Gleaning of insects is noted as a foraging behaviour specific mate choice and larval traits that influence ecological performance underlie the striking similarity of Enallagma species across continents. This concurrent parallel evolution in both stages of a complex life cycle, especially when both stages do not share the same selective environment, may be a very unusual mechanism generating cryptic species." (Authors)] Address: Stoks, R., Laboratorium voor Aquatische Ecologie, K.U. Leuven, De Beriotstraat 32, B-3000 Leuven, Belgium. E-mail: robbystoks@bio.kuleuven.ac.be

7634. Stoks, R.; Nystrom, J.L.; May, M.L.; McPeek, M.A. (2005): Parallel evolution of ecological and reproductive traits to produce cryptic damselfly species across the Holarctic. Evolution 59(9): 1976-1988. (in English) ["The damselfly genus Enallagma originated in the Nearctic, and two Nearctic lineages recently underwent radiations partly associated with multiple independent habitat shifts from lakes dominated by fish predators into lakes dominated by dragonfly predators. A previous molecular study of four Palearctic morphospecies and all representative Nearctic species identified the presence of two cryptic species sets, with each set having Palearctic and Nearctic representatives. However, the cryptic species within each set are not sibling species. Here, we present quantitative data on ecologically important larval morphologies and behaviours involved in predator avoidance and on adult male morphological structures involved in mate recognition to quantify the phenotypic relationships among these cryptic species sets. For the adult stage, our data indicate strong paral evolution of adult morphological structures involved in specific mate recognition - the male cerci.\footnote{Stolen, E.D. (2005): Great Egrets gleaning dragonflies. Florida Field Naturalist 33(1): 15-16.} (in English) ["Although mainly piscivorous, the Great Egret (Ardea alba) takes a variety of food items including dragonflies (McCrimmon et al. 2001, Hancock and Kushlan 1984, Palmer 1962). Clark (1980) described gleaning of dragonflies from low salt marsh vegetation by Tricolored Herons (Egretta tricolor) near a nesting colony. Gleaning of insects is noted as a foraging behaviour specific mate choice and larval traits that influence ecological performance underlie the striking similarity of Enallagma species across continents. This concurrent parallel evolution in both stages of a complex life cycle, especially when both stages do not share the same selective environment, may be a very unusual mechanism generating cryptic species." (Authors)] Address: Stoks, R., Laboratorium voor Aquatische Ecologie, K.U. Leuven, De Beriotstraat 32, B-3000 Leuven, Belgium. E-mail: robbystoks@bio.kuleuven.ac.be

flies during the three minutes (one and three dragonflies captured). The last individual observed gleaning dragonflies was not observed long enough to quantify its foraging behavior. Thus, dragonfly gleaning behaviour appeared to be a foraging strategy rather than incidental or opportunistic captures during foraging for other prey. The weather was typical of early spring in Florida, with clear skies and air temperature around 22°C with a light wind around 11 km/h. On numerous occasions while conducting monthly aerial surveys of wading bird foraging habitat use during the past six years, I have noticed small groups of Great Egrets foraging in non-flooded Spartina bakeri salt marsh during the winter dry season. These groups typically consist of 2-10 individuals separated by 10-100 body lengths. Individuals appear to be standing upright and are stationary or moving slowly within the tall (1-2 m) grass. Accounts of Great Egrets taking various small mammals (Palmer 1982) led me to assume that the birds were foraging for terrestrial vertebrates, but clearly they may have been foraging for insects. Address: Tennessen, K.J. (2005): The larvae of Enallagma davisi Westfall and E. recurvatum Davis (Odonata: Coenagrionidae). J. New York Entomol. Soc. 113(3–4): 205–211. (in English) "[The larvae of E. davisi and E. recurvatum have round gill tips similar to E. minusculum but final stadia are significantly larger (total length 11.4–13.8 mm for davisi and recurvatum combined vs. 9.5–9.7 mm for minusculum) and the lateral carinae of abdominal segments 2–7 have distinct stout setae. The prementum of E. davisi (length 1.85–2.30 mm, width 1.56–1.80 mm; n=10) is slightly larger than that of E. recurvatum (length 1.75–1.85 mm, width 1.48–1.53 mm; n=5). The cerci of E. davisi in lateral view are wider than long in males and about as wide as long in females; in E. recurvatum the cerci are longer than wide in both sexes." [Author] Address: Tennessen, K., 125 N. Oxford St, Wautoma, WI 54982, USA. E-mail: ktennessen@centurytel.net

7637. Tennessen, K.J. (2005): The larvae of Enallagma davisi Westfall and E. recurvatum Davis (Odonata: Coenagrionidae). J. New York Entomol. Soc. 113(3–4): 205-211. (in English) "[The larvae of E. davisi and E. recurvatum have round gill tips similar to E. minusculum but final stadia are significantly larger (total length 11.4–13.8 mm for davisi and recurvatum combined vs. 9.5–9.7 mm for minusculum) and the lateral carinae of abdominal segments 2–7 have distinct stout setae. The prementum of E. davisi (length 1.85–2.30 mm, width 1.56–1.80 mm; n=10) is slightly larger than that of E. recurvatum (length 1.75–1.85 mm, width 1.48–1.53 mm; n=5). The cerci of E. davisi in lateral view are wider than long in males and about as wide as long in females; in E. recurvatum the cerci are longer than wide in both sexes." [Author] Address: Tennessen, K., 125 N. Oxford St, Wautoma, WI 54982, USA. E-mail: ktennessen@centurytel.net

7638. Van de Meutter, F. (2005): Local and regional processes in macroinvertebrate communities in shallow lakes. Proefschrift voorgedragen tot het behalen van de graad van Doctor in de Wetenschappen. Katholieke Universiteit Leuven. Faculteit Wetenschappen. Departement Biologie. Laboratorium voor Aquatische Ecologie: 205 pp. (in English, with Dutch summary) "This thesis consists of three major parts. A first part deals with the interaction of the local factors turbidity and predation with lake macroinvertebrates and macroinvertebrate community structure in lakes. In the second part we investigate to what extent the presence of littoral invertebrate predators may interfere with horizontal migration behaviour of Daphnia. Finally, in the third part we focus on the effects of the regional process dispersal and the interaction between dispersal and the drainages of the lakes, on structuring lake macroinvertebrate (meta)communities."

"(Author) Odonata are studied in many cases, especially in Chapter 2 (Water turbidity affects predator-prey interactions in a fish-damselly system), Chapter 3 (Behavioural linkage of pelagic prey and littoral predators: microhabitat selection by Daphnia induced by damselly larvae), and Chapter 4 (Spatial avoidance of littoral and pelagic invertebrate predators by Daphnia)."

"Summaries: Chapter I: The effect of turbidity state and microhabitat on macroinvertebrate assemblages: a pilot study of six shallow lakes. Shallow lakes can occur in two alternative stable states, a clear-water state and a turbid state. This is associated with separate assemblages of fish, zooplankton and plants. Little is known about whether macroinvertebrate assemblages differ across both stable states. This study investigated this in a connected set of three turbid and three clear-water shallow lakes. To overcome confounding effects of differences in spatial structure of macrophytes in turbid and clear-water lakes, we sampled three microhabitats that occurred in both alternative stable states: open water, sedge pondweed (Potamogeton pectinatus) and reed (Phragmites australis). Univariate analyses indicated no differences in the number of organisms, taxon richness or diversity between turbid and clear-water lakes. Multivariate analysis, however, indicated a trend towards differences in the macroinvertebrate community structure of both stable states. Two taxa explained a significant amount of the variation between both lake types, both of which preferred the clear-water lakes. The number of organisms and the taxon richness were higher in reed than in the other microhabitats, but diversity and evenness did not differ among the microhabitats. Multivariate analyses separated all three microhabitats. Four taxa, mainly detritus feeders and collector-gatherers, explained most of the variation in the data and preferred the reed microhabitat. The effects of turbidity state (11.8 % explained variance) and microhabitat (24 % explained variance) on the macroinvertebrate assemblages were largely independent from each other (2 % shared variance). Although macroinvertebrates are not implemented in the initial theory of stable states, our results indicate different assemblages across both stable states. Chapter II: Water turbidity affects predator-prey interactions in a fish-damselly system. Community structure may differ dramatically between clear-water and turbid lakes. These differences have been attributed to differences in the cascading effect of fish on prey populations, due to the reduced efficiency of fish predation in the presence of macrophytes. However, recent theoretical ideas suggest that water turbidity may shape predator-prey interactions, and it is predicted that prey will relax its antipredation behaviour in turbid water (H1). As a result, the nature of predator-prey interactions is expected to shift from both direct and indirect in clear water to dominantly direct in turbid water (H2). We tested these ideas in a fish-damselly predator-prey system. In a first behavioural experiment, we looked at antipredation behaviour of damselly lar-
va e isolated from habitats that differ in turbidity, in the presence of fish in clear and turbid water. As predicted in H1, the larvae were more active in turbid than in clear water. In a complementary enclosure experiment, we reared larvae in a clear-water pond and a turbid pond, respectively, and manipulated the origin of the larvae (clear-water, turbid pond), fish presence (absent, present), and vegetation density (sparse, abundant). In both ponds, fish had a direct negative effect on survival of the larvae, which was mitigated in the presence of vegetation. In the fish treatment, the change in average body mass tended to be higher in the turbid than the clear pond, suggesting indirect effects of fish were mitigated in the turbid pond. This was supported by a negative effect of fish on effective growth rate of larvae in the clear pond, but not in the turbid pond. These results are compatible with the idea that predator-prey relationships are mainly governed by direct effects in turbid water, and by direct and indirect effects in clear water. Chapter III: Behavioural linkage of pelagic prey and littoral predators: microhabitat selection by Daphnia induced by damselfly larvae. Only recently ecologists started treating the previously separately considered benthic, littoral and pelagic zones of lake ecosystems as closely connected compartments. Here we study a link between organisms belonging to a different compartment - namely the pelagic and the littoral - through behaviour in a series of laboratory experiments. Waterflies of the genus Daphnia are inhabitants of the pelagic zone and suffer a high predation pressure from syntopic vertebrate predators (mainly fish). Presumably to escape this predation, they sometimes migrate in the day to the littoral to seek refuge within macrophytes and return to the pelagic at night. Zygopterans from the genus Ischnura do commonly co-occur in ponds with Daphnia and are known as opportunistic predators of Daphnia. In two initial experiments in microcosms in the lab we showed that Ischnura larvae are littoral predators strongly associated with macrophytes. Although we found that predation rates of individual ischnura larvae on Daphnia are approximately 1.5 fold lower in macrophytes compared to open water, total predation from Ischnura on Daphnia per unit area is tenfold higher within macrophytes than in open water, making the open water a safer place for Daphnia with regard to Ischnura predation. In a third microcosm experiment we monitored horizontal distribution of Daphnia in the absence, presence and odour only of Ischnura larvae. After 2 hours, on average 10 % less Daphnia remained within the vegetation when Ischnura larvae or only their odour were present compared to when Ischnura or Ischnura odour were absent. We interpret this as a behavioural anti-predation response of Daphnia to the presence of Ischnura larvae that seems primarily chemically mediated. The observed horizontal migration of the pelagic prey driven by the littoral predator may couple both lake compartments and may interact with the predator-prey relationships within the pelagic. Chapter IV: Spatial avoidance of littoral and pelagic invertebrate predators by Daphnia. Studies on spatial avoidance behaviour of predators by prey often ignored the fact that prey typically face multiple predators which themselves interact and show a spatial pattern in abundance and predation rates. In a series of laboratory experiments we investigated predation risk and horizontal migration of the cladoceran Daphnia magna between open water and vegetation in response to two important invertebrate predators with a contrasting spatial distribution: pelagic Chaoborus and vegetation-associated Ischnura. As expected, predation risk by Chaoborus was higher in open water due to higher numbers and higher predation rates of Chaoborus, while for Ischnura, predation risk was highest in the vegetation due to higher densities but despite lower predation rates of Ischnura. In accordance with this, Daphnia moved into the vegetation in the single presence of the pelagic Chaoborus. In the single presence of Ischnura, however, Daphnia showed no response. We hypothesize this may be the result of a constitutive behaviour of Daphnia to avoid pelagic fish, which impedes a response to the open water. In the combined predator treatment, Daphnia migrated to the open water zone. The increased risk of predation in the vegetation, due to a facilitating effect of Chaoborus on Ischnura predation rates is believed to have caused this migration of the Daphnia. This response of Daphnia declined through time and Daphnia moved toward the vegetation. A decline in the activity of the Ischnura larvae through time may have switched the risk balance in favour of the vegetation environment. Chapter V: Lake-to-lake dispersal of lentic macroinvertebrates through lake outlets. Little is known on dispersal of lentic macroinvertebrates. We quantified dispersal of lentic macroinvertebrates through lake connections in a highly connected lake system, and investigated the role of connection properties and timing (day, night) on dispersal rate. Furthermore, by comparing dispersing macroinvertebrate assemblages with the macroinvertebrate assemblages of source lakes, we tested whether dispersal was neutral or a taxon-specific process. Many taxa dispersed through the lake connections, probably mainly by passive transport. Taxon richness of the dispersing macroinvertebrate assemblage was proportional to taxon richness in the source lakes. The number of individuals that dispersed, however, was not related to source lake densities, possibly because of the highly patchy distribution of lentic macroinvertebrates within lakes and the relatively short sampling time. Baetidae, Chironomidae and Physidae exhibited higher dispersal rates, corrected for source pond densities, than a selection of other macroinvertebrate families, indicating that the extent of dispersal may be taxon-specific. None of the physical properties of the connections affected dispersal. The number of dispersing macroinvertebrates was higher during the night than during daytime. Of seven frequently dispersing families, Chaoboridae and Chironomidae showed higher dispersal during the night, probably resulting from diel vertical migration behaviour. Dispersal rates of actively and passively over-land dispersers through lake connections did not differ. Since over-land dispersal probably is more frequent in active dispersers compared to passive dispersers, dispersal through lake-outlets in connected lake systems may generate different spatial patterns compared to over-land dispersal with regard to the composition of communities and the genetic structure of populations. Chapter VI: Rapid response of macroinvertebrates to drainage management of shallow lakes. Shallow lakes throughout the world are subject to drainages, either as part of fish farming practices to harvest the fish, or as part of lake restoration projects. Lake drainages of fish lakes are known to improve macrophyte and zooplankton diversity, but the effect on the macroinvertebrate community is poorly known. In this study, we investigated temporal trends in the macroinvertebrate community following lake drainage in six shallow connected lakes. We evaluated drainage effects for all macroinvertebrates at the family level and for Coleoptera, Hemi-
ptera and Odonata at the genus or species level. After the drainages, diversity increased for all macroinvertebrates at the family level, Hemiptera and Odonata. Taxon richness increased for Coleoptera, Hemiptera and Odonata. Recolonization of the lakes by the former inhabitants occurred within the first year after the drainages and was supplemented with a set of species that previously were rare or did not occur in the lakes. Changes in the environmental conditions of the lakes were small and transient, except for the decline in fish. The fact that species that occurred in the lakes before the drainages rapidly recolonized the lakes is attributed to the high connectivity in our study system. The occurrence of supplementary species probably was linked to the decline in fish predation, suggesting fish was a dominant factor in shaping the communities. In summary, lake drainage has a positive effect on the diversity and richness of macroinvertebrates in shallow connected lakes. This positive effect seems largely due to a combination of a decline in fish predation following lake drainage and the high rate of recolonization amongst others via connections to nondrained lakes. Lake drainage therefore probably is the most cost-effective lake restoration tool in shallow connected lakes. Other restoration tools may be more favourable in isolated lakes where recolonization may be constrained. **Chapter VII: Metacommunity structure of lentic macroinvertebrates: contrasting active and passive dispersers.** Macroinvertebrates inhabiting ponds and lakes can be categorized as active or passive dispersers. Because dispersal over land is assumed to be very limited in passive dispersers, connections between lakes may provide important additional dispersal corridors between lakes. Active dispersers can easily fly from lake to lake over land, and the additional contribution of dispersal via lake connections to dispersal may be negligible. As a result, metacommunities of active and passive macroinvertebrate dispersers may be differentially affected by lake connectivity and hence show different spatial structures. We investigated this hypothesis in a system of 34 connected lakes. In agreement with our expectations, we found that communities of passively dispersing macroinvertebrates were regionally structured according to a spatial model that incorporated the connections among the lakes, while active dispersers were not. Active dispersers, and surprisingly also passive dispersers, were also strongly structured conform the spatial model of Euclidian distances among the lakes, possibly suggesting that over-land dispersal as well was an important dispersal mechanism. These results confirm the importance of connectivity among habitats for metacommunity structure and dynamics, but also indicate that the net effect of connectivity on metacommunity structure depends on the prevailing mode of dispersal of the organisms. **Chapter VIII: Habitat selection drives macroinvertebrate community turnover along the hydroperiod gradient.** Community turnover along the hydroperiod gradient is generally assumed to result from local selective mechanisms, abiotic limitation and species sorting, while the possibility of habitat selection behaviour is largely ignored. In this study, the colonizing assembly of macroinvertebrates in small, fishless habitats deviated strongly from that observed in a surrounding large set of fish lakes. By studying distance-similarly relationships, we could show that fish lakes did not act as sources for the colonization of the fishless habitats. We argue that neither abiotic limitation, nor species sorting due to invertebrate predators in the fishless habitats or due to fish in the fish lakes were able to explain the observed patterns. Our results indicate that strong habitat selection may substantially contribute to community turnover along environmental gradients observed in nature, thereby offsetting a direct role for abiotic limitation and species sorting. Address: Van de Meutter, F., Laboratorium voor Aquatische Ecologie, K.U. Leuven, De Beriotstraat 32, B-3000 Leuven, Belgium. E-mail: frank.vandemeutter@bio.kuleuven.ac.be

7639. Vega, F.J.; García-Criado, F.; Miguélez, D.; Valladares, L.F. (2005): Diversidad de odonatos en los humedales rehabilitados del Parque Natural de Salburua (Álava). Estudios del Museo de Ciencias Naturales de Álava 20: 107-114. (in Spanish, with English summary) [*Adult Odonata were sampled from May to September 2003 in Salburua Natural Park (Álava, Basque Country, Spain) with the aim of characterising the diversity of this group in the area. The specimens were actively captured from 7 sampling stations using hand nets. 27 species (16 Zygoptera and 11 Anisoptera) were recorded. One of them, Symptemper meridionale, is cited for the first time from the province of Álava and its presence in the Basque Country is confirmed. The richness value can be considered high when compared with studies conducted in other areas. This fact, together with the presence of some threatened species, specially Coenagrion mercuriale (National Catalogue of Threatened Species and Annex II of the Habitat Directive) and Coenagrion scitulum (designated as vulnerable in Europe by some authors), allow us to consider Salburua as an area of special interest for odonate conservation in the Basque Country." (Authors)] Address: Vega, F.J., Depto de Biologia Animal, Facultad de Ciencias Biologicas y Ambientales, Universidad de León, 24071 León, Spain. E-mail: dbafum@unileon.es

7640. Venturelli, P.; Tonn, W.M. (2005): Invertivory by northern pike (Esox lucius) structures communities of littoral macroinvertebrates in small boreal lakes. J. N. Am. Benthol. Soc. 24(4): 904-918. (in English) [Canada, Alberta; "Recent comparative studies suggest that macroinvertebrates in small Boreal Plains lakes respond to large fluctuations in fish densities caused by winterkill and subsequent recovery even when such fluctuations involve the normally piscivorous northern pike (Esox lucius). We introduced pike into a boreal lake made fishless by a past winterkill to isolate experimentally the effects of pike on littoral macroinvertebrates. We compared postmanipulation macroinvertebrate data from the experimental lake (EXP) to premanipulation data from the same lake, to parallel data from 2 unmanipulated reference lakes (R1 and R2) containing pike, and to data from mesocosms within EXP. Pike in all 3 lakes preyed heavily upon macroinvertebrates; diets consisted predominantly of the amphipod Gammarus lacustris in R1 and R2 and erpobdellid leeches in EXP. Principal components analysis (PCA) of macroinvertebrate communities distinguished between systems with and without fish and detected a shift in the macroinvertebrate community of EXP and predator-exposed control mesocosms away from large carnivorous taxa (e.g., odonates, coleopterans, and leeches) toward less conspicuous taxa such as dipterans and trichopterans following manipulation. Responses of individual taxa were generally in agreement with PCA; erpobdellid leeches and odonates showed consistent negative responses to pike. Our study provides experimental evidence at the whole-lake scale that northern pike can affect littoral macroinvertebrates in small boreal lakes, and demon-
strates the sensitivity that littoral food webs in these systems can have to changes in the density of fish." 

(Authors) Address: Venturelli, P., Dept Biological Sciences, University of Alberta, Edmonton, Alberta, Canada T6G 2E9

7641. Wu, Z.-j.; Li, Y.-m.; Wang, Y.-p.; Adams, M.J. (2005): Diet of introduced bullfrogs (Rana catesbeiana): Predation on and diet overlap with native frogs on Daishan Island, China. Journal of Herpetology 39(4): 668-674. (in English) [The authors examined the diet of introduced Rana catesbeiana and three native frog species (R. limnocharis, R. nigromaculata, and Bufo bufo gargazians) co-occurring at a group of ponds on Daishan Island, east of China, to gain insight into the nature of potential interactions between Bullfrogs and native frog species. The three most important diet items for juveniles bullfrogs were Cambaridae (33.60%), B. sommatophore (12.57%), and Odonata (11.35%). The diet of female bullfrogs and Bufo bufo gargazians didn't include Odonata. ] Address: Wu, Z.-j., Institute of Zoology, Chinese Academy of Sciences, 25 Beisihuanxi Road, Haidian, Beijing 100080, China

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7642. Aowphol, A.; Thirakhupt, K.; Nabhitabhata, J.; Voris, H.K. (2006): Foraging ecology of the Tokay gecko, Gekko gecko in a residential area in Thailand. Amphibia-Reptilia 27: 491-503. (in English) [The foraging behaviour of G. gecko was observed at the visitor complex of the Khao Khiao Open Zoo at the Khao Khiao-Khao Chomphu Wildlife Sanctuary in Chon Buri Province, Thailand. Foraging parameters of G. gecko (foraging period, time spent moving, foraging attempts, foraging success, prey size consumed, and foraging distance) did not vary significantly between males, females, and juveniles. Individuals foraged between 18:01 and 09:00 hrs. Peak emergence time was between 18:01 and 20:00 hrs. Peak retreat time was between 04:01 and 07:00 hrs. Major food items included insects of the orders Lepidoptera, Orthoptera, and Coleoptera. Prey sizes of males, females, and juveniles were not significantly different, indicating no prey size selection. This may have been due to low insect availability in the habitat. G. gecko tended to be a sit-and-wait forager spending most of the time waiting for active prey. However, it sometimes foraged more actively when insect abundance was relatively high. Foraging behavior of males tended to be more variable than females and juveniles. In addition, variation in foraging parameters among individuals was noted. Foraging strategies of G. gecko observed in this study are interpreted in the context of optimal foraging theory." (Authors) Address: Thirakhupt, K., Dept Biology, Faculty of Science, Chulalongkorn University, Pathumwan, Bangkok, 10330 Thailand. E-mail: Kumthorn@sc.chula.ac.th

7643. Aygen, D.; Emslie, S.D. (2006): Royal Tern (Sterna maxima) Chick Diet at Fisher Island National Wildlife Refuge, Virginia. Waterbirds 29(3): 395-400. (in English) [In 2003, chick diet of Royal Tern included one undetermined dragonfly.] Address: Emslie, S.D., University of North Carolina, Department of Biology and Marine Biology, 601 S. College Road, Wilmington, NC 28403, USA. E-mail: emslies@uncw.edu

7644. Bartnikaitė, I.; Bernotiene, R.; Pakalniškis, S.; Žygutienė, M. (2006): Control of bloodsucking black fly (Simuliidae) populations in Lithuania. Ekologia 4: 70-75. (in English) [The outbreak of bloodsucking black flies began in the 70s of the 20th century in the south-eastern part of Lithuania. By 1990, the biting activity of bloodsucking black flies increased and had become a serious problem. The bloodsucking insects caused losses of cattle and domestic birds and tormented holiday-makers in the Druskininkai health-resort. Biological larvicide based on Bacillus thuringiensis var. israelensis was used for bloodsucking black fly control in 1999-2005. The larvicide was introduced into the Nemunas River stream in one point directly from the river bank. A sufficient efficacy was achieved in a 164 km long segment of the river every year." (Authors) No effects on Odonata are observed.] Address: Bernotiene, Rasa, Institute of Ecology of Vilnius University, Akademijos 2, LT-08421 Vilnius, Lithuania. E-mail: rasab@uokli.lt

7645. Bedjanic, M. (2006): Current status of taxonomy, research and conservation of dragonfly fauna (Insecta: Odonata) of Sri Lanka. Bambaradenlya, C.N. B. (Ed): Fauna of Sri Lanka. Status of Taxonomy, Research and Conservation. IUCN: 20-34. (in English) [Altogether 116 described odonate species are known from Sri Lanka. The level of endemism is high - 53 taxa or 45.7 % are confined to the island. The families Chlorocyphidae, Euphaeidae, Protoneruridae, Platystictidae, Gomphidae and Corduliidae consist of almost exclusively endemic taxa. Additionally, four new endemic species are currently being described, bringing the actual number of dragonfly taxa to a total of 120 and the number of endemic representatives to a total of 57 taxa or 47.5 %. The odonate fauna of Sri Lanka is still insufficiently known. The know ledge on distribution, biology and taxonomy of adults and especially larval forms is very poor. Destruction Of primary and secondary rainforests, destruction of forest corridors along streams, pollution and other pressures on streams and rivers in the southwestern and central parts of Sri Lanka are the major threats to the exceptionally rich endemic dragonfly fauna. More than 80% of the species confined to Sri Lanka are classified as endangered. Altogether 20 highly threatened endemic dragonfly species from Sri Lanka are currently proposed for inclusion on the new IUCN Global Red List of Threatened Animals. The paper elaborates on future research priorities with recommendations for the conservation of odonate fauna in Sri Lanka." (Author) Address: Bedjanic, M., Kolodvorska 21b, SI-2310 Slovenska Bistrica, Slovenia. Email: matjazbedjanic@yahoo.com

7646. Casas, J.J.; Gessner, M.O.; Langton, P.H.; Calle, D.; Descals, E.; Salinas, M.J. (2006): Diversity of patterns and processes in rivers of eastern Andalusia. Limnetica 25(1-2): 155-170. (in English, with Spanish summary) [We document the outstanding diversity of fluvial ecosystems in eastern Andalusia, mostly attributable to the high environmental heterogeneity of the region. [...] Fluvial communities respond to this spatial heterogeneity with marked qualitative and quantitative changes among rivers and along the upstream-downstream continuum, generally exhibiting a great decrease in taxonomic and functional diversity as human impacts increase towards the lower reaches. Discharge fluctuations add heterogeneity on the temporal scale and are an additional essential determinant of biological diversity. Climatic, geological and hydrological charac-
teristics profoundly affect the structure of the riparian vegetation, which in turn strongly conditions the community structure of benthic macroinvertebrates and organic matter turnover in fluvial ecosystems." (Authors) Macroinvertebrates including Odonata are treated on the order level.] Address: Casas, J., Departamento de Biología Vegetal y Ecología, Universidad de Almería, 04120-Almería, Spain. E-mail: jcasas@ual.es


7648. Govindaraju, P.; Price, S.; Anholt, B.R. (2006): Introduced Bullfrogs (Rana catesbeiana) in western Canada: Has their ecology diverged? Journal of Herpetology 40(2): 249-260. (in English) "Organisms can diverge in life history when introduced outside their native range due to release from predators, competitors, and parasites, and also due to genetic drift and local adaptation. We studied the ecology of R. catesbeiana in its introduced range in British Columbia (BC). To assess differences between introduced and native populations, we compared the population ecology of BC bullfrogs to published life-history parameters from the bullfrog's extensive native range in eastern North America. [...]. Terrestrial insects were the primary prey item of bullfrogs < 150 g, whereas frogs were the primary prey item of larger bullfrogs. The life-history parameter values estimated for BC bullfrogs were within the range observed for bullfrogs in their native habitats. Due to milder weather conditions in southwestern BC, the seasonal pattern and growth rate of bullfrogs were similar to lower latitude populations in Kentucky and Missouri. We found no evidence to support the hypothesis that when released from native predators and parasites bullfrogs build up to unusually high population densities or attain significantly larger sizes in their introduced range." (Authors) Passing references to Odonata are made.] Address: Govindaraju, P., Department of Biology, University of Victoria, Victoria, British Columbia, V8W 3N5, Canada. E-mail: purnimap@uvic.ca

7649. Graça, M. (2006): Allochthonous organic matter as a food resource for aquatic invertebrates in forested streams. The importance of forests for dragonflies in different continents. In: Rivera, AC (ED). 2006. Forests and Dragonflies. 4th WDA Symposium of Odonatology, Pontevedra, Spain, July 2005. Pensoft Series Faunistica 61: 37-47. (in English) "This paper summarises the role or organic matter in the ecology of forested low order streams. Forests are among (lie most productive systems on Earth. More than 90% of forest primary production will end in detrital pathways, in soil and water. The amount of energy in the form of plain litter entering forested low order streams is several times higher than the energy synthesized by aquatic producers: therefore leaves produced in the riparian zones are a main energy source and decomposition is an important ecological process in those systems. Decomposition is mainly a biological process initiated by aquatic fungi and shredding invertebrates. Those organisms promote the transformation of leaves into fine particles used by bacteria, collectors and filter-feeding invertebrates. Therefore, much of the energy allocated into secondary production in streams has an allochthonous origin. Nutrients liberated as a result of decomposition are used further downstream, in lakes or estuaries by primary producers. The rate at which leaf litter is decomposed is controlled by intrinsic leaf properties (nutrient content, plant chemical and physical defences) as well as environmental factors (e.g. nutrients in water). Disturbances of riparian zones and eutrophication can affect decomposition and, for this reason, changes in decomposition rates could be used as a functional parameter to assess stream health. Given that the standing stock of leaf litter has a positive effect on leaf consumers, allowing high biomass and diversity, it is likely to also affect top invertebrate predators including odonates: however, the literature on this subject is still scarce." (Author) Address: Manuel A. S. Graça, M.A., iMAR, Departamento de Zoología, Universidade de Coimbra. 3004-517 Coimbra, Portugal. E-mail: mgraca@ic.unic.pt

7650. Harzsch, S. (2006): Neurophylogeny: Architecture of the nervous system and a fresh view on arthropod phylogeny. Integrative and Comparative Biology Advance Access published February 28, 2006. doi:10.1093/icb/icj011: 1-33. (in English) "The phylogenetic relationships within the Arthropoda have been controversial for more than a century. Today, comparative studies on the structure and development of the nervous system contribute important arguments to this discussion, so that the term "neurophylogeny" was coined for this discipline. The large number of recent studies on the nervous system in various nonmodel arthropods indicates that we are far advanced in the process of analyzing the cellular architecture of the arthropod nervous system in a depth that will ultimately provide characters at a level of resolution equal or even superior to that of characters traditionally used in morphological phylogenetic studies. This article sets out to summarize the current state of the discussion on arthropod phylogeny (including Odonata) and briefly evaluates the morphological characters that have been used as arguments in favour of the traditional Tracheata hypothesis. Then, a thorough overview is given of characters derived from structure and development of the arthropod brain and the ventral nerve cord from the cellular level to the level of larger neuropil systems. These characters support the new Tetraconata hypothesis suggested by Dohle and provide evidence for a clade that unites malacostracan and remipede crustaceans with the Hexapoda." (Author) Address: Harzsch, S., Universität Ulm, Abt. Neurobiologie & Sektion Biosystematische Dokumentation, Albert-Einstein-Str. 11, D-89081 Ulm, Germany. E-mail: steffen.harzsch@uni-ulm.de

7651. Hoess, R. (2006): Catalogue of type material in the Odonata collection of the Natural History Museum Basel. Entomologica Basiliensia et Collectionis Frey 28: 1-31. (in English) "A list of all types, apart from topotypes, present in the Odonata collection of the Natural History Museum, Basel is provided, whether they are indicated in the literature or not. The respective original descriptions are also listed. The type status, method of conservation, state of preservation, and the content of labels is given for each of the 111 specimens, belonging to 57 taxa, as well as additional information e.g. on other types of the respective taxon. The collection holds types of about 1% of the extant species of Odonata, thus being one of the more important Odonata collections worldwide; 37 taxa are represented by their pri-
mary types, and seven genera by type material of the respective type species. Most specimens have been collected on expeditions made by non-specialist odonatologists." (Author)] Address: Hoess, R., Normannenstr. 35, 3018 Bern, Switzerland. E-mail: ReneHoess@1st.ch

7652. Honcu, M. (2006): Dragonflies (Odonata) of Kokorínsko Protected Landscape Area. Bohemia central 27: 231-239. (in Czech, with English summary) [In the past 15 years, a total of 33 Odonata species was registered in the Kokorínsko Protected Landscape Area (Central and Northern Bohemia, Czech Republic), representing 46.5 % of all dragonflies living in the Czech Republic. "Common species prevail, owing to the low altitude the sub-mountain and mountain species were not found. Very surprising is the occurrence of Ophioogomphus leucia, Leucorrhinia pectoralis and two Mediterranean species Crocothemis erythraea and Aeshna isosculeae. Noteworthy is the occurrence of Les- tes dryas, Brachytron pratense, Gomphus vulgatissi- mus, Somatochlora flavomaculata, Symptemet damae, and S. flaveolum. The population of G. vulgatissimus found in the Pšovka brook is one of the most abundant in Northern Bohemia." (Author)] Address: Honcu, M., Vlastivědí muzeum a galerie Ėeská Lípa, Nám. Os- vobození 297, CZ - 470 01 Ėeská Lípa, Czech Republic. E-mail: honcu@muzeum.cnet.cz


7655. Kosterin, O.E.; Korsun, O.V. (2006): A collection of odonata from the Argun' (Hailar) River basin in Transbaikalia, east Siberia, Russia. Notulae Odonatolo- gicae 6(8): 81-85. (in English) [B.F. BELYSHEV (1973, 1974, 1980, 1986) and O.P. Kruglov (1990, 1991) conducted expeditions at this location. In 2005, new records were collected on expeditions made by non-specialist odonatologists. Such mating interactions may impose strong selection on female mating preferences to favor trait values in conspecific males that allow females to discriminate them from their heterospecific rivals. We explore the consequences of such selection in models of the evolution of female mating preferences when females must interact with heterospecific males from which they are completely postreproductively isolated. Specifically, we allow the values of both the most pre- ferred male trait and the tolerance of females for males that deviate from this most preferred trait to evolve. Also, we consider situations in which females base their mating decisions on multiple male traits and must inter- act with males of multiple species. Females will rapidly differentiate in preference when they sometimes mis- take heterospecific males for suitable mates, and the differentiation of female preference will select for conspecific male traits to differentiate as well. In most cir- cumstances, this differentiation continues indefinitely, but slows substantially once females are differenti- ated enough to make mistakes rare. Populations of females with broader preference functions (i.e., broader toler- ance for males with trait values that deviate from females' most preferred values) will evolve further to dif- ferentiate if the shape of the function cannot evolve. Also, the magnitude of separation that evolves is larger and achieved faster when conspecific males have lower relative abundance. The direction of differentiation is also very sensitive to initial conditions if females base their mate choices on multiple male traits. We discuss how these selection pressures on female mate choice may lead to speciation by genetic assimilation among populations of a progenitor species that experi- ences different assemblages of heterospecifics. Opportuni- ties for differentiation increase as the number of traits involved in mate choice increase and as the num- ber of species involved increases. We suggest that this mode of speciation may have been particularly preval- ent in response to the cycles of climatic change throughout the Quaternary that forced the assembly


7657. Martens, A. (2006): Buchbesprechungen: Schorr, M. & M. Lindeboom (eds) 2004: Dragonfly Re- search. 2. Lauternbornia 56: 40. (in German) [Review of Version 2 of the odonatological literature database. In the meantime Version 6 of this data and pdf repository was published with more than 26000 titles and more than 4000 pdf.] Address: Martens, A., Pädagogische Hochschule Karlsruhe, Postfach 111062, D-76060 Karlsruhe, Germany. E-mail: andreas.martens@ph-karlsruhe.de

7658. Mauffray, B. (2006): Additional records of Georgia (United States) Odonata from the B.E. Mont- gomery archives. Notulae Odonatologicae 6(8): 86-87. (in English) ["In 2006, the B.E. Montgomery archives, housed at the International Odonata Research Institute, Gainesville, Florida, USA, was sorted. A number of county records omitted from Mauffray & Beaton (2005, Bull. Am. Odonatol. 9[2]: 21-66) are listed here with a few notes on "doubtful" and "expected" species." (Au- thor)] Address: Mauffray, B., 4525 N.W. 53nd Lane., Gainesville, FL 32653, USA. E-mail: iori@afn.org

7659. McPeek, M.A.; Gavrilets, S (2006): The evolu- tion of female mating preferences: Differentiation from species with promiscuous males can promote speci- ation. Evolution 60(10): 1967-1980. (in English) ["Fe- males of many species are frequently courted by promiscuous males of their own and other closely re- lated species. Such mating interactions may impose strong selection on female mating preferences to favor trait values in conspecific males that allow females to discriminate them from their heterospecific rivals. We explore the consequences of such selection in models of the evolution of female mating preferences when females must interact with heterospecific males from which they are completely postreproductively isolated. Specifically, we allow the values of both the most pre- ferred male trait and the tolerance of females for males that deviate from this most preferred trait to evolve. Also, we consider situations in which females base their mating decisions on multiple male traits and must inter- act with males of multiple species. Females will rapidly differentiate in preference when they sometimes mis- take heterospecific males for suitable mates, and the differentiation of female preference will select for conspecific male traits to differentiate as well. In most cir- cumstances, this differentiation continues indefinitely, but slows substantially once females are differenti- ated enough to make mistakes rare. Populations of females with broader preference functions (i.e., broader toler- ance for males with trait values that deviate from females' most preferred values) will evolve further to dif- ferentiate if the shape of the function cannot evolve. Also, the magnitude of separation that evolves is larger and achieved faster when conspecific males have lower relative abundance. The direction of differentiation is also very sensitive to initial conditions if females base their mate choices on multiple male traits. We discuss how these selection pressures on female mate choice may lead to speciation by genetic assimilation among populations of a progenitor species that experi- ences different assemblages of heterospecifics. Opportuni- ties for differentiation increase as the number of traits involved in mate choice increase and as the num- ber of species involved increases. We suggest that this mode of speciation may have been particularly preval- ent in response to the cycles of climatic change throughout the Quaternary that forced the assembly

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and disassembly of entire communities on a continuum-wide basis." (Authors) References to damselflies (Enallagma) are made.] Address: McPeek, M., Dept Biol. Sci., Dartmouth College, Hanover, New Hampshire 03755, USA. E-mail: mark.mcpeek@dartmouth.edu

7660. Meurgey, F. (2006): A possible economic impact of libellulid larvae on production of freshwater shrimps in Guadeloupe, French West Indies (Anisoptera: Libellulidae). Notulae Odonatologicae 6(7): 79-80. (in English) ["It seems, the odonate presence in shrimp farming ponds has a negative effect on shrimp production. As recorded at Pointe Noire, an approx. 20% decrease of post-larvae production was noticed for several years, mainly due to Pantala flavescens predation on shrimps. There are two rearing basins at this site, the largest of these has a surface of ca 100 m². During two days, 2302 exuviae were collected there and numerous final instar larvae were observed." (Authors) Address: Meurgey, F., Muséum d'Histoire naturelle de Nantes, 12, rue Voltaire, F-44000 Nantes, France. E-mail: Francois.Meurgey@mairie-nantes.fr

7661. Michael, J.L.; Batzer, D.P.; Fischer, J.B.; Gibbs, H.L. (2006): Fate of the herbicide sulflometuron methyl (Oust) and effects on invertebrates in drainages of an intensively managed plantation. Can. J. Forest. Res. 36: 2497-2504. (in English, with French summary) ["The off-site movement and impacts on water quality and aquatic ecosystems of sulflometuron methyl applied as the herbicide Oust to catchments in short-rotation plantations in the coastal plain of South Carolina were studied. Sulflometuron methyl was applied at the rate of 0.053 kg active ingredients ha⁻¹ to 5.4- and 5.9-ha catchments (C5 and C6, respectively). Off-site movement of sulflometuron methyl in drainage ditches was observed between application on 14 March 2001 and 14 June 2001 for the first five flow-producing rain events on C5 and the first four events on C6. The maximum observed concentrations (24 μg L⁻¹ on C5 and 23 μg L⁻¹ on C6) occurred during the first storm. Subsequent maximum concentrations for flow-producing storms were 10.0, 5.0, 0.5, and 0.1 μg L⁻¹ on C5 and 15.1, 6.7 and 0.5 μg L⁻¹ on C6. Pulsed inputs of sulflometuron methyl to stormflow were ephemeral and the maximum concentration for each storm event lasted 15 min or less. The faunal communities observed in these drainage ditches were dominated by a diversity of invertebrates typical of wetland habitats, such as midges, mosquitoes, water beetles, physid snails, and water fleas. Negative effects of sulflometuron methyl treatment on these communities in treated watersheds were not observed." (Authors) Tab. 2 lists a few Odonata on the genus level.] Address: Michael, J.L., Forestry Sciences Department of Integrative Biology, Brigham Young University, Provo, Utah 84602, USA

7662. Mola, L.M.; Papeschi, A.G. (2006): Holokinetic chromosomes at a glance. Journal of Basic & Applied Genetics 17(1): 17-33. (in English) ["Current knowledge on holokinetic chromosomes is reviewed in this work. Their distribution in the different kingdoms is compiled and updated. The main criteria for their recognition are provided and discussed, from basic morphology and behaviour (ascertained by light microscopy) to a more precise characterization by means of immunofluorescence techniques and ultrastructural studies. The two modes of meiosis pre- and post-reductional) ecoun- tered in holokinetic systems are described as well as other topics related to the meiotic process. The principal mechanisms of karyotype evolution (fusion, simploidy, fragmentation/agnatoplody, translocation, poliploidy) and their occurrence and frequency in the different taxa are summarized. Finally, the different hypotheses about the origin of holokinetic chromosomes are described." (Authors) Address: Mola, Liliana Maria, Laboratorio de Citogenetica y Evolucion, Dpto. Ecologia, Genetica y Evolucion, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires. Int. Giiralde 2620, Ciudad Universitaria, Pabellon II, 4O Piso. (C1428EHA) Ciudad Autonoma de Buenos Aires, Argentina. E-mail: limola@ee.cn.uba.ar

7663. Naraoka, H. (2006): Landing of Epioephbia superstes (Sel.) larvae on snow-covered slopes (Epioephbioptera: Epioephbiidae). Notulae Odonatologicae 6(8): 92-93. (in English) [Nurukawa, Aomori prefecture, Japan; "larvae were seen crawling up on steep snow walls during 3-27 April with a peak in the second half of April. With the approach of the spring season in April, the snow-covered stream opens up here and there, and the larvae crawled up through the openings and moved slowly on the snow during 09:00-14:30 h. ... The walking larvae entered the cavities around the tree roots or the crevices in the snow that was still covering the steep banks, and found shelter under the dead leaves. Probably they remain under the leaves until emergence. The latter commences at this locality in mid May, meaning the larvae may be able to survive on land during almost a month." (Author) Address: Naraoka, H., 36-71 Fukunoda, Kitatsugaru, Aomori 0383661, Japan


7665. Nijboer, R.; Verdonschot, P.; Piechocki, A.; Tomczyk, G.; Klukowska, M. (2006): Characterisation of pristine Polish river systems and their use as reference conditions for Dutch river systems. Alterra-rapport 1367, ISSN 1566-7197: 221 pp. (in English) ["A central feature of the European Water Framework Directive are the reference conditions. The ecological quality status is determined by calculating the distance between the present situation and the reference conditions. To describe reference conditions the natural variation of biota in pristine water bodies should be measured. Because pristine water bodies are not present in the Netherlands anymore, water bodies (springs, streams, rivers and oxbow lakes) in central Poland were investigated. Macrophytes and macroinvertebrates were sampled and environmental variables were measured. The water bodies appeared to have a high biodiversity and a good ecological quality. They contain a high number of rare macroinvertebrate species. There are only few species that can not occur in the Netherlands, but their abundances were low. The Polish water bodies are suitable to describe reference conditions for similar Dutch water types. The data resulting from this project can be used

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to update the descriptions of reference conditions in the 'Handboek Natuurdoeltypen'or to develop the descriptions for the Water Framework Directive types." (Authors) Odonata are part of the water body indicator system. The list of taxa also includes Aeshna viridis, Stylurus flavipes, and Ophiogomphus cecilia]. Address: Altterra, P.O. Box 47; 6700 AA Wageningen; The Netherlands. E-mail: info.altterra@wur.nl

7666. Orlova, M.I.; Telesh, I.V.; Berezina, N.A.; Antsulevich, A.E.; Maximov, A.A.; Litvinchuk, L.F. (2006): Effects of nonindigenous species on diversity and community functioning in the eastern Gulf of Finland (Baltic Sea). Helgol. Mar. Res. 60: 98-105. (in English) "An increase of xenodiversity in plankton and benthos in the eastern Gulf of Finland was observed from 1998 to 2004. Nonindigenous species account for 4.8% of all species found and up to 96% of total biomass. Invasive benthic omnivores, the alien amphipods Gmelinoides fasciatus and Pontogammarus robustoides and the predaceous fish Percottus gleni in with their versatile diets strongly affect the community structure. Invasive sessile seston-feeders that directly (through grazing and water clearance) and indirectly (through recycling of nutrients) interact with other ecosystem components, are mainly represented by the zebra mussel Dreissena polymorpha, which affect the structure of benthic and planktonic communities as well as benthicipelagic coupling. The invasive predatory cladocerans Cerocapss pengoi and Evadne anonyx and larvae of D. polymorpha are only temporary components in the zooplankton, which is limiting their overall effect. Alien benthic bioturbators, the polychaetes Marenzelleria neglecta and the oligochaete Tubificoides pseudogaster account for a high proportion of total abundance and biomass but their effects on native species need further research." (Authors) The content of stomachs of Percottus gleni included Odonata.] Address: Orlova, Marina, Laboratory of Freshwater and Experimental Hydrobiology, Zoological Institute of the Russian Academy for Sciences, Universitetskaya Emb. 1, 199034 St. Petersburg, Russia. E-mail: marinaorlova@rambler.ru

7667. Orr, A.G. (2006): Odonata in Bornean tropical rain forest formations: Diversity, endemcity and applications for conservation management. In: Cordero Rivero, A. (Ed.) Forest and Dragonflies. Fourth WDA International Symposium of Odonatology, Pontevedra (Spain), July 2005. Sofia-Moscow: Pensoft: 51-78. (in English) "The island of Borneo was originally almost completely covered by closed canopy tropical rainforest. Owing to an aseasonal, hot, humid climate and high rainfall, forests were well supplied with streams and standing water. Consequently the rich, largely endemic odonate fauna must have evolved in association with these forests, and non-forest species, common today in disturbed land, must formerly have been rare opportunists in forest gaps or localised lacustrine species, it is estimated that at least 70% of the fauna is presently confined to forest habitats and probably depends on forest for its survival. This study relates odonate distribution to a mosaic of complex tropical rain forest formations in Brunei. The tiny sultanate of Brunei still enjoys about 80% forest cover, representative of all the seven major formations found on the island and a great many of the 30+ sub-formations, and results from a nation-wide survey of odonates from most habitats are considered to be broadly applicable to the entire island of Borneo and many other parts of equatorial south-east Asia. Greatest odonate diversity, both a and b, and greatest endemcity, is found in the primary lowland mixed dipterocarp forests, especially those growing in highly dissected landscapes such as occur at the KBFSC. at the edges of the central uplands. High diversity and endemcity is also found in swamp forest, especially freshwater swamp, with certain endangered peat swamp formations also important. The highly vulnerable kerangas forest harbours fewer species, none uniquely, and the mangrove fauna is still more depauperate. This study identifies a single wide-ranging specialist restricted to this habitat. Secondary dipterocarp forest is certainly less rich in odonates than primary forest, but lack of sites for parallel comparisons makes it difficult at present to state how serious this effect is. These results emphasise the importance of conserving a wide range of primary forest formations to achieve satisfactory odonate conservation, a strategy congruent with the conservation of charismatic land-based vertebrates and forest peoples." (Author)] Address: Orr, B., 26 Currimundi Rd, Caloundra, Q4551, Australia

7668. Park, H.-h.; Lee, J.-h. (2006): Arthropod trophic interaction relationship in a temperate rice ecosystem: A stable isotope analysis with 13C and 15N. Environ. Entomol. 35(3): 684-693. (in English) "Arthropod trophic relationship in temperate rice fields during the growing season were explored in 2000 and 2001 by measuring signatures of naturally occurring carbon and nitrogen stable isotopes. 13C and 15N values for rice plants, soil, and arthropods varied slightly between both years, and the values were rather distinctive according to functional groups. Isotopic changes in rice plants affected values for herbivorous insects. Seasonal changes in 13C and 15N values for predators indicated that prey composition of their diets changed seasonally. Early in the season, there were two distinct clusters: (1) rice plants-herbivorous insects-parasitoids cluster and (2) filter-feeders/detritivores and predators cluster. The correlations in each case suggest interactions. During mid-season, the rice plants-herbivorous insects-parasitoids interaction was maintained, and herbivorous insects such as planthoppers were linked to predators. Also, detritivores such as Entomobryidae spp. seemed to be linked. During the late season, close interactions occurred at all trophic levels. Our study provided isotopic evidence that filter feeders/detritivores such as Chironomidae and Entomobryidae play a valuable role in maintaining the predator complex in the rice ecosystem during the rice-growing season. Also, fundamental data of stable carbon and nitrogen isotopes acquired in this study would be of value for use in advanced community studies for rice fields." (Authors) Table 1 includes Aeshnidae and Lestidae, and the means of carbon and nitrogen stable isotope ratios of sampled specimens.] Address: Park, H.-h., Entomology Program, School of Agricultural Biotechnology, College of Agriculture and Life Sciences, Seoul National University, San 56-1, Shillim-dong, Gwanak-gu, Seoul 151-921, Republic of Korea

7669. Prunier, F. (2006): Sex ratio y Biometría en tres poblaciones de libélulas de Sierra Morena: Anax imperator, Boyeria irene, Cordulegaster boltoni immaculifrons (Insecta: Odonata). Boletín de la Sociedad Andaluza de Entomología 13(2005): 67-71. (in Spanish, with English summary) [Total length and sex ratio were measured in three Andalucian (Spain) populations.] Address: E-mail: florent.prunier@netcourier.com
was unnecessary.

junior synonym of Aeshna crenata Hagen, 1856 (B.F. Rambur, 1842). Aeshna gigas Bartenef is considered a

graphic des Gomphines, Muquardt, Bruxelles).

refer to the same taxonomic species. The references of
cancer as a replacement. However, both nominal taxa

ruptus Selys, 1858 (nee Selys, 1857). STEINMANN

Replacement name for Gomphus (Onychogomphus)

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但实际上 junior primary homonyms.

that they are junior secondary homonyms; they are ac

made. Steinmann argues for all names to be replaced

*nomen oblitum as well." (Author) Address: Tailly, M.; Zampieri, D (2006): Crocothemis

servilia added to the Armenian fauna and new records of Lindenia tetraphylia and Selysiosthiasis nigra from

Anisoptera: Gomphidae, Libellulidae). Notulae Odonatologicae 6(8): 93-94. (in English) [Croco-

tomy of Meghri in southern Armenia, close to the border of Iran (38°53.

443N, 46°15.926E; 516 m asl). Lindenia tetraphylia, 1 ♀, 23-VI-1958, Mingeuchar (40°46.12N, 47°2" 56E).

Selysiosthiasis nigra, 1 ⊀, 1♀, both from Mingeuchar, da-

ted 29-VI-1958 and 23-VI-1958, respectively.] Address:

Tailly, M., Hoonakkerdreef 35, B-8791 Waregem, Belgi-

um. E-mail: marc.tailly@pandora.be


of one letter is sufficient to prevent homonymy (Int.

Critier, 1825) in Hamburg nach über 70 Jahren. Bombus 70/71: 292. (in German) [Germany; Stylurus flavipes, 1.8.2003, Elbe, S Altengamme.] Ad-

dress: Tolasch, T., Universität Hohenheim, Inst. Zoolo-

gie, Fg Tierkunde 220c, Garbenstr. 30, D-70593 Stut-

gart, Germany. E-mail: tolasch@uni-hohenheim.de


flavipes (Charpentier, 1825) in Hamburg nach über 70

Jahren. Bombus 70/71: 292. (in German) [Germany; Stylurus flavipes, 1.8.2003, Elbe, S Altengamme.] Ad-

dress: Tolasch, T., Universität Hohenheim, Inst. Zoolo-

gie, Fg Tierkunde 220c, Garbenstr. 30, D-70593 Stut-

gart, Germany. E-mail: tolasch@uni-hohenheim.de


Italy (Anisoptera: Gomphidae). Notulae Odonatologicae

6(8): 90-92. (in English) ["A new site for L. tetraphylia from Sardinia and 4 from Tuscany are put on record. Some of these apparently harbour reproductive popula-

tions. Selysiosthiasis nigra is for the first time recorded from Tuscany." (Authors)] Address: Utzeri, C., Diparti-

tmento di Biologia Animale e dell'Uomo, Università di Roma "La Sapienza". Viale dell'Università 32,1-00185

Roma, Italy. E-mail: carlo.utzeri@uniroma1.it

7675. Vega, F.J.; Garcia-Barrera, P.; del Carmen


Cretaceous Sierra Madre Formation, Chiapas, south-

eastern Mexico. Revista Mexicana de Ciencias Geoló-

*piutai* Steinmann, 1997a: 201, Argia. — Replacement

name for Argia apicalis Matsumura, 1913 (nee Say, 1839). The status of Argia apicalis Matsumura was as-
certained by ASAHINA (1951: 15, Kontyu 19: 15-22),

when he introduced the name Rhipidolestes okinawan

sp. n. [recte: okinawanus] for this species.

*schmidtii* Steinmann, 1997a: 259, Enallagma. — Re-

placement name for Enallagma risi Pinhey, 1962 (nee

Schmidt, 1961). The homonymy of Enallagma risi Pin-

hey was already recognised by PINHEY (1966: 9, Arnol
da 2(33): 1-24), who introduced Enallagma an-
golicum nom. nov. for this species. Presently assigned to

Pinheyagron.

*secundus* Steinmann, 1997b: 112, Gomphurus. — Re-

placement name for Gomphus septima Westfall, 1956

(nee Needham, 1930). Both nominal taxa Septimus

Needham, 1930 and septima Westfall, 1956 were in-

deed described in Gomphus (contra e.g. BRIDGES,

1991: VII. 190, Catalogue of the family-group, genus-

group and species-group names of the Odonata of the

World, Privately published, Urbana). These names

should, however, not be considered homonyms. Sep-

timus is an adjective, but septima appears to be a noun

in apposition. ‘This species is named for Dr Septima

Smith ... ’ (WESTFALL, 1956: 253, Quart. J. Fla. Acad.

Sci. 19: 251-258). Both names cannot be considered ‘variant spellings’ of the same name. Since a difference

of one letter is sufficient to prevent homonymy (Int.


of Zoological Nomenclature, London: Article 57.6),

Gomphurus secundus Steinmmn is an unnecessary re-

placement name.

*vilma* Steinmann, 1997b: 52-53, Gynacantha. — Re-

placement name for Aeschna viridis Rambur, 1842 (nee

Eversmann, 1836). This name has not been used as a

valid name for a taxonomic taxon since RAMBUR

(1842, Histoire naturelle des Insectes. Nevropteres.

Roret, Paris). The status is thus uncertain, and should

be considered a nomen oblivum. Based on the same

type, the name Gynacantha vilma has to be considered

a nomen oblivum as well.” (Author) Address: Tailly, M.;

Zampieri, D (2006): Crocothemis

vilma

Steinmann, 1997b: 172, Onychogomphus. — Re-

placement name for Gomphus (Onychogomphus)

rup tus Selys, 1858 (nee Selys, 1857). STEINMANN

(1997b) includes two nominal taxa in his catalogue, viz.

Nihongomphus rup tus Selys, 1857, and Onychogom-

phus rup tus Selys, 1858. For the latter he proposes O.

cancer as a replacement. However, both nominal taxa

refer to the same taxonomic species. The references of

Steinmann to Selys (1857, Monogr. Gomph: 393), and
to Selys (1858, Mem. Soc. r. Set, Liege 11: 635) pertain
to the same publication (E. de SELYS, 1858, Mono-

graphic des Gompthes, Muguartd, Bruxelles).

*johnsoni* Steinmann, 1997b: 12, Aeshna — Replac-

ement name for Aeschna gigas Bartenev, 1909 (nee

Rambur, 1842). Aeschna gigas Bartenev is considered a

junior synonym of Aeschna crenata Hagen, 1856 (B.F.


1, part 2, Nauka, Novosibirsk), so a replacement name

was unnecessary.
7676. Ward, P.; Labandeira, C.; Laurin, M.; Berner, R.A. (2006): Confirmation of Romer’s Gap as a low oxygen interval constraining the timing of initial arthropod and vertebrate terrestrialization. Proceedings of the National Academy of Sciences of the USA 103(45): 16818-16822. (in English) "[The first terrestrialization of species that evolved from previously aquatic taxa was a seminal event in evolutionary history. For vertebrates, one of the most important terrestrialized groups, this event was interrupted by a time interval known as Romer’s Gap, for which, until recently, few fossils were known. Here, we argue that geochronologic range data of terrestrial arthropods show a pattern similar to that of vertebrates. Thus, Romer’s Gap is real, occupied an interval from 360 million years before present (MYBP) to 345 MYBP, and occurred when environmental conditions were unfavorable for air-breathing, terrestrial animals. These model results suggest that atmospheric oxygen levels were the major driver of successful terrestrialization, and a low-oxygen interval accounts for Romer’s Gap. Results also show that terrestrialization among members of arthropod and vertebrate clades occurred in two distinct phases. The first phase was a 65-million-year (My) interval from 425 to 360 MYBP, representing an earlier, prolonged event of complete arthropod terrestrialization of smaller-sized forms (425–385 MYBP) and a subsequent, modest, and briefer event of incipient terrestrialization of larger-sized, aquatic vertebrates (385–360 MYBP). The second phase began at 345 MYBP, characterized by numerous new terrestrial species emerging in both major clades. The first and second terrestrialization phases bracket Romer’s Gap, which represents a depauperate spectrum of major arthropod and vertebrate taxa before a major Late Paleozoic colonization of terrestrial habitats." (Authors) Fig. 1 includes Odonata. Address: Berner, R.A., Department of Geology and Geophysics, Yale University, Akademijos 2, LT-08412 Vilnius, Lithuania. E-mail: robert.berner@yale.edu.

7677. Yermokhin M.V.; Yevdokimov N.A. (2006): Rare and disappearing species of freshwater invertebrates in the Red Book of Saratov region. Povolzhskii ekologicheskii shurnal 2006, Special issue C: 41-46. (in Russian) [The Red Data Book status of some rare and disappearing species in the Saratov region is listed. Seven species are mentioned, Calopteryx splendens, C. virgo, Anax imperator, Aeshna grandis, A. cyanea, A. juncea, Sympretrum pedemontanum. Whilst the conservation status of some species is mentioned as having changed compared to the 1996 Red Data Book, the empirical basis of this comparison is not given.] Address: Yermokhin M.V., Saratov State University N.G. Tschernyshevskii, 410012 Saratov, Astrachanskaja 83, Russia

2007

7678. Banaduc, D. (2007): Sibiu National History Museum hydrobiological collections. Brukenthal. Acta Musei 3: 185-186. (in English) [The Odonata collection - the oldest specimen dates back to 1849 - includes a total of 1608 specimens, collected in Europe, Africa, Asia, and North and South America. Material sampled in Europe and especially in Romania is prevalent. The most important material originates from Hans Plattner, Transylvanian Society for Natural Sciences of Sibiu, Worell and Hannenheim.] Address: Banaduc, D., Muzeul de Istorie Naturala Sibiu, Str. CetaNi, nr. 1, Sibiu, RO - 550160, Romania. E-mail: doru.banaduc@brukenthal-museum.ro

7679. Bernotiene, R.,Višinskienė, G. (2007): The diversity of benthic invertebrates in three rivers in Lithuania. Acta Biol. Univ. Daugavp. 7(2): 87-96. (in English) [6 odonate taxa were recorded. These are not specified with the exception of Ophiogomphus cecilia] Address: Bernotiene, R., Institute of Ecology of Vilnius University, Akademijos 2, LT-08412 Vilnius, Lithuania. E-mail: rasab@eoki.lt

7680. Bogacka-Kapusta, E.; Kapusta, A. (2007): The diet of Roach, Rutilus rutilus (L.), and Bleak, Alburnus alburnus (L.) larvae and fry in the shallow littoral zone of a heated lake. Archives of Polish Fisheries 15: 401-413. (in English, with Polish summary) [Odonata biomass contributed significantly to the diet of roach and bleak inhabiting Lake Gosławskie, Poland. The dietary composition of fish changes over time. Species richness (invertebrate taxa including Odonata) in the diets of roach and bleak larvae and fry was high. The variety of the dietary composition of early developmental stages of roach and bleak was strictly correlated to body length.] Address: Bogacka-Kapusta, Elzbieta, Dept of Ichthyology, The Stanislaw Sakowicz Inland Fisheries Institute in Olszyn, ul. Oczapowskiego 10, 10-719 Olszyn, Poland. E-mail: elaismin@infish.com.pl

7681. Bogacka-Kapusta, E.; Kapusta, A.; Duda, A.; Szczepkowski, M.; Kolman, R. (2007): Evaluation of the suitability of samples collected in vivo for investigations of juvenile sturgeon stomachs. Archives of Polish Fisheries 15: 165-170. (in English, with Polish summary) [32 stomachs of sturgeon (Acipenser different species, taxa, hybrids) were analysed for diet contents; Odonata were represented in 25% of the stomachs.] Address: Bogacka-Kapusta, Elzbieta, Dept of Ichthyology, The Stanisław Sakowicz Inland Fisheries Institute in Olszyn, ul. Oczapowskiego 10, 10-719 Olszyn, Poland. E-mail: elaismin@infish.com.pl

7682. Briliute, A.; Budrys, E. (2007): New record of damsify Lestes barbarus in the south of Lithuania (Odonata: Lestidae). New and Rare for Lithuania Insect Species. Records and Descriptions 19: 10-12. (in English, with Lithuanian summary) [Two specimens are described and figured. Abstracters note: The figured specimens belong to an anisopteran genus.] Address: Briliute, A.; Budrys, E. (2007): The diet of Roach, Rutilus rutilus (L.), and Bleak, Alburnus alburnus (L.) larvae and fry in the shallow littoral zone of a heated lake. Archives of Polish Fisheries 15: 401-413. (in English, with Polish summary) [Odonata biomass contributed significantly to the diet of roach and bleak inhabiting Lake Gosławskie, Poland. The dietary composition of fish changes over time. Species richness (invertebrate taxa including Odonata) in the diets of roach and bleak larvae and fry was high. The variety of the dietary composition of early developmental stages of roach and bleak was strictly correlated to body length.] Address: Bogacka-Kapusta, Elzbieta, Dept of Ichthyology, The Stanislaw Sakowicz Inland Fisheries Institute in Olszyn, ul. Oczapowskiego 10, 10-719 Olszyn, Poland. E-mail: elaismin@infish.com.pl
recognized as new species: Geneiorhynchus desportesi from the Big Sandy Creek Unit of the Big Thicket, Texas, and 3 previously reported taxa from the Big Sandy Creek Unit. Descriptions are provided for 2 previously named species, Geneiorhynchus monieri from naiads of Libellula depressa collected from Bayreuth, Germany, and Roscoff, France, and Geneiorhynchus shteini n. sp. from naiads of A. cyanea collected from Montpellier, France, Geneiorhynchus baudoini n. sp. from naiads of A. grandis collected from Vincennes and Besse-et-Saint Anastaise, France, and Geneiorhynchus shteini n. sp. from naiads of A. cyanea and Aeshna sp. collected from Lakes Pert and Svyat, Karelian Republic, Russian Federation and both Hersbruck and Bamberg, Germany.

7686. Danks, H.V. (2007): The elements of seasonal adaptations in insects. Canadian entomologist 139: 1-44. (in English, with French summary) "The many components of seasonal adaptations in insects are reviewed, especially from the viewpoint of aspects that must be studied in order to understand the structure and purposes of the adaptations. Component responses include dispersal, habitat selection, habitat modification, resistance to cold, dryness, and food limitation, trade-offs, diapause, modifications of developmental rate, sensitivity to environmental signals, life-cycle patterns including multiple alternatives in one species, and types of variation in phenotype and development. Spatial, temporal, and resource elements of the environment are also reviewed, as are environmental signals, supporting the conclusion that further understanding of all of these seasonal responses requires detailed simultaneous study of the natural environments that drive the patterns of response." [Author] Some references to Odonata are made. Address: Danks, H.V., Biological Survey of Canada (Terrestrial Arthropods), Canadian Museum of Nature, P.O. Box 3443, Station D, Ottawa, Ontario, Canada K1P 6P4. E-mail: hdanks@mus-nature.ca


7688. Dechruksa, W.; Krailas, D.; Ukont, S.; Inkapatnakul, W.; Koonchornboon, T. (2007): Trematode infections of the freshwater snail family Thiaridae in the Khek river, Thailand. Southeast Asian J. trop. med. public health 38(6): 1016-1028. (in English) "The freshwater snail family Thiaridae was studied at five different locations: water sources for the Khek River, Thailand. Snail samples were collected by hand using counts per unit of time sampling method between December 2004 and October 2005. The physico-chemical quality of the water changed with the seasons and affected the sampling areas during both the dry season and the flood season. A total of 9,568 snail samples comprised of 14 species were found. These were 284 Tarebia granifera, 24 Melanoidea tuberculata, 86 Thiara scabra, 3,295 Paracrostoma pseudosulcospira pseudosulcospira, 736 P. paludiformis paludiformis, 3,266 P. paludiformis ubiosa, 117 P. morrisoni, 304 Brotia (Brotia) bidorsa bidorsa, 1,250 B. (Brotia) microsculpta, 146 B. (Senckenbergia) wykoffi, 1 B. (Brotia) pagodula, 5 B. (Brotia) bidorsa spiralis, 5 B. (Brotia) insolita and 49 B. (Brotia) manningi. The cercariae were investigated.
using shedding and crushing methods where they were categorized into two types and five species. The first type, Parapleururophoceraceae cercariae, were comprised of Hoplorchis pumilio Looss, 1899 and Centrocestus formosanus Nishigori, 1924. The second type, Xiphidiocercariae were comprised of Acantharthium nitidum (Ritsema, 1913, 1920), and Haematoloechus similis Looss, 1899. The cercarial infection rates in the above 5 species were 0.1% (5 : 9,568), 0.2% (15 : 9,568), 0.3% (24 : 9,568), 0.4% (37 : 9,568) and 0.1% (5 : 9,568), respectively. 5 species of snails were susceptible to trematode infections. They were: T. granifera, M. tuberculata, T. scabra, P. paludiformis paludiformis and B. (Senckenbergia) wykoffi; infections were found in 26.1% (174:284), 33.3 % (8:24), 1.2% (1:86), 0.3% (2:736) and 0.7% (1:146), respectively. * (Author) A passing reference to Odonata is made.

Address: Kralias, Duangduen, Dept of Biology, Faculty of Science, Silpakorn University, Nakhon Pathom 73000, Thailand. E-mail: kduang@su.ac.th


7690. Evenhuis, N.L. (2007): Field Notes of E.H. Bryan, Jr. on the Whitney South Seas Expedition (February – November 1924). Compiled by Neal L. Evenhuis. Bishop Museum Technical Report 37: 334 pp. (in English) [This report documents the journals written by Bishop Museum curator Edwin Horace Bryan, Jr. (1908–1985) as he participated on one of the Whitney South Seas Expedition trips to the South Pacific. These notes span most of the year 1924 (February through November). He traveled from Honolulu to Samoa including the northern Cooks and Fiji. Many brief but general notes on dragonflies are made, and in a few cases the folk names of Odonata are noted (Savaii Island: Odonata - semu. Dragonflies - mataga.) Address: Evenhuis, N.L., Pacific Biological Survey, Bishop Museum, 1525 Bernice Street, Honolulu, Hawaii 96817, USA. E-mail: neale@bishopmuseum.org

7691. Ferletic, U. (2007): Small red damselfly Ceriagrion tenellum (Insecta: Odonata) in Slovenia. Graduation Thesis (University studies), Biotechnical faculty, Department of biology, University of Ljubljana: XI, 88 pp. (in Slovenian, with English summary) [C. tenellum is rare and endangered in Slovenia. "It is found only in Is-tra and the Vipava valley. From May to October 2004 I checked 17 localities for presence of the species, number of individuals and habitat characteristics. On four localities present plant species were determined and on two localities population size was estimated. C. tenellum was found on 10 localities, only 4 of which support numerous and stable populations, while on others few specimens were occasionally observed. Two populations sizes were estimated with 209±109 and 51±20 specimens respectively in July and 179±78 and 43±17 specimens in August. Four plant species were found on all four localities. To preserve C. tenellum in Slovenia the four localities with the strongest populations should be kept in the present state, whereas for the other locations long term monitoring would be needed." (Author)] Address: Ferletic, Urška, University of Ljubljana, Biotechnical faculty, Večen pot 111, Department of biology, SI-1000 Ljubljana, Slovenia


7693. Griffis-Kyle, K.L.; Ritchie, M.E. (2007): Amphibian survival, growth and development in response to mineral nitrogen exposure and predator cues in the field: an experimental approach. Oecologia 152: 633-642. (in English) [*Mineral nitrogen (N) has been suggested as a potential factor causing declines in amphibian populations, especially in agricultural landscapes; however, there is a question as to whether it remains in the water column long enough to be toxic. We explored the hypothesis that mineral N can cause both lethal and sublethal toxic effects in amphibian embryos and larvae in a manipulative field experiment. We sampled 12 ponds, fertilizing half with ammonium nitrate fertilizer early in the spring, and measured hatching, survival, development, growth, and the incidence of deformities in native populations of wood frog (Rana sylvatica) and eastern tiger salamander (Ambystoma tigrinum tigrinum) embryos and larvae held in in situ enclosures. We found that higher ammonium concentrations negatively affect R. sylvatica more strongly than A. tigrinum. R. sylvatica tended to have lower survival as embryos and young tadpoles, slowed embryonic development, and an increased proportion of hatchlings with deformities at experimentally elevated ammonium. A. tigrinum did not experience significantly reduced survival, but their larval development was slowed in response to elevated ammonium and the abundance of large invertebrate predators. Variable species susceptibility, such as that shown by R. sylvatica and A. tigrinum, could have large indirect effects on aquatic community structure through modification of competitive or predator-prey relationships. Ammonium and nitrate + nitrite concentrations were not correlated with other measures that might have affected amphibians, such as pH, pond area, depth, or vegetation. Our results highlight the potential importance of elevated ammonium on the growth, development and survival of amphibians, especially those that breed in surface waters receiving anthropogenic N inputs.* (Authors) Odonata are treated on the order level.] Address: Griffis-Kyle, K.L., Department of Fishery and Wildlife Sciences, New Mexico State University, MSC 4901, P.O. Box 30003, Las Cruces New Mexico 88003, USA. E-mail: kerrygk@nmsu.edu

Hämerle, E., St. Antoniusstraße 18, A-6890 Lustenau; Austria

7695. Hicham, K.; Lofti, A. (2007): The dynamics of macroinvertebrate assemblages in response to environmental change in four basins of the Etueffont landfill Leachate (Belfort, France). Water Air Soil Pollution 185: 63-77. (in English) ["We investigated the relationships between the composition and structure of macroinvertebrate communities and some environmental variables over a year in four basins of the Etueffont landfill leachate (Belfort, France) using co-inertia analysis. Culicidae larvae were the dominant macroinvertebrate group in the studied basins, contributing to 87% of the total zoobenthos density, followed by Corixidae (8.8%), Chironomids (2.5%) and other larvae (each <1%). The lowest density of chironomid larvae was recorded in the first basin which is used as a discharge system for the leachate produced by the landfill. In basin 4, however, the Baetidae, Orthocladiinae (Orthocladius spp., Chae- tocadius spp. and Isocladii spp.) and Tanytropodinae (Psictrotanyus spp.) developed favoured by low levels in ammonia, COD, BOD, EC, metals and high oxygen concentrations. The co-inertia analysis illustrated both temporal and spatial variabilities in the basins and revealed a strong relationship between environmental conditions and benthic macroinvertebrates assemblages. This ordination technique showed that the chironomid community structure might be used successfully to differentiate between sites with different levels and types of pollution." (Authors) Gomphidae and Zygoptera are rarely represented.] Address: Lofti, A., Laboratoire de Biologie Environnementale, INRA 3184, Université de Franche-Comté, 1, Place Leclerc, 25030 Besançon Cedex, France. E-mail: lofti.aleya@univ-fcomte.fr


7697. Huang, H.; Sun, M. (2007): Dragonfly forew- and hindwing interaction at various flight speeds and wing phasing. AI A A Jour. 45(2): 508-511. (in English) ["Dragonflies are accomplished fliers. Scientists have always been fascinated by their flight. Experimental and computational studies on a single airfoil in dragonfly hovering mode were conducted by Fremuth [1] and Wang [2], respectively. They showed that large vertical force was produced during each downstroke. In each downstroke, a vortex pair was created; the large vertical force was explained by the downward two-dimensional jet induced by the vortex pair [2]. Recently, due to the advances in computational and experimental techniques and facilities, researchers are beginning to study dragonfly aerodynamics and forewing-hindwing interactions using three-dimensional model wings [3-5]. Sun and Lan [3] studied the aerodynamics and the forewing-hindwing interaction of a dragonfly in hover flight, using the method of computational fluid dynamics (CFD). Maybury and, Lehrmann [4] and Yamamoto and Isogai [5] conducted experimental studies on the forewing-hindwing interaction at hovering conditions. Wang and Sun [6] extended the computational study of Sun and Lan [3] to the case of forward flight. In most of these studies, only hovering flight was considered. Only Wang and Sun [6] investigated the effects of forward flight speed, but the investigation was limited to a few phase differences (gamma(d) = 0, 60, 90, and 180 deg; gamma(d) denotes the difference in phase angle between the forewing and the hindwing stroke cycles, positive when the hindwing leads the forewing and negative when the forewing leads the hindwing). Because the distance of a wing from the wake of another wing depends on the flight speed and the relative motion of the fore- and hindwings, it is expected that the forewing-hindwing interaction is strongly influenced by the flight speed and the relative phase difference. Therefore, it is desirable to study the forewing-hindwing interaction by systematically varying the flight speed and the phase angle. Moreover, in the: above studies [3-6], attention was mainly paid on whether or not the aerodynamic forces were changed by the forewing-hindwing interaction, while how the interaction occurred was not well understood. It is of interest to make further investigation on the flow field of the wing wake to reveal how the forewing-hindwing interaction occurs. In the present study, we address the above questions by numerical simulation of the flows of model dragonfly wings. The phasing and the flight speed are systematically varied. Advance ratio (the nondimensional flight speed) ranges form 0 to 0.6. At each advance ratio, eight phase differences, -180, -135, -90, -45, 0, 45, 90, and 135 deg, are considered." (Authors) Address: Huang, H., Beijing Univ. of Aeronautics & Astronautics, 100083 Beijing, China

7698. Kalnins, M. (2007): Brown Orthetrum Orthetrum brunneum (Fonscolombe, 1837) - a new dragonfly species in Latvia. Acta Biol. Univ. Daugavp. 7(2): 109-111. (in English) ["We investigated the relationships between the composition and structure of macroinvertebrate assemblages. This ordination technique showed that the chironomid community structure might be used successfully to differentiate between sites with different levels and types of pollution." (Authors) Gomphidae and Zygoptera are rarely represented.] Address: Lotfi, A., Laboratoire de Biologie Environnementale, INRA 3184, Université de Franche-Comté, 1, Place Leclerc, 25030 Besançon Cedex, France. E-mail: lotfi.aleya@univ-fcomte.fr

7699. Kurjalaainen, S. (2007): Sudenkorientojen (Odonata) uudet maakuntahavainnot 2002–2007 [New provincial records of Finnish dragonflies (Odonata) in 2002–2007]. Sahibergia 13: 13-25. (in Finish, with English summary) ["This paper presents 48 new provincial records of Finnish dragonflies made in 2002–2007. In this period two species new to the Finnish fauna have been found, viz. Aeshna mixta and Sympectma paedisca. By 2007, both of them are already distributed in a large area adjacent to the southern coast. Also Coenagrion puella, Sympetrum sanguineum, and Leucorrhinia pectoralis have become more common and are currently distributed in a wider area than before. The large number of new provincial records result from greatly increased interest in dragonflies in Finland and widened distribution pattern of some species. An updated version of a distribution table of Finnish dragonflies by biogeographical provinces is presented." (Author) Address: Kurjalaainen, S., Neidonpuistonie 6 D 8, FI-02400 Kirkkonummi, Finland. E-mail: sk@korento.net

7700. Kawase, N.; Natuhara, Y. (2007): Suitable habitats and the habitat network of a threatened aeshnid dragonfly, Aeschnophlebia longistigma Selys (Odonata: Aeshnidae) in suburban areas of Sakai City, Osaka Prefecture, Japan. Jpn. J. Environ. Entomol. Zool. 18 (3): 123-131. (in Japanese, with English summary) ["Suitable habitats (ponds or marshes that are well covered by tall aquatic plants) of the threatened A. longistigma were identified by observing aerial photographs of suburban area of Sakai City. Field surveys..."
were then carried out to find adult dragonflies in those identified habitats. Although 19 suitable habitats were found in the area investigated, adult dragonflies were found only in 10 of the 19 habitats. Additionally, only 3 of 10 habitats were regarded as suitable breeding habitats or sources by determining the existence of larval exuviae or teneral adults. In the 3 habitats, a tall-growing aquatic plant Phragmites australis was seen to dominate. As a result of analyzing the distances of the 10 habitats, adults dragonflies found in the 7-sink habitats were traveling 2,260 ± 841 m from the nearest 3-source habitats. * (Authors) Address: Kawase, N., Osaka Prefecture University, Graduate School of Life and Environmental Sciences, 1-1 Gakuen-cho, Sakai, Osaka 599-8531, Japan

7701. Kratzer, E.B.; Batzer, D.P. (2007): Spatial and temporal variation in aquatic macroinvertebrates of the Okefenokee Swamp, Georgia, USA. Wetlands 27(1): 127-140. (in English) [*Aquatic macroinvertebrates of the Okefenokee Swamp have been largely overlooked despite their ecological importance and value as water quality indicators. In a two-year study we analyzed taxon richness and abundances of individual macroinvertebrate taxa in the Okefenokee Swamp to assess temporal variation among seasons and spatial variation among five plant community habitats (marsh prairies, cypress forest, scrub-shrub thickets, deepwater lakes, and boat trails) and across six areas of the Okefenokee. Chironomids and ceratopogonid midges and water mites numerically dominated the macroinvertebrate community, and chironomids, dytiscid beetles, and libellulid dragonflies had the greatest generic richness. Multivariate analysis of macroinvertebrate community structure did not show clear patterns among seasons, habitats, or areas. Furthermore, few individual taxa had either spatial or temporal variation in abundance. Wetland macroinvertebrate communities were relatively homogeneous across the Okefenokee Swamp possibly because conditions important to these organisms did not vary dramatically among habitats or seasons. Alternatively, most resident taxa might be ecological generalists able to exploit a broad range of conditions." (Authors) Address: Kratzer, Erika, Dept of Entomology University of Georgia, Athens, Georgia, USA 30602. E-mail: ekratzer@vt.edu

7702. Mahan, R.D.; Johnson, J.R. (2007): Diet of the Gray Treefrog (Hyla versicolor) in relation to foraging site location. Journal of Herpetology 41(1): 16-23. (in English) [Missouri, USA; using a stomach-flushing technique, stomach contents of H. versicolor also resulted in one prey item identified as a mandible of a "Coenagrionidea". *Despite growing concern over habitat destruction, little is known regarding the activities of pond-breeding amphibians in the terrestrial environment. Yet, because most pond-breeding amphibian species spend the majority of their time in terrestrial habitats, it is important to understand what role terrestrial habitat plays in their life history. We examined the stomach contents of the Gray Treefrog (Hyla versicolor) in central Missouri using a stomach-flushing technique. Treefrogs were stomach-flushed; stomach contents were dried and weighed; and prey items were counted and identified for frogs caught in both artificial arboreal refugia and at breeding ponds. The majority of prey consisted of ants (41.2%) and beetles (29.6%). Both males and females caught in artificial refugia contained greater stomach content mass than those caught at breeding ponds. There was a positive correlation between mass of stomach contents and distance from breeding ponds, with the average number of beetles per stomach increasing with distance from ponds. There was also greater stomach content mass in frogs found in artificial refugia on white oaks than red oaks or sugar maples, but there was no relationship between tree diameter and stomach content mass. These results demonstrate the importance of protecting terrestrial habitat to maintain foraging sites for treefrogs."

7703. Miller, J. (2007): Mantis religiosa frisst Anax parthenope. mercuriale 7: 43. (in German) [Photo of M. religiosa preying on A. parthenope, 19-09-2004, Salin de Giraud, Camargue, France.] Address: Miller, J., Le harstraße 6c, 86179 Augsburg, Germany

7704. Ramsey, J.B.; White, D.S.; Jin, H.-S. (2007): Spatial distribution of benthic macroinvertebrates in a sidearm embayment of Kentucky Lake. Journal of the Kentucky Academy of Science 68(1): 50-58. (in English) [*The macrobenthos of Ledbetter Embayment, Kentucky Lake, were sampled monthly (January 2005 through July 2006) to determine community structure with focus on the physical and chemical factors influencing spatial distribution and density. We collected 38 species, including 27 insects, four molluscs, two crustaceans, and three annelids. Species composition was similar to that observed in other midwestern reservoirs except that some taxa, typically rare in other systems, were very abundant. Mean density was 1158 m^-2 and density increased with water depth. Macrobeenthic distribution was patchy. Profundal collector-gatherers were associated with depositional zones created by flow patterns within the embayment driven by the main stem current. Most littoral species showed associations with allochthonous input or substrate heterogeneity provided by incoming streams. The physical structure of Kentucky Lake embayments and commensurate patterns of organic matter deposition, depth, and substrate composition appear to be the primary factors structuring the macrobenthos." (Authors) Four odonate taxa are listed on the genus level.] Address: Ramsey, J., Hancock Biological Station and Center for Reservoir Research, 561 Emma Drive, Murray, Kentucky 42071

7705. Richards, L.A.; Windsor, D.M. (2007): Seasonal variation of arthropod abundance in gaps and the understory of a lowland moist forest in Panama. Journal of Tropical Ecology 23: 169-176. (in English) [*Treefallow gaps contribute to the habitat heterogeneity of tropical forest floors. Previous studies have shown that these gaps play an important role in plant and bird communities, however less is known about their role in arthropod communities. Using eight Malaise traps we investigated the difference in arthropod abundance of 19 taxonomic groups between gaps and understory for 21wk during the rainy season and 8wk in the dry season on Barro Colorado Island, Panama. More (33.8%) arthropods were collected in gaps during the rainy season and 32.2% more in the understory during the dry season. To assess the possible factors contributing to these differences we measured light, plant densities and young leaf densities, as indicators of abiotic factors and food resources for insect herbivores. Arthropod abundance was negatively correlated with light in the dry season."

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Thus, abiotic stress may explain the pattern of abundance in the dry season. While there was no correlation with light in the rainy season, predator abundance was positively correlated with herbivore abundance. The plant and young leaf density data suggest that there is significantly higher food availability for herbivores in gaps. Thus, less stressful abiotic conditions and more food resources may contribute to more herbivores followed by more predators in gaps during the rainy season.

"(Authors) Odonata capture rate in gaps was higher than in understory both in rainy and dry season.) Address: Richards, Lora, Dept of Biology, Univ. of Utah, 257 S. 1400 E., Salt Lake City UT 84112, USA. E-mail: rrichards@bio.ut.edu

7706. Rodrigues Fernandes, F.; Dominici Cruz, L.; Ferreira Rodrigues, A.A. (2007): Diet of the Gray-Breasted Martin (Hirundinidae: Progne chalybea) in a wintering area in Maranhão, Brazil. Revista Brasileira de Ornitologia 15(3): 445-447. (in English, with Portuguese summary) [P. chalybea is a Neotropical migrant that reproduces in southern Brazil and migrates to northern South America during the non-breeding period in April to September, where it occupies urban areas. This study presents some preliminary data on diet of the population of P. chalybea that winters in Presidente Dutra. A total of 27 stomachs were analyzed, 17 from May, and 10 from August. The analyses of stomach contents resulted in the identification of 4,599 individual preys, belonging to nine insect Orders. Hymenoptera was the most abundant, being found in all stomachs, and contributing to 69.9% of all prey items. Odonata contribute with 0.1% of prey items found in 2 of the 27 stomachs.) Address: Ferreira Rodrigues, A.A., Universidade Federal do Maranhão, Departamento de Biologia, Av. dos Portugueses, s/n, Campus Universitario do Bacanga, CEP 65080.040, Sao Luis, MA, Brasil. E-mail: augusto@ufma.br


7708. Schlothofer, A.M.; Labak, M.; Beasley, V.R.; (2007): Ribeirão ondatrae cercariae are consumed by aquatic invertebrate predators. J. Parasitol. 93(5): 1240-1243. (in English) ["Trematodes amplify asexually in their snail intermediate hosts, resulting in the potential release of hundreds to thousands of free-living cercariae per day for the life of the snail. The high number of cercariae released into the environment undoubtedly increases the probability of transmission. Although many individual cercariae successfully infect another host in their life cycle, most fail. Factors that prevent successful transmission of cercariae are poorly understood. Microcrustaceans and fish have been observed to eat cercariae of some species, although the possibility that predation represents a significant source of mortality for cercariae has been largely unexplored. We tested the cercariophagic activity of several freshwater invertebrates on Ribeirão ondatrae, a trematode that causes limb deformities in amphibians. Individuals of potential predators were placed into wells of multwell plates with 10–15 cercariae, and numbers of cercariae remaining over time were recorded and compared with numbers in control wells that contained no predators. Of the species tested, Hydra sp., damselfly (Odonata, Coenagrionidae) larvae, dragonfly (Odonata, Libellulidae), larvae, and copepods (Cyclopoidea) consumed cercariae. In some cases, 80–90% of the cercariae offered to damselfly and dragonfly larvae were consumed within in 10 min. In most cases, predators continued to consume cercariae at the same average rates when offered cercariae together with individuals of an alternate prey item. Hydra sp. ate fewer cercariae in these trials. Our findings suggest the need for field and laboratory studies to further explore the effects of predators on transmission of R. ondatrae to amphibian larvae. In addition, the results suggest that conservation of the biodiversity and numbers of aquatic predators may limit adverse impacts of trematode infections in vertebrate hosts." (Authors)] Address: Schlothofer, Anna, The Metropolitan State College of Denver, Department of Biology, Campus Box 53, P.O. Box 173362, Denver, Colorado 80217. E-mail: schlotho@gmail.com

7709. Takegawa, Y.; Fukuda, H.; Totsuka, K.; Kimoto, H.; Taketo, A. (2007): Phylogenetic relationship among several Japanese Odonate species inferred from mitochondrial DNA sequences. Memoirs Fukushima Institute of Technology 37: 235-242. (in English) ["Using mitochondrial DNA sequences, phylogenetic relationships were studied on several odonate species occurring in Honshu, Japan. A calopterygid damselfly, Mnais pruinosa was roughly classified into two groups: subspecies nawai and others which were subdivided into subspecies pruinosa and costalis. On the other hand, the nucleotide sequences of COI region in Somatochloria viridianae were identical between subsp. viridianae and atrovirens. The sequence of Symetrup frequens differed from that of S. depressiusculus in a single nucleotide, but this change was synonymous, and thought to be within individual variation or polymorphism." (Authors)] Address: Kimoto, H., Department of Bioscience, Fukui Prefectural University

7710. Tol, J. van (2007): The Odonata of Sulawesi and adjacent islands, part 6. Revision of the genus Drapanosticha Laidlaw (Zygoptera: Platystictidae). Odonatologica 36(2): 171-189. (in English) ["The genus Drapanosticha Laidlaw is revised for Sulawesi and adjacent islands. D. ephippia Liefvink is redescribed, and D. bicolor sp. n. (Buton Island), D. hamulifera sp. n. (Kabaena Island), D. penicillata sp. n. (central Sulawesi) and D. watusiwensis sp. n. (SE Sulawesi) are described as new to science. A key to the males is provided. Based on the structure of posterior margin of the pronotum, D. ephippia presumably represents a monophyletic clade with the D. lymetia and D. megametta species-groups, including species from the mainland of New Guinea. This group is distributed from Mindanao (Philippines) eastward to the northern Moluccas, northern New Guinea and the Solomon Islands. The newly described species are morphologically quite diverse; they are presumably most closely related to species occurring SE of Sulawesi." (Author)] Address: Tol, J. van, National Museum of Natural History, P.O. Box 9517, NL-2300 RA Leiden, The Netherlands

Japanese Society for Experimental Mechanics 7(3): 240-246. (in Japanese, with English summary) "This paper describes the application of liquid particles to the measurement of the airflow around the forewing of the dragonfly, Sympetrum frequens. The particles with the diameter of approximately 10 μm were obtained by heating a mixture of glycols and distilled water. They were scattered as tracer particles in a wind tunnel. A PIV system was used to analyze the airflow around the dragonfly forewing with Re = 1.1 × 10^3. On the other hand, a three-dimensional dragonfly forewing model was constructed for a numerical simulation. This simulation was used to obtain the velocity distributions around the model as well as the aerodynamic characteristics such as lift and drag coefficients. The experimental velocity results were in a good agreement with those of the simulation. Therefore, it was confirmed that the use of liquid particles comprising glycols was suitable for the analysis of low Reynolds number flows by the PIV system." (Authors) Address: Sudo, S., Faculty of Systems Science and Technology, Akita Prefectural University, Ebino-kuchi 84-4, Yurihonjo 015-0055, Japan

7712. Ueuma, Y.; Sagawa, T. (2007): A preliminary report of Odonata and such liek [sic] faunas of Hangando moor in Mt. Hakusan. Annual Report of The of Hakusan Nature Conservation Center 34: 31-33. (in Japanese, with English translation of the title) [Highland bogs are not known until now from the Hakusan Mountains. However, it is said that such a bog was located upper reach of the Myodani river at Hakuho, Hakusan city, Ishikawa prefecture (Matsumura et. al. 1980), and the precise location was not clear. This time we conducted a preliminary investigation of the bog on July 19, 2007. The bog was located at a height of ca. 1400 m a. s. l., and as the area was called Hangando for a long time, we named the bog Hangando moor. The vegetation of the area is Japanese beech, Japanese oak trees, cedars and bamboo grass and low bushes. The moor was divided by a small stream on the east and the west, in the former with three bog pools and the latter, one bog, wider and deeper than the east bogs, and small pools. The moor was covered with bog moss, and surrounded by grassy field of dew grass and lilies. We could not find such a proof of a high moor there as Matsumura et. al. indicated. Table 1 shows our findings from the two areas. At the west area rather a lot of Leucorrhinia dubia, the first specimen from Ishikawa prefecture; formerly only photos of the species were recorded, were sighted (Photo 3). Others are Cordulia aenea amurensis, the first specimen from the Hakusan Mountains in Ishikawa prefecture, Coenagrion laceolatum, seemingly exuvia of Aeshna juncea and Sympetrum frequens. In the water salamanders and water beetles were found and 5 species of birds were seen. At the east, L. dubia (>10) and Ceriagrion melanurum were sighted. It is noticeable that such a lot of L. dubia were found from the Hakusan Mountains, and also the location of L. dubia and C. a. amurensis there seems to be the western limit in Japan. (Naoya Ishizawa)] Address: Ueuma, Yasuo, Hakusan Nature Conservation Center, Japan

7713. Wiesenborn, W.D.; Heydon, S.L. (2007): Diets of breeding Southwestern willow flycatchers in different habitats. The Wilson Journal of Ornithology 119(4): 547-557. (in English) "We identified arthropods in fecal samples from 56 Southwestern Willow Flycatchers (Empidonax traillii extimus) at three localities in Nevada and Arizona, USA with different plant communities during the 2004 breeding season. We concurrently collected arthropods in flight with Malaise traps and on different plant species by sweep net. These potential prey were identified to Order and counted. Fecal samples contained 57 taxa of spiders and insects including 32 families in 8 Orders. Flycatchers consumed similar diversities (numbers of taxa), but different taxonomic compositions (abundances in Orders) of arthropods among localities." (Authors) Odonata were more abundant in fecal samples at Topock Marsh than at Pahranagat Lake or Virgin River. They comprised 20% of arthropods in fecal samples at Topock Marsh and included Anisoptera and Zygoptera.) Address: Wiesenborn, W.D., U.S. Bureau of Reclamation, Lower Colorado Regional Office, P. O. Box 61470, Boulder City, NV 89006, USA. E-mail: wwiesenborn@lc.usbr.gov

7714. Zessin, W.; Ludwig, R. (2007): Intraspecific aggression under Libellen (Odonata) auf Zerstörung der Flügel gerichtet. Virgo, Mitteilungsblatt des Entomologischen Vereins Mecklenburg 10(1): 67-68. (in German) [Two specimens of Aeshna mixta accidentally fixed by a spider clues tried to free in vain from their trap. With increasing failure they directed their aggression against the opposite specimen biting into the wings.] Address: Zessin, W., Lange Str. 9, D-19230 Jasnitz, Germany. E-mail: zessin@zoo-schwerin.de

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7715. Aistleitner, E.; Barkemeyer, W.; Lehmann, G.; Martens, A. (2008): A checklist of the Odonata of the Cape Verde Islands. Mitt. internat. entomol. Ver. Frankfurt a.M. 33(1/2): 45-57. (in English) "To date, 14 species of Odonata have been recorded from the archipelago. The checklist is based on previously published records, unpublished details from the historical collection of Leonardo FEA and collections made on 8 trips from 1998 to 2007. The dragonfly fauna comprises species typical for arid conditions, being widespread in Africa and known from several other African islands." (Authors) Address: Martens, A. Pädagogische Hochschule Karlsruhe, Postfach 111062, D-76060 Karlsruhe, Germany. E-mail:andreas.martens@ph-karlsruhe.de

7716. Almeida Andrade, H.T. de; Santiago, A.S.; Fernandes Medeiros, J. (2008): Estrutura da comunidade de invertebrados bentônicos com enfoque nos insetos aquáticos do Rio Piranhas-Assu, Rio Grande do Norte, no nordeste do Brasil. EntomoBrasilis 1(3): 51-56. (in Portuguese, with English summary) "The aim of this work was to verify the bentthic invertebrates, and to identify the functional trophic groups that exist in the Piranhas-Assu, in Alto do Rodrigues municipality, Rio Grande do Norte State. The samples were carried taken on May (rain season), July and September (dry season) from 2002, in different sites in the river. The measurements of water speed, wide, temperature and river deep where made. It was collected 3525 individu..."

7718. Balzan, M.V. (2008): The distribution of Orthetrum trinacria Selys, 1841 and Trithemis anulata Palisot de Beauvois, 1807 in the Maltese Islands (Odonata: Libellulidae). Bulletin of the Entomological Society of Malta 1: 91-96. (in English) "[Two recently recorded dragonfly species, Orthetrum trinacria and Trithemis anulata, were observed over several bodies of water in Gozo. The distribution of these species is documented. Moreover, it is suggested that the introduction of these species could have been favoured by changes in the climate, in the light of similar observations made throughout Southern Europe." (Author) Address: Balzan, M.V., International Environment Institute, Univ. of Malta, 3rd Floor, Chemistry Building, Room 311, Msida, Malta. E-mail: balzamv@gmail.com


7720. Böke, R (2008): Die Libellen (Odonata) im Landkreis Holzminden (Niedersachsen). Braunschweiger Naturkundliche Schriften 8(1): 151-171. (in German, with English summary) [Germany: "In the district of Holzminden, situated in the south of Lower Saxony, 49 of the 81 dragonfly species occurring in Germany have been found. 38 species are indigenous in at least one of the 161 investigated locations. 27 species are listed with threat category 1 to 3 in the Red Data List of Germany (20), Lower Saxony (22), or Northrhine-Westphalia - "Weserbergland" region (17). Specific valuable biotopes are located in the Soiling mountains with their upland moors, in the Weser valley, and in the mountainous regions with natural brooks and their headwaters. While the trend of the population of many species is negative, supported by the climatic changes the southern species Erythromma lindenii and Erythromma vindulum are expanding also in the district of Holzminden." (Author) Address: Böke, R., Viktoria-Luise-Weg 12, 37603 Holzminden, Germany

7721. Boros, E.; Forro, L.; Gere, G.; Kiss, O.; Vörös, L.; Amdrikovics, S. (2008): The role of aquatic birds in the regulation of trophic relationships of continental soda pans in Hungary. Acta Zoologica Academiae Scientiarum Hungariae 54 (Suppl. 1): 189-206. (in English) "[The aim of this study was to estimate the population sizes, food resources, food selection and trophic regulation of aquatic birds in these soda pans. We classified the estimated density of birds into 3 simple nutrient cycling guilds: net-importer, exporter-importer and the net-exporter. The most important aquatic bird guild was the net-importer guild (51–70%), and the second was the exporter-importer guild (41–27%), while the relative densities of the net-exporter guild was the lowest (8–3%) in the investigated 2 pans. The captive foraging experiment demonstrated that the filter-feeder wildfowl (Anas species) could successfully remove the microcrustacean plankton and invertebrate nektom from the water. The biomass of planktonic crustaceans was significantly more by an order of magnitude than the biomass of the other invertebrates (benthos [including Odonata], nektom). The relatively simple trophic relationships demonstrated by bottom-up function of some keystone herbivore aquatic bird species, while the top down control is determined by several wildfowl and wader species. The external nutrient load of the aquatic birds causes hypertrophic level of inorganic nutrient resources for the algae, while the planktonic primary production varied only between oligotrophy and mesotrophy because of the extreme physical conditions of these waters. The observed net heterotrophy and several trophic relationships seem to be regulated by aquatic birds." (Authors) Address: Boros, E., Naturgol Ltd., H-1196 Budapest, Kosuth L. u. 76, Hungary. E-mail: drborose@gmail.com

7722. Bots, J.; de Bruyn, L.; van Damme, R.; van Gossum, H. (2008): Effects of phenotypic variation onto body temperature and flight activity in a polyphenic insect. Physiological Entomology 33: 138-144. (in English) "[According to biophysical principles, colour and size are important phenotypic factors that may influence body temperature and activity in ectothermic insects. In taxa showing female-limited polymorphism, males and female morphs differ in body colour, size and activity pattern. However, no previous study has evaluated whether such phenotypic and behavioural variation relates to differences between males and female morphs in thermal properties. In the present study, the relationships between body colour, size, activity and body temperature are examined under laboratory and field conditions, for the polymorphic damselfly Enallagma cyathigerum. Contrary to expectation, males and female colour morphs of this species do not differ in thermal properties (i.e. heating characteristics or field body temperatures). When questioning phenotype and activity, temperature does not appear to be relevant for understanding the maintenance of female-limited poly-morphism." (Authors) Address: Bots, Jessica, Evolutionary Ecology Group, Department of Biology, University of Antwerp, Groenenborgerlaan 171, B-2020, Antwerp, Belgium. E-mail: jessica.bots@ua.ac.be

7723. Brown, J.W.; Bahr, S.M. (2008): The insect (Insecta) fauna of Plummerrs Island, Maryland: Brief collecting history and status of the inventory. Bulletin of the Biological Society of Washington 15: 54-64. (in English) "[Plummerr Island, a small site situated along the northern shore of the Potomac River in Montgomery County, Maryland, has been the research home of the Washington Biologists’ Field Club for more than 100 years. Field
work conducted by club members from 1901 to about 1925 resulted in the accumulation of thousands of insect specimens of all orders from the Island, most of which are deposited in the collections of the National Museum of Natural History, Smithsonian Institution. Little collecting was conducted from ca. 1930–1950. In the 1960s sampling by Karl Krombein focused on beetles and wasps and that by Terry Erwin on carabid beetles. Since 1998 the Lepidoptera fauna, leaf beetles (Chrysomelidae), and darkling beetles (Tenebrionidae) all have been the subject of investigations. In 2005 and 2006 Malaise traps were deployed to sample other orders (e.g., Trichoptera, Diptera, Hymenoptera). While the four major insect orders (i.e., Coleoptera, Diptera, Lepidoptera, and Hymenoptera) are represented by large numbers of historical specimens, only Lepidoptera have been surveyed thoroughly in recent times; notable exceptions include specific families: carabid beetles, leaf beetles, darkling beetles, sawflies, and bees and wasps. Based on an examination of the insect collection of the National Museum of Natural History and a review of relevant literature, we document 3012 insect species in 253 families, encompassing 18 insect orders: Collembola, Odonata, Dermaptera, Blattodea, Phasmatoidea, Orthoptera, Psocoptera, Thysanoptera, Hemiptera, Neuroptera, Megaloptera, Coleoptera, Mecoptera, Trichoptera, Lepidoptera, Diptera, Siphonaptera, and Hymenoptera. Address: Brown, J.W., Systematic Entomology Laboratory, P.S.I., Agricultural Research Service, U.S. Department of Agriculture, National Museum of Natural History, Smithsonian Institution, P.O. Box 37012, Washington, D.C. 20013-7012, USA. E-mail: john.brown@ars.usda.gov.

7724. Calloûet, K.A.; Carlson, J.C.; Wesson, D.; Jordan, F. (2008): Colonization of abandoned swimming pools by larval mosquitoes and their predators following Hurricane Katrina. J. Vector Ecol. 33(1): 166-172. (in English) ["Thousands of flooded swimming pools were abandoned in New Orleans following Hurricane Katrina and provided a natural experiment to examine colonization of a novel aquatic habitat by mosquito larvae and their aquatic predators. We conducted a randomized survey of flooded swimming pools in two neighborhoods in January 2006 and found that 64% contained mosquito larvae, 92% contained predatory invertebrates, and 47% contained fishes. We collected 12,379 immature mosquitoes representing five species, primarily Culiseta inornata, and secondarily, the arboviral vector Culex quinquefasciatus. Dragonfly nymphs in the families Aeshnidae and Libellulidae were the most common predatory invertebrates collected among a total of 32 non-mosquito invertebrate species. Eleven species of fishes were collected, with Gambusia affinis accounting for 76% of the catch. Diversity of fishes in swimming pools was positively correlated with proximity to a levee breach and the fish assemblage found in swimming pools was similar to that found along shorelines of Lake Pontchartrain and drainage canals that flooded the study area. Mosquito larvae were rare or absent from pools containing fishes; however, path analysis indicated that the presence of top predators or abundant competitors may somewhat mitigate the effect of Gambusia affinis on mosquito presence." (Authors)] Address: Calloûet, K.A., Dept of Tropical Medicine, Tulane Univ., New Orleans, LA 70112, USA.

7725. Chen, J.-S.; Chen, J.Y.; Chou, Y.F. (2008): On the natural frequencies and mode shapes of dragonfly wings. Journal of Sound and Vibration 313: 643-654. (in English) ["A base-excitation modal testing technique is adopted to measure the natural frequencies and mode shapes of dragonfly wings severed from thorax. The severed wings are glued onto the base of a shaker, which is capable of inducing translational motion in the lateral direction of the wing plane. Photonic probes are used to measure the displacement history of the shaker base and the painted spots of the wing simultaneously. A spectrum analyzer is employed to calculate the frequency response functions, from which the natural frequencies and the associated mode shapes of the wing structure can be extracted. Our experimental results show that the fundamental natural frequency of dragonfly wings is in the order of 170 Hz when it is clamped at the wing base. The average flapping frequency 27 Hz of dragonflies is about 16% of the fundamental natural frequency. At this frequency ratio, the inertial force of the wing is negligible compared to the elastic force. In other words, the wing deformation during flapping flight is solely due to the balance between the dynamic force and the elastic force of the wing structure. The wing structures are generally lightly damped, with damping ratio in the order less than 5%." (Authors) Study species are Orthetrum pruinatum and O.sabina.] Address: Chen, J.-S., Department of Mechanical Engineering, National Taiwan University, Taipei 10617, Taiwan. E-mail: jschen@ntu.edu.tw

7726. Craig, C.N.; (2008): Nestedness in Playa odonates as a function of area and surrounding land use. Wetlands 28(4): 995-1003. (in English) ["As degradation of wetlands continues to occur as a result of human activities, it is important to identify aquatic and amphibious species’ extinction risks and the relative hospitalities of sites to support intact biotic communities; one such technique involves comparing the nestedness of assemblages as an assay of predictability and stability. We measured the degree of nestedness of odonate communities in the playa wetland complex of the Texas panhandle (data from 23 species in 73 playas in the summers of 2003–05) under current conditions as well as four simulations of future socioeconomic and climate change. Compared to randomized (null model) assemblages, significant nestedness was found for the system as a whole as well as for each year separately and for playas within each of the two dominant regional forms of land cover (cropland and grassland). Cropland and grassland playas were further split into three size categories, based on natural size breaks. Although departures from nestedness (idosyncrasy) were unrelated to playa size or surrounding land use, larger playas surrounded by cropland displayed lower nestedness than did smaller ones whereas grassland playas showed the opposite pattern. This relationship between playa area and surrounding land-use type showed that there is lower stability in odonate community composition in even large playas if those playas are surrounded by agriculture. Departures from nestedness mainly consisted of unexpected species presences rather than absences, with idiosyncratic species being larger in total body length and including two range extensions. Under simulations of playa losses, community patterns were similar to contemporary data, suggesting that the ephemeral and dynamic nature of playas may already expose the odonate community to selective pressures possible under future land conversion." (Authors)] Address: Craig, Crystal, Dept Biol. Scien., Texas Tech Univ. Lubbock, Texas, USA 79409. E-mail: nancy.mcentyre@ttu.edu
manipulation of aquatic vegetation in wetlands is still needed to leave some areas unmanipulated to provide cover. Because of high spatial and temporal variability in wetlands and aquatic invertebrate communities, the response of aquatic invertebrates to vegetation management techniques was not consistent and no management regime offered a particular advantage in enhancing aquatic invertebrate communities. However, managers should be aware that some type of physical manipulation of aquatic vegetation in wetlands is still warranted on a regular basis to reduce nuisance vegetation, enhance seed production, and create optimal habitat conditions for migratory waterfowl and other wetland-dependent birds. [...] Each of the Odonata taxa differed among treatments. Enallagma biomass was highest in grazed wetlands, while Lestes biomass was highest in farmed wetlands. Libellula biomass was higher in grazed and reference wetlands than in mowed and farmed wetlands.” (Authors) Address: Davis, C.A., Natural Resource Ecology and Management Department, 008C Agricultural Hall, Oklahoma State University, Stillwater, Oklahoma, USA 74078. E-mail: craig.a.davis@okstate.edu

Davis, C.A.; Bidwell, J.R. (2008): Response of aquatic invertebrates to vegetation management and agriculture. Wetlands 28(3): 793-805. (in English) “Wetland managers rely on a variety of vegetation management techniques to set back plant succession, enhance seed production, create semi-marsh conditions, and reduce the coverage of invasive plants in wetlands. We evaluated the effects of vegetation management techniques (prescribed burning, cattle grazing, mowing, and disking) on aquatic invertebrate communities in seasonal wetlands in the Rainwater Basin Region of Nebraska, USA. Because many of these wetlands are embedded in an agricultural landscape, we also evaluated the effects of agriculture on aquatic invertebrates. We conducted the study in 24 wetlands during spring 2004 and 2005. In general, aquatic invertebrate richness and diversity were similar among wetlands subjected to different management regimes. However, richness and diversity were highest in grazed wetlands and lowest in disked wetlands. Regardless of the management regime, total benthic and nektonic invertebrate biomasses were higher in managed wetlands than unmanaged wetlands. In 2004, naidid oligochaete biomass was highest in farmed wetlands. Cattle grazing, mowing, and prescribed burning seemed to have the greatest influence on individual taxa; 12, eight, and seven of the taxa (out of 32) had higher biomasses in grazed, mowed, and burned wetlands, respectively. Within mowed wetlands, the biomasses of some taxa (Gyraulus, Lymnaea, and Physa) were lower in managed areas than unmanaged areas, emphasizing the need to leave some areas unmanipulated to provide cover. Because of high spatial and temporal variability in wetlands and aquatic invertebrate communities, the response of aquatic invertebrates to vegetation management techniques was not consistent and no management regime offered a particular advantage in enhancing aquatic invertebrate communities. However, managers should be aware that some type of physical manipulation of aquatic vegetation in wetlands is still warranted on a regular basis to reduce nuisance vegetation, enhance seed production, and create optimal habitat conditions for migratory waterfowl and other wetland-dependent birds. [...] Each of the Odonata taxa differed among treatments. Enallagma biomass was highest in grazed wetlands, while Lestes biomass was highest in farmed wetlands. Libellula biomass was higher in grazed and reference wetlands than in mowed and farmed wetlands.” (Authors) Address: Davis, C.A., Natural Resource Ecology and Management Department, 008C Agricultural Hall, Oklahoma State University, Stillwater, Oklahoma, USA 74078. E-mail: craig.a.davis@okstate.edu

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7731. De Marco Júnior, P. (2008): Libellulidae (Insecta: Odonata) from Itapiracó Reserve, Maranhão, Brazil: New Records and Species Distribution Information. Acta Amazonica 38(4): 819-822. (in English) "In this work, I apply a simple protocol to species occurrence inventory of Odonata in a region of Maranhão state, Brazil which has very few distributional records. Some relations between species occurrence and environmental characteristics are discussed, mainly in relation to the high occurrence of Erythemis. Eighteen new records are presented discussing the role of this approach to generate useful information for conservation purposes." (Authors) Address: De Marco, P., Laboratório Ecologia Teórica e Síntese, Depto de Biologia Geral, Universidade Federal de Goiás, BR-74001-970, Goiânia, GO, Brazil. E-mail: pdemarco@icb.ufg.br

7732. Degabriele, G. (2008): An annotated catalogue of the Odonata collection of Guido Lanfranco at the National Museum of Natural History in Malta. Bulletin of the Entomological Society of Malta 1: 85-89. (in English) "An annotated list (n = 10 properly labelled species, and one exuvium) of the Odonata collection of Guido Lanfranco, is provided. The specimens were captured between 1952 and 1971, and may be the oldest surviving specimens caught and still available in local collections from Malta. Almost all locally occurring species are represented, with some specimens collected in sites and habitats that have since been destroyed by urban development. A portion of the specimens bear no data labels and do not contribute to the knowledge of the distribution of the species. During the cataloguing process, specimens in poor condition were restored." (Authors) Address: Degabrielle, G., Centifolia, Triq it-Tank, Siggiewi, SGW 3412, Malta. E-mail: gergo@euroweb.net.mt

7733. Duan, X.-d.; Wang, Z.-y. (2008): Experimental study on the effect of habitat isolation on river ecology. In: Advances in Water Resources and Hydraulic Engineering – Proceedings of 16th IAHR-PAD Congress and 3rd Symposium of IAH-R-ISHS (Vol.VI: Hydropower Hydraulics). Eds.: Changkung Zhang & Hongwu Tang. ISBN: 978-7-302-18662-5: 86-91. (in English) "The field investigations and an experiment were conducted in the Juma river in the suburbs of Beijing (China) to study the effect of habitat fragmentation on river ecology, using benthic macro-invertebrates as indicator species. Three experimental plots were isolated from a relatively undisturbed stream habitat with sheet iron. The benthic assemblages and water parameters were measured by sampling periodically. The results indicate that the abundance, taxa richness and bio-diversity of invertebrates significantly decrease in the experimental plots owing to the habitat isolation. The smaller the experimental habitat plot, the more significantly these biotic indices decrease. The contents of the dissolved oxygen in the studied plots present the inconsistent variations. The comparison of the benthic communities shows that the relative abundances of Ephemeroptera and Diptera reduces significantly in the isolated plots, and that of the Odonata and Lamellibranchia increase significantly. It is also found that the benthic communities need some time to stabilize after isolation, and then present apparent variation over time. There is a relatively high degree of taxa turnover between isolated plots and the non-isolated reach, which can be attributed to the flight and dispersal of many aquatic insects in their adult stage. However, the benthic communities in isolated plots are not nested subsets in the natural non-isolated stream. This paper also gives some suggestions of the river restoration and the preservation of river ecological integrity based on the study and the present status of the rivers in China." (Authors) Address: not stated

7734. Fidelis, L.; Nessman, J.L.; Hamada, N. (2008): Spatial distribution of aquatic insects communities in small streams in Central Amazonia. Acta amazonica 38(1): 127-134. (in Portuguese, with English summary) "Small streams, at the Biological Dynamics of Fragmented Forest Project – INPA ca. 80 Km north from the city of Manaus (Amazonas, Brasil) , were studied concerning the composition of the aquatic insects communities in different substrates. In each one of the 20 stretches, four samples of the principal biotopes were collected: leaf litter in riffle areas, leaf litter deposited on the bottom of the stream, sand and roots/vegetation on marginal banks. The aim of this study were to evaluate the aquatic insect fauna and relate it with specific substrates inside the igarapé. Leaf litter in riffle presented high richness number (106) while sand showed the lowest value (55). Higher similarity values occurred between leaf litter deposited on the bottom and marginal roots/vegetation. Lower values occurred between leaf litter in riffle and sand substrates. Some collected taxa were considered indicators of one type of substrate, but there were some taxa that showed no preference. The indicator taxa occurred in riffle litter were found in deposited leaf litter in Southeast streams of Brazil. This indicates the current velocity may be responsible for the community established. The size of the stream is related to the order and flow regime. In this study bigger streams (presenting higher values of flow and order) showed more distinct communities in each substrate than the smaller ones." (Authors) The samples include "Progomphus". Address: Fidelis, Luana, INPA / DCEN, Caixa Postal 478, CEP. 69070-970, Manaus – AM. E-mail: luafidelis@uol.com.br

7735. Fliedner, H.; Martens, A. (2008): The meaning of the scientific names of Seychelles dragonflies (Odonata). Phelsuma 16: 49-57. (in English) "The meaning of the scientific names of all Odonata species known from the Seychelles is explained in detail. The basis of many scientific names is ancient Greek or Latin describing characters of the insects or names of important researchers. Understanding the meaning of these names should offer an additional approach for being familiar with these insect species. Additionally, it is a good approach to understand research history of tropical insects - in which the Seychelles play an important role just from the beginning." (Authors) Address: Fliedner, H., Louis-Seegelken Str., D-28717 Bremen, Germany. E-mail: H.Fliedner@t-online.de

7736. Gliwka, B.; Seškauskait, D. (2008): Rare species of Lepidoptera and Odonata recorded from the environments of Lake Praviršulis (Central Lithuania) in 2007–2008. New and rare for Lithuania insect species 20: 64-68. (in English, with Lithuanian summary) [Ichnura pumilio, Leucorrhinia pectoralis, Ophiogomphus cecilia] Address: Gliwka, B., University of Latvia, Chair of Baltic Linguistics, Visvalžu 4a, LV-1050 Riga, Latvia. E-mail: bernrgliwka@yahoo.de

skiego Kola Entomologicznego 7: 8-9. (in Polish, with English summary) [In the surroundings of Czestochowa, Poland, 23 odonate species - including Aeshna subarctica and Leucorrhoa dubia - were recorded between 2005 and 2007.] Address: Gniatkowski, J., ul Oskara Lange 7/97, PL-42-207 Czestochowa, Poland.

7738. Gros, P. (2008): Erste Nachweise von Sonomochlora arctica (Zetterstedt1840) und Lestes barbarus (Fabricius 1798) aus dem Ibmmer Moos (Inniertal, Oberösterreich) sowie aktuelle Libellenfunde aus diesem Europaschutzgebiet (Insecta: Odonata). Beiträge zur Naturkunde Oberösterreichs 18: 115-121. (in German, with English summary) ["S arctica and L. barbarus are reported from the Upper Austrian bog of Ibm for the first time. In Upper Austria, these two dragonfly species are currently only known from very few sites. Details of these discoveries are given, typical features of the concerned species are described. Beyond that, all dragonfly species recently found in this area by the author are listed." [Author] Address: Gros, P., Haus der Natur, Museumsplatz 5, A-5020 Salzburg, Austria. E-Mail: patrick.gros@hausdernatur.at]

7739. Günther, A. (2008): Erste Nachweise der Kleinen Zangenlibelle (Onychogomphus f. forcipatus) an der Freiberger Mulde. Mitteilungen des Naturschutzinstitutes Freiberg 4: 72-76. (in German) [In June 2008, O. forcipatus was recorded along the river Freiberger Mulde between Gleisberg and Roßwein (Landkreis Mittelsachsen, Sachsen, Germany). This record is the first after 60 years.] Address: Günther, A., Naturschutzinstitut Freiberg, Waisenhausstraße 10, D-09599 Freiberg, Germany. E-Mail: a.guenther@abo.freibepresse.de


7744. Jensen, K.; Das, I. (2008): Dietary observations on the Asian Softshell Turtle (Amyda cartilaginea) from Sarawak, Malaysian Borneo. Chelonian Conservation and Biology 7(1): 136-141. (in English) ["We examined the diet of A. cartilaginea from 2 localities in Sarawak: Loagan Bunut National Park and Balai Ringin. The most commonly found items in stomach contents, when using percentage frequency of occurrence, were plant material (77%) and unknown vertebrate parts (55%). Fecal analysis indicated similar results: plant material (100%), unknown vertebrate parts (84%), fish (69%), and unknown arthropods (62%). Results indicate that A. cartilaginea is an opportunistic omnivore." [Authors] The diet of one female A. cartilaginea included one "Odonata."] Address: Jensen, Karen, Institute of Biodiversity and Environmental Conservation, Universiti Malaysia Sarawak, 94300, Kota Samarahan, Sarawak, Malaysia. E-Mail: kiti.jensen@yahoo.com; idas@ibec.unimas.my

7745. Kamisawa, Y.; Isigai, I. (2008): Optimum flapping wing motions of dragonfly. Trans. Japan Soc. Aero. S Sc.: 51: 114-123. (in English) ["We studied the optimum flapping wing motions of a dragonfly (Anax parthenope julius) from hovering to cruising flight at various speeds, using a 3D Navier-Stokes code coupled with an optimization algorithm. The minimum necessary power curve and optimum flapping wing motions for the various flight velocities were determined using the optimization algorithm. The minimum power curve shows the typical U-shape. The optimum flapping wing motions were evaluated by comparison with experimental data. Examining the flow patterns showed that the large-scale flow separation around the wings is suppressed at these optimum conditions, except for very low flight speeds including hovering." [Authors] Address: Isigai, I., Micro Flying Robot Laboratory, Nippon Bunri University]

7746. Kazanci, N. (2008): Contribution to the knowledge of Odonata Fauna of Turkey: Central Anatolia. Review of Hydrobiology 2: 119-128. (in English, Turkish summary) ["This paper provides data on 41 Odonata species from Central Anatolia and Bolu province between 1977 and 1980. Adults were collected surrounding lakes, dams, wetlands and running waters. Some observations of larval habitats of species were also given. Pollution and habitat destruction are the main reasons of the elimination of the Odonata species in freshwater ecosystems." [Author] Address: Kazanci, Nilgün., Hacettepe University Science Faculty Biology Department Hydrobiology Section, Beyepe, Ankara, Turkey. E-Mail: nilgun.kazanci@gmail.com

7749. Kosco, J.; Manko, P.; Miklisova, D.; Kosuthova, L. (2008): Feeding ecology of invasive Percottus gleniin (Perciformes, Odontobutidae) in Slovakia. Czech J. Anim. Sci. 53(11): 479-486. (in English) [Stomach contents of 331 specimens of P. gleniin were dominated by chironomids, ephemeropterans and crustaceans. Odonata larvae were represented in two sampling periods (April, August), but accounted to less than 2% of food items.]

7750. Kovacs, T.; Godunko, R.J.; Juhasz, P.; Kiss, B.; Muller, Z. (2008): Quantitative records of larvae of Ephemeroptera, Odonata and Plecoptera from the Zakarpats'ka Region, Ukraine (2004, 2006). Folia historica naturalia musei matraensis 32: 135-147. (in English) ["We compared benthic community structure among stands of T. angustifolia (narrow-leaf cattail) and herbicide-treated (Glypro) and untreated P. australis (common reed) over two summers in a Lake Erie coastal wetland (i.e., drowned river mouth). Both macrophytes are invasives, but only Phragmites is currently controlled by herbicides because of its reputed "undesirable" effects on wetland community structure and function. Macrinovertebrate diversity was similar among stand types and relatively high (Shannon-Weaver indices 2.6-4.2), probably because of high system primary productivity and a mix of lentic and riverine species. Proportions of macroinvertebrate functional feeding groups were also similar, but Jaccard's similarity indices were relatively low (29%-57%), suggesting macroinvertebrate compositional differences among stand types. Coleopterans particularly affected species presence/absence patterns, but their presence was associated with low water level rather than hydrophyte type per se. Moreover, total macroinvertebrate densities were greater in both Phragmites treatments than in Typha; a pattern generated mostly by gastropods (>95% Gyaulus reflectus and Physella gyrina) and chironomids. Microalgal food supply likely plays a part in explaining these density differences, given diatom-dominated epiphyton was denser on submerged shoots of Phragmites than on Typha. Common diatom assemblages were similar among stand types, but species richness was significantly greater on untreated-Phragmites than on herbicide-treated, early senescent Phragmites and untreated-Typha. However, advanced senescence from herbicide application (~3 months) did not apparently affect macroscale habitat suitability and structure above and below the waterline, given counts of ovipositing odonates (mostly Ischnura and Enallagma) and captures of juvenile fishes (>90% Lepomis spp.) were similar among stand types. Overall, our results suggest that benthic community structure is comparable between similarly-aged stands (~4 yrs old) of invading reed and cattail and is not directly or indirectly affected by Glypro application." (Authors) Of the 813 Odonata individuals observed, a total of 86 were observed to oviposit; 93% of these were zygopterans, and 7% were anisopterans. The main genera of zygopterans observed were Ischnura and Enallagma, whereas the main genus of anisopterans observed was Anax. Counts of ovipositing odonates did not significantly differ among stand types or among sample dates.] Address: Holomuzki, J., Dept of Evolution, Ecology, and Organismal Biology, The Ohio State University, 1680 University Drive, Mansfield, Ohio, USA 44906. E-mail: holomuzki.3@osu.edu

7751. Kulesza, A.E.; Holomuzki, J.R.; Klaren, D.M. (2008): Benthic community structure in stands of Typha angustifolia and herbicide-treated and untreated Phragmites australis. Wetlands 28(1): 40-56. (in English) ["The phylogenetic relationship of the suborder Anisoptera distributed on Jeju Island, Korea, was analyzed by comparing partial mitochondrial 16S ribosomal RNA (rRNA) gene sequences. The length of the partial mitochondrial 16S rRNA genes for the 27 species of the Anisoptera studied ranged from 405 to 421 base pairs (bp). No intra-genus length-variations were identified in the genera Anax and Orthetrum, while the genes of Somatochlora and Sympretum displayed lengths of 411 to 412 and 406 to 411 bp, respectively. The GC content of the partial mitochondrial 16S RNA gene ranged from 26.76% to 30.83%. A parsimony analysis of the unambiguously aligned mitochondrial 16S RNA gene sequences from 28 species, including outgroup species, produced eight equally most parsimonious trees. The strict consensus tree had three large independent groups: group I (family Aeshnidae), group II (family Libellulidae), and group III (family Corduliidae). Interestingly, the eight species of the genus Sympretum were clearly distinguishable from the other species. The strict consensus tree, based on the mitochondrial 16S rRNA gene sequences, contained monophyletic groups. These results concurred with previous studies published by several researchers that were based on morphological characteristics." (Authors) Anax parthenope; Anax nigrofasciatus; Anax guttatus; Gymacantha japonica; Polycanthagyna melanica; Aeschnophlebia anisoptera; Somatochlora graeseri; Somatochlora clavata; Epophthalmia elegans; Macromia amphigena; Lyriothemis pachygastra; Orthetrum affaticerum; Ortheething melania; Crocothemis servilia; Deiella phaon; Sympratum sriolatum; Sympratum darwinianum; Sympratum desertorum; Sympratum uniforme; Sympratum kunckeli; Sympratum infuscatum; Sympratum risi; Sympratum speciosum; Pseudothemis zonata; Rhothyemis fuligiosa; Pantala flavessens; Tramea virginia] Address: Kosco, J.; Manko, P.; Miklisova, D.; Kosuthova, L. (2008): Feeding ecology of invasive Percottus gleniin (Perciformes, Odontobutidae) in Slovakia. Czech J. Anim. Sci. 53(11): 479-486. (in English) [Stomach contents of 331 specimens of P. gleniin were dominated by chironomids, ephemeropterans and crustaceans. Odonata larvae were represented in two sampling periods (April, August), but accounted to less than 2% of food items.]

7752. Machida, K.; Oikawa, T.; Shimunuki, J. (2008): Structure analyses of the wings of Anotogaster sieboldii and Hybris subjacens. Journal of the Japanese Society of Experimental Mechanics 8(2): 142-146. (in Japanese, with English summary) ["The phylogenetic relationship of the suborder Anisoptera distributed on Jeju Island, Korea, was analyzed by comparing partial mitochondrial 16S ribosomal RNA (rRNA) gene sequences. The length of the partial mitochondrial 16S rRNA genes for the 27 species of the Anisoptera studied ranged from 405 to 421 base pairs (bp). No intra-genus length-variations were identified in the genera Anax and Orthetrum, while the genes of Somatochlora and Sympretum displayed lengths of 411 to 412 and 406 to 411 bp, respectively. The GC content of the partial mitochondrial 16S RNA gene ranged from 26.76% to 30.83%. A parsimony analysis of the unambiguously aligned mitochondrial 16S RNA gene sequences from 28 species, including outgroup species, produced eight equally most parsimonious trees. The strict consensus tree had three large independent groups: group I (family Aeshnidae), group II (family Libellulidae), and group III (family Corduliidae). Interestingly, the eight species of the genus Sympretum were clearly distinguishable from the other species. The strict consensus tree, based on the mitochondrial 16S rRNA gene sequences, contained monophyletic groups. These results concurred with previous studies published by several researchers that were based on morphological characteristics." (Authors) Anax parthenope; Anax nigrofasciatus; Anax guttatus; Gymacantha japonica; Polycanthagyna melanica; Aeschnophlebia anisoptera; Somatochlora graeseri; Somatochlora clavata; Epophthalmia elegans; Macromia amphigena; Lyriothemis pachygastra; Orthetrum affaticerum; Ortheething melania; Crocothemis servilia; Deiella phaon; Sympratum sriolatum; Sympratum darwinianum; Sympratum desertorum; Sympratum uniforme; Sympratum kunckeli; Sympratum infuscatum; Sympratum risi; Sympratum speciosum; Pseudothemis zonata; Rhothyemis fuligiosa; Pantala flavessens; Tramea virginia]} Address: Kosco, J.; Manko, P.; Miklisova, D.; Kosuthova, L. (2008): Feeding ecology of invasive Percottus gleniin (Perciformes, Odontobutidae) in Slovakia. Czech J. Anim. Sci. 53(11): 479-486. (in English) [Stomach contents of 331 specimens of P. gleniin were dominated by chironomids, ephemeropterans and crustaceans. Odonata larvae were represented in two sampling periods (April, August), but accounted to less than 2% of food items.]

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case of an advanced flight such as "Flapping flight", "Glide", and "Hovering". The wings of a dragonfly are made by veins and membranes. In addition, the wings of a dragonfly have some characteristic structures, such as "Nodus". Thus, the wings of a dragonfly have many complicated structures. The costal vein configuration of the wings of a dragonfly is different from them of other insects. So, we paid attention to the costal vein configuration of the wings of a dragonfly. Therefore, in this study, we researched about the effect of the costal vein.

As a result, it was showed that the configuration of costal vein made the deformation of bending and torsion small. In addition, it was showed that the configuration of costal vein closely related to nodus. In this study, several 3-D models of the dragonfly's wing were created and analyzed by the 3-D finite element method (FEM)." (Authors) Address: not transliterated.

7753. Makarieva, A.M.; Gorskova, V.G.; Lib, B.I.; Chown, S.L.; Reich, P.B.; Gavrilov, V.M. (2008): Mean mass-specific metabolic rates are strikingly similar across life's major domains: Evidence for life's metabolic optimum. Proceedings of the National Academy of Sciences 105(44): 16994-16999. (in English) ["A fundamental but unanswered biological question asks how much energy, on average, Earth's different life forms spend per unit mass per unit time to remain alive. Here, using the largest database to date, for 3,006 species that includes most of the range of biological diversity on the planet—from bacteria to elephants, and algae to sapling trees—we show that metabolism displays a striking degree of homeostasis across all of life. We demonstrate that, despite the enormous biochemical, physiological, and ecological differences between the surveyed species that vary over 1020-fold in body mass, mean metabolic rates of major taxonomic groups displayed at physiological rest converge on a narrow range from 0.3 to 9 W kg1. This 30-fold variation among life's disparate forms represents a remarkably small range compared with the 4,000- to 65,000-fold difference between the mean metabolic rates of the smallest and largest organisms that would be observed if life as a whole conformed to universal quarterpower or third-power allometric scaling laws. The observed broad convergence on a narrow range of basal metabolic rates suggests that organismal designs that fit in this physiological window have been favoured by natural selection across all of life's major kingdoms, and that this range might therefore be considered as optimal for living matter as a whole." (Authors) Odonata included into this study are: Anax junius, Brachymesia gravida, Erythemis simplicollis, Erythrodplax berenice, and E. connata.] Address: Makarieva, Anastasia, Theoretical Physics Division, Petersburg Nuclear Physics Institute, Gatchina, St. Petersburg 188300, Russia

7754. Martens, A.; Schiess, H.; Kunz, B.; Wildermuth, H. (2008): Onychogomphus uncatus in Deutschland: die historischen Funde am Hochrhein (Odonata: Gomphidae). Libellula 27(1/2): 53-61. (in German, with English summary) ["According to diary notes by Friedrich Ris, the Canadian odonatologist Edmund M. Walker collected several specimens of O. uncatus on 16-viii-1928 on the German side of the High Rhine near Altenburg. This should be considered the first record in Germany. Based on Ris' diary further published accounts, of which precise records have been lacking, can now be clearly interpreted. A survey of all hitherto known records between 1883 and 1991 from Switzerland and Germany is given." (Authors)] Address: Martens, A., Pädagogische Hochschule Karlsruhe, Postfach 111062, D-76060 Karlsruhe, Germany. E-mail:andreas.martens@ph-karlsruhe.de

7755. Monnerat, C. (2008): Première observation de l'Aeschnide Aeschna isocela (O.F. Müller, 1776) (Odonata: Aeshnidae) en Ajoie (canton du Jura: Suisse). Entomo Helvetica 1: 135-137. (in French, with English and German summaries) [A single adult male A. isocela - quite obviously vagrant - was seen the 15 of June 2006 at Porrentruy.] Address: Monnerat, C., Centre suisse de cartographie de la faune (CSCF), Maximilien de Meuron 6, 2000 Neuchâtel, Switzerland. E-mail:christian.monnerat@unine.ch

7756. Montesinos, A.; Santoul, F.; Green A.J. (2008): The diet of the night heron and purple heron in the Guadalquivir Marshes. Ardea 55(2): 161-167. (in English, with Spanish summary) [Spain; in Purple heron (Ardea purpurea), Odonata nymphs were present in 13.5 % of samples. The Night heron (Nycticorax nycticorax) did not feed on Odonata.] Address: Green, A., Department of Wetland Ecology. Estación Biológica de Doñana-CSIC, Avda. Américo Vespucio s/n, 41092 Sevilla, Spain. E-mail:aggreen@ebd.csic.es

7757. Pelabon, C.; Hansen, T.F. (2008): On the adaptive accuracy of directional asymmetry in insect wing size. Evolution 62(11): 2855-2867. (in English) ["Subtle left–right biases are often observed in organisms with an overall bilateral symmetry. The evolutionary significance of these directional asymmetries remains uncertain, however, and scenarios of both developmental constraints and adaptation have been suggested. Reviewing the literature on asymmetry in insect wings (including a paper on Calopteryx maculata), we analyze patterns of directional asymmetry in wing size to evaluate the possible adaptive significance of this character. We found that directional asymmetry in wing size is widespread among insects, with left- and right-biased asymmetries commonly observed. The direction of the asymmetry does not appear to be evolutionarily conserved above the species level. Overall, we argue that the very small magnitude of directional asymmetry, 0.7% of the wing size on average, associated with an extremely imprecise expression, precludes directional asymmetry from playing any major adaptive role." (Authors)] Address: Pelabon, C., Dept of Biology, Centre for Conservation Biology, Norwegian University of Science and Technology, Trondheim, Norway. E-mail: christophe.pelabon@bio.ntnu.no

7758. Phillips, I.D.; Parker, D.; McMaster, G. (2008): Aquatic invertebrate fauna of a northern prairie stream: range extensions and water quality characteristics. Western North American Naturalist 68(2): 173-185. (in English) [28 Odonata taxa, in most cases on the species level, are listed from Pipestone Creek watershed in southeastern Saskatchewan, Canada.] Address: Phillips, I.D., Stewardship Division, Saskatchewan Watershed Authority, #330-350 3rd Av. North, Saskatoon, SK, Canada S7K 2H6. E-mail: iain.phillips@swa.ca

258 Odonata specimens collected during the expeditions carried out in Western Turkey between 2005-2006 by the “Grigore Antipa” National Museum of Natural History. In all, 27 Odonata species were identified, grouped in nine families. The paper also presents some group distributional data for these 27 species” Address: Pisica, Elena, Muzeul Național de Istorie Naturală “Grigore Antipa”, Sos. Kiseleff nr. 1, 011341 București 2, Romania. E-mail: elenap@anptipa.ro

7760. Popova, O.N.; Haritonov, A.Yu. (2008): Interannual changes in the fauna of dragonflies and damselflies (Insecta, Odonata) in the Southern Urals. Russian Journal of Ecology 39(6): 405-413. (in English) "[Data on the abundance and occurrence of 64 odonate species in the Southern Urals are considered. A comparative analysis of the odonate fauna in the early 20th century, in the 1960s and 1970s, and in the early 21st century is performed. On this basis, it is concluded that its structure has been markedly changing with time, with the magnitude of these changes being comparable to that of regional faunistic differences. The causes of these changes are discussed. The apparent enrichment of the odonate fauna is attributed primarily to the appearance of new anthropogenic habitats." (Authors) Original Russian Text © O.N. Popova, A.Yu. Haritonov, 2008, published in Ekologiya, 2008, No. 6, pp. 427–435] Address: Institute of Animal Systematics and Ecology, Siberian Branch, Russian Academy of Sciences, ul. Frunze 11, Novosibirsk, 630091, Russia. E-mail: pc@eco.nsc.ru

7761. Pryke, J.S.; Samways, M.J. (2008): Conservation of invertebrate biodiversity on a mountain in a global biodiversity hotspot, Cape Floral Region. Biodivers. Conserv. 17: 3027-3043. (in English) "[Data on the abundance and occurrence of 64 odonate species in the Southern Urals are considered. A comparative analysis of the odonate fauna in the early 20th century, in the 1960s and 1970s, and in the early 21st century is performed. On this basis, it is concluded that its structure has been markedly changing with time, with the magnitude of these changes being comparable to that of regional faunistic differences. The causes of these changes are discussed. The apparent enrichment of the odonate fauna is attributed primarily to the appearance of new anthropogenic habitats." (Authors) Original Russian Text © O.N. Popova, A.Yu. Haritonov, 2008, published in Ekologiya, 2008, No. 6, pp. 427–435] Address: Institute of Animal Systematics and Ecology, Siberian Branch, Russian Academy of Sciences, ul. Frunze 11, Novosibirsk, 630091, Russia. E-mail: pc@eco.nsc.ru

7762. Qiao, H.-l.; Luo, Y.-q.; Tian, C.-m.; Sun, J.-h.; Feng, X.-f. (2008): Diversity of insect communities with different development phases in natural Populus euphratica forests in Xinjiang. Forestry Studies in China 10(1): 56-59. (in English) "[An investigation method with sample plots was used to study insect communities in four different growth phases of P. euphratica forests, which are juvenile, middle aged, over-mature and degraded forests, in Tarim, Xinjiang in July, 2005 and April, 2006. In our studies, 5,116 insect specimens, belonging to 12 orders, 61 families and 141 species, were collected. Lepidoptera and Coleoptera were the dominant orders. In middle-aged forests, species, individual numbers and diversity indices of insect communities were higher than those in other woodlands. The species richness and diversity indices were lowest in degraded forests because of extremely scarce vegetation." (Authors) Three libellulid species with 11 specimens are listed without taxonomic details.] Address: Qiao, H.-l., Key Laboratory for Silviculture and Conservation of Ministry of Education, Beijing Forestry Univ., Beijing 100083, P. R. China. E-mail: youqingluo@126.com

7763. Rivera-Ureña, J.J.; Camacho-Pinzón, D.L.; Botero-Botero, A. (2008): Estructura numérica de la entomofauna acuática en ocho quebradas del departamen- to del Quindío-Colombia. Acta biol. Colomb.13(2): 133-146. (in Spanish, with English summary) [A study of the aquatic insect fauna of 8 streams in the department of Quindío, Colombia in La Tebaida and Calarcá was carried out. During August to December of 2004, 1917 individuals were collected including 216 odonate specimens. These are listed at the genus level.] Address: Botero-Botero, A., Fundación Neotrópica-Colombia, Ar- menia - Quindío, Carrera 7 No. 12-55 La Tebaida Quin- dó, Colombia. E-mail: albotero33@yahoo.com

7764. Rocha, V.; Aguilar, L.M.; Silva-Pereira, J.E.; Moro-Rios, R.F.; Passos, F.C. (2008): Feeding habits of the crab-eating fox, Cerdocyon thous (Carnivora: Canidae), in a mosaic area with native and exotic vegetation in Southern Brazil. Revista Brasileira de Zoologia 25(4): 594-600. (in English, with Portuguese summary) "[C. thous (Linnaeus, 1766) is the most widespread neotropical canid, most commonly inhabiting forested areas. This animal is a generalist omnivore that is able to use environments disturbed by human activities. The aim of this study was to describe its diet through the stomach content analysis of 30 samples obtained from specimens that were run over in a mosaic composed by Araucaria Pine Forest, Semideciduous Seasonal Forest, natural grasslands, and exotic vegetation. The items were quantified by frequency of occurrence (F.O.) and percentage of occurrence (P.O.). A total of 64 food items were found among 171 occurrences. According to F.O. method, plant items corresponded to 93.3% of the occurrences, followed by animal items (86.7%) and human rejects (16.6%).[...]" (Authors) In one occasion wings of a Coenagrionidae were found as stomach content.] Address: Rocha, V., Biocologia e Manejo Integrado de pragas e doenças florestais, Pesquisa Florestal, Klabin S.A. Avenida Aracária, 84279-000 Lagoa, Paraná, Brasil. E-mail vlamir@klabinxom.br

metric morphometric analysis showed wing shape differences between entire populations; traditional morphometry did not reveal such differences based on linear measurements of wing characters between most of populations. In general, geometric morphometric of Eurasian populations showed that two almost separate European and Asian groups of C. splendens are recognizable except some relations of C. s. waterstoni (from Turkey) to Eastern European populations, and C. s. xanthostoma (from Spain) to Asian populations. These conclusions were partly confirmed by AFLP results, but were not consistent with results of traditional morphometry which is mainly affected by linear size and area of wing and wing spot. Hence, use of wing spot patterns must be studied critically before those are used up as systematic characters at any taxonomic level. The AFLP results of our samples showed low levels of gene flow between populations except one case in the central Asia between Russian and Kazakhstani populations which is partly due to lack of effective obstacles and presence of Irtysh river. Many populations showed double or more geographical origin, a circumstance that can reflect rapid diversification and introgression. The reasons of this situation and likely elations between three main subspecies, C. s. waterstoni, C. s. intermedius and C. s. xanthostoma have been discussed. The deepest split in the phylogeography of C. splendens populations was found within the unglaciated areas in the east border of Turkey and Azerbaijan. We discuss the isolation of C. s. waterstoni. We interprete the unexpected relation between Azerbijani and French populations as an intrusion of intermedia-genes in both. The conclusion drawn from comparison of the data in all three analyses is that the results of shape analysis between populations was more akin to molecular data and more reliable than linear measurements of wing characters, although some populations showed the same result in both methods. These observations suggest that wing spot similarity necessarily cannot capture the full genetic grouping of populations and therefore, is not an infallible character in Calopteryx splendens subspecies." [Author]


7767. Slos, S.; Stoks, R. (2008): Predation risk induces stress proteins and reduces antioxidant defense. Funct. Ecol. 22(4): 637-642. (in English) [1. Despite its wide ecological relevance, we know little about the physiological mechanisms underlying the growth vs. mortality by predation trade-off. Here, we test for two costly, potential physiological correlates of the flight-or-flight response that may contribute to the growth reduction under predation risk: induction of stress proteins (Hsp60 and Hsp70) and of antioxidant enzymes (superoxide dismutase, SOD and catalase, CAT), in larvae of the damselfly Enallagma cyathigerum. 2. Under predation risk, there was a growth reduction and an increase in oxygen consumption, indicative of the flight-or-flight response. Predation risk did not affect Hsp60 levels but induced an increase in energetically costly Hsp70...
levels. 3. Under predation risk, levels of SOD remained constant and those of CAT decreased. Together with the increase in respiration, this should inevitably result in oxidative stress. 4. Our results suggest that induction of stress proteins may contribute to the partly physiologically mediated growth reduction under predation risk and that oxidative stress is a novel cost of predation risk that may have important long-term negative fitness consequences for the prey. The latter adds to the recent insight that costs of stressors and life-history trade-offs may not always directly operate through increased energy consumption and differential allocation, but, may also work through the increased production of reactive oxygen species. Authors] Address: Slos, Stefanie, Laboratory Aquatic Ecology and Evolutionary Biology, Univ. of Leuven, Ch, Deberiestraat 32, B-3000 Leuven, Belgium. E-mail: stefanie.slos@bio.kuleuven.be

7768. Srivastava, D.S.; Trzcinski, M.K.; Richardson, B.A.; Gilbert, B. (2008): Why are predators more sensitive to habitat size than their prey? Insights from bromeliad insect food webs. American Naturalist 172(6): 761-771. (in English) "Ecologists have hypothesized that the exponent of species-area power functions (z value) should increase with trophic level. The main explanation for this pattern has been that specialist predators require prior colonization of a patch by their prey, resulting in a compounding of the effects of area on trophic levels. We propose two novel explanations, neither of which assumes trophic coupling between species. First, sampling effects can result in different z values if the abundances of species differ (in mean or evenness) between trophic levels. Second, when body size increases between trophic levels, effects of body size on z values may appear as differences between trophic levels. We test these alternative explanations using invertebrate food webs in 280 bromeliads from three countries. The z value of predators was higher than that of prey. Much of the difference in z values could be explained by sampling effects but not by body size effects. When damselflies occurred in the species pool, predator z values were even higher than predicted, as damselflies avoid small, drought-prone bromeliads. In one habitat, dwarf forests, detrital biomass became decoupled from bromeliad size, which also caused large trophic differences in z values. We argue that there are often simpler explanations than trophic coupling to explain differences in z values between trophic levels." Authors] Address: Srivastava, Diane, Dept of Zoology, University of British Columbia, 6270 University Boulevard, Vancouver, British Columbia V6T 1Z4, Canada. E-mail: srivast@zoology.ubc.ca

7769. Stamper, C.E.; Downie, J.R.; Stevens, D.J.; Monaghan, P. (2008): The effects of perceived predation risk on pre- and post-metamorphic phenotypes in the common frog. Journal of Zoology 277(3): 205-213. (in English) "When organisms undergo radical changes in habitat during ontogeny, dramatic phenotypic reshaping may be required. However, physiological and functional interrelationships may constrain the extent to which an individual's phenotype can be equally well adapted to their habitat throughout the life cycle. The phenotypic response of tadpoles to the presence of a predator has been reported for several species of anuran but the potential post-metamorphic consequences have rarely been considered. We reared common frog Rana temporaria tadpoles in the presence or absence of a larval odonate predator, Aeshna juncea, and examined the consequences of the resulting phenotypic adjustment in the aquatic larval stage of the life cycle for the terrestrial juvenile phenotype. In early development tadpoles developed deeper tail fins and muscles in response to the predator and, in experimental trials, swam further than those reared in the absence of a predator. While the difference in swimming ability remained significant throughout the larval period, by the onset of metamorphosis we could no longer detect any differences in the morphological parameters measured. The corresponding post-metamorphic phenotypes also did not initially differ in terms of morphology. At 12 weeks post-metamorphosis, however, frogs that developed from predator-exposed tadpoles swam more slowly and less far than those that developed from tadpoles reared in the absence of predators, the opposite trend to that observed in the larval stage of the life cycle, and had narrower femurs. These results suggest that there may be long-term costs for subsequent life-history stages of tailoring the larval phenotype to prevailing environmental conditions. Authors] Address: Stamper, Clare, Dept of Environmental and Evolutionary Biology, Institute of Biomedical and Life Sciences, Univ. of Glasgow, Glasgow, UK. Email: c.e.stamper@exeter.ac.uk

7770. Sudo, S.; Tsuyuki, K.; Honda, T. (2008): Swimming mechanics of dragonfly nymph and the application to robotics. Journal International Journal of Applied Electromagnetics and Mechanics 27(3): 163-175. (in English) "This paper concerns with the development of swimming micro mechanism based on the study of swimming functions and mechanisms of the minute organisms. At the beginning, this paper describes the swimming analysis of a dragonfly nymph using the high speed video camera system. It was found that dragonfly nymphs can swim skillfully by reciprocating motions consisting of a power stroke and a recovery stroke. Based on the swimming analysis of the dragonfly nymph, the micro swimming robot with the wireless energy supply system was produced. Driving elements of the micro swimming robot are composed of NdFeB permanent magnet, polystyrene body, and a polyethyleneeterephthalate film fin. Frequency characteristics of the micro swimming robot propelled by the alternating magnetic field and small permanent magnet were examined experimentally." Authors] Address: Sudo, S., Faculty of Systems Science & Technology, Akita Prefectural Univ., Ebinokuchi 84-4, Yurinonjo 015-0055, Japan

7771. Švitra, G.;Gliwa, B. (2008): New records of Nehalennia speciosa (Charpentier, 1840) (Odonata, Coenagrionidae) in Lithuania in 2006–2008. New and rare for Lithuania insect species 20: 10-13. (in English, with Lithuanian summary) Between 2006 and 2008, seven new populations of N. speciosa were detected totalling all known localities in Lithuania of this rare species to thirteen. The new additions are briefly documented. Address: Švitra G., Lithuanian Entomological Society, Akademijos 2, LT-08412 Vilnius, Lithuania. E-mail: giedvis@gmail.com

7772. Sy, T. (2008): Ein neuer Fundort der Scharlachlibelle Ceriagrion tenellum (de Villers, 1789) in Sachsen-Anhalt (Odonata, Coenagrionidae). Entomologische Nachrichten und Berichte 52(1): 61-64. (in German) A second record in the German Federal State Sachsen-Anhalt from 17-VII-2007 (Jäverntzer Moor near Gardelegen) is documented and discussed in de-
tail. The species probably has colonised the new habitat less than 20 years ago. The nearest population exists in a distance of 20 km.] Address: Sy, T., RANA - Büro fur Ökologie und Naturschutz, Frank Meyer, Mühlweg 39, D-06114 Halle(Saale), Germany. E-mail: thoren algu@rana-halle.de

7773. Tafangenyasha, C.; Dube, L.T. (2008): An investigation of the impacts of agricultural runoff on the water quality and aquatic organisms in a Lowweld sand river system in southeast Zimbabwe. Water Resour. Manage. 22: 119-130. (in English) ["In this research we examined the hypothesis that agricultural pollution is a key determinant of variability in nutrients concentrations and benthic fauna in a semi-arid tropical lowland region of southeast Zimbabwe. Water quality was monitored in the river water column and river bottom sediments at a time when dissolved oxygen concentration was thought to be very low during the winter period in the rivers passing through low input agricultural sections and intensive commercial agricultural sections. The surveys used established chemical methods and biological methods. Benthic fauna assemblages were used to complement chemical cases of nutrient loading at localities chosen for sampling. Unpolluted control sites were not significantly different (t test, p<0.05) from polluted sites in levels in mean values of dissolved oxygen, conductivity, total dissolved solids and mean density (no.m2) of benthic invertebrates in May. Significant differences (t test, p<0.05) were not found in mean values of calcium, magnesium, potassium, total nitrogen, nitrate nitrogen, ammonia nitrogen and total phosphorous in river bottom sediments in May and August. These data certainly do not support the notion that the Runde River is severely polluted by the upstream agricultural activities and the hypothesis that agricultural runoff is a key determinant of water quality is rejected. As the data suggests the Runde River may be receiving moderate nutrient pollution. The positive effects of moderate eutrophication on fish catch and the trade-off in pollution implied here needs to be addressed by appropriate agricultural and environmental policies that relate to water pollution and land use." [Authors] Four Odonata taxa are listed at the genus level.] Address: Tafangenyasha, C., Department of Environmental Science and Health, National University of Science and Technology, P. Bag AC 939, Bulawayo, Zimbabwe. E-mail: ctafangenyasha@nust.ac.zw

7774. Tchibozo, S.; Aberlenc, H.-P.; Ryckewaert, P.; Le Gall, P. (2008): Première évaluation de la biodiversité des Odonates, des Cétoines et des Rhopalocères de la forêt marécageuse de Lokoli (Sud Bénin). Bulletin de la Société entomologique de France 113(4): 497-509. (in French, with English summary) [2006; 24 Odonata species are listed, with 13 new species for Benin, including Oxythemis phoenicoceles, a rare species, and Ceriagrion citrinum, an endangered species on the IUCN red list.] Address: Tchibozo, S., Centre de Recherche pour la Gestion de la Biodiversité et du Terroir (Cerget), B.P. 0385 Cotonou, Bénin. E-mail: tchisev@yahoo.fr

7775. Triapitsyn, S.V.; Querino, R.B.; Feitoza, M.C.B. (2008): A new species of Anagrus (Hymenoptera: Mymaridae) from Amazonas, Brazil. Neotropical Entomology 37(6): 681-684. (in English, with Portuguese summary) [The new fairyfly species from the Neotropics, Anagrus (Anagrus)amazonensis sp. n., is described and illustrated. Anagrus Haliday is a large genus of Mymaridae (Hymenoptera), which now includes eight species recorded from Brazil. This new species attacks eggs of damselflies.] Address: Triapitsyn; S.V., Entomology Research Museum, Dept. of Entomology, Univ. California, Riverside, California 92521, USA. E-mail: sergeiu.triapitsyn@ucr.edu

7776. Vanappelghem, C.; Lambret, P.; Prioul, B. (2008): Symposium international sur le suivi des odonates d'Europe. La lettre des sociétaires. Société française d'Odonatologie 48: 6-7. (in French) [This is an extensive report on the international symposium on monitoring European Odonata held in Wageningen, the Netherlands on 13/14 June 2008.] Address: Vanappelghem, C., 14, rue Brûle Maison, F-59000 Lille, France. E-mail: cedvana@free.fr

7777. Vilaseca, C.J.; Baptiste, L.G.; López-Ávila, A. (2008): Incidence of the margins on the natural biological control of Spodoptera frugiperda (J. E. Smith) (Lepidoptera: Noctuidae) in rice crops. Revista Corpoica – Ciencia y Tecnología Agropecuaria 9(2): 45-54. (in Spanish, with English summary) ["Multiple researches have shown the environmental, economic and productive benefits that can be generated when including natural vegetation in the margins of the crops. This happens thanks to the presence of natural habitats, which are the ones that promote biotic factors such as natural enemies and abiotic ones as temperature, humidity or rain that can affect negatively the pests. The objective of this research was to evaluate and compare the effect of other natural systems present at the same landscape such as crop of oil palm and gallery forests over the natural biological control of Spodoptera frugiperda in growing areas of rice. For this purpose, an area of study was selected at the Colombian plain foothills (Villanueva, Casanare), a place that is characterized for having big extensions of rice, surrounded by oil palm plantations and gallery forests. The abundance of S. frugiperda in the stages of larva and imago was evaluated, as well as the parasitism of eggs and larvae and the diversity of natural enemies and other arthropods. It was found that plantations of oil palm, as the gallery forests promote the natural biological control of S. frugiperda by increasing the diversity of the natural enemies and reduction of the pest population in the borders of the crop. The importance of parasitoids as Apanteles marginiventris and predators of the order Odonata in the control of S. frugiperda was identified. It is highlighted the importance to associate perennial crops as oil palm with transitory crops as rice in the planning of agroecosystems on the region and promote the conservation of gallery forest, as long as they can become key factors in the natural biological control of pests. Nevertheless, aspects as the low quality of the habitat and frequently use of chemical pesticides affected the results." [Authors]] Address: Vilaseca, C.J.; Ecólogo. Pontificia Universidad Javeriana, Bogotá. Colombia. E-mail: javiervilad@hotmail.com

7778. Wei, L., Han, N.; Zjang, L.; Helgen, K.M.; Parsons, S.; Zhou, S.; Zhang, S. (2008): Wing morphology, echolocation calls, diet and emergence time of black-bearded tomb bats (Taphozous melanopogon, Emballonuridae) from southwest China. Acta Chiropteronologia 10(1): 51-59. (in English) [T. melanopogon was studied from May to October 2006 in Guangxi Province, southwest China. A total of 344 fecals was collected; Odo-
nata contributed with 1.05% to abundance. The diet of this species consists mostly of Lepidoptera and Hemi-
ptera.] Address: Zhang, S., School of Life Science, East China Normal University, 3663 Zhongshan Beilu, Putuo, Shanghai 200062, China. E-mail: syzhang@bio.ecnu.
edu.cn

7779. Weidel, B.; Carpenter, S.; Cole, J.; Hodgson, J.; Kitchell, J.; Pace, M.; Solomon, C. (2008): Carbon sources supporting fish growth in a north temperate lake. Aquatic Sciences 70: 347-260. (in English) Blue-gill growth was primarily the result of feeding on Trichoptera, Odonata, Diptera, terrestrial invertebrates (predominantly Coleoptera) and Cladocera. These same diet items made up the majority of age 0 yellow perch growth, whereas age 1 perch diets consisted mainly of Odonata (> 60%). Adult Odonata was the pre-
dominant terrestrial item contributing to largemouth bass growth, but diets also included Coleoptera, small mammals, and arachnids.] Address: Weidel, B., Center for Limnology, University of Wisconsin, Madison, Wis-
consin 53706, USA. E-mail: weidel@wisc.edu

ellen Europas Bd. 5 in "Die Neue Brehm-Bücherei 653". ISBN: 3-89432-896-7: 496 pp. (in German) [The late Philip S. Corbet wrote to this outstanding book on odonate biology exemplified using the European Corduliidae: "The prospect of a book devoted to the family Corduliidae, or Emeralds, will instantly ap-
peal to any odonatologist. Members of this family are strikingly elegant, and they possess a romantic, almost magical, quality, being furtive in their habits and fre-
quently wild, beautiful and remote habitats. The elu-
usive habit of corduliids means that relatively little information has been placed on record about their biology." The information presented in this monograph comprises a comprehensive synopsis of observations published by other workers, integrated and greatly enlarged by own researches of H. Wildermuth, in the field and laboratory. "The content of this book upholds the best tradition of the science of natural history: meticulous field observa-
tions are extended by behavioural experiments and mi-
croscopic dissections conducted in the laboratory. The book's scope embraces all aspects of the family that any reader might wish to learn about: systematics; no-
menclature; evolution; the life cycle, including the mor-
phology and natural history of all developmental stages; adult life, including maturation, foraging, and reproduct-
ive behaviour; neurophysiology, with special emphasis on the visual system of Corduliidae; and habitat selec-
tion and threat and conservation of the dragonfly fam-
ily." Monographs of the eleven European species com-
prise information on the discovery and name of each species, taxonomic information, descriptions of imago and larva, emergence, flight period, habitat, habits, ac-
companying species, threats and conservation meas-
ures, needs of research, and distribution differed ac-
cording to the European countries. The book also includes an extensive bibliography, and an excellent(!) register. Corbet: "The former is an important handbook of the family for every investigator, the latter will facilitate everyone not common with the German language to read this book overcoming diffi-
culties with the language. I am sure: This book is worth to refresh your German. (Martin Schorr) For additional details see the publishes home page: http://www.west-
arp.de/pages/hauptsei.php?text=webbn.php?Ken-
nung=540c61fcd2769292c37d8c862d3db06e&
ltfnr=3-
89432-324-8&seite=1] Address: Wildermuth, H., Halt-
bergstr. 43, CH-8630 Rüti, Switzerland. E-mail: hans-
ruedi@wildermuth.ch

7781. Wilson, H.W. (2008): The behavior of the Sea-
side Dragonlet, Erythrodixiplax berenice (Odonata: Libel-
lulidae), in a Maine Salt Marsh. Northeastern Naturalist 15(3): 465-468. (in English) [E. berenice was studied over two summers at Weskeag Marsh, South Thomas-
ton, Maine, USA. "These dragonflies are lethargic, spending over 99% of their time perched on the culm of a salt marsh plant. No evidence of territorial behaviour was found. Females oviposit while in tandem in algal mats on the surface of salt-water pannes. They perch preferentially into the wind, presumably to aid in provid-
ing lift on take-off." (Author)] Address: Department of Biology, Colby College, 5739 Mayfi ower Hill, Wa-
terville, ME, 04901, USA. E-mail: whwilson@colby.edu.

sect Conservation and Diversity 1: 95-107. (in English) ["1. The relationship between benthic invertebrate as-
semblage composition and surrounding land use has been examined in various ways, but most studies are undertaken at a coarse scale, or they compare obvi-
ously different landscapes. In Japan, these obvious dif-
fferences in landscape are rare, and humans reside even in remote montane areas. 2. In order to clarify the influence of human residence on benthic invertebrate assemblages, seasonal and site differences among benthic samples collected from a 15-km stretch of Kuro-
son Stream and their relation with riparian land use were examined. 3. The number of individuals and gen-
era differed significantly both spatially and temporally. Multivariate assemblage structure also differed significan-
tly across space and time along the stream. 4. In-
crease of residential areas affected the in-stream benthic invertebrate assemblage. Site differences along the stream and the effect of human residence were not masked by the potentially homogenizing influence of tributary streams. 5. The composition of surrounding ve-
getation was the most important factor influencing benthic community structure. The presence or absence of human residential areas and seasonal change were also important variables. 6. Benthic invertebrates may be carried and migrate to main streams from tributaries;
however, this phenomenon was not observed. Assemblages of benthic invertebrates that inhabit a particular site do not change and are considered to vary seasonally across a certain range." (Author). The following taxa are listed: Epiophlebia spp., Lanthus spp., and Caenopteryx spp. Address: Yoshimura, M., Forest Biodiversity Group, Kansai Research Center, Forestry and Forest Products Research Institute, Nagaiyutaro 68, Momoyama, Fushimi, Kyoto 612-0855, Japan. E-mail: yoshi@affrc.go.jp

7783. Zawal, A.; Dyatlova, E.S. (2008): Parasitizing on damselflies (Odonata: Coenagrionidae) by water mite (Acari: Hydrachnida) larvae from Odesa province (southwestern Ukraine). Natura Montenegrina 7(3): 453-462. (in English, with Serbian summary) [Ishchura elegans, I. pumilio, Coenagrion pulchellum, and Erythromma najas] "from the Odesa province were found with 6 parasitic water mite species (Hydrachnites ochtopus, Arrenurus cuspiderator, A. maculator, A. tricuspidator, A. sp.1, A. sp.2). The greatest numbers of the larvae were recorded on I. elegans and C. pulchellum. Larvae of H. ochtopus were mainly attached to the lateral side of odonata’s body while larvae of Arrenurus genus were only attached to the ventral side of odonata’s body. The preferred parts were mesosternum and metasternum. Larvae two of the parasitic species never been described therefore they are said as Arrenurus sp.1 and A. sp.2. The larvae of Hydraphantidae were recorded first time on odonata’s body." (Authors) Address: Zawal, A., Universitet Szczecinski, Wydzial Nauk Przyrodniczych, Katedra Zoologii Bezkregowców i Limnologii, ul. Waska 13, PL-71-415 Szczecin, Poland. E-mail: zawal@univ.szczecin.pl

7784. Zessin, W. (2008): Einige Aspekte zur Biologie paläozoischer Libellen (Odonatoptera). Entomologica generalis 31(3): 261-278.["Some aspects concerning the biology of Palaeozoic dragonflies (Odonatoptera): In the more than 320 million years old evolution the monophyletic group Odonatoptera (dragonflies) developed a number of unique morphological adaptations. One of them is the very complex mating behaviour (‘tandem position’ and ‘wheel position’) which is the strongest argument for a monophyletic status of the recent dragonflies. A first theory concerning the development of this strange behaviour as well as the evolution of such unique structures was published by Zessin [1995]; it was modified subsequently by Bechly, Brauckmann, Zessin & Gröning [2001] and Zessin et al. [2001]. Based upon two fossil specimens of Namurotypus sippeli Brauckmann & Zessin 1989 and Erasiprotorides valentini (Brauckmann 1985) of Namurian B age from Hagen-Vorhalle, Germany, with preserved wings as well as even the male and female genitalia, the evolution of the, mating wheel’ and of the mode of oviposition of recent dragonflies with its peculiar copulation apparatus is discussed; both specimens are therefore of outstanding scientific value for the reconstruction of the development of these body structures. The enlargement of the wing-span of certain Late Palaeozoic Odonatoptera [as for example the specimens mentioned above from the Namurian B of Hagen-Vorhalle; Erasiprotorides pellagersens Brauckmann 1983, and Piesbergopterus hielescheri Zessin 2006 of Westphalian D age of the Piesberg near Osnabrück, Germany, and other Pseudocarboniferous species from Central Europe and North America] is discussed in connection with the supposed increasing oxygen concentration in the air during the Late Carboniferous and Early Permian; largest known insect at all is the Early Permian Meganeuropsis permiana Carpenter 1939 with a wing-span of 72 cm. The flying ability of the giant Odonatoptera is discussed, too, by focussing on Stephonotypus schneideri Zessin 1983. Gliding flight is assumed to be predominant, interrupted by phases of wing flapping. Improvements of the flight ability by nodus- and pterostigma-like structures within the wings were already developed during the Late Carboniferous. Certain characters of the head (size of mandibles and eyes) and spiniferous legs (with three terminal claws) recommend a predatory mode of life similar to the ones of recent Odonatoptera. The well-preserved large orthopteroid-like ovipositor of Erasiprotorides valentini (Brauckmann 1985) suggests an endophytic or an endodrasmatic oviposition in soils at the bottom of ponds. The giant dragonflies (Meganisoptera) were not able to adapt their mode of life to the rapidly decreasing oxygen concentration in the air at the end of the Permian period and became completely extinct. Other, smaller Permocarboniferous Odonatoptera with petiolate wing-base - for example such Protozygoptera as Bechlya ericobinsoni Jarzembowski & Nel 2002, Oboonera kukalovae Zessin 2008, the species of the Kennedyidae Tillyard 1925 and Saxonagron minutas Nel et al 2000 (firstly grouped by NEL et al 2000 with the Zygoptera Selys 1854, th en, NEL et al 2008, with the Panodonata) - survived the Permian/ Triassic crisis and gave origin to the rich diversity of the Mesozoic and to the recent species. The so-called, secondary copulation’ must have already evolved during Permocarboniferous or Lower Triassic, because each of the recent suborders of the Odonata [Anisoptera, Anisozygoptera, and Zygoptera] share it; therefore their common stem species (presumably of Permian or Triassic age) must already have had ‘secondary copulation’ (with the female taking off the sperm from a special structure at the 2nd and 3rd abdominal segment while forming a, mating wheel’ with the male). The larval instars of the giant Odonatoptera are poorly known; a single wing of a nymph is described from the Stephanian of Wettin (Sachsen-Anhalt, Germany) as Schlechtendaliola nympha Handlirsch 1919." (Author) Address: Zessin, W., Lange Str. 9, D-19230 Jasnitz, Germany. E-mail: zessin@zoo-scherwin.de

7785. Zhang, B.; Ren, D.; Pang, H. (2008): New Isophlebioid Dragonflies from the Middle Jurassic of Inner Mongolia, China (Insecta: Odonata: Isophlebioptera: Camptoperlebiidae). Acta geologica Sinica (English Edition) 82(6): 1104-1114. (in English) ["Three new species of fossil dragonflies assigned to Sinokaratawia Nel, Huang & Lin in family Camptoperlebiidae, i.e. S. daohugouica sp. nov., S. magica sp.nov. and S. gloriosa sp. nov., and new materials of male S. prokopi Nel, Huang & Lin, 2007 are described from the Middle Jurassic of Daohugou, Inner Mongolia, China. An emended diagnosis of genus Sinokaratawia was proposed." (Authors) Address: Ren Dong, College of Life Sciences, Capital Normal University, Beijing 100037, China. E-mail: rendong@mail.cnu.edu.cn

raised offspring from a single population, leaving open possibilities of this species was only carried out on laboratory-morphological differences in southern Swedish individu... 2. Previous research suggests the existence of sexual dimorphism in body size and shape, patterns of phenotypic integration differed most between the morphs and not between the sexes. Finally, linear selection gradients showed that female morphology affected fecundity differently between the morphs. 5. We discuss the relevance of these results to the male mimicry hypothesis and to the existence of potential ecological differences between the morphs.* [Authors] Address: Zhang Dazh, School of Life Science, Ningxia University, Yinchuan 750021, China

7787. Zhang, D.; Dai, J. (2008): Odonata species diversity of Yinchuan. Journal of Ningxia University (Natural Science Edition) 29(4) : 343-347. (in Chinese, with English summary) [The Odonata diversity (n = 24) in Yinchuan region, China was surveyed from May to September in 2006. Five plots were chosen. Species diversity was analyzed by Margalef's richness indexes (dMa), Shannon-Wiener's diversity index (H'), Simpson index (D), Pielon evenness index (I) and Jaccard similarity coefficients. 827 samples were collected. Symmetry frequens is the most abundant species. S. frequens, Orthetrum albistylum, Pantala flavescens, Crocothemis servilia, Ischnura elegans and Coenagron dyeri are dominant species. The dMa score in five plots from high to low is: Junfu Lake, Shuidongguo, Hequan Lake, West Lake and Bao Lake. The highest H' was Shuidongguo plot, and Bao Lake plot was lowest. The authors conclude that the environmental heterogeneity and the diversity of Odonata are significantly positive correlated.] Address: Zhang. D., School of Life Science, Ningxia University, Yinchuan 750021, China

7788. Anikin, V.V.; Streshnev, A.V.; Boyarkin, A.G. (2008 (>2004)): [Productivity, composition and bioinclusion of the macrozoobenthos of the Surskoje reservoir]. Actual Problems of Geography and Ecology 2(4): O.P.. (in Russian) [Platycnemis pennipes and Coenagrion hastulatum are mentioned from two and one out of 10 sampling sites, respectively. Odonata larvae occurred in densities of 10 to 26 ind/m², or 0.05 to 0.28 g/m².] Address: E-mail: vvanikin@mail.ru

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7789. Abbott, J.K.; Gosden, T.P. (2009): Correlated morphological and colour differences among females of the damselfly Ischnura elegans. Ecological Entomology 34(3): 378-386. (in English) [*1. The female-limited colour polymorphic damselfly Ischnura elegans has proven to be an interesting study organism both as an example of female sexual polymorphism, and in the context of the evolution of colour polymorphism, as a model of speciation processes. 2. Previous research suggests the existence of correlations between colour morph and other phenotypic traits, and the different female morphs in I. elegans may be pursuing alternative phenotypically integrated strategies. However, previous research on morphological differences in southern Swedish individuals of this species was only carried out on laboratory-raised offspring from a single population, leaving open the question of how widespread such differences are. 3. The present study therefore analysed multi-generational data from 12 populations, investigating morphological differences between the female morphs in the field, differences in the pattern of phenotypic integration between morphs, and quantified selection on morphological traits. 4. It was found that consistent morphological differences indeed existed between the morphs across populations, confirming that the previously observed differences were not simply a laboratory artefact. It was also found, somewhat surprisingly, that despite the existence of sexual dimorphism in body size and shape, patterns of phenotypic integration differed most between the morphs and not between the sexes. Finally, linear selection gradients showed that female morphology affected fecundity differently between the morphs. 5. We discuss the relevance of these results to the male mimicry hypothesis and to the existence of potential ecological differences between the morphs.*] [Authors] Address: Abbott, Jessica, Department of Animal Ecology, Ecology Building, Lund University, SE-223 63 Lund, Sweden. E-mail: abbottj@queensu.ca

7790. Anderson, R.C. (2009): Do dragonflies migrate across the western Indian Ocean?. Journal of Tropical Ecology 25(4): 347-358. (in English) [*In the tropical Indian Ocean, the Maldives Islands lack surface freshwater, so are unsuitable for dragonfly reproduction. Nevertheless, millions of dragonflies (Insecta, Odonata; mostly globe skimmer, Pantala flavescens) appear suddenly every year starting in October. Arrival dates in the Maldives and India demonstrate that the dragonflies travel from southern India, a distance of some 500–1000 km. Dates of arrival and occurrence coincide with the southward passage of the Inter-tropical Convergence Zone (ITCZ). Circumstantial evidence suggests that the dragonflies fly with north-easterly tail winds, within and behind the ITCZ, at altitudes over 1000 m. It is proposed that this massive movement of dragonflies is part of an annual migration across the western Indian Ocean from India to East Africa. Arrival dates in the Seychelles support this hypothesis. Dragonflies also appear (in smaller numbers) in the Maldives in May, with the onset of the southwest monsoon, suggesting a possible return migration from Africa. These proposed migrations of dragonflies, regularly crossing 3500 km or more of open ocean, were previously unknown. It is known that these dragonflies exploit ephemeral rain pools for reproduction; the monsoons and ITCZ bring not only alternating, seasonal rains to India and Africa, but also appropriate winds for dragonflies to follow those rains. Several bird species migrate from India across the western Indian Ocean to wintering grounds in Africa. They do so at the same time as the dragonflies, presumably taking advantage of the same seasonally tail winds. Many of these birds also eat dragonflies; the possible significance of this was not previously appreciated.*] [Authors] Address: Anderson, C., Manta Marine Pvt Ltd, P.O. Box 2074, Malé, Republic of Maldives. E-mail: anderson@divehinet.net.mv

Fitness components. In this study, we evaluate quality and heteromorphs) differ in measures of quality and (or) developmental instability and fecundity. Animal Biology Mont, H.J.; Stoks, R.; van Gossum, H. (2009): Female morphs of a colour polymorphic damselfly differ in developmental instability and fecundity. Animal Biology 59: 41-54. (in English) ["Sex-limited colour polymorphism occurs in several animal taxa and is usually explained in the context of sexual selection. Specifically, for polymorphism restricted to the female sex, multiple phenotypes may have evolved in response to male harassment. Such male harassment is generally considered to entail differential costs to female morphs, which may ultimately result in fitness differences. However, contrary to this prediction, most previous studies do not support that female morph (andromorphs and heteromorphs) differ in measures of quality and (or) fitness components. In this study, we evaluate quality and fitness differences between mated female morphs of the damselfly Enallagma cyathigerum. We suggest that many earlier studies may have failed to observe morph differences in quality or fitness because selection by male harassment was weak. Here, we selected a study population for which our expectation was that levels of per female capita male harassment were high. Nevertheless, also in this population mated female morphs did not differ in body size or condition (body mass/body length). However, mated female morphs did differ in levels of developmental instability: heteromorphs consistently showed a higher level of fluctuating asymmetry than andromorphs. Also, mated female morphs differed in fecundity: andromorphs had a lower clutch size than heteromorphs. In addition, larger females contained more eggs, but the slope of this relationship was steeper in heteromorphs. In conclusion, mated female morphs of the damselfly Enallagma cyathigerum differ in flight morphology, with andromorphs being more similar to males than gynomorphs. In addition, we evaluated whether differences in flight morphology are consistent or whether some morphs are more plastic in response to seasonal environmental fluctuations. Most morphometrics showed similar seasonal plasticity for males and both female morphs, which could only partly be explained from allometry. Consistent with high manoeuvrability in flight, males had broader wings and lower wing loading than females. Variation between female morphs was less pronounced, with no consistent differences in length, aspect ratio, total surface, and wing loading. However, we detected morph-specific differences in shape and width, with andromorphs having broader wings than gynomorphs similarly to males." [Authors] Address: Gossum, H. van, Evolutionary Biology Group, University of Antwerp (RUCA), Groenenborgerlaan 171, B-2020 Antwerp, Belgium. E-mail: hvgossum@ruca.ua.ac.be

7801. Boudot, J.P.; Kalkman, V.J.; Azpilicueta Amorin, M.; Cordero Rivera, A.; Degabriele, G.; Dommanget, J.-L.; Ferreira, S.; Garrigós, B.; Jovic, M.; Kotarac, M.; Lopau, W.; Marinov, M.; Mihokovic, N.; Riservato, E.; Samraoui, B.; Schneider, W. (2009): Atlas of Odonata of the Mediterranean and North Africa. Libellula Suppl. 9: 256 pp. (in English, with German summary) ["This atlas gives the distribution of Odonata in Africa north of the 18th northern parallel, the Levant, Anatolia and the whole of Mediterranean Europe. Some nearby areas like Portugal, The Canary Islands, Madeira, Serbia, Macedonia, Bulgaria and parts of the Arab-Persian Peninsula, Iraq and Iran are included as well. Records, shown via a 50 km x 50 km UTM MCGRS grid, are categorized according to their date - prior to 1980 and from 1980 onwards. 179 species are presently recognized in this area." [Authors] Address: Boudot, J.-P., LIMOS, UMR CNRS 7137, Universités de Nancy, Faculté des Sciences, B.P. 239, F-54506 - Vandoeuvre-lès-Nancy Cedex, France. E-mail: jean-pierre.boudot@ilimos.ujhp-nancy.fr

7802. Bredenhand, E.; Samways, M.J. (2009): Impact of a dam on benthic macroinvertebrates in a small river in a biodiversity hotspot: Cape Floristic Region, South Africa. Journal of Insect Conservation 13(2): 297-307. (in English) [Suitable reservoirs and monitoring methods are needed to manage scarce water supplies in dry countries. We assessed here the impact on aquatic macroinvertebrates of the only dam on the Eerste River, which runs through the heart of a biodiversity hotspot, the Cape Floristic Region, South Africa. The dam and associated activities, were the only forms of disturbance in this otherwise pristine area. We sampled over 20,000 macroinvertebrate individuals and illus-
trated some categorical effects of the impoundment and its effects on macroinvertebrate assemblages. Macroinvertebrate species diversity below the dam was only half of that in the pristine catchment area above the dam. Furthermore, Ephemeroptera, Plecoptera and Trichoptera diversity and abundance dropped to almost zero as a result of the impoundment. In contrast, the abundance of the Diptera family Chironomidae increased substantially below the dam. These changes in macroinvertebrate diversity mirrored those recorded in biologically less diverse areas, but are of major concern in this biodiversity hotspot with its rich endemic fauna. We conclude that such an impoundment, while important for human welfare, results in a high price being paid in terms of loss of local biodiversity." (Authors) All specimens - including Odonata - were identified to family level according to South African Scoring System version 5 protocol.] Address: Samways, M.J., Dept Ent. & Nematol., Univ. Stellenbosch, Private Bag X1, ZA-7602, Matieland, South Africa. E-mail: samways@sun.ac.za


7804. Bried, J.T. (2009): Location and seasonal differences in adult dragonfly size and mass in northern Mississippi, USA (Odonata: Libellulidae). International Journal of Odonatology 12(1): 123-130. (in English) [*Size and mass are often uniformly related within individuals and populations, but the relationship may vary in time or space. I asked whether isolated adult dragonfly populations within the same environmental context (climate, physiography, ecoregion) differ in both size and mass, and whether earlier emerging dragonflies are both larger and heavier on average. Differences were apparent among locally separated populations (ca 130-160 km apart), with the most northerly populations containing larger and heavier adults on average. Site-level environmental variation probably exerted a larger influence than broad-based ecogeographic rules (e.g., Bergmann's rule) at this fine scale. On average, earlier emerging dragonflies tended to outsize and/or outweigh later emerging dragonflies, a commonly observed pattern in adult odonates and other insect taxa. Size and mass did not produce the same results in every case, suggesting the size-mass relationship within dragonfly species can vary among spatially or seasonally isolated adult populations.* (Author)] Address: Bried, J.T., The Nature Conservancy, 195 New Karner Road, Albany, New York 12205, USA. E-mail: jbred@tnc.org


7806. Cicort-Lacaci, A.-S.; Dimancea, N.; Blaga-Lungulescu, R.M.; Hodosan, O.; Benkd, A. (2009): Diet composition of a Triturus dobrogicus (Amphibia) population from Arad County, western Romania. Biharean Biologist 3(1): 77-82. (in English) [*Odonata larvae" play a minor role as diet in a Triturus dobrogicus population from Cerneiului Plain.] Address: Cicort-Lacaci, A.-S., University of Oradea, Faculty of Sciences, Department of Biology, 1 Universitatii str., 410087 - Oradea, Romania. E-mail: cicort.alfred@yahoo.com

7807. Clausnitzer, V.; Kalkman, V.J.; Ram, M.; Collen, B.; Baillie, J.E.M.; Bedjanic, M.; Darwall, W.R.T.; Dijkstra, K.-D.; Dow, R.; Hawking, J.; Karube, H.; Makova, E.; Paulson, D.; Schütte, K.; Suhling, F.; Villanueva, R.J.; von Ellenrieder, N.; Keith Wilson, K. (2009): Odonata enter the biodiversity crisis debate: The first global assessment of an insect group. Biological Conservation 142(8): 1864-1869. (in English) [*The status and trends of global biodiversity are often measured with a bias towards datasets limited to terrestrial vertebrates. The first global assessment of an insect order (Odonata) provides new context to the ongoing discussion of current biodiversity loss. A randomly selected sample of 1500 (26.4%) of the 5680 described dragonflies and damselflies was assessed using IUCN's Red List criteria. Distribution maps for each species were created and species were assigned to habitat types. These data were analysed in respect to threat level for regions and habitat types. We have found that one in 10 species of Odonata is threatened with extinction. This threat level is among the lowest of groups that have been assessed to date, suggesting that previous estimates of extinction risk for insects might be misleading. However, Odonata only comprise a small invertebrate order, with above-average dispersal ability and relatively wide distribution ranges. For conservation science and policy to be truly representative of global biodiversity a representative cross-section of invertebrates needs to be included." (Authors)] Address: Clausnitzer, Viola, Graefestr. 17, D-06110 Halle/Saale, Germany. E-mail: violacl@t-online.de

7808. Contreras-Garduño, J.; Canales-Lazcano, J.; Jiménez-Cortés, J.G.; Juárez-Valdez, N.; Lanz-Mendoza, H.; Córdoba-Aguilar, A. (2009): Spatial and temporal population differences in male density and condition in the American rubyspot, Hetaerina americana (Insecta: Calopterygidae). Ecological Research 24(1): 21-29. (in English) [*Increased resource availability should favour higher animal density. It may also affect sex ratio, the male condition, and mating competition over access to females, although the direction of these variables is not straightforward to predict. Using a non-experimental approach, we carried out preliminary research using the territorial H. americana by comparing two spatially separated populations and the same population in two different seasons (each comparison with varying population densities). We first compared the sex ratio by counting males (using two categories, territorial and non-territorial) and females; relative foraging time (as an indicator of how much feeding resources each site provides); wing spot size (a sexual ornament), body size and immune melanization response (these two variables were used to assess male condition); and fighting time and contest number (to assess competi-
For the seasonal comparison we used a third population in which we only compared male spot size and relative foraging time, males reach a better condition despite the competition being more intense." (Authors)] Address: Cordoba-Aguilar, A., Centro de Investigaciones Biologicas, Univ. Autonoma del Estado de Hidalgo, Apdo. P. 69-1, Plaza Juarez, Pachuca, Hidalgo 42001, Mexico E-mail: acordoba@uaeh.reduae.mx

7809. Córdoba-Aguilar, A.; Serrano-Meneses, M.A.; Cordero-Rivera, A. (2009): Copulation duration in nonterritorial Odonate species lasts longer than in territorial species. Annals of the Entomological Society of America 102(4): 694-701. (in English) "We tested whether long copulation duration is more likely to have evolved in nonterritorial odonate species than in territorial species, given that nonterritorial males do not incur the costs of territory defense. A phylogenetic comparative method that controls for the phylogenetic nonindependence of species was used to compare copulation duration among 46 species of the two main odonate suborders (Anisoptera and Zygoptera). Copulation duration of nonterritorial anisopteran species was longer than for territorial dragonflies; however, this relationship was not found for Zygoptera. Long copulations in Anisoptera may be related to a male's ability to manipulate a female's stored sperm. It is suggested that constraints that prevent a territorial male from lengthening copulation do not seem to operate in Zygoptera. Other selective processes (i.e., cryptic female choice and/or sexual conflict) may also be important determinants of copulation duration in the Zygoptera. To our knowledge, this is the first exploration of the relation copulation duration and mating systems in insects." (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.reduae.mx

7810. Costa, J.M.; Oldrini, B.B.; Anjos-Santos, D. (2009): Eight new Leptagrion larvae from Brazil (Zygoptera: Coenagrionidae). Odonatologica 38(2): 93-111. (in English) "The ultimate instar larvae of L. andromachi, L. macrurum, L. perlongum, and L. vriesianum were described and illustrated from the states of Rio de Janeiro, RJ, Brazil. L. ovata, L. bocainense, L. capixabae, L. dardanoi, L. elongatus, L. macrurum, L. perlongum, and L. vriesianum are described and illustrated from the states of Rio de Janeiro, Espirito Santo, Minas Gerais, Pernambuco, and Santa Catarina. All specimens are deposited in Museu Nacional, Rio de Janeiro, Brazil. A comparative tab. of the structural characters is included." (Authors)] Address: Costa, J.M., Depto de Entomologia, Museu Nacional, Universidade Federal do Rio de Janeiro, Quinta da Boa Vista, São Cristóvão, BR-20940-40 Rio de Janeiro, RJ, Brazil. jcosta@globo.com

7811. Couteyen, S., (2009): Biogéographie et spéciation des Odonates de l’Ile de la Réunion. Ann. soc. entomol. Fr. (n.s.) 45(1): 83-91. (in French, with English summary) "The odonatological fauna of la Réunion is fundamentally of Mauritian origin for the geological history of the Mascarenes and the different routes taken by cyclones in the south-west of the Indian Ocean. The study of the Odonata distribution according to various aquatic ecosystems of the island shows that: 1. Indigenous species with wide repartition are mainly found in open ecosystems of low and moderate altitude (from 0 to 800 meters). These ecosystems include as many as 13 species and have the highest Odonata density. 2. The Odonata fauna of la Réunion can be distinguished from those of the other islands of the Madagascan region by the presence of two species originated from the continent which are confined above an altitude of 1000 meters. 3. For most of them, endemic species live in forested ecosystems. Those ecosystems do not hold more than five species of the odonatological fauna of the island. Finally, it seems that the speciation of Odonata in la Réunion doesn’t take place in the diversified ecosystems with widely distributed species, but in a set of marginal ecosystems with low Odonata diversity." (Author)] Address: Couteyen, S., Association réunionnaise d’Ecologie, 188 chemin nidi joli, F-97430 le Tampon, île de la Réunion, France. E-mail: scouteyen@ecologie.re

7812. Damms, S.; Hadrys, H. (2009): Thresithmis morrisoni sp. nov. and T. palustris sp. nov. from the Okavango and Upper Zambezi Floodplains previously hidden under T. stictica (Odonata: Libellulidae). International Journal of Odonatology 12(1): 131-145, pls III-IV. (in English) "During the course of a population genetic study of Thresithmis stictica that included sites in Namibia, Kenya, Tanzania, Ethiopia, Botswana and Zambia, two undescribed libellulid species were discovered in the Okavango and Upper Zambezi Floodplains. These species were both previously identified as T. stictica. We describe the two species, T. morrisoni sp. nov. (holotype ♀: Namibia, Nature Reserve Popa Falls, Okavango River at the rapids, 18°07’S, 21°40’E, IV 2007, leg. K.-D.B. Dijkstra; dep. in the National Museum of Namibia, Windhoek) and T. palustris sp. nov. (holotype ♀: Botswana, Oka-vango Delta, Moremi Game Reserve, 19°15’S, 23°20’E, II 2007, leg J. Kipping; dep. in the Nat. Mus. of Namibia, Windhoek) and compare them with T. stictica." (Authors)] Address: Damms, Sandra, ITZ, Ecology & Evolution, TiHo Hannover, Bünteweg 17, 30559 Hannover, Germany. E-mail: sandra.giere@ecolevol.de

7813. Deeds, J.; Bogar, D.; Koval, R.; McWilliams, J.; Schiffer, C. (2009): Six new Odonata state records in Pennsylvania. Arga 21(2): 5-6. (in English) [Records of Enallagma anna, Ischnura kellicotti, Ophiogomphus incarnatus, Macromia taeniolata, Libellula deplanata, and Celithemis fasciata are documented.] 7814. Dibble, C.J.; Kauffman, J. E.; Zuzik, E.M.; Smith, G.R.; Retting, J.E. (2009): Effects of potential predator and competitor cues and sibship on wood frog (Rana sylvatica) embryos. Amphibia-Reptilia 30(2): 294-298. (in English) "Chemical cues emitted from predators or competitors are often important for animals living in aquatic ecosystems as they allow potential prey to assess predation risk and make appropriate risk-sensitive responses. In our experiment, we examined if R. sylvatica embryos exposed to potential predator and competitor cues would alter their time to hatching, size at hatching, or survivorship. Eggs from four different sibships were subjected to a variety of cues including dragonfly larvae (potential tadpole predator), mosquito (Gambusia affinis; a non-native potential egg
and tadpole predator), and overwintered tadpoles of Rana sp. (potential competitors). We found no significant effects of any of the cues. However, we did find significant variation in mean time to hatching and mean hatching size among sibships. Our results suggest that wood frog embryos may have limited ability to respond to some cues at the embryonic stage, at least for the concentrations and conditions used in this experiment. Our results do indicate genetic or parental effects can affect embryonic wood frog development rate and hatching size. * (Authors) Address: Smith, G.R., Dept Biology, Denison University, Granville, OH 43023, USA. Email: smithg@denison.edu


7816. Dow, R.A.; Reels, G.T. (2009): Expedition to Mount Dulit, Sarawak, August-September 2008 - Odonata. IDF-Report 19: 1-16. (in English) [This is a report on a short expedition to Mount Dulit, Sarawak, conducted by Rory Dow and Graham Reels in late August, and early September, 2008. The objective of the expedition was to survey Odonata on the mountain, with particular attention to reconfirming the presence of a number of species (Rhinoneura caerulea, Bornangiolestes nigra, Drepanosticta dulitensis, D. forficula, & D. dentifera and Orthetrum borneense) originally described from Mt. Dulit by Kimmins (1936), from material collected by members of an Oxford University Expedition to Sarawak in 1932 (Harrison 1933). The mountain was not re-visited by odonatologists until 2006. A total of 49 species is listed. Some of the target species could not be traced due to insurmountable problems to reach the plateau of the Dulit mountains.] Address: Dow, R.A., 6 Bramley Avenue, Coulson, Surrey, CR5 2DP, UK. E-mail: rory.dow@virgin.net

7817. Dumont, H.J. (2009): Aquatic insects of the Nile basin, with emphasis on the Odonata. Monographiae Biologicae 89: 631-646. (in English) "Much work has been done on the Diptera of the Nile, because many species are vectors of disease of man and cattle. Some biogeographic work has been done on the Heteroptera, but the group that is known best is that of the Odonata. With c. 250 species out of an estimated 900 for Africa, the Nile is not particularly rich. Unlike the Congo basin, it lacks a high degree of endemicity. Relatively most endemic species are found on the faunistically depauperate Ethiopian plateau, followed by the East African lake zone. Quite a few wide-ranging Afrotropical species have used the Nile valley as a pathway to reach the Mediterranean shores, while in Lower Egypt some Paleaeartic species of Irano-Turanian extraction occur. There has been exchange, across Sinai with the Levant, and perhaps across the Bab-el-Mandeb passage with Arabia. Some of these exchanges have been recent, others are older, and (sub) speciation has occurred since. Old endemics of Arabia and The Levant (at genus level) may not have had anything to do with the Nile. Their ancestors may have used the Red Sea valley as a pathway for dispersal before the opening of Bab-el-Mandeb. Not only the Afrotropical fauna of the Levant is a pluvial relict of Pleistocene age; also in West Sudan, relicts of an African forest fauna are found in a mountainous Sahel environment (Jebel Marra). Oriental elements in the Nile fauna are extremely rare. " (Author) Address: Dumont, H.J., Univ. Gent, Inst. Animal Ecology, K.L. Ledeganckstraat 35, B-9000 Gent, Belgium. E-mail: Henri.Dumont@ugent.be

7818. Ellenrieder, N.v. (2009): Odonata of the Argentine Yungas cloud forest: distribution patterns and conservation status. Odonatologica 38(1): 39-53. (in English) "Odonata of streams, small rivers and ponds were sampled in the Yungas cloud forest of NW Argentina, and presence / absence information of species from samples and from examination of collections was recorded in a spatial-relational data base. Alpha, beta, and gamma diversity and total species richness expected for the area were estimated. Similarity in composition of odonate communities from lotic and lentic environments were analyzed according to latitudinal and altitudinal gradients, using multivariate analysis. Assemblages from NW Argentina were compared to those from equivalent sites in SE Peru. Odon. species diversity was found to follow both a latitudinal (decreasing from N to S) and an altitudinal gradient (decreasing from low to high elevations). Based on IUCN (2001) criteria, the conservation status of the odonate species endemic to the Yungas cloud forest was assessed at a global scale; 6 species were assessed as of Least Concern and 2 as Near Threatened." (Author) Address: Ellenrieder, Natalia von, Museo de Ciencias Naturales, Universidad Nacional de Salta, Mendoza 2, Salta 4400, Argentina. E-mail: natalia.ellenrieder@gmail.com

7819. Escoto-Moreno, J.A.; González-Soriano, E.; Escoto-Rocha, J. (2009): Odonata from Aguascalientes state, Mexico. Odonatologica 38(2): 151-158. (in English) "A list is presented of 58 species, including their distribution by municipalities; 50 of these are new records for the state. Information on general distribution of selected species is also provided. In accordance with the non-parametric estimation Chao2, the number of observed species represents ca 87.8% of the total number of species estimated for the state of Aguascalientes." (Authors) Address: Escoto-Moreno, J.A., Depto de Biologia, Universidad Autónoma de Aguascalientes, Avenida Universidad 940, MX-20100 Aguascalientes, Mexico. E-mail: jerjaem2002@yahoo.es

7820. Ferenti, S.; Dimancea, N.; David, A.; Tântar, A.; Daraban, D. (2009): Data on the feeding of a Rana ribundabunda population from Sarighiol de Deal, Tulcea County, Romania. Biharean Biologist 3(1): 45-50. (in English) "The diet of 86 specimens of R. ribundabunda is mainly represented by the Coleoptera, Diptera and Hymenoptera (Cicada). The majority of prey have a terrestrial origin. The presence of different size preys indicates opportunistic feeding. Odonata contribute between 3.5 - 6% to the diet. [Address: Ferenti, Sara, University of Oradea, Faculty of Science, Dept of Biology, 1 Universitatii str., 410087, Oradea, Romania. Biharean Biologist 3(1): 45-50. (in English) "Colonization by the zebra mussel, Dreissena polymorpha, was quantified for five dragonfly species that differed in size and larval habits in a Michigan lake."

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Both larger size and a non-burrowing habit independently increased susceptibility to colonization. In 2005, over 50% of the final instars of the sprawlers Didymops transversa and Hagenius brevistylus were colonized, as well as younger instars. Rarely colonized were Progomphus obscurus and Dromogomphus spinosus, whose larvae burrow under sand, and the sprawler Epitheca princeps, whose final instars were lightly covered with sand. Hagenius larvae that had been preyed upon carried more mussels than those dying of other causes. More generally, mussel attachment decreased the probability that sprawlers left the water to emerge, the distance that some species traveled before emerging, and the ability of an overturned sprawler to right itself. On average, final instars of Didymops and Hagenius remaining in the water carried three times as many mussels as individuals known to emerge. Compared to uncolonized individuals, Epitheca and Progomphus with mussels emerged closer to the water line. Among colonized Didymops, the distance traveled on land before emerging decreased with increasing mussel load. Of the colonized Didymops that could right themselves, righting time increased with mussel load. Because the two common species of sprawlers were disproportionately colonized, and mussel attachment decreased their chances of emerging, our results suggest that D. polyurata has the potential to affect the community structure of this guild of aquatic and terrestrial predators. (Authors) Address: Finke, O.M., Dept Zool., Univ. Oklahomá, 730 Van Vleet Oval, Room 314, Norman, OK 73019, USA. E-mail: fincke@ou.edu

Fontanarrosa, M.; Collantes, M.B.; Bachmann, A.O. (2009): Seasonal patterns of the insect community structure in urban rain pools of temperate Argentina. Journal of Insect Science 9:10: 18 pp. (in English) ["Temporary aquatic environments are widespread in the world, and although there are considerable regional differences in their type and method of formation they have many physical, chemical and biological properties in common. With the aim to increase knowledge of urban temporary pool fauna, the objectives of this work were to assess the seasonal patterns of species composition, richness, and diversity of the aquatic insect community inhabiting rain pools in urban temperate Argentina, and to identify the environmental variables associated to these patterns. Four temporary pools of an urban green space in Buenos Aires City were studied throughout a 1-year period. Eleven flood cycles with very varied hydroperiods and dry periods, mainly associated with rainfall, were identified. Insect species richness in these temporary urban pools, 86 taxa were documented, was found to be within the range reported for wild temporary water bodies of other regions of the world. The present results provide evidence for the existence of a clear link between habitat and community variability. Hydroperiod and seasonality were the main environmental factors involved in structuring the insect communities of the studied water bodies. Urban pools in green spaces have the potential to act as their dwellers like corridors through the urban matrix. Taking into account these characteristics and their accessibility, urban temporary pools can be considered as promising habitats for the study of ecological processes involving the insect community." (Authors) Odonata are treated on the order resp. in app. 1 family level Address: Soledad Fontanarrosa, M., Departamento de Ecología, Genética y Evolución, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires, CONICET, Argentina. E-mail: fontanarrosa@ege.fcen.uba.ar

Garrison, R.W.; von Ellenrieder, N. (2009): Redefinition of Mesopletobasis Sjöstedt 1918 with the inclusion of Metaleptobasis cyanolineata (Wasscher 1998) comb. nov. and description of a new species, Mesopletobasis elongata (Odonata: Coenagrionidae). Zootaxa 2145: 47-68. (in English, with Spanish summary) ["Metaleptobasis cyanolineata is transferred to Mesopletobasis and a new species, Mesopletobasis elongata, is described. The genus is diagnosed by the combination of rounded frons, highly modified pronotum with supplementary tooth vestigial or absent, vein descending from quadrangle forming an unbroken line to wing margin, and genital ligula with a small inner fold and with spine-like projections on lateral margins distal to flexure. Its species are illustrated, mapped, and keyed." (Authors)] Address: Garrison, R.W., Associate Insect Biosystematist, Plant Pest Diagnostics, California Department of Food & Agriculture, 3294 Meadowview Road, Sacramento, CA 95832-1448, USA. E-mail rgarson@cdfa.ca.gov


Gligorovic, B.; Pjesic, V.; Zekovic, A. (2009): A contribution to the knowledge of the dragonflies (Odonata) of mountainous area Lukavica (Montenegro). Natura Montenegrina 8(1) (2008): 31-39. (in English, with Serbian summary) [12 species including Coenagrion hastulatum, Aeshna juncea, and Cordulia aenea are reported from the region. The record of Aeshna cyanea on Manito jezero Lake (1764 m a.s.l.) represents the highest altitude of finding of this species in Montenegro.] Address: Gligorovic, B., Dept of Biology, Faculty of Sciences, University of Montenegro, Cetinjski put b.b., 81000 Podgorica, Montenegro. E-mail: bogic1@cg.yu

Gonzalez-Soriano, E., Depto Zool., Facultad de Ciencias Exactas y Naturales, Univ. de Buenos Aires, CONICET, Argentina. E-mail: mail: dorotaz@orange.pl

7822. Fleck, G.; Waller, A.; Serafin, J.; Nel, A. (2009): The oldest Calopterygidae in the Eocene Baltic amber (Odonata: Zygoptera). Zootaxa 1985: 52-56. (in English) ["A larva of the damselfly family Calopterygidae is described from Eocene Baltic amber. It is the oldest record of this family partially filling the gap between previous records from the Oligocene and the Mesozoic inferred from molecular analyses for this family." (Authors)] Address: Serafin, J., 3Ul. Balladyny 5A, 05-502 Piaseczno, Poland. E-mail: dorotaz@orange.pl

7823. Fontanarrosa, M.; Collantes, M.B.; Bachmann, A.O. (2009): Seasonal patterns of the insect community structure in urban rain pools of temperate Argentina. Journal of Insect Science 9:10: 18 pp. (in English) ["Temporary aquatic environments are widespread in the world, and although there are considerable regional differences in their type and method of formation they have many physical, chemical and biological properties in common. With the aim to increase knowledge of urban temporary pool fauna, the objectives of this work were to assess the seasonal patterns of species composition, richness, and diversity of the aquatic insect community inhabiting rain pools in urban temperate Argentina, and to identify the environmental variables associated to these patterns. Four temporary pools of an urban green space in Buenos Aires City were studied throughout a 1-year period. Eleven flood cycles with very varied hydroperiods and dry periods, mainly associated with rainfall, were identified. Insect species richness in these temporary urban pools, 86 taxa were documented, was found to be within the range reported for wild temporary water bodies of other regions of the world. The present results provide evidence for the existence of a clear link between habitat and community variability. Hydroperiod and seasonality were the main environmental factors involved in structuring the insect communities of the studied water bodies. Urban pools in green spaces have the potential to act as their dwellers like corridors through the urban matrix. Taking into account these characteristics and their accessibility, urban temporary pools can be considered as promising habitats for the study of ecological processes involving the insect community." (Authors) Odonata are treated on the order resp. in app. 1 family level Address: Soledad Fontanarrosa, M., Departamento de Ecología, Genética y Evolución, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires, CONICET, Argentina. E-mail: fontanarrosa@ege.fcen.uba.ar

7824. Garrison, R.W.; von Ellenrieder, N. (2009): Redefinition of Mesopletobasis Sjöstedt 1918 with the inclusion of Metaleptobasis cyanolineata (Wasscher 1998) comb. nov. and description of a new species, Mesopletobasis elongata (Odonata: Coenagrionidae). Zootaxa 2145: 47-68. (in English, with Spanish summary) ["Metaleptobasis cyanolineata is transferred to Mesopletobasis and a new species, Mesopletobasis elongata, is described. The genus is diagnosed by the combination of rounded frons, highly modified pronotum with supplementary tooth vestigial or absent, vein descending from quadrangle forming an unbroken line to wing margin, and genital ligula with a small inner fold and with spine-like projections on lateral margins distal to flexure. Its species are illustrated, mapped, and keyed." (Authors)] Address: Garrison, R.W., Associate Insect Biosystematist, Plant Pest Diagnostics, California Department of Food & Agriculture, 3294 Meadowview Road, Sacramento, CA 95832-1448, USA. E-mail rgarson@cdfa.ca.gov


7826. Gigorovic, B.; Pjesic, V.; Zekovic, A. (2009): A contribution to the knowledge of the dragonflies (Odonata) of mountainous area Lukavica (Montenegro). Natura Montenegrina 8(1) (2008): 31-39. (in English, with Serbian summary) [12 species including Coenagrion hastulatum, Aeshna juncea, and Cordulia aenea are reported from the region. The record of Aeshna cyanea on Manito jezero Lake (1764 m a.s.l.) represents the highest altitude of finding of this species in Montenegro.] Address: Gigorovic, B., Dept of Biology, Faculty of Sciences, University of Montenegro, Cetinjski put b.b., 81000 Podgorica, Montenegro. E-mail: bogic1@cg.yu

7827. Gonzalez-Soriano, E.; von Ellenrieder, N. (2009): What is Amphipteryx agrioides Selys 1853 (Odonata: Amphipterygidae)? Zootaxa 2074: 61-64. (in English) [The purpose of this paper is to determine the correct identity of A. agrioides, provide diagnostic illustrations of the same, and discuss the location of its type locality] Address: Gonzalez-Soriano, E., Depto Zool., Facultad de Ciencias Exactas y Naturales, Univ. de Buenos Aires, CONICET, Argentina. E-mail: dorotaz@orange.pl
7828. Gosden, T.P.; Svensson, E.I. (2009): Density-dependent male mating harassment, female resistance, and male mimicry. Am. Nat. 173: 709-721. (in English) [*Genetic variation in female resistance and tolerance to male mating harassment can affect the outcome of sexually antagonistic mating interactions. We investigated female mating rates and male mating harassment in natural populations of Ischnura elegans. This damselfly species has a heritable sex-limited polymorphism in females, where one of the morphs is a male mimic (androchrome females). The three female morphs differ in mating rates, and these differences are stable across populations and years. However, the degree of premating resistance toward male mating attempts varied across generations and populations. Male mating harassment of the female morphs changed in a density-dependent fashion, suggesting that male mate preferences are plastic and vary with the different morph densities. We quantified morph differences in male mating harassment and female fecundity, using path analysis and structural equation modeling. We found variation between the morphs in the fitness consequences of mating, with the fecundity of one of the nonmimetic morphs declining with increasing male mating harassment. However, androchrome females had lower overall fecundity, presumably reflecting a cost of male mimicry. Density-dependent male mating harassment on the morphs and fecundity costs of male mimicry are thus likely to contribute to the maintenance of this female polymorphism.*] Address: Svensson, E.I., Department of Animal Ecology, Ecology Building, Lund University, S-223 62 Lund, Sweden. E-mail: erik.svensson@zooekol.lu.se.

7829. Gossum, H. van; Bots, J.; Snijkers, T.; Meyer, J.; Wassenbergh, S. van; De Coen, W.; De Bruyn, L. (2009): Behaviour of damselfly larvae (Enallagma cyathigerum) (Insecta, Odonata) after long-term exposure to PFOS. Environmental Pollution 157(4): 1332-1336. (in English) [*Perfluorooctane sulfonic acid (PFOS) is a persistent and ubiquitous environmental contaminant that has been detected in organisms worldwide. Here, we evaluate whether long-term (1 and 4 months) exposure to PFOS contamination affects the behavioural performance of freshwater larvae of the damselfly E. cyathigerum. Our results show reduced behavioural performance with increasing PFOS concentration. In 1 month exposed larvae, no observed effect concentrations (NOECs) were 100 µg/L for general activity. In 4 months exposed larvae, NOECs were 10 µg/L, for each behavioural trait, except swimming acceleration of male larvae where the NOEC was 100 µg/L. When faced with PFOS concentrations above the NOEC, E. cyathigerum larvae were less active, less capable to escape a simulated predator attack and less efficient in foraging. Together, our results show that damselfly larvae suffer reduced survival-related behavioural performance.*] Address: Gossum, H. van, Evolutionary Biology Group, University of Antwerp (RUCA), Groenenborgerlaan 171, B-2020 Antwerp, Belgium. E-mail: hvgossum@ruca.ua.ac.be


7831. Hämäläinen, M.; Reels, G.T.; Zhang, H. (2009): Description of Aristocypha aino sp. nov. from Hainan, with notes on the related species (Zygoptera: Chlorocyphidae). Tombo 51: 16-22. (in English, with Japanese summary) [*A new chlorocypheid damselfly species, Aristocypha aino sp. nov. (holotype ♀ from Jianfengling National Nature Reserve, Hainan Island, China) is described and illustrated for both sexes. Its systematic relationship with other taxa in the genus is discussed. Rhinocypha bifrenestrata Fraser, 1922 is ranked as a synonym of Aristocypha cuneata (Selys, 1853), not as a synonym of A. quadrimaculata (Selys, 1853). Rhinocypha chaoi Wilson, 2004 is transferred to the genus Aristocypha.*] Address: Hämäläinen M., Dept Applied Zool., P.O.Box 27, FIN-00014 University of Helsinki, Finland; E-mail: matti.hamalainen@helsinki.fi

7832. Hamasaki, K.; Yamanaoka, T.; Tanaka, K.; Nakatani, Y.; Iwashii, N.; Sprague, D.S. (2009): Relative importance of within-habitat environment, land use and spatial autocorrelations for determining odonate assemblages in rural reservoir ponds in Japan. Ecological Research 24(3): 597-605. (in English) [*To clarify the major factors affecting odonate assemblages in rural reservoir ponds among within-habitat environments, land use around ponds and spatial autocorrelation, we surveyed odonate adults in 70 study ponds in Ibaraki Prefecture, Japan, during three sampling periods in 2005. Redundancy analyses (RDA) for these three factor groups were executed to determine their strength in explaining the odonate species composition. Their relative contributions were also evaluated by the method of variation partitioning. A total of 41 odonate species were recorded in the study ponds, and 24 of them, excluding rare species, were used for our analysis. Summed effects including all three factor groups explained approximately 39% of the variation in odonate species composition. We found that spatial autocorrelation was the most important, though the within-habitat environment and land use had comparable effects. We conclude that spatial autocorrelation should be considered in this type of analysis, though we could not clearly explain what caused such a spatial structure. Pond area and debris that had accumulated at the bottom of ponds were selected as the within-habitat environment, and the forests and paddy fields around ponds were selected for land use after the procedure of forward stepwise selection. These results suggest that the recent decrease of forests around the ponds has had a negative effect on the odonate assemblages.*] Address: Hamasaki, K., Biodiversity Division, National Institute for Agro-Environmental Sciences, 3-1-3 Kannondai, Tsukuba Ibaraki, 305-8604, Japan. E-mail: kenjih@affrc.go.jp

7833. Hammers, M.; Sánchez-Guillén, R.A.; Gossum, H. van (2009): Differences in mating propensity between immature female color morphs in the damselfly Ischnura elegans (Insecta: Odonata). Journal of Insect Behaviour 22: 324-337. (in English) [*Female-limited color polymorphisms occur in a variety of animal taxa where excessive male sexual harassment may explain the coexistence of multiple female color morphs. In the color polymorphic damselfly Ischnura elegans, mature
and immature female color morphs coexist at the mating site where males are in search for suitable mating partners. Here, we study male preference and female mating propensity for the two immature female morphs. As would be expected, compared to mature morphs, both immature female morphs mate much less. Within immature females, one morph consistently mates more frequently compared to the other morph, a pattern that is similar for the ontogenetically corresponding mature female morphs. Preference experiments with the two differently colored immature female morphs, however, did not indicate male mate preference for either morph. Low mating frequencies of immature females at natural sites in combination with relatively high attractiveness of immature models in terms of male preference indicate that female behavior influences female mating success." (Authors) Address: Huang, D.-y., Nanjing Inst. Geology & Paleontology, Chinese Acad. Sci., Nanjing 210008, PR China. E-mail: huangdiying@sina.com

7837. Ishizawa, N. (2009): Akatomo, "Red Dragonflies". Argia 21(2): 13-14. (in English) "[The note presents an English translation of the famous Japanese song, and reports on the current situation (2005) of aka tombo - Sympetrum frequens, now seems to be lost around the birthplace of the poet, Miki, Rofu.] Address: Ishizawa, N., 1644-15, Yamaguchi, Tokorozawa City, Saitama Pref., Japan. E-mail: sieba4318@rivo.mediati.net

7838. Johansson, F.; Soderquist, M; Bokma, F. (2009): Insect wing shape evolution: independent effects of migratory and mate guarding flight on dragonfly wings. Biological journal of the Linnean society 97(2): 362-372. (in English) "[Although, in some insect taxa, wing shape is remarkably invariant, the wings of Anisoptera dragonflies show considerable variation among genera. Because wing shape largely determines the high energetic costs of flight, it may be expected that interspecific differences are partly due to selection. In the present study, we examined the roles of long-distance migration and high-manoeuvrability mate guarding in shaping dragonfly wings, using a phylogeny-based comparative method, and geometric morphometrics to quantify wing shape. The results obtained show that migration affects the shape of both front and hind wings, and suggest that mate guarding behaviour may also have an effect, especially on the front wing. These effects on front wing shape are at least partly independent. Our findings are interesting when compared with the geographically widespread and ecologically diverse dipterans Acalyptrae (including the genus Drosophila). The wings in that group are similar in function and structure, but show strikingly low levels of interspecific variation." (Authors) Address: Johansson, F., Dept of Ecology and Environmental Science, Animal Ecology Group, Umea University, 90187 Umea, Sweden. E-mail: frank.johansson@eg.umu.se

7839. Johnson, J. (2009): Presumed Enallagma anna Williamson × carunculatum Morse hybrids from Oregon and California. Bulletin of American Odonatology 11(1): 8-10. (in English) "[Two presumed male E. anna × carunculatum hybrids, one from Crook County, Oregon, the other from Inyo County, California, are described and their abdominal terminalia are figured. Figures of E. anna and carunculatum are provided for comparison.]" (Author) Address: Johnson, J., 3003 Unander Avenue, Vancouver, WA 98660, USA. E-mail: jjohnson@comcast.net

7840. Johnson, J. (2009): Ophiocordyceps odonatae—An odonate-specific fungal pathogen. Argia 21(2): 4-5. (in English) "[The paper briefly reports on the fungus O. odonatae. Dr. Joey Spatafora (E-mail: spatafo@science.oregonstate.edu) from the Oregon State Arthropod Collection (OSAC) holds a specimen from Japan with this fungus noting that such a fungus is new known from the neotropics. Conscientized for fungi in Odonata specimens, a Gynacantha nervosa from the Dominican
Republic was traced which was infected by a fungal pathogen. The latter will be processed in near future.]

7841. Jones, B.R.; Bogdanowicz, S.M.; Jordan, S. (2009): Isolation and characterization of 16 polymorphic microsatellite loci in the endemic Hawaiian damselfly Megalagron xanthomelas (Odonata: Coenagrionidae). Molecular Ecology Resources 9(1): 165-167. (in English) *[Microsatellite loci have been isolated from two species of endemic Hawaiian damselflies, Megalagron xanthomelas and M. eudytum, that are of conservation concern. Sixteen polymorphic loci were characterized in 32 M. xanthomelas from one population on Molokai and one on Hawaii Island. The total number of alleles per locus ranged from two to 16 and observed population heterozygosity ranged from 0.0 to 0.963. Eleven of these loci amplified successfully in M. eudytum as well. These loci will be used to further conservation efforts and infer genetic consequences of Pleistocene glaciations.* (Authors)] Address: Jones, B., Dept of Biology, Bucknell University, Lewisburg, PA 17837, USA. E-mail: BRJones04@gmail.com

7842. Jorcin, A.; Nogueira, M.G.; Belmont, R. (2009): Spatial and temporal distribution of the zoobenthos community during the filling up period of Porto Primavera Reservoir (Paraná River, Brazil). Braz. J. Biol. 69(1): 19-29. (in English, with Portuguese summary) [*This study is part of the limnological monitoring undertaken by the Energy Company of the State of São Paulo (CESP) during the filling up process of the Porto Primavera Reservoir (Hydroelectric Power Plant Engenheiro Sérgio Motta). This reservoir, located in the high Paraná River between the States of São Paulo and Mato Grosso do Sul, is the fourth largest in the country. The first filling up phase started in December 1998 and the second phase in March 2001. Samples for benthic community and sediment characteristics analysis were quarterly collected between August of 1999 and November 2001 and also in August of 2002 (11 sampling campaigns). Samplings were carried out at 13 stations distributed in the reservoir, and at one point located downstream of the dam. 128 invertebrate taxa were identified [(including “Gomphidae” and “Aphylia”) ...]. Noticeable variations in the fauna density were observed, considering both different periods and locations. The maximum density of organisms (mean value of 7812 ind.m⁻²) was recorded in the center of the reservoir, and the minimum (mean value 9 ind.m⁻²) in the more lacustrine area near the dam. The greatest species richness per sample (24 taxa) was observed in the reservoir upstream (fluvial zone). The maximum diversity (Shannon-Wiener Index) per station/period, 3.82 and 3.86 bits.ind⁻¹, were calculated in the transitional river/reservoir zone during the beginning (August 1999) and in the reservoir central zones in the end (August 2002) of the filling up period, respectively. There was no clear relation between the distribution of the different faunistic groups and the sediment granulometric characteristics. However, the decrease or even total absence of invertebrates was observed at stations with high organic matter concentration (>40%) in a low degrada-
tion state (coarse detritus). This fact may be related to the lack of sediment deposits, which would cause difficulties to the fixation of the benthic fauna. Additionally, in those conditions more reduced chemical conditions are expected in function of the intense decomposition process of the flooded vegetation.* (Authors)] Address: Jorcin, A., Depto de Zoologia, Instituto de Biociências, Universidade Estadual Paulista – UNESP, Distrito de Rubião Júnior, CEP 18600-000, Botucatu, SP, Brazil. E-mail: ajorcin@ibb.unesp.br

7843. Jovic, M.; Malidzana, S. (2009): List of dragonflies in the collection of the national History Museum of Montenegro (Insecta: Odonata). Acta entomologica ser-bica 14(1): 121-124. (in English) [The Odonata collection of the Natural History Museum of Montenegro totals to 86 specimens representing 28 species. In most cases they were collected during the 2006 and 2007 summer seasons. The list contains about half of all known dragonfly species in Montenegro, including Coen-
agrion scitulum, which is here recorded for the first time from Montenegro. This species has a wide Medi-
terranean distribution but is most common in the west-
ern part of its range; it is considered a Least Concerned species on the Red List of Mediterranean Odonata (BOUDOT et al., 2009).] Address: Jovic, M., Natural History Museum Belgrade, Njegoševa 51, P.O. Box 401, YU-11000 Belgrade, Serbia. E-mail: milos.jovic @ nhmbeo.rs

7844. Jovic, M. (2009): Report on Macedonia 2008 project - Odonata. IDF-Report 21: 1-23. (in English) [Macedonia; in the period from 29 May till 12 June 2008, 34 Odonata species were collected and observed at 38 localities. The list of species e.g. includes Coen-
agrion ornatum, C. scitulum, C. pulchellum, Ophiogom-
phus cecilia, and Cordulegaster heros.] Address: Jovic, M., Natural History Museum, Njegoševa 51, P.O. Box 401, 11000 Belgrade, Serbia. email: milos.jovic @ nhmbeo.rs

distribution across 109 localities on the Crimean Peninsula is provided. The study is based on a literature review and a field survey between 1999 and 2008. Eryth-
romma lindenii and Epitheca bimaculata are here recor-
ded for the first time from Crimea. Diagnostic morpholo-
gical characters of Calopteryx splendens taurica and 
Orthetrum coerulescens ancesp are briefly described. Di-
scriptions of typical Crimean habitats of dragonflies are also presented. The necessity of the protection of Crimean freshwater habitats is discussed.*] Address: Khrokalo, Lyudmilla, Environmental biotech-
nology and bioenergy department, National Technical University of Ukraine “KPI”, Kyiv, Ukraine, ikhrokalo@-
m ail.ru

7846. Kim, S.-B.; Oh, H.-S.; Kim, W.-T.; Tadauchi, O. (2009): Phenetic analysis of the Anisoptera (Insecta: Odonata) in Jeju Island, Korea, based on morphological characters. J. Fac. Agr., Kyushu Univ. 54(1): 123-132. (in English) [*This study was conducted from April 2002 to September 2007 to investigate the relationships of 27 species of Anisoptera which were collected in wetlands of Jeju Island, using a phenetic analysis of external morphological characters. The generated phenogram revealed the presence of two superfamilies within An-
isoptera, Aeshnoidea and Libelluloidae. Moreover, the three groups, Aeshnidae, Libellulidae and Corduliidae, were clearly branched. As a result, the phenogram was similar to that of the ordinary systematic classification. The Aeshnidae was divided into Anax and Gynacantha, and Polycanthagyna and Aeschnophlebia. Three species of Anax (e.g., guttatus, parthenope and nigrofasci-
rivers and ditches. It is distributed in northern and eastern parts of Central Europe as well as in southern Scandinavia. In the past it has been introduced in other regions of Europe like France and Switzerland. Since several years S. aloides has been planted out in newly created ponds where it had rapidly overgrown most of the water surface. By introducing this neophyte conservationists intend to foster the pond fauna. However, the consequences for the pond ecosystem are disadvantageous. Allelopathic effects inhibit the growth of other aquatic plants within the pond. As a consequence, facets of biodiversity decrease and over-growing increases. The management of ponds should aim at creating habitats similar to the stagnant waters which existed more than 150 years ago, when the floodplains were still natural landscapes. [Author] Special emphasis is given to Aeshna viridis, and the disadvantageous effects of S. aloides in Swiss waterbodies for dragonflies and additional macrozoobenthic species. Address: Küry, D., Life Science AG, Greifengasse 7, 4058 Basel, Switzerland. E-mail: daniel.kuery@lifescience.ch

Küry, D. (2009): Krebschere (Stratiotes aloides) in Naturschutzweihern der Schweiz. Bauhinia 7848. Kohler, K.; Quast, M.; Sahlén, G. (2009): Morphological differences in the ovary of Libellulidae (Odonata). International Journal of Odonatology 12(1): 147-156. (in English) [All female Odonata have been assumed to produce oocytes continuously during their mature life span. However, a recent study of ovoviviparous orientation and development led to the suggestion that Libellulidae are divided into two groups of species, one with continuous, the other with stepwise ovocyte production. To find more evidence of this division, we compared the size variation and growth within the vitellarium of the ovary, studying oocytes, and follicle cells. We found that morphological characters discriminate between the two ovary types in eight of the 10 investigated species. In both types we found an increase in all measurements from the anterior to the posterior end of the vitellarium. The increase in oocyte width and follicle cell length was significantly higher in species with a continuous ovocyte production. We also noted that follicle cells may have more than one nucleus and that their number can vary during vitellogenesis. Our study confirmed the hypotheses that two different ovary types exist in Libellulidae. The two species not fitting into this grouping could be an artefact of small sample size due to intra-specific phenotypic plasticity, or else there might be more than two ovary groups, or even a continuum. We could not offer an explanation as to how the process of stepwise ovocyte production differs from continuous based production on morphological characters.] [Authors] Address: Koch, Kamilla, Department of Ecology, Johannes-Gutenberg University of Mainz, Becherweg 13, 55128 Germany. E-mail: kochka@uni-mainz.de

Koch, K.; Quast, M.; Sahlén, G. (2009): Morphological differences in the ovary of Libellulidae (Odonata). International Journal of Odonatology 12(1): 147-156. (in English) [All female Odonata have been assumed to produce oocytes continuously during their mature life span. However, a recent study of ovoviviparous orientation and development led to the suggestion that Libellulidae are divided into two groups of species, one with continuous, the other with stepwise ovocyte production. To find more evidence of this division, we compared the size variation and growth within the vitellarium of the ovary, studying oocytes, and follicle cells. We found that morphological characters discriminate between the two ovary types in eight of the 10 investigated species. In both types we found an increase in all measurements from the anterior to the posterior end of the vitellarium. The increase in oocyte width and follicle cell length was significantly higher in species with a continuous ovocyte production. We also noted that follicle cells may have more than one nucleus and that their number can vary during vitellogenesis. Our study confirmed the hypotheses that two different ovary types exist in Libellulidae. The two species not fitting into this grouping could be an artefact of small sample size due to intra-specific phenotypic plasticity, or else there might be more than two ovary groups, or even a continuum. We could not offer an explanation as to how the process of stepwise ovocyte production differs from continuous based production on morphological characters.] [Authors] Address: Koch, Kamilla, Department of Ecology, Johannes-Gutenberg University of Mainz, Becherweg 13, 55128 Germany. E-mail: kochka@uni-mainz.de

Küry, D. (2009): Krebschere (Stratiotes aloides) in Naturschutzweihern der Schweiz. Bauhinia 7848. Kohler, K.; Quast, M.; Sahlén, G. (2009): Morphological differences in the ovary of Libellulidae (Odonata). International Journal of Odonatology 12(1): 147-156. (in English) [All female Odonata have been assumed to produce oocytes continuously during their mature life span. However, a recent study of ovoviviparous orientation and development led to the suggestion that Libellulidae are divided into two groups of species, one with continuous, the other with stepwise ovocyte production. To find more evidence of this division, we compared the size variation and growth within the vitellarium of the ovary, studying oocytes, and follicle cells. We found that morphological characters discriminate between the two ovary types in eight of the 10 investigated species. In both types we found an increase in all measurements from the anterior to the posterior end of the vitellarium. The increase in oocyte width and follicle cell length was significantly higher in species with a continuous ovocyte production. We also noted that follicle cells may have more than one nucleus and that their number can vary during vitellogenesis. Our study confirmed the hypotheses that two different ovary types exist in Libellulidae. The two species not fitting into this grouping could be an artefact of small sample size due to intra-specific phenotypic plasticity, or else there might be more than two ovary groups, or even a continuum. We could not offer an explanation as to how the process of stepwise ovocyte production differs from continuous based production on morphological characters.] [Authors] Address: Koch, Kamilla, Department of Ecology, Johannes-Gutenberg University of Mainz, Becherweg 13, 55128 Germany. E-mail: kochka@uni-mainz.de
original description of I. ancilla Selys, 1860 (the type species of the genus) and with specimens identified as that species. Diagnostic illustrations and notes on Idionura distribution and biology are provided." (Author) Address: Lencioni, F.A.A.,Rua Aníbal, 216 – Jardim Colegíno – Jacarei – São Paulo – Brazil - CEP (ZIP) 12310-780. Email: odonata@zygoptera.bio.br

7851. Leuthold, W. (2009): Libellen (Odonata) im Neeracherried (Kanton Zürich). Das Artenspektrum und seine Veränderungen in 20 Jahren. Vierteljahresschrift der Naturforschenden Gesellschaft in Zürich 154(1/2): 21-29. (in German, with English summary) [The Odonata of the Neeracherried, a 100 ha marsh in the Canton of Zürich, Switzerland, a total of 42 species was recorded (25 Anisoptera; 17 Zygoptera) – nine species more than were found in a similar study some 20 years ago. "Two then fairly widespread species have apparently disappeared (Sympertrum flavoeolum and Lestes dryas). The differences in species composition are probably due to several factors such as long-term habitat changes, measures of habitat management, changes in distribution of individual species and some differences in the methods of study. – A fairly sizeable population of the critically endangered Lestes virens (still) exists in the Neeracherried." (Author) Address: Leuthold, W., Kinkelstr. 61, CH-8006 Zürich, Switzerland. Email: wleuthold@bluewin.ch

7852. Levine, T.D.; Lang, B.K.; Berg, D.J. (2009): Parasitism of mussel gills by dragonfly nymphs. The American Midland Naturalist 162(1): 1-6. (in English) ["Predators of unionid mussels are generally identified as fishes or aquatic mammals. During a mark and recapture study of the critically endangered mussel Popenaias poppei, we discovered a nymph of the dragonfly Gomphus militaris eating the gills of a gravid mussel; larvae and gill material were found in the nymph’s gut. Many (15.2%) of the other mussels captured during a quantitative survey exhibited damage consistent with that inflicted by this dragonfly. Few non-gravid mussels were damaged and gravid mussels exhibited substantially more damage in gills used for brooding larvae than in gills not typically used for brooding. This previously unreported parasitic relationship may reflect a unique cost associated with reproduction and should be considered in the development of conservation strategies for P. poppei. Our observations underscore the need for basic ecological data when monitoring endangered species." (Authors)]

7853. Li, Z.-x.; Shen, W.; Tong, G.-s.; Tian, J.-m.; Yu-Quoc, L. (2009): On the vein-stiffening membrane structure of a dragonfly hind wing. Journal of Zhejiang University Science A 10(1): 72-81. (in English) ["Aiming at exploring the excellent structural performance of the vein-stiffening membrane structure of dragonfly hind wings, we analyzed two planar computational models and three 3D computational models with cambered corrugation based on the finite element method. It is shown that the vein size in different zones is proportional to the magnitude of the vein internal force when the wing structure is subjected to uniform out-of-plane transverse loading. The membrane contributes little to the flexural stiffness of the planar wing models, while exerting an immense impact upon the stiffness of the 3D wing models with cambered corrugation. If a lumped mass of 10% of the wing is fixed on the leading edge close to the wing tip, the wing fundamental frequency decreases by 10.7%~13.2%; if a lumped mass is connected to the wing via multiple springs, the wing fundamental frequency decreases by 16.0%~18.0%. Such decrease in fundamental frequency explains the special function of the wing pterostigma in alleviating the wing quivering effect. These particular features of dragonfly wings can be mimicked in the design of new-style reticulated stiffening thin-walled roof systems and flapping wings in novel intelligent aerial vehicles." (Authors) Address: Li, Z.-x., Institute of Structural Engineering, Zhejiang University, Hangzhou 310058, China. Email: lizx19993@zju.edu.cn

7854. Locklin, J.L.; Vodopich, D.S. (2009): Bidirectional gender biases of gregarine parasitism in two coexisting dragonflies (Anisoptera: Libellulidae). Odonatological 38(2): 133-140. (in English) ["Parasitism affects all taxa and influences individual and population success. Parasitism of adult dragonflies is widespread and frequently includes gregarine (Apicomplexa) life stages in the gut of the host. This research investigates variation in gregarine parasite prevalence and load in male versus female adults of Erythemis simplicicollis and Brachymesia gravaida associated with 2 central Texas reservoirs in close proximity. Parasite prevalence was biased toward male E. simplicicollis and toward female B. gravaida. Results suggest that gender bias in parasite prevalence is influenced by gender behaviour and environment more so than by immuno-response differences between genders." (Authors) Address: Locklin, J.L., Dept of Biology, Baylor University, One Bear Place 76798, Waco, TX 97388, USA. Email: jasonlocklin@baylor.edu

7855. Machado, A.B.M. (2009): Denticulobasis and Tuberculobasis, new genera close to Leptobasis, with description of ten new species (Odonata: Coenagrionidae). Zookeys 2108: 1-36 (2009): 1-36. (in English) ["Two new genera, Denticulobasis and Tuberculobasis, are described. Denticulobasis contains three species: D. dunklei sp. nov. from Loreto, Peru, and D. garrisoni sp. nov. and D. arikon sp. nov. from Rondônia, Brazil. Tuberculobasis includes 12 species, all from South America, seven of which are new, viz.: T. arara sp. nov. from Rondônia, Brazil, T. gejskesi sp. nov. from Suriname, T. guarani sp. nov. from São Paulo, Brazil, T. larijana sp. nov. from Rondônia, Brazil, T. macuxi sp. nov. from Roraima, Brazil, T. tino sp. nov. from Pará, Brazil, and T. williamsoni sp. nov. from Colombia and Venezuela. Five species are herein transferred from Leptobasis Selys, 1877 to Tuberculobasis: L. cardinals (Frase, 1946), L. costalimai Santos, 1957, L. inversa Selys, 1876, L. mammilaris Calvert, 1909, and L. yanomami De Marmels, 1992. The new genera are close to Leptobasis; differences between them are analyzed and their diagnostic characters are described. In addition, diagnostic characters of females of three species of Tuberculobasis, most likely new, are illustrated but they are not named. A key for males and females of Tuberculobasis is provided, and an attempt to understand the life cycle is made." (Author) Address: Machado, A.B.M., Departamento de Zoologia, Instituto de Ciências Biológicas, Universidade Federal de Minas Gerais, Caixa Postal 486, BR 31270-901, Belo Horizonte, Minas Gerais, Brasil. Email: angelo@icb.ufmg.br

59. (in English) "The survival of hibernating adults was assessed in its winter habitat in the Netherlands to gain insight in the potential importance of this life-history phase for the population dynamics of this endangered species. Compared to other Odonata, monthly survival rates (Dec. 2004 - March 2005) were high (mean ± SE = 0.75 ± 0.08), but overall winter survival was low (0.42). Potential causes of mortality during hibernation are discussed. The results imply that effective protection of this species in the Netherlands may benefit from the protection of both its breeding and wintering habitat." [Address: Manger, R., Stoepveldsingel 55, 9403 SM Assen, The Netherlands. E-mail: rmanger@planet.nl

7857. Marinov, M. (2009): Spatial modelling of dragonfly habitats in New Zealand (Odonata: Insecta). Dissertation. Master of Applied Sciences, Lincoln Univ., Christchurch, New Zealand: VI, 50 pp., 15 app. (in English) "While New Zealand is poor in Odonata species the seventeen species thus far established have great natural importance (Moore 1989). Ten of them are endemic to the islands representing the country. Those include four genera known to occur only in this part of the world (Rowe 1987). This poses a great responsibility on New Zealand to protect this natural treasure. Damselflies and dragonflies are considered well protected within the national parks, but the loss of habitats could severely impact them in the future. This suggests that a habitat assessment should be prepared for the whole country that will serve as base-line data set for monitoring the development of the natural environment for the Odonata species in New Zealand. Fourteen species have been selected for this analysis. Their biological features and ecological requirements were considered in preparing a working habitat assessment methodology. Habitat models were developed using ArcGIS 9.2 software. Multistep spatial analysis was carried out to reclassify the layers containing the important information on the land topology representing crucial elements in the Odonata species habitats. The final outputs are individual species maps where the New Zealand territory is marked with four different colour classes corresponding to the ranks of importance that each area is considered to have for individual species. The models are named probabilistic in that they reveal the areas where the ecological demands of the species are approached at a maximum level. However, they should not be used as distribution maps. Probabilistic models are contrasted against deterministic models used in other Odonata habitat models. The strengths and weaknesses are discussed and some important conclusions and recommendations are described and suggested." [Author] Address: Marinov, M., 5/160 Rossall Str., Merivale, Christchurch, New Zealand. E-mail: mgmarinov@mail.bg

7858. McMeeking, RM; Ma, LF; Arzt, E. (2009): Mechanism maps for frictional attachment between fibrillar surfaces. Journal of applied mechanics - Transactions of the ASME 76(3) [Art. No. 031007]: 8 pp. (in English) "The mechanics of frictional attachment between surfaces with pillars, inspired by the head fixation system of dragonflies, is analyzed. The system consists of two surfaces of interdigitating pillars held together through friction, as by the densely packed bristles of two brushes when pressed together. The adhesive strength of the system is promoted by high elastic modulus, high friction coefficient, large aspect ratio, and dense packing of the fibers. However, the design is limited by the compressive buckling, the compressive indentation or cracking of the contacting pillars, yielding in shear or similar mechanisms that limit the achievable friction stress, and tensile failure of the pillars upon pull-out. Maps, which summarize the strength of the adhesive system and the failure limits and illustrate the trade-off among the design parameters, are presented. Case studies for steel, nylon, and ceramic pillars show that useful strength can be achieved in such attachments; when buckling during assembly and contact failure can be avoided, adhesive performance as high as 30% of the tensile strength of the pillar material may be possible." [Authors] Address: Arzt, E., Leibniz Institute for New Materials (INM), Campus D2 2, 66123 Saarbrücken, Germany

7859. McPeek, M.A.; Shen, L.; Farid, H. (2009): The correlated evolution of three-dimensional reproductive structures between male and female damselflies. Evolution 63(1): 73-83. (in English) "For many taxa, species are defined by the morphologies of reproductive structures. In many odonates, these structures are the cerci of males (used to hold females during mating) and the thoracic plates of females where the male cerci contact the females' bodies. A previous study showed that the shapes of cerci of Enallagma males (Zygoptera: Coenagrionidae) are best explained by an evolutionary model of punctuated change at the time of speciation, with a homogeneous rate of change across the entire phylogeny of the genus. In the present study, we examine the evolution of shape change in the corresponding female plates. We found that, like male cerci, the shapes of Enallagma female thoracic plates could best be explained by an evolutionary model of punctuated change at the time of speciation, with a homogeneous rate of change across the clade. Moreover, the evolutionary contrasts quantifying the rates of change in male cerci and female thoracic plates were positively related across the history of the clade, demonstrating that these male and female structures evolve in a correlated fashion. This pattern of evolution suggests that these structures are primary signals of species identity during mating." [Authors] Address: McPeek, M., Dept Biol. Sci., Dartmouth College, Hanover, New Hampshire 03755, USA. E-mail: mark.mcpeek@dartmouth.edu

7860. Muzón, J.; Weigel Munoz, S.; Campos, R. (2009): Description of the bromeliad-dwelling final instar larva of Leptagion andromache Hagen in Selys (Zygoptera: Coenagrionidae). Zootaxa 2089: 65-68. (in English) [Specimens examined: 3 males 2 females, reared final instar larvae; Argentina, Misiones province, Parque Nacional Igazu, 25°39'S, 54°18'W, October to November 2005, leg., R. Campos and M. Mogi. All specimens deposited in the collection of the Departamento Entomología, Museo de La Plata.] Address: Muzón, J., Instituto de Limnología "Dr. R. A. Ringuet" (CONICET - CCT La Plata), C.C. 712, 1900, La Plata, Argentina. E-mail: muzon@ipla.edu.ar

7861. Möller, A.P.; Mousseau, T.A. (2009): Reduced abundance of insects and spiders linked to radiation at Chernobyl 20 years after the accident. Biology letters 5(3): 356-359. (in English) "[Effects of low-level radiation on abundance of animals are poorly known. We conducted standardized point counts and line transects of bumble-bees, butterflies, grasshoppers, dragonflies and spider webs at forest sites around Chernobyl differing in background radiation by over four orders of mag-
itude. Abundance of invertebrates decreased with increasing radiation, even after controlling for factors such as soil type, habitat and height of vegetation. These effects were stronger when comparing plots differing in radiation within rather than among sites, implying that the ecological effects of radiation from Cherno- nobyl on animals are greater than previously assumed. [...] The total number of dragonflies was 105 during point counts, with abundance decreasing significantly with radiation, time of day and habitat." (Authors) Address: Müller, A.P., Department of Biological Sciences, University of South Carolina, Columbia, SC 29208, USA. E-mail: anders.moller@u-psud.fr

7862. Nagel, L.; Robb, T.; Forbes, M.R. (2009): Parasite-mediated selection amidst marked inter-annual variation in mitosis parasitism and damselfly life history traits. Ecology 16(2): 265-270. (in English) "[Para-site-mediated selection in host populations is thought to vary in magnitude temporarily. We monitored variation in life history traits that are known or suspected to influence fitness in a population of damselflies parasitized by larval water mites. Mite prevalence and intensity varied considerably over 5 y and was often higher in females. Prevalence and intensity were highest in the years when the damselfly emergence periods were early and of short duration, which also corresponded to damselflies emerging at larger sizes. Mites appeared to exert negative effects on apparent survival in some years only, and only for females, suggesting that parasite-mediated selection on damselflies is variable and dependent on other factors such as emergence times, weather, and sex and body size of hosts." (Authors) Address: Forbes, M.R., Dept of Biology, Carleton University, 587 Tory Building, 1125 Colonel By Drive, Ottawa, ON K1S 5B6, Canada. E-mail: mforbes@ccs.carleton.ca


7865. Ninomiya, T.; Yoshizawa, K. (2009): A revised interpretation of the wing base structure in Odonata. Systematic Entomology 34(2): 334-345. (in English) "[Homology of the wing base structure in the Odonata is highly controversial, and many different interpretations of homology have been proposed. In extreme cases, two independent origins of insect wings have been suggested, based on comparative morphology between the odonate and other pterygote wing bases. Difficulties in establishing homology of the wing base structures between Odonata and other Pterygota result mainly from their extreme differences in morphology and function. In the present paper, we establish homology of the wing base structures between Neoptera, Ephemeroptera and Odonata using highly conservative and unambiguously identifiable characters (the basal wing hinge and subcostal veins) as principal landmarks. Homology of the odonate wing base structure with those of Ephemeroptera and Neoptera can be identified reliably. Based on this interpretation, the ancestral condition of the insect wing base structure is discussed." (Authors) Address: Yoshizawa, K., Systematic Entomology, Graduate School of Agriculture, Hokkaido University, Sapporo 060-8589, Japan. E-mail: psocid@res.agr.hokudai.ac.jp

7866. Novelo-Gutiérrez, R.; Gómez-Anaya, J.A. (2009): A comparative study of Odonata (Insecta) assemblages along an altitudinal gradient in the sierra de Coalcomán Mountains, Michoacán, Mexico. Biodivers. Conserv. 18: 679-698. (in English) "[Odonate diversity in the Coalcomán Mountain Range (CMR), Michoacán State, Mexico, was surveyed, and samplings were made during 2 years in eight streams along an altitudinal gradient. Presence–absence data were analyzed using non-parametric and parametric methods. Beta and gamma diversities were estimated using Whittaker’s and Lande’s formulae, respectively. A total of 2,526 adults and 489 larvae were captured, yielding 116 species (c diversity), 44 genera and 9 families. 5 new species were discovered. The genus Argia was the most important contributor to Zygoptera diversity and total richness (c diversity), yielding 40.4 and 14.7%, respectively. The non-parametric estimator Chao2 provided the closest theoretical estimate of species richness, and Chench’s model fit the data well (R2 ranged from 99.44 to 99.99) to explain a high proportion of the variance (98.8). We conclude that beta diversity is important at the landscape scale, supporting the hypothesis that Mexico is a beta diverse country. Our results triple the number of known species of Odonata for Michoacán. Given the considerable richness of odonates at local and landscape scales, our results support the proposal of the Coalcomán Mountain Range as a priority area for conservation and related research." (Authors) Address: Novelo-Gutiérrez, R., Depto 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

7867. Oberholster, P.J.; Botha, A.-M.; Ashton, P.J. (2009): The influence of a toxic cyanobacterial bloom and water hydrology on algal populations and macroinvertebrate abundance in the upper littoral zone of Lake Krugersdrift, South Africa. Ecotoxicology 18(1): 34-46. (in English) "[The biological interactions and the physical and chemical properties of the littoral zone of Lake Krugersdrift were studied for a 4-month period when a dense, toxic cyanobacterial bloom dominated by Microcystis aeruginosa was present in the main lake basin. The presence of a toxic strain of M. aeruginosa was confirmed through the use of ELISA and molecular markers that detect the presence of the mcyB and mcyD genes of the mcy gene cluster that synthesizes microcystin. An increase in Microcystis toxicity at sites dominated by the cyanobacterial scum was accompanied by an increase in total abundance of the macroinvertebrate families Hirudinidae, Chironomidae, and Tubificidae. Sites located away from the cyanobacterial
scum had a lower abundance but a higher diversity of macroinvertebrates (including Coenagrionidae). The water quality under the Microcystis scum was characterized by low pH values, low concentrations of dissolved oxygen, and lower total alkalinity values. The periphytic alga Ulothrix zonata was absent in areas dominated by the cyanobacterial scum, possibly as a result of overshadowing by the scum or direct toxic allelopathic effects on growth and photosynthesis. The diatom Diatomium vulgaris dominated the benthic algal flora beneath the cyanobacterial scum."  [Authors] Address: Oberholster, F.J., CSIR Natural Resources and the Environment, PO Box 395, Pretoria ZA0001, South Africa. E-mail: anna.oberholster@up.ac.za

7868. Obolewski, K.; Glińska-Lewczuk, K.; Kobs, S. (2009): An attempt at evaluation the influence of water quality on the qualitative and quantitative structure of epiphytic fauna dwelling on Stratiotes aloides L., a case study on an oxbow lake of the Lyna river. J. Elemental. 14(1): 119-134. (in English, with Polish summary) "[The paper contains the results of a study on the dependence of the qualitative and quantitative structure of the phythophilous macrofauna dwelling on S. aloides (water soldier) on the quality of waters in a lentic oxbow lake of the Lyna River. The observations were carried out during the vegetative season (April – June) 2006 at high and moderate water levels. During the study, a total of 18 taxa of invertebrates dwelling on the above plant species were identified, with the exact number of taxa varying in time: 11 taxa were noticed in April and May, and in June their number went up to 13. The examination of hydrochemical parameters of the oxbow lake waters revealed that the density of macrofauna was lower at higher values of proper conductivity and macronutrients, ammonia nitrogen and COD, increasing at high levels of sulphates. High concentrations of ammonia nitrogen and non-organic components coincided with decreased biomass of epiphytic animals on water soldier. Additionally, it has been observed that elevated concentrations of potassium ions have a negative influence on the biomass of most epiphytic animals (except Eppodella sp.).]"  [Authors] The biomass of Odonata is considered in tables and graphs.] Address: Obolewski, K., Chair of Land Reclamation and Management, University of Warmia and Mazury, pl. Łódzki 2, Olsztyn-Kortowo 10-719, Poland. E-mail: obolewsk@apsl.edu.pl

7869. Parkes, K.A.; Amos, W.; Moore, N.W.; Hoffman, J.I.; Moore, J. (2009): Population structure and speciation in the dragonfly Sympetrum striolatum / nigrescens (Odonata: Libellulidae): An analysis using AFLP markers. Eur. J. Entomol. 106(2): 179-184. (in English) "[There has been a long-standing debate as to whether Sympetrum striolatum (Charpentier, 1840) and the darker northern form, S. nigrescens (Lucas, 1912) should be recognised as separate species of dragonfly. Here we address this question using genetic analysis based on AFLP markers and samples collected from sites across the species’ United Kingdom range. The program STRUCTURE finds no support for specific clusters. Instead, it reveals strong patterns of divergence between populations sampled from Scottish islands and those on the mainland, suggesting that salt water is a major barrier to gene flow. Thus, the dark form is quite likely to reflect a beneficial polymorphism that allows individuals to take advantage of short periods of warmer weather. Our AFLP markers appear to be very rapidly evolving, showing little or no overlap between congen-eric species, and hence are ideally suited to answering questions relating to the levels of gene flow among populations within species."

7870. Paulson, D. (2009): Dragonflies and Damselflies of the West. Princeton University Press: 536 pp. (in English) [This book is the first fully illustrated field guide to all 348 species of Odonata in western North America. Every species is generously illustrated with 863 full-colour photographs and a distribution map, and structural features are illustrated where they aid in-hand identification. Detailed species accounts include information on size, distribution, flight season, similar species, habitat, and natural history. Dennis Paulson’s introduction provides an essential primer on the biology, natural history, and conservation of Odonata along with helpful tips on how to observe and photograph them.] Address: http://press.princeton.edu/titles/8871.html

7871. Paulson, D. (2009): Larval Tiger beetles eat dragonflies. Argia 21(2): 13. (in English) [On 9-V-2009 at Red Slough Wildlife Management Area, McCurtain County, Oklahoma, USA, two mature male Erythemis simplicicollis were found that had been captured by larval tiger beetles (Cicindela sp.)] Address: Paulson, D. R., Slater Museum, Univ. of Puget Sound, Tacoma, WA 98416, USA. E-mail: dpaulson@ups.edu

7872. Pinto, A.P.; Carvalho, A.L. (2009): On a small collection of dragonflies from Barcarena Municipality, Pará State, Brazil, with the rediscovery of Acanthallagma luteum Williamsson & Williamson. Bulletin of American Odonatology 11(1): 11-16. (in English, with Spanish summary) "[A small series of 42 specimens of Odonata from the Barcarena municipality, northern Brazil, is brought on record. 18 species belonging to the families Calopterygidae, Coenagrionidae, and Libellulidae were identified. The rare species Acanthallagma luteum Williamsson & Williamson is reported for the first time after its description on the Libellulidae Erythrodplax fusca (Rambur), Gynothemis pumila (Karsch), Orthemis ferruginea (Fabricius) and Zenithoptera lanieli Sants.]

7873. Poomima, V.; Mathai, M.T.; Inbaraj, R.M. (2009): Analysis of ecdysterone in Bradinopyga geminata (Rambur) larvae by reverse phase - high performance liquid chromatography, RP-HPLC (Anisoptera: Libellulidae). Odonatologica 38(1): 61-65. (in English) "[Ecdysterone or 20-hydroxyecdysone (20E) is a polyhydroxylated ecdysone that plays a major role in insect growth and metamorphosis. The 20E level was analyzed in 2 larval instars of the dragonfly using RP-HPLC. The presence of 20E was demonstrated for the first time in dragonflies, with the higher levels occurring in the older larval instar (larger larvae), while in the younger instar (smaller larvae) low or negligible levels were recorded. This has implications for extending the use of odonate larvae as biocontrol agents in aquatic ecosys-
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7875. Reece, B.A.; McIntyre, N.E. (2009): Community assemblage patterns of odonates inhabiting a wetland complex influenced by anthropogenic disturbance. Insect Conservation and Diversity 2(2): 73-80. (in English) ["Many wetland complexes around the world are highly influenced by human activity (chiefly land conversion for agriculture). Measuring the impact of such activity hinges not only upon using appropriate wetland indicator taxa but also upon metrics that are sensitive enough to capture subtle effects. 2. Over a 5-year period, we quantified the distribution and community structure of odonates occupying a wetland complex in Texas. When using traditional community metrics, there were no significant differences in diversity or evenness in the odonate assemblages in wetlands surrounded by the two dominant regional forms of land use (tilled cropland and grassland). Similarity analyses likewise failed to detect any significant differences in odonate community composition with land use. 3. Discriminant function analysis, however, revealed that species co-occurrences could be distinguished on the basis of surrounding land use, which indicates that odonate assemblages in these wetlands are structured in a manner that typical community metrics fail to adequately describe. 4. Differences between the approaches are discussed, particularly with regard to the use of presence-absence data." (Authors)] Address: Reece, B.A., McIntyre, Nancy, Department of Biological Science, Texas Tech University, Lubbock, TX 79409-3131, USA. E-mail: nancy.mcintyre@ttu.edu

7876. Reece, B.A.; McIntyre, N.E. (2009): Odonata of Playas in the southern high plains, Texas. The Southwestern Naturalist 54(1): 96-99. (in English, with Spanish summary) ["Playas represent the only natural source of above-ground freshwater in the southern High Plains of North America; there are >20,000 such wetlands in the Panhandle of Texas (area of the highest concentration of playas). Many organisms use these small, ephemeral ponds during some stage of their life histories; […] of this otherwise semi-arid region require these aquatic habitats for larval development. Relatively few distributional records have been established for Odonata in this region, so we conducted a baseline survey to assess distributional patterns of odonates in playas. 5 seasons of observation and collection yielded important presence-absence data, resulting in 110 county records for the 16 counties in the study area." (Authors)] Address: Reece, B.A., Dept of Biological Sciences, Texas Tech University, Lubbock, TX 79409-3131, USA. E-mail: b.reece@ttu.edu


7878. Remsburg, A.J.; Turner, M.G. (2009): Aquatic and terrestrial drivers of dragonfly (Odonata) assemblages within and among north-temperate lakes. J. N. Am. Benthol. Soc., 2009, 28(1):44-56. 44-56. (in English) ["The physical structure of vegetation influences diversity, interactions, movement, and thermoregulation of animals. Vegetation structure might be a good indicator of habitat requirements of generalist predators, such as Odonata, and thereby affect species diversity. Odonates use aquatic and terrestrial habitats during larval and adult life stages, respectively, but the relative importance of vegetation in these habitats is poorly understood. We compared how aquatic and riparian habitat variables affected odonate larvae from 41 sites (each 30 m in shoreline length) on 17 lakes in northern Wisconsin. We used principal components analyses to reduce multiple habitat variables to 2 lakelevel axes (lake size and development, lake wetlands and predators), 2 site-level littoral axes (littoral macrophytes, littoral muckiness), and 2 site-level riparian axes (riparian structural complexity, riparian tall wetland plants). Most (61.6%) of the variance in larval species richness occurred at the site level. Density of the most abundant family, Gomphidae, was positively related to riparian tall wetland plants, whereas species richness was positively correlated with abundance of littoral macrophytes (on the basis of multiple linear regression with an information theoretic approach). Surveys in 18 paired littoral microsites in 9 lakes indicated that larvae from the despiger and sprawler behavioral guilds were most abundant in microsites with submerged macrophytes. However, predation risk, assessed by tethering larvae in patches of submerged macrophytes, did not differ between habitats with and without macrophytes. We tested whether shoreline plants affected recruitment from the adult stage by comparing adult odonate behaviors in response to 2 riparian vegetation treatments. Adult damselfly abundance was higher where we placed potted wetland plants than at manicured lawns without tall vegetation. Our results indicate that odonate larvae might be influenced by vegetation structure in both aquatic and riparian habitats and demonstrate how animals with complex life histories link aquatic and terrestrial communities." (Authors)] Address: Remsburg, Alysa, Biodiversity Center, Unity College, Unity, Maine 04988 USA. E-mail: aremsburg@unity.edu

7879. Rojas-R., N.C.; Sánchez, M. (2009): New records of Acanthagrion (Odonata: Coenagrionidae) from Colombia. Bulletin of American Odonatology 11(1): 17-19. (in English, with Spanish summary) ["7 species of Acanthagrion, A. abuanae, A. adustum, A. inexpectum, A. minutum, A. vidua, A. peruvianum, and A. viridescens, are newly reported from Colombia and characters that differ from the original descriptions are mentioned, thus expanding their known variability." (Authors)] Address: Sánchez, Melissa, Museo de Historia Natural, Universidad de los Andes, Bogotá, Colombia. Email: mel-sanc@uniandes.edu.co

7880. Rose, J.S. (2009): Dragonfly Days 2009. Argia 21(2): 3-4. (in English) [60 Odonata species were recorded along the Dragonfly Days at 23-25-V-2009 held in Texas, USA and spotting several regional localities for Odonata. The activities resulted e.g. in a first sighting...
of Leptobasis vaccillans for USA.] Address: E-mail: opihig@grvrr.com

7881. Sarzetti, L.C.; Labandeira, C.C.; Muzón, J.; Will, P.; Cúneo, N.R.; Johnson, K.R.; Genise, J.F. (2009): Odonatan endophytic oviposition from the Eocene of Patagonia: The ichnogenus Paleooovoidus and implications for behavioral stasis. Journal of Paleontology 83(3): 431-447. (in English) [We document evidence of endophytic oviposition on fossil compression / impression leaves from the early Eocene Laguna del Hunco and middle Eocene Río Pichileufú floras of Patagonia, Argentina. Based on distinctive morphologies and damage patterns of elongate, ovoid, lens-, or teardrop-shaped scars in the leaves, we assign this insect damage to the ichnogenus Paleooovoidus, consisting of an existing ichnospecies, P. rectus, and two new ichnospecies, P. arcuatum and P. bifurcatus. In P. rectus, the scars are characteristically arranged in linear rows along the midvein; in P. bifurcatus, scars are distributed in double rows along the midvein and parallel to secondary veins; and in P. arcuatum, scars are deployed in rectilinear and arcuate rows. In some cases, the narrow, angulate end of individual scars bear a darkened region encompassing a circular hole or similar feature indicating ovipositor tissue penetration. A comparison to the structure and surface pattern of modern ovipositional damage on dicotyledonous leaves suggests considerable similarity to certain zygodopteran Odonata. Specifically, members of the Lestidae probably produced P. rectus and P. bifurcatus, whereas species of Coenagrionididae were responsible for P. arcuatum. Both Patagonian localities represent an elevated diversity of potential fern, gymnosperm, and especially angiosperm hosts, the targets of all observed oviposition. However, we did not detect targeting of particular plant families. Our results indicate behavioral stasis for the three ovipositional patterns for at least 50 million years. Nevertheless, synonymy of these oviposition patterns with mid-Mesozoic ichnospecies indicates older origins for these distinctive modes of oviposition." [Authors] Address: Muzón, J., Inst. Limnol. "Dr. R.A. Ringuet", C.C. 712, AR-1900 La Plata, Argentina. E-mail: muzon@iplia.edu.ar

7882. Schouten, M.A.; Verweij, A.; Barendregt, A.; Kleukers, R.M.J.; Kalkman, V.J.; de Ruiter, P.C. (2009): Determinants of species richness patterns in the Netherlands across multiple taxonomic groups. Biodiversity and Conservation 18: 203-217. (in English) ["We examined the species richness patterns of five different species groups (mosses, reptiles and amphibians, grasshoppers and crickets, dragonflies, and hoverflies) in the Netherlands (41,500 km²) using sampling units of 5 9 5 km. We compared the spatial patterns of species richness of the five groups using Spearman’s rank correlation and used a stepwise multiple regression generalized linear modelling (GLM) approach to assess their relation with a set of 36 environmental variables, selected because they can be related to the several hypotizes on biodiversity patterns. Species richness patterns of the five groups were to a certain extent congruent. Our data suggest that environmental heterogeneity (in particular habitat heterogeneity) is one of the major determinants of variation in species richness within these five groups. We found that for taxonomic groups comprising a low number of species, our regression model explained more of the variability in species richness than for taxonomic groups with a large number of species." [Authors] Address: Schouten, M.A., Department of Environmental Sciences, Copernicus Institute for Sustainable Development and Innovation, Utrecht University, P.O. Box 80115, 3508 TC Utrecht, The Netherlands. E-mail: m.a.schouten@uu.nl

7883. Schultz, T.D. (2009): Diversity and habitats of a prairie assemblage of Odonata at Lostwood National Wildlife Refuge, North Dakota. Journal of the Kansas Entomological Society 82: 91-102. (in English) [An inventory of the Odonata at the Lostwood National Wildlife Refuge (LNWR) was conducted during the summer of 2003. Adult censuses and larval sampling at 32 wetland sites produced 10 dragonfly and 14 damselfly species that were resident in the refuge. In 2006, two additional species were added. The odonate fauna of LWNR consisted primarily of widespread, common species that are adapted to fishless lentic communities and tolerant of alkaline and impermanent water regimes. Enallagma annexum, E. boreale, Lestes disjunctus, L. congener, Sympetrum costiferum, and S. internum were the most abundant odonates at the refuge. The odonate communities of semipermanent, oligosaline ponds were the most diverse and included species of Aeshna, Anax, Libellula, Leucorhinia, Sympetrum, Lestes, Coenagrion, Enallagma, Ischnura, and Nehalennia. Large polysaline lakes were inhabited only by Ischnura damula and four species of Enallagma. Seasonal ponds that remained flooded until mid-July produced large numbers of S. internum, L. disjunctus, and L. unguiculatus. Spring-fed bogs and fens supported several species that were rare at the refuge including Sympetrum danae, S. semicinctum, and Amphaiogria abbreviatum. Long-term monitoring of odonate diversity and abundance may be useful in tracking the effects of climate change in the prairie pothole region but must take into account yearly fluctuations due to variation in winter and summer precipitation." [Author] Address: Schultz, T.D., Department of Biology, Denison University, Granville, OH, USA 43023 Schultz@denison.edu

7884. Simaika, J.P. (2009): Diversity of Nature’s Valley damsels and dragons: Groot river. Nature’s news (Newsletter of the Nature’s Valley Trust) 25: 4-6. (in English) [The paper gives a brief introduction to the 14 species recorded at the Groot River so far. Nearly half are endemic to South Africa, and of these, four are restricted to the southern Cape.] Address: www.naturesvalleytrust.co.za

7885. Simaika, J.P.; Samways, M.J. (2009): Reserve selection using Red Listed taxa in three global biodiversity hotspots: Dragonflies in South Africa. Biological Conservation 142(3): 638-651. (in English) ["The Red List can be used a gauging tool by conservationists to assess which species require focused conservation attention. Mapping the relative distributions of species, and identification of centers of richness, endemism and threat are a first step towards site-oriented conservation action. We use here a specially developed biodiversity index, based on three weighted sub-components assigned to each species: geographical distribution, Red List status, and sensitivity to habitat change. We test this approach using what is called here the Dragonfly Biotic Index (DBI) to prioritize sites for conservation action, with special emphasis on species occurrence in three global hotspots in southern Africa. Using a selected set of the 23 top prioritized sites, we compare the DBI's performance to that of a rarity-complementarity
algorithm. As with several other taxa, local endemism levels are highest in the Cape Floristic Region (CFR), while richness is highest in the north east, particularly in the stream systems of the Maputaland–Pondoland–Albany (MPA) hotspot. Red Listed Odonata species are also concentrated in the CFR, while richness is highest in the MPA hotspot. Site prioritization using the DBI reveals that CFR sites protect Red Listed taxa rather well, despite the fact that catchments are only partially protected. The DBI demonstrates high levels of redundancy in representing Red Listed species, in other words, the same species are represented in several catchments. The value in the DBI thus lies in maximizing redundancy (i.e. representation) of globally Red Listed species. The rarity–complementarity algorithm represents all species, but without greater emphasis on the rare and threatened (i.e. Red Listed) species. We conclude that the DBI is of great value in selecting biodiversity hotspots, while the algorithm is useful for selecting complementarity hotspots. We identify protection gaps and recommend complementarity searches in centers of endemism and existing reserves, as well as gap areas. These searches will hone Red List assessments and identify priority sites, as well as monitor already-identified sites for changes in quality of habitat."

[Authors] Address: Samways, M.J., Dept Entomol. & Nematol., Univ. Stellenbosch, Private Bag X1, ZA-7602, Matieland, South Africa. E-mail: samways@sun.ac.za

7886. Simaika, J.P.; Samways, M.J. (2009): An easy-to-use index of ecological integrity for prioritizing freshwater sites and for assessing habitat quality. Biodiversity and Conservation 18(5): 1171-1185. (in English) "["Prioritizing and assessing the condition of sites for conservation action requires robust and ergonomic methodological tools. We focus here on prioritizing freshwater sites using two promising biodiversity indices, the Dragonfly Biotic Index (DBI) and Average Taxonomic Distinctness (AvTD). The AvTD had no significant association with either species richness or endemism. In contrast, the DBI was highly significantly associated with species richness and endemism, although the strengths of the associations were weak. These associations are related to how the sub-indices in the DBI are weighted, and how species are distributed geographically. Additionally, the DBI was found to be very useful for site selection based on its ability to measure ecological integrity, combined with level of threat, at multiple spatial scales. The AvTD was found to be useful principally for regional use. As the DBI is a low-cost, easy-to-use method, it has the additional use as a method for assessing habitat quality and recovery in restoration programs. The DBI operates at the species level, and is therefore highly sensitive to habitat condition and has great potential for environmental assessment and monitoring freshwater biodiversity and quality. Practical, worked examples of river restoration are given here. In view of the ease and versatility by which the DBI can be employed, we recommend its testing and possible integration into freshwater management and conservation schemes elsewhere in the world."]"

[Authors] Address: Samways, M.J., Dept Entomol. & Nematol., Univ. Stellenbosch, Private Bag X1, ZA-7602, Matieland, South Africa. E-mail: samways@sun.ac.za

7887. Slos, S.; Meester, L.D.; Stoks, R. (2009): Behavioural activity levels and expression of stress proteins under predation risk in two damselfly species. Ecological Entomology 34(3): 297-303. (in English) "It has become apparent that predators may strongly decrease prey fitness without direct contact with the prey, as they induce the development of defence systems that limit the availability of energy for growth and reproduction. Recent studies suggest that stress proteins may help prey organisms deal with this stress. The pattern is not general, however, and little is known about species differences in physiological traits in coping with predator stress, and covariation of physiological with other antipredator traits. 2. To explore these issues, we quantified levels of constitutive and fish-induced stress proteins (Hsp60 and Hsp70) and anti-predator behaviours in larvae of two damselfly species that differ in lifestyle. Both stress proteins were fixed at higher levels in Erythromma najas, which has a slow lifestyle, than in Lestes sponsa, which has a fast lifestyle. Similarly, antipredator behaviours were fixed at safer levels in E. najas than in L. sponsa. 3. These results suggest that stress proteins may be part of antipredator syndromes of damselfly larvae, and there may be trait co-specialisation between stress proteins and behavioural antipredator traits. Studies formally testing these hypotheses in more species may prove rewarding in advancing our understanding of the functional integration of physiological antipredator traits in relation to the prey's lifestyle."

[Authors] Address: Slos, Stefanie, Lab. of Aquatic Ecology & Evolutionary Biology, Katholieke Universiteit Leuven, Ch. Debèriotstraat 32, B-3000 Leuven, Belgium. E-mail: stefanie.slos@bio.kuleuven.be

7888. Slos, S.; De Block, M.; Stoks, R. (2009): Autotomy reduces immune function and antioxidant defence. Biology letters 5(1): 90-92. (in English) "["Costs of autotomy, an antipredator defence, are typically explained by impaired mobility; yet physiologically mediated costs may also play a role. Given the resemblance to wound healing, a decreased immune function and an associated reduction in antioxidant defence is expected after autotomy. In line with this, after lamellae autotomy, larvae of Lestes viridis showed lower levels of innate immunity (i.e. phenoloxidase, PO) and antioxidant defence (superoxide dismutase, SOD). Levels of catalase (CAT) remained, however, unaffected. In line with its cytotoxicity, PO co-varied positively with CAT, yet negatively with SOD. We identified a novel cost of autotomy in terms of a reduced innate immunity, which may provide an alternative explanation for the often observed costs of autotomy and which may generate indirect interactions between predators and parasites."

Address: Stoks, R., Laboratorium voor Aquatische Ecologie, K.U.Leuven, De Beriotstraat 32, B-3000 Leuven, Belgium. E-mail: robbystoks@bio.kuleuven.ac.be

7889. Stetzuhn, H. (2009): Kleines Granatauge (Erythromma viridulum) am Rodder Maar, Ldkrs Ahrweiler. Pflanzen und Tiere in Rheinland-Pfalz (Berichtsjahr 2008) 19: 160. (in German) ["The Odonata fauna of the Grand Canyon ecoregion (GCE) on the southern Colorado Plateau includes 89 species (35 genera, seven families), including 49 Anisoptera species (25 genera, four families) and 40 Zygoptera species (10 genera, three families), and with 58 Odonata species in Grand Canyon (GC): 24 genera, seven famili-
ies). Three biogeographic hypotheses account for this relatively high regional species richness: faunal affinity (origin), elevation effects on range, and landform impacts across spatial scale. The GCE Odonata assemblage is the result of mixing of taxa from adjacent Neotropical and Neartic regions. Allochthonous taxa include 34.8% tropical (Mexican, Caribbean, Neotropical, or Pantropical) and 21.3% boreal (Neartic or Holarctic) species. Autochthonous species (43.8%) are range-centered in North American, neither clearly Neartic nor Neotropical, with a strong Pacific Coast influence. Area-adjusted species richness is negatively linearly related to elevation. Tropical species have lower elevation ranges than do boreal species, whereas the elevation ranges of both allochthonous groups overlap those of autochthonous species. Odonata generally overcome landform-based range constraints at coarse spatial scales, but barrier/filter and corridor effects predominate over refuge and null biogeographic effects in GC. Anisoptera and Zygoptera biogeographic patterns are similar, except that 9-fold more Zygoptera species exist in refugia in GC compared with Anisoptera. Although no GCE Odonata previously have been considered rare or at risk, 15 (16.9%) species are restricted to three or fewer localities, four (4.5%) of species have been detected at only a single locality, and four high-elevation Neartic species may be at risk of extirpation though climate change impacts on their habitats.* (Authors) Address: Stevens, L.E., Museum of Northern Arizona, 3101 N. Ft. Valley Rd, Flagstaff, AZ 86001, USA. E-mail: farvana@aol.com

7891. Stevenson, D.J.; Beaton, G.; Elliott, M.J. (2009): Distribution, status and ecology of Cordulegaster sayi Selys in Georgia, USA (Odonata: Cordulegastridae). Bulletin of American Odonatology 11(1): 20-25. (in English) "[C. sayi is one of the most poorly known dragonfly species of the southeastern United States. Over a 13-year period (1996-2008), we documented C. sayi from 17 sites in 11 counties in southern Georgia, including nympha collections. At 11 (65%) sites, nympha habitat consisted of mucky seepages at the base of the slopes of xeric sandhills; at the remaining six sites, the habitat consisted of seepages on the slopes of steep hardwood bluffs above major streams (or within ravines associated with these bluffs). Salamanders of the genus Pseudotriton (P. ruber and P. montanus) are characteristic associates of C. sayi nympha habitats. Because nympha habitats are perennial seepages located downslope of Longleaf Pine (Pinus palustris)–Turkey Oak (Quercus laevis) sandhills, and because adults typically forage in these habitats, we consider C. sayi a Longleaf Pine ecosystem endemic." (Authors) Address: Stevenson, D.J.; Project Orianne, Ltd., Indigo Snake Initiative, 414 Club Drive, Hinesville, Georgia, USA 31313. E-mail: dstevenson@projectorianne.org

7892. Strobbe, F.; McPeek, M.A.; de Block, M; De Meester, L; Stoks, R. (2009): Survival selection on escape performance and its underlying phenotypic traits: a case of many-to-one mapping. Journal of evolutionary biology 22(6): 1172-1182. (in English) "Selection often operates not directly on phenotypic traits but on performance which is important as several traits may contribute to a single performance measure (many-to-one mapping). Although largely ignored in the context of selection, this asks for studies that link all relevant phenotypes with performance and fitness. In an enclosure experiment, we studied links between phenotypic traits, swimming performance and survival in two Enallagma damselflies. Predatory dragonflies imposed survival selection for increased swimming propensity and speed only in E. annexum; probably E. aspersum was buffered by the former species’ presence. Accordingly, more circular caudal lamellae, structures involved in generating thrust while swimming, were selected for only in E. annexum. Other phenotypic traits that contributed to swimming speed were not selected for in either species, probably because of many-to-one mapping (functional redundancy). Our results indicate that not only the phenotypic distributions of syntopic prey organisms but also many-to-one mapping should be considered when documenting phenotype–performance–fitness relationships." (Authors) Address: McPeek, M., Dept Biol. Sci., Dartmouth College, Hanover, New Hampshire 03755, USA. E-mail: mark.mcpeek@dartmouth.edu

7893. Svensson, E.I.; Abbott, J.K.; Gosden, T.P.; Coreau, A. (2009): Female polymorphisms, sexual conflict and limits to speciation processes in animals. Evolutionary Ecology 23(1): 93-108. (in English) "[Heritable and visually detectable polymorphisms, such as trophic polymorphisms, ecotypes, or colour morphs, have become classical model systems among ecological geneticists and evolutionary biologists. The relatively simple genetic basis of many polymorphisms (one or a few loci) makes such species well-suited to study evolutionary processes in natural settings. More recently, polymorphic systems have become popular when studying the early stages of the speciation process and mechanisms facilitating or constraining the evolution of reproductive isolation. Although colour polymorphisms have been studied extensively in the past, we argue that they have been underutilized as model systems of constraints on speciation processes. Colouration traits may function as signalling characters in sexual selection contexts, and the maintenance of colour polymorphisms is often due to frequency-dependent selection. One important issue is why there are so few described cases of female polymorphisms. Here we present a synthetic overview of female sexual polymorphisms, drawing from our previous work on female colour polymorphisms in lizards and damselflies. We argue that female sexual polymorphisms have probably been overlooked in the past, since workers have mainly focused on male-male competition over mates and have not realized the ecological sources of genetic variation in female fitness. Recent experimental evolution studies on fruit flies (Drosophila melanogaster) have demonstrated significant heritable variation among female genotypes in the fitness costs of resistance or tolerance to male mating harassment. In addition, female-female competition over resources could also generate genetic variation in female fitness and promote the maintenance of female sexual polymorphisms." (Authors) Address: Svensson, E.I., Section for Animal Ecology, Ecology Building, Lund University, Lund 223 62, Sweden. E-mail: erik.svensson@zooekol.lu.se

7894. Svidersky, V.L.; Plotnikova, S.I.; Gorelkin, V.S. (2009): Structural-functional peculiarities of the wing apparatus of insects that do not have and do have the maneuvering flight. Journal of Evolutionary Biochemistry and Physiology 44(6): 643-656. (in English) "The work considers character of behaviour in flight and discusses peculiarities of structural-functional organization of the wing apparatus of two representatives of insects..."
— the migratory Asian locust Locusta migratoria (a low-maneuvering insect) and the dragonfly-darner Aeshna sp. (an insect able to perform complex maneuvers in air). The main principles underlying the insect wing apparatus activity are considered and the mechanisms allowing the dragonflies to perform complex maneuvers in the flight are analyzed in detail. (Authors) Original Russian Text published in Zhurnal Evolutionarynoi Biokhimii i Fiziologii, 2008, Vol. 44, No. 6, pp. 545–555. Address: Svidersky, V.L., Sechenov Institute of Evolutionary Physiology and Biochemistry, Russian Academy of Sciences, St. Petersburg, Russia. E-mail: office@iepb.ru

7895. Tajima, Y.; Watanabe, M. (2009): Changes in the number of spermatooza in the female sperm storage organs of Ischnura asiatica (Brauer) during copulation (Zygoptera: Coenagrionidae). Odonatologica 38(2): 141-149. (in English) [*Spermatoozoan dynamics in the female sperm storage organs of I. asiatica were examined with interrupted copulation experiments in the field. The copulation process was divided into 3 stages (I, II and III) according to the movements of the male abdomen. Females interrupted just after the termination of stage I of copulation contained a much lower number of spermatooza, both in the bursa copulatrix and in the spermatheca, than solitary females captured before being attached by males. At the tip of the male's secondary genitalia, there was a pair of horns which might be used to remove sperm from the bursa copulatrix and the spermatheca during copulation. The latter was joined to the base of the former by a spermathecal duct. Since each horn of the male genitalia was significantly shorter than the spermathecal duct, the spermatheca might be inaccessible to males. The actual position of the horns in the female sperm storage organs during stage I of copulation was observed by freezing copulating pairs using quick-freeze aerosol sprays. The horns were in the bursa copulatrix, but no horns had entered the spermatheca. Additional mechanisms of sperm removal from the spermatheca are proposed.*] (Author) Address: Graduate School of Life & Environmental Sciences, Univ. of Tsukuba, Tsukuba, Ibaraki 305-8572, Japan. E-mail: watanabe@kankyo.envr.tsukuba.ac.jp


van der Poorten, N. (2009): Lycnothemis defonsekae spec. nov. from Sri Lanka, with a review of the known species of the genus (Anisoptera: Libellulidae). Odonatologica 38(1): 15-27. (in English) [*Both sexes of the new species and its early instar larva are described and illustrated. Holotype ♀: Ratnapura district, near Kudawe, alt. 500 m, 3-VII-2007; to be deposited at the Colombo National Museum. The habitat characteristics and species behaviour are briefly outlined. The new species is compared to all known congeners. It closely resembles Lycnothemis acigaster and L. elegantissima.*] (Authors) Address: van der Poorten, Nancy, 17 Monkton Avenue, Toronto, Ontario, M8Z 4M9, Canada. E-mail: nmgvdp@netscape.net

van Huyssteen, P.; Samways, M.J. (2009): Overwintering dragonflies in an African savanna (Anisoptera: Gomphidae, Libellulidae). Odonatologica 38(2): 167-172. (in English) [*To better understand overwintering capability of dragonflies in the African savanna, observed individuals were placed into predetermined age categories at sites along the Mogalakwena river, Limpopo province, South Africa, during mid-winter. Age categories were determined by degree of wing wear each

vence) in eastern Cuba is brought on record. A total of 19 species in four families (Lestidae, Coenagrionidae, Aeshnidae, Libellulidae) were collected; 15 were libellulids. *(Authors) Address: Trapero Quintana, A., Depto de Biologia, Universidad de Oriente, Patricio Lumumba s/n, C.P. 90500, Santiago de Cuba, Cuba. E-mail:atrapero@cnt.uo.edu.cu

7898. Trapero Quintana, A.D.; & Cuellar Araújo, N. (2009): Description of the last instar larva of Cannaphila insularis funerea (Carpenter, 1897) (Anisoptera: Libelulidae), with notes on the habitat of the species. Zoo税收 2034: 61-64. (in English) [The description is based on two male exuviae collected in the outlet of the Chalons basin (20°04′13″N, 75°48′47″W, 108 m), 4-VIII-2007, and the Los Gomez stream (20°02′52″N, 75°49′18″W, 90 m), 30-V-2008, col. Traper. Both locations are in northern Santiago de Cuba.] Address: Trapero Quintana, A.D., Departamento de Biologia, Universidad de Oriente. Ave. Patricio Lumumba. Santiago de Cuba 90500. Cuba. E-mail: trapero76@gmail.com

7899. Trapero-Quintana, A.; Cabrera Anaya, A.; Torres Cambas, Y.; Rodriguez Montelier, L. (2009): Reproductive behavior of Enallagma coecum (Hagen) in Cuba (Zygoptera: Coenagrionidae). Odonatologica 38 (1): 7-13. (in English) [*The reproductive behaviour is described from 2 populations on the outskirts of Santiago de Cuba, between June 2005 and May 2006. Males started arriving at the water body in the morning nearly 2 h before females. Sperm translocation was brief (less than 30 s), and the duration of copulation averaged about 18 min. During oviposition the female was guarded in tandem by the male, except when she submerged under water, when non-contact guarding was observed. The mean duration of oviposition was about 10 min. Abiotic factors that interfered with the reproduction were wind, absence of sun, and rain; and the biotic interactions included conspecific males, spiders of the genus Dolomedes, Gambusia punctata fishes and the lizard Anolis sagrei.] Address: Trapero Quintana, A., Departamento de Biologia de la Universidad de Oriente, Patricio s/n, Santiago, Cuba, CP 90500, Cuba. E-mail: atrapero@cnt.uo.edu.cu
individual had sustained. The Dragonfly Biotic Index (DBI) was used to categorize species into rare, widespread generalists versus rare, narrow-range specialists. All the recorded species were common, widespread generalists, occupying microhabitats created by the winter dry season decrease in water level and flow rate, and able to survive seasonal habitat changes. Seven of the 8 species were libellulids, and 1 gomphid. Their ability to thermoregulate by selecting appropriate perch sites, in addition to their high habitat tolerance, plays an important role allowing them to survive as adults throughout winter. It is confirmed that the libellulids observed here were highly habitat tolerant, common and widespread species whose success comes about at least partly from their ability to overwinter and be ready to take advantage of the first rains."

(Authors) The species involved in this study are: Ictinogomphus ferox, Orthemis chrysostigma, Crocothemis erythraea, C. sanguinolenta, Trithemis annulata, T. arteriosa, T. furva, and T. kirbyi.] Address: Samways, M.J., Dept Entomol. & Nematol., Univ. Stellenbosch, Private Bag X1,ZA-7602, Matieland, South Africa. E-mail: samways@sun.ac.za

7902. Velasquez, N.; Bautista, K.; Guevara, M.; Ramirez, D.; Realpe, E.; Perez-Gutierrez, L.A. (2009): Larval development and growth ratio in Ischnura cruzi De Marmels, with description of last larval instar (Zygoptera: Coenagrionidae). Odonatologica 38(1): 29-38. (in English) "[Under stable laboratory conditions larval stages were measured and morphologically compared in order to establish growth ratio and total number of instars through their postembryonic development. Head width, total length, metatetmur length, forewing ped length, and length and width of prementum were measured to determine variation between instars, and growth ratio was calculated. By Dyar’s Law, 12 larval instars were estimated. Fundamental morphological differences were found in order to distinguish the stages and at the same time to have a record of the morphological development through the stages. Finally, the last larval instar is described and illustrated." (Authors] Address: Perez-Gutierrez, L.A., Departamento de Biologia, Universidad del Atlántico, Km. 7, Antigua Vía, Puerto Colombia, Barranquilla, Colombia; 1 la.perez60@egresados.uniandes.edu.co

7903. Villanueva, R.J.T. (2009): Dragonflies of Babuyan and Batanes group of islands, Philippines (Insecta: Odonata). IDF-Report 17: 1-16. (In English) "Odonata were recorded and voucher specimens collected between April 23 and May 14 2008. In the islands of Sabtang and Itbayat >90% of the known freshwater system was explored while for Batan and Calayan approximately 60 and 40 percent respectively. In total 33 species belonging to 21 genera and 7 families were found. In addition to this three unidentified species were seen. All these species are new to the islands and one species is new to the Philippines. Furthermore, four of the recorded species (Amphicnemis in Calayan, Drepanosticta 1 & 2 in Calayan and Batan, Teinobasis in Calayan and Batan) are probably new to science. For a further four species the material shows differences with the specimens from the mainland. Some of these might also represent species new to science. Nearly 55 percent of the recorded species are Anisoptera. On the island of Calayan I found 29 species, most of which are forest specialists. Among these species are three probably new species, Amphicnemis, Drepanosticta and Teinobasis. Some of the species, Diplacina, Neurobasis and Teinobasis requires further comparison with known species. Only one species (Rhoythemis regia) noted on the island was not captured. On Sabtang, I found 12 species including a new record for the Philippines (Tramea virginia). On Batan, 9 species were found including two possibly new species of Zygoptera. Only one species noted in the island was not collected. The island of Itbayat has nine species including possible one new species. Two species were noted only by sighting and could not be confirmed for proper identification." (Author] Address: Villanueva, R.J.T., D3C Gahol Apartment, Lopez Jaena St., Davao City, 8000 Philippines. E-mail: reaganjoseph@lycos.com

7904. Vukusic, P.; Stavenga, D.G. (2009): Physical methods for investigating structural colours in biological systems. J. R. Soc. Interface 6, Suppl 2: S133-S148. (in English) "Many biological systems are known to use structural colour effects to generate aspects of their appearance and visibility. The study of these phenomena has informed an eclectic group of fields ranging, for example, from evolutionary processes in behavioural biology to micro-optical devices in technologically engineered systems. However, biological photonic systems are invariably structurally and often compositionally more elaborate than most synthetically fabricated photonic systems. For this reason, an appropriate gamut of physical methods and investigative techniques must be applied correctly so that the systems’ photonic behaviour may be appropriately understood. Here, we survey a broad range of the most commonly implemented, successfully used and recently innovated physical methods. We discuss the costs and benefits of various spectrometric methods and instruments, namely scatterometers, microspectrophotometers, fibre-optic-connected photodiode array spectrometers and integrating spheres. We then discuss the role of the materials’ refractive index and several of the more commonly used theoretical approaches. Finally, we describe the recent developments in the research field of photonic crystals and the implications for the further study of structural coloration in animals." (Author) Neurobasis chinensis exhibits bright and highly saturated iridescent green hind wings as a result of the melanin-backed multilayer in its wing membrane.] Address: Vukusic, P., School of Physics, University of Exeter, Exeter EX4 4QL, UK. E-mail: p.vukusic@ex.ac.uk

7905. Wilson, S.R.; Ricciardi, A. (2009): Epiphytic macroinvertebrate communities on Eurasian watermilfoil (Myriophyllum spicatum) and native milfoils Myriophyllum sibiricum and Myriophyllum alterniflorum in eastern North America. Canadian Journal of Fisheries and Aquatic Sciences 66(1): 18-30. (in English, with French summary) "Aquatic macrophytes play an important role in the survival and proliferation of invertebrates in freshwater ecosystems. Epiphytic invertebrate communities may be altered through the replacement of native macrophytes by exotic macrophytes, even when the macrophytes are close relatives and have similar morphology. We sampled an invasive exotic macrophyte, M. spicatum, and native milfoils M. sibiricum and M. alterniflorum in four bodies of water in southern Quebec and upstate New York during the summer of 2005. Within each waterbody, we compared the abundance, diversity, and community composition of epiphytic macroinvertebrates (including Odonata on different taxonomical levels) on exotic and native Odonatological Abstract Service 24 (July 2009) - page 61
Myriophyllum. In general, both M. sibericum and M. alterniflorum had higher invertebrate diversity and higher invertebrate biomass and supported more gastropods than the exotic M. spicatum. In late summer, invertebrate density tended to be higher on M. sibericum than on M. spicatum, but lower on M. alterniflorum than on M. spicatum. Our results demonstrate that M. spicatum supports macroinvertebrate communities that may differ from those on structurally similar native macrophytes, although these differences vary across sites and sampling dates. Thus, the replacement of native milfoil by M. spicatum may have indirect effects on aquatic food webs. *(Authors)* Address: Ricciardi, A., Redpath Museum. McGill University. 859 Sherbrooke Street West. Montreal. QC H3A 2K6. Canada. E-mail: tony.ricciardi@mcgill.ca

7906. Wissinger, S.A.; Greig, H.; McIntosh, A. (2009): Absence of species replacements between permanent and temporary lentic communities in New Zealand. J. N. Am. Benthol. Soc. 28(1): 12-23. (in English) *(The species composition of lentic communities often shifts along hydroperiod gradients, in part because temporary-habitat specialists replace closely related permanent-habitat specialists. These replacements reflect tradeoffs between traits that facilitate coexistence with permanent-habitat predators and those that prevent dessication. The evidence for species replacements and the underlying tradeoffs is considerable in North America, but few studies have explored this pattern in other regions. We compared benthic communities in permanent and temporary habitats on the South Island of New Zealand. Ordination across 58 sites showed that community composition was distinctly different between the 2 types of habitats. Assemblages in permanent habitats had .23 the number of species as those in temporary habitats. We found little evidence for temporary-habitat specialists; i.e., species in temporary communities were a nested subset of those in permanent communities. Quantitative sampling at 12 intensively studied sites revealed that chironomids, water bugs, beetles, and crustacea accounted for 90% of the biomass in temporary, but only 1 4% of the biomass in permanent habitats, which were dominated by molluscs, annelids, caddisflies, and odonates. Damselflies, dragonflies, caddisflies, and several other large-bodied taxa common in permanent habitats were absent from most temporary habitats. We propose 2 explanations for the absence of species replacements in these groups in the New Zealand habitats that we studied. First, drying is unpredictable within and between years, perhaps precluding the evolution of temporary-habitat specialization. Second, fish predation on benthic invertebrates, a driver for phylogenetic diversification in North America, appears to be comparatively weak in New Zealand. Comparative studies across a range of climates and faunas will be needed to identify the ecological and phylogenetic contexts that favour evolution of generalists vs specialists along permanence gradients.)* *(Authors)* Address: Wissinger, S.A., Biology Department, Allegheny College, Meadville, Pennsylvania 16335 USA. E-mail addresses: swissing@allegheny.edu

7907. Zhang, H.-m.; Tong, X.-l. (2009): First description of the larval and adult male Paragomphus wuzhi-shanensis Liu (Anisoptera: Gomphidae). Odonatologica 38(2): 173-178. (in English) *(The descriptions and illustrations are based on specimens reared in the laboratory from larvae collected from the type locality of Hainan, China. A comparison is also provided between adult males P. capricornis (from Guangdong), and P. wuzhi-shanensis and P. pardalinus (both from Hainan).)* Address: Zhang, H.-m., Dept of Entomology, College of Natural Resources and Environment, South China Agricultural University, Guangzhou 510642, China. E-mail: xtong@scau.edu.cn

7908. Zhang, H.-m.; Tong, X.-l. (2009): First description of the larval and adult male Paragomphus wuzhi-shanensis Liu (Anisoptera: Gomphidae). Odonatologica 38(2): 173-178. (in English) *(The descriptions and illustrations are based on specimens reared in the laboratory from larvae collected from the type locality of Hainan, China. A comparison is also provided between adult males P. capricornis (from Guangdong), and P. wuzhi-shanensis and P. pardalinus (both from Hainan).)* Address: Zhang, H.-m., Dept of Entomology, College of Natural Resources and Environment, South China Agricultural University, Guangzhou 510642, China. E-mail: xtong@scau.edu.cn

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