ODONATOLOGICAL ABSTRACTS

2000

(17936) BACH, L., 2000. Auswirkungen von Revitalisierungsmassnahmen an dem Heidebach Ise auf dessen Libellenfauna. *Angew. Landschaftsökol.* 37: 267-270. (With Engl. s.). – (Author's current address unknown).
Based on the 1991-1999 monitoring of the effects of various revitalisation measures on the odon. fauna of the Ise rivulet (Lüneburger Heide, Germany), it was noticed that particularly the typical stream spp. did profit from the revitalisation. Its effect on 15 spp. is shown in a graph.

(17937) ZHOU, W.-b. & Z.-z. LI, 2000. Scalmogomphus guizhouensis sp. nov. and Lamelligomphus parvulus sp. nov., two new dragonflies from China (Anisoptera: Gomphidae) *Wuyi Sci. J.* 16: 18-21. (Chin., with Engl. s.). – (First Author: Dept Ent., Zheijang Mus. Nat. Hist., Gu-shan, Hanzhou-310012, China).
S. guizhouensis sp. n. (holotype ♂, allotype ♀: Guizhou, Huangguoshu, 18-VI-2000) and L. parvulus (holotype ♂, allotype ♀: Yunnan, Xiaguan, 10-VII-2000) are described and illustrated. The types are deposited at Zheijang Mus. Nat. Hist., Hanzhou).

2001

(17938) FELLOWES, J.R. et al., [Eds], 2001. Report of rapid biodiversity assessments at Jianfengling Nature Reserve, Southwest Hainan, 1998 and 2001. *Sth China Forest Biodiv. Surv. Rep.* [Online Simplified Version] 3: ii + 26 pp. – (Kadoorie Farm & Bot. Garden Corp., Lam Kam Rd, Tai Po, N.T. Hong Kong, China).
27 odon. spp. are listed; – Ledong and Dongfang counties, China.

2002

(17939) EIGENHEER, K., 2002. *Die Libellen an der Aare zwischen Büren a. A. und Rothrist (Schweiz).* (With 1 p. Suppl., 2004). Eigenheer, Brügglen. 47 pp. – (Hofmatt 115, CH-4582 Brügglen).
A report on the odon. survey (1992-2001) along a 54 km stretch of the Aare river (cantons Berne, Solothurn, Aargau), Switzerland. Including the Supplement, 30 spp. were recorded. Annotations on their abundance, autochthony and ecology are provided.

2003

(17940) BLACHUTA, J. & J. BLACHUTA, 2003. Ecological assessment of the Bug river based on its macrozoobenthos. *Proc. 6th Int. Conf. "Zagospodarowanie Zlewni Bugu* [...]", Warszawa-Popowo, pp. 147-155. (Pol., with Engl. s.). – (Inst. Meteorol. & Water Mngmt, Wroclaw, Poland).
From the Bug and its tributaries (Poland) 7 odon. spp. are listed.

(17941) FELLOWES, J.R. et al., [Eds], 2003. Report of rapid biodiversity assessment at Nanling National Nature Reserve, Northwest Guangdong, China, June-July 2000. *Sth China Forest Biodiv. Surv. Rep.* [Online Simplified Version] 29: ii + 33 pp. – (Kadoorie Farm & Bot. Garden Corp., Lam Kam Rd, Tai Po, N.T. Hong Kong, China).
91 odon. taxa are listed, of which 5 spp. are new and undescribed; – Ruyuan co. (Shaoguan distr.), and Yangshan and Lianzhou counties (Qingyuan distr.).

(17942) FERRERAS-ROMERO, M., F.J. CANO-VILLEGAS & J.C. SALAMANCA-OCANA, 2003. Valoración de la cuenca del rio Guadiamar (sur de España), afectada por un vertido minero, en base a su odonatofauna. *Limnetica* 22(3/4): 53-62. (With Engl. s.). – (Depto Cien. Ambientales / Zool., Univ. Pablo de Olavide, Ctra. de Utrera km 1, ES-41012 Sevilla).

The odon. community is analysed in the Guadiamar catchment (S Spain), affected by a mining spill that occurred in Apr. 1998. Compared to other Andalusian catchments, the number of spp. (18) was not particularly low, though 55.5% of them were libellulids, and the absence of some typically rheophilous Calopterygidae and Gomphidae spp. was significant. This fact highlights the currently poor ecological condition of that part of the catchment. In addition, the biogeographical analysis showed that a high proportion of spp. are of N African origin.

(17943) SANFORD, M.R., J.B. KEIPER & W.E. WALTON, 2003. The impact of wetland vegetation drying time on abundance of mosquitoes and other invertebrates. *J. Am. Mosquito Contr. Ass.* 19(4): 361-366. – (First Author: Dept Ent., Univ. California, Riverside, CA 92521, USA).

Vegetation management for constructed treatment wetlands often involves knocking down emergent vegetation and inundating the dead vegetation after a period of drying. Such practices create favourable circumstances for larval mosquitoes and other insects. Predators readily colonized the pools, although more slowly than did most of the dipteran taxa. Hydrophilid (Coleoptera) and aeshnid larvae were the 2nd and the 3rd most abundant predator colonizing the pools, respectively.

(17944) STOKS, R. & M.A. McPEEK, 2003. Antipredator behavior and physiology determine Lestes species turnover along the pond-permanence gradient. *Ecology* 84(12) 3327-3338. – (First Author: Lab. Aquat. Ecol., Univ. Leuven, Debériotstraat 32, B-3000 Leuven).

Identifying key traits that shape trade-offs that restrict spp. to only a subset of environmental gradients is crucial to understanding and predicting species turnover. Previous field experiments have shown that Lestes larvae segregate along the entire gradient of pond permanence and predator presence and that differential predation risk and life history contraints together shape their distribution. Here, laboratory experiments are reported that identify key differences in behaviour and physiology among spp. that structure their distributions along this gradient. The absence of adaptive antipredator behavioural responses against large dragonfly larvae and fish of L. dryas, the only sp. to inhabit predator-free vernal ponds that dry each year, is consistent with its high vulnerability to predation and probably the key trait that excludes it from parts of the gradient with predators. The reciprocal dominance of 2 other Lestes spp. in permanent waters dominated by either dragonflies or fish can be explained by the lack of effective antipredator behaviours against dragonflies and fish, reapectively. Maximal growth rates did not differ among Lestes along the gradient. However, in the natural predator environment of vernal ponds (only conspecific cannibals), the vernal-pond Lestes had higher growth rates than the other Lestes suggesting that this excludes other Lestes from vernal ponds. Similarly, Lestes spp. that inhabit temporary ponds (i.e., ponds that dry intermittently every few years but not every year) had a higher growth rate than the fishless permanent-pond Lestes in the presence of the syntopic dragonfly predator. These growth differences among Lestes in predator treatments were not due to differences in food intake, but due to differences in physiology. The vernal-pond Lestes converted more assimilated food into body mass compared to the other Lestes in the presence of conspecific larvae, and the temporary-pond Lestes had a higher conversion efficiency than the fishless permanent-pond Lestes in the presence of the syntopic dragonfly predators. In contrast, reductions in growth rate within species in the presence of syntopic predators were both physiologically and behaviourally mediated. The interplay between behaviour and physiology may be a common feature of the growth/predation-risk trade-off, and their joint study is therefore critical to mechanistically link phenotype, performance and, community assembly along the freshwater habitat gradient.

(17945) VERSTRAEL, T., J. BOUWMAN, R. KLEUKERS, H. TURIN, R. VERHAGEN & H. DE VRIES, 2003. Prioritiaire insecten en andere ongewervelden in Noord-Brabant. – [Prioritary insects and other invertebrates in Noord-Brabant]. *Vlinderstichting Rapp.* VS2003.022: 36 pp. (Dutch). – (c/o De Vlinderstichting, P.O. Box 506, NL-6700 AM Wageningen).

In the provincial fauna of Noord-Brabant (the Netherlands), 17 odon. spp. are either nationally red-listed or they are included in the European Habitat Directive. Their status, habitat requirements and general location of their populations in the province are stated.

2004

(17946) ESENKO, I., 2004. *Zaživimo z naravo!: ptice in ekološko vrtnarjenje.* – [*Let us revive with nature!: birds and ecological gardening*]. Didakta, Radovljica. 123 pp. ISBN 961-6463-89-6. (Slovene).
Coenagrion puella and Libellula depressa are among the most common inhabitants of garden ponds in Slovenia.

(17947) JOBIN, L.-J. & J.-M. PERRON, 2004. Odonatofaune du parc écologique du mont Shefford, division de recensement de Shefford, Québec. *Naturaliste can.* 128(1): 27-30. – (Authors' addresses not stated).
A brief description of the Park, with a commented list of 42 spp.; – Quebec, Canada.

(17948) MARTIN CASACUBERTA, R., 2004. Odonata of Catalonia: catalogue and geographic analysis. *Boln Asoc. esp. Ent.* 28(1/2): 55-69. (Span., with Engl. s.). – (C./Marti Juliá 19-23, 1° 1ª, ES-08911 Barcelona).
This is not a "critical catalogue" of the 65 spp. hitherto recorded from Catalonia (Spain), but these are said to be listed in a tab. However, most corduliids and all libellulids are missing there, therefore the utility of the paper is limited.

(17949) PALMER, C.G., W.J. MULLER, A.K. GORDON, P.-A. SHERMAN, H.D. DAVIES-COLEMAN, L. PAKHOMOVA & E. DE KOCK, 2004. The development of a toxicity database using freshwater invertebrates, and its application to the protection of South African water resources. *Sth Afr. J. Sci.* 100: 643-650, tab 1 excl. – (First Author: Unilever Cent. Environ. Water Quality, UCEWQ, Inst. Water Res., Rhodes Univ., P.O. Box 95, Grahamstown-6140, Sth Afr.).
The UCEWQ has developed a toxicity database that, to date, records the responses of 21 Sth African freshwater taxa to 26 single-substance pollutants or mixtures, in which the odon. are represented by Enallagma sp. The database is reproduced here.

(17950) PENALVER, E. & X. DELCLOS, 2004. Insecto del Mioceno Inferior de Ribesalbes (Castellón, España): interacciones planta-insecto. *Trab. Mus. Geol. Barcelona* 12: 69-95. (With Engl. s.). – (First Author: Area Paleont., Inst. Cavanilles, Univ. València, Apartado Oficial 2085, ES-46071 Paterna, València).
The ichnofossils, originating from insects found in the Lower Miocene locality of "La Rinconada" near Ribesalbes (Castellón prov., Spain), are described, illustrated and discussed. The ovipositions on the leaves of Laurophyllum, Caesalpiniaceae and Populus show ovate to oblong eggs of 0.9-1.1 mm length and 0.2-0.3 mm width, occurring in eccentric archs, sometimes in a zigzag pattern. They are ascribed to coenagrionids.

(17951) REASH, R.J., 2004. Dissolved and total copper in a coal ash effluent and receiving stream: assessment of in situ biological effects. *Envir. Monit. Assmt* 96: 203-220. – (Am. Electr. Power Water & Ecol. resour. Serv., Columbus, OH, USA).
The study was conducted adjacent to Ohio Power Company's Muskingum river power plant (SW Ohio, USA), which generates electric power by burning coal. Coal ash wastewater effluent is discharged to the river. The sites adjacent to effluent and 20 m downstream of it had the highest number (6) of odon. spp. The high water velocity of the discharge apparently creates a favourable microhabitat that, combined with Cu-complexing constituents in the discharge, supersedes potential effects of high Cu levels.

2005

(17952) BECKEMEYER, R., 2005. Afrikaan Anisoptera and Zulu Zygoptera: a trip to South Africa [Newsl.] *Idalia Soc.* 16(2): 3-5. – (957 Perry Ave, Wichita, KS 67203-3141, USA).
A field trip report, with records (Feb. 2003).

(17953) COLLAR, D.C., T.J. NEAR & P.C. WAINWRIGHT, 2005. Comparative analysis of morphological diversity: does disparity accumulate at the same rate in two lineages of centrarchid fishes? *Evolution* 59(8): 1783-1794. – (First Author: Sect. Evol. & Ecol., Univ. California, Davis, CA 95616, USA).
Odon. are reported in the diet of 5 N American (out of 12 examined) Lepomis (sunfish) spp. and in

1 (out of 8 examined) Micropterus (black basses) sp. – (*Abstractor's Note*: Odon. are not reported in the diet of L. [= Eupomotis] gibbosus, whereas in Slovenia the latter regularly preys on zygopteran larvae, if [rarely] occurring in its habitat.).

(17954) JAKUBAS, D. & A. MIDUSZEWSKA, 2005. Diet omposition and food consumption in the grey heron (Ardea cinerea) from breeding colonies in northern Poland. *Eur. J. Wildl. Res.* 51: 191-198. – (Dept Vert. Ecol. & Zool., Univ. Gdansk, Legionów 9, PO-80-441 Gdansk.
The diet was investigated in 3 colonies. It was assessed during the breeding season on the base of pallets and regurgitated food. Odon. were represented in all colonies, but their numbers among the food items varied intercolonially (0-2%).

(17955) NAKAMURA, S. & S. MATSUDA, 2005. The insects in the riversides of Takatsu river, Shimane prefecture: a result of survey in 2000. *Bull. Hoshizaki Green Found.* 8: 99-172. (Jap., with Engl. s.). – (First Author: Nishihon-machi 1-7-7, Shobara, Hiroshima, 727-0013, JA).
Includes an annotated list of 52 odon. spp., recorded from 5 localities along the river; – Japan.

(17956) STOKS, R., J.L. NYSTROM, M.L. MAY & M.A. McPEEK, 2005. Parallel evolution in ecological and reproductive traits to produce cryptic damselfly species across the Holarctic. *Evolution* 59(9): 1976-1988. – (First Author: Lab. Aquat. Ecol., Univ. Leuven, Beriotstraat 32, B-3000 Leuven).
The zygopteran gen. Enallagma originated in the Nearctic, and 2 Nearctic lineages recently underwent radiations partly associated with multiple independent habitat shifts from lakes dominated by fish predators into lakes dominated by odon. predators. A previous molecular study of 4 Palearctic morphospecies and all representative Nearctic spp. identified the presence of 2 cryptic spp. sets, with each set having Palearctic and Nearctic representatives. However, the cryptic spp. within each set are not sibling spp. Here, are presented quantitative data on ecologically important larval morphologies and behaviours involved in predator avoidance and on adult ♂ morphological structures involved in mate recognition to quantify the phenotypic relationships among these cryptic spp. sets. For the adult stage, the data indicate strong parallel evolution of the structures involved in specific mate recognition, the ♂ cerci. For the larval stage, morphometric analyses show that the Palearctic spp. evolved a nearly identical morphology to the sibling-clade members in the Nearctic that live in waters where dragonflies are the top predators. This implicates the importance of odon. predation in the history of the Palearctic clade. Behavioural analyses suggest population differentiation in response to the actual predator environment in the Palearctic clade consistent with the spp. differentiation seen in the Nearctic. The results suggest parallel evolution of adult traits that influence specific mate choice and larval traits that influence ecological performance underlie the striking similarity of Enallagma spp. 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 spp.

(17957) WWF-US, Asia Program, 2005. *Ecosystem profile Eastern Himalayas region*. Critical Ecosystem Partnership Fund. ii + 97 pp. – (Publisher's address not stated).
Epiophlebia laidlawi is the only odon. sp. considered. The compilers of the present work were apparently not familiar with much of the literature pertaining to it, hence Nepal is stated as its sole distribution area and it is said that for E. laidlawi no biodiversity area ("site outcome") could be identified. – (For the currently known E. laidlawi distribution in India, Nepal and Bhutan, and for a comprehensive bibliography on the subject, see T. Brockhaus & A. Hartmann, 2009, *Odonatologica* 38: 203-215).

2006

(17958) ABELLÁN, P., D. SANCHÉZ-FERNANDEZ, A. MILLÁN, F. BOTELLA, J.A. SÁNCHEZ-ZAPATA & A. GIMÉNEZ, 2006. Irrigation pools as macroinvertebrate habitat in a semi-arid agricultural landscape (SE Spain). *J. arid Envir.* 67: 255-269. – (First Author: Depto Ecol. & Hydrobiol., Univ. Murcia, Campus de Espinardo, ES-30100 Murcia).
A total of 8 odon. taxa (listed at gen. or sp. level) are recorded from 40 pools examined. Pools, constructed with low-density polyethylene covered with sand and stones, contained a significantly greater species richness, abundance and diversity than those constructed with high-density plastic materials. Sig-

nificant differences were also found in odon. species richness between pools with and without submerged vegetation. The presence of bank and emergent vegetation seemed to have the same effect.

(17959) KOUAME, M.K., A. OUATTARA, M.Y. DIETOA & G. GOURENE, 2006. Alimentation du Clupeidae Pellonula leonensis dans le lac barrage de Buyo (Côte d'Ivoire). *Cybium* 30(2): 145-150. (With Engl. s.). – (Last Author: Lab. Environ. & Biol. aqaut., Univ. Abobo-Adjame, 02 BP 801, Abidjan-02, Ivory Coast).
In the P. leonensis diet in the Buyo reservoir on the Sassandra river (Ivory Coast), Phyllomacromia sp. and unidentified Coenagrionidae, Aeshnidae, Libellulidae and other odon. were found. Index of relative importance of the respective taxa was between 0.4 and 6.2%.

(17960) LAGUNOV, A.V., 2006. Chlenistonogie iz mezhdunarodnoy krasnoy knigi v faune Chelyabinskoy oblasti. – [Internationally red-listed arthropods in the fauna of the Chelyabinsk district]. *Izv. chelyabinsk. nauch. Cent.* 4(34): 96-100. (Russ.). – (Il'menskiy Gos. Zapovednik, OrO RAN, Miass, Russia).
Aeshna viridis, Ophiogomphus cecilia, Leucorrhinia albifrons and L. caudalis are listed.

(17961) MARQUES VIEIRA, M.E., 2006. *A comunidade de macroinvertebrados em dois trechos do Rio Morato (Guaraqueçaba, PR): estrutura, composição e ocupação especial.* Diss. Mestre Ecologia, Univ. Fed. Paraná, Curitiba. viii + 48 pp. (Port., with Engl. s.). – (Author's current address unknown).
The macroinvertebrate community of 2 similar stretches upstream and downstream of the Salto Morato Falls (Paraná, Brazil) is described. 9 odon. genera and "Calopterygidae" are listed, spp. names are not provided.

(17962) PATHANI, S.S. & K.K. UPADHYAY, 2006. An inventory of zooplankton, zoobenthos and fish fauna in the river Ramganga (W) of Uttaranchal, India. *ENVIS Bull. Himalayan Ecol.* 14(2): 37-46. – (Kumaon Univ., S.S.J. Campus, Almora-263601, Uttaranchal, India).
The information is presented on the occurrence and abundance of "Agrion", Rhinocypha and Matrona in a 45 km section of the river, at Gairsen, Chakhutia and Masi (alt. 1060-1650 m a.s.l.).

(17963) SAMWAYS, M., 2006. Astonishing recovery of rare and threatened dragonflies. *Newsl. Fac. AgriSci. Univ. Stellenbosch* 27: 1-2. – (Dept Conserv. Ecol. & Ent., Cent. Agric. Biodiv., Univ. Stellenbosch, P. Bag X1, Matieland-7602, SA).
The rich endemic odon. fauna of Sth Africa has been under threat from invasive alien trees, particularly eucalypts, wattles and pines. These shade out the habitat, making it unsuitable for the sun-loving endemic spp. The Biodiversity Recovery Index (BRI) is the ratio of the total odon. spp. score before alien tree removal to the score when they are removed. The highest recorded BRI so far is 6 (600% recovery), attained on the top of Table Mountain. Among the spp. that have made a comeback is Syncordulia venator (last recorded on the mountain is 1934). Ecchlorolestes peringueyi has also appeared.

(17964) TERMAAT, T. & D. GROENENDIJK, 2006. Witsnuitlibellen in de Groote en Deurnese Peel: onderzoek naar oorzaken van het verspreidingspatroon. – [Leucorrhinia dubia and L. rubicunda in the Groote Peel and the Deurnese Peel: inquire into factors controlling their distribution]. *Vlinderstichting Rapp.* VS2006.019: 31 pp. (Dutch). – (c/o De Vlinderstichting, P.O. Box 506, NL-6700 AM Wageningen).
These are large fens in the Noord-Brabant prov. (the Netherlands). Their vegetation structure appears very similar and the minute difference in pH is insignificant. The 2 spp. co-occur in the Deurnese Peel, whereas the nearby Groote Peel is populated solely by L. rubicunda. Under favourable and stable conditions L. dubia has larger populations than L. rubicunda, but the latter has larger ecological amplitude, it is more mobile and the adults and larvae are larger. Under stable conditions the 2 spp. are in balance, but even a slight disruption in the environment stability is likely to trigger a break-down of the balance: L. rubicunda will prevail and finally L. dubia completely disappear.

(17965) WHITE, D., D. WHITE & N. POWER, 2006. *Fauna survey report on the Burleigh Greenspace Conservation Reserve, Gold Coast City*. Gold Coast City Council, 56 pp. – (First Author: 32 Terrigal Crescent, Southport, Qld 4215, AU).
Includes a list of 20 odon. spp. recorded from the Reserve, Queensland, Australia.

2007

(17966) BUIDIN, C. & Y. ROCHEPAULT, 2007. Inventaire des odonates de Minganie. *Naturaliste can.* 131(2): 10-16. – (First Author: 1 ch. du Grand Ruisseau, Rivière-Saint-Jean, QC, G0G 2N0, CA).
Commented lists of spp. known to occur in Minganie and on the island of Anticosti (32 spp. each), Quebec (Canada).

(17967) CLOPTON, R.E., T.J. COOK & J.L. COOK, 2007. Revision of Geneiorhynchus Schneider, 1875 (Apicomplexa: Eugregarinida: Actinocephalidae: Acanthosporinae) with recognition of four new species of Geneiorhynchus and description of G. manifestus n. sp. parasitizing naiads of the green darner, Anax junius (Odonata: Aeshnidae) in the Texas Big Thicket. *Comp. Parasitol.* 74(2): 273-285. – (First Author: Dept Nat. Sci., Peru St. Coll., Peru, NE 68421 USA).
The 6 known spp. (G. monnieri, G. aeshnae, G. desportesi sp. n., G. baudoini sp. n., G. shteini sp. n., G. manifestus sp. n.) are intestine parasites in larval Anisoptera (Aeshna, Anax, Libellula).

(17968) DE BLOCK, M., M.A. McPEEK & R. STOKS, 2007. Life-history evolution when Lestes damselflies invaded vernal ponds. *Evolution* 62(2): 485-493. – (Second Author: Dept Biol. Sci., Dartmouth Coll., Hanover, NH 03755, USA).
Little is known about the macroevolution of life-history traits along environmental gradients, especially with regard to the directionality compared to the ancestral states and the associated costs to other functions. Here it is examined how age and size at maturity evolved when Lestes damselflies shifted from their ancestral temporary pond habitat (i.e., ponds that may dry once every decade or so) to extremely ephemeral vernal ponds (ponds that routinely dry completely each year). Larvae of L. congener, L. dryas and L. forcipatus were reared from eggs until emergence under different levels of photoperiod and transient starvation stress. Compared to the 2 temporary-pond Lestes spp. the phylogenetically derived vernal-pond L. dryas developed more rapidly across photoperiod treatments until the final instar, and only expressed plasticity in development time in the final instar under photoperiod levels that simulated a later hatching date. The documented change in development rate can be considered adaptive and underlies the success of the derived species in vernal ponds. Results suggest associated costs of faster development are lower mass at maturity and lower immune function after transient starvation stress. These costs may not only have impeded further evolution of the routine development rate to what is physiologically maximal, but also maintained some degree of plasticity to time constraints when the habitat shift occurred.

(17969) GOLUB, V.B. et al., [Eds], 2007. *Questions of aquatic entomology of Russia and adjacent lands.* (Materials of the 3rd All-Russia Symposium on amphibiotic and aquatic insects, Voronezh, 2007). 409 pp. ISBN 978-5-9273-1169-9. (Russ., with Engl. s's).
[Odonatological papers]: *Dombrovsky, K.O.*: Biotopic allocations and dynamics of the number of damselfly larvae (Odonata) of the Kakhovskoye water reservoir (pp. 96-100, 401); – *Dyatlova, E.S.*: Polymorphism of coenagrionid damselflies in the southwestern Ukraine (pp. 107-113, 401); – *Matushkina, N.A.*: The morpho-functional adaptations in Lestidae (Odonata, Zygoptera) to the oviposition into plant substrates of different stiffness (pp. 177-183, 403-404); – To the study of dragonflies (Odonata, Anisoptera) of Moscow and Moscow region (pp. 183-191; 404); – *Ryazanova, G.I.*: Reproduction tactics in the males of Lestes sponsa (Hansemann) (Odonata, Zygoptera): individual reproduction success or success of the population (pp. 287-292, 406); – *Semenova, V.A. & V.B. Golub*: Results of evaluating the condition of the benthic layer of the Voronezhkoye reservoir on the basis of stability of development index of the test-object, the damselfly Ischnura elegans (Odonata, Coenagrionidae) (pp. 296-302, 406-407); – *Silina, A. Ye.*: Substance and energy outflow from marsh ecosystem by insect emerging: the succession aspect (pp. 303-320, 407); – *Sluvko, A.A.*: The biological rhythms of the Odonata of the Astrakhan province (pp. 325-329, 407); – *Stain, V.Yu.*: Arealogical analysis of the Odonata fauna of the North Caucasus (pp. 335-342, 407-408); – *Sharapova, T.A.*: The Odonata larvae in the periphyton of West Siberia (pp. 374-376, 409).

(17970) KARJALAINEN, S., 2007. New provincial records of Finnish dragonflies (Odonata) in 2002-2007. *Sahlbergia* 13: 13-25. (Finn., with

Engl. s.). – (Neidonpuistontie 6 D 8, FIN-02400 Kirkkonummi).
48 new provincial records are presented, incl. those of Sympecma paedisca and Aeshna mixta that were discovered during this period as new for the Finnish fauna. Also Coenagrion puella, Sympetrum sanguineum and Leucorrhinia pectoralis have become more common and are currently distributed in a wider area than before. An updated distribution tab. of Finnish Odon. by biogeographical provinces is appended.

(17971) KRELJ, Ž., 2007. *Ecological status of pond Tivoli.* Graduation thesis, Univ. Ljubljana. xi+76 pp. (Slovene, with Engl. s.).
The Tivoli pond is a shallow, eutrophic water body in the city park Tivoli on the NW margin of Ljubljana (Slovenia). Its plankton and macroinvertebrate communities were investigated from Oct. 2005 to June 2006. Larval Coenagrion puella and Enallagma cyathigerum are the sole odon. spp. recorded.

(17972) MACHIDA, K. & T. OIKAWA, 2007. Structure analyses of the wings of Anotogaster sieboldii and Hybris subjacens. *Key engineering Materials* 345/346: 1237-1240. – (Tokyo Univ. Sci., 2641 Yamazaki, Noda-shi, Chiba, 278-8510, JA).
Various 3-D models of A. sieboldii wing (Odon.) are analysed using the finite element method and compared with the model of H. subjacens wing (Neuroptera). It is concluded that the arch configuration of the odon. costal vein controls the bending and torsion of the wing. – For the Jap. version of this paper, see *OA* 17991.

(17973) MEURGEY, F., 2007. *Étude sur la repartition et l'écologie de Protoneura romanae (Odonata, Zygoptera, Protoneuridae) libellule endémique de Guadeloupe.* Parc National de Guadeloupe & Museum d'Histoire Naturelle, Nantes. 30 pp. – (Mus. Hist. Nat., 12 rue Voltaire, F-44000 Nantes).
The spatial and altitudinal distribution of P. romanae is outlined, and its larval habitat features and ecology are described.

(17974) RAMSEY, J.B., D.S. WHITE & H.-S. JIN, 2007. Spatial distribution of benthic macroinvertebrates in a sidearm embayment of Kentucky Lake. *J. Ky Acad. Sci.* 68(1): 50-58. – (First Author: Hancock Biol. Stn, 561 Emma Dr., Murray, KY 42071, USA).
The larvae of 4 odon. gen. (incl. Progomphus) are reported from Ledbetter Embayment (KY, USA). Enallagma, Lestes and Macromia were found primarily near the mouth of a spring inlet on the SW edge of the embayment.

(17975) RAVANELLO, C.T., 2007. *Abundance and diversity of Odonata larvae (Insecta) in rivers of the hydrographic basin of upper Uruguay river, Santa Catarina.* Diss. Mestre Ciências Ambientais Univ. Communitária Regional Chapecó. xii+43 pp. (Port., with Engl. s.). – (Author's current address unknown).
9 rivers were sampled (W of Santa Catarina, Brazil) with the objective to verify the influence of the abiotic variables on the community and to examine association patterns between the fauna and the substrate. 958 larvae were collected, pertaining to 36 gen. of Calopterygidae, Coenagrionidae, Megapodagrionidae, Aeshnidae, Gomphidae and Libellulidae.

(17976) ROUQUETTE, J.R. & D.J. THOMPSON, 2007. Patterns of movement and dispersal in an endangered damselfly and the consequences for its management. *J. appl. Ecol.* 44: 692-701. – (Pop. & Evol. Biol. Res. Gr., Sch. Biol. Sci., Univ. Liverpool, Crown St., Liverpool, L69 7ZB, UK).
A multisite mark-release-recapture project was carried out with Coenagrion mercuriale in the valley of the Itchen river in southern England to determine the extent of movement and the factors affecting movement of mature adults. A total of 8708 individuals was marked. The sp. was found to be extremely sedentary, with dispersal limited to an area of contiguous habitat. The median net lifetime movement was 31.9 m and 66% of individuals moved less than 50 m in their lifetime. Movements of greater than 500 m were rare and the longest recorded movement was 1.79 km. This makes it the most sedentary odon. that has been studied in the UK. The highest recapture rates and the lowest movement distances were recorded at the most isolated site. Time between capture and recapture, and day in season had an effect on movement, and individuals travelled further on their first than on subsequent moves. There was no consistent effect of age or sex on distance moved. There was strong evidence for inverse density-dependent movement, with individuals moving further in low-density than high-density populations. This is probably the first

time that inverse density-dependent movement has been observed in a natural population of odonates. Patterns of movement and dispersal are strongly affected by landscape structure and population density. This means that C. mercuriale is unable to recolonize isolated sites and requires 'stepping stone' habitats to improve its chances of survival in the medium and long term. Suitable habitat management between sites that are beyond the dispersal distance of individuals can be used to connect or reconnect populations. Within existing sites only small sections of habitat should be managed in any one year and new areas should be created close to existing populations. The long-term persistence of C. mercuriale requires a landscape approach to management, with connectivity an important part of management planning.

(17977) SCHAEL, D.M., 2007. *Gamma-Grassridge 765kV transmission power lines (×2). Ecological and biodiversity assessment: wetland-specialist study.* Cent. Afr. Conserv. Ecol. viii+56 pp. – (Address not stated).
This report endeavours to investigate potential impacts to freshwater ecosystems that may be affected by the proposed development transmission line corridor from the Gamma substation outside of Victoria West to the Grassridge substation outside of Port Elisabeth, Sth Africa. It includes an annotated list of odon. spp. that could potentially occur in the proposed transmission line corridor.

(17978) SCIBERRAS, A., J. SCIBERRAS & D. MAGRO, 2007. A celebration of dragonflies. *Malta Independent*, issue of 19 Nov., pp. 8-9. – (First Author: 131 'Arnest', Arcade St., Paola, Malta).
A feature article in a local newspaper; – Malta.

(17979) SHARMA, G., R. SUNDARARAJ & L.R. KARIBASVARAJA, 2007. Species diversity of Odonata in the selected provenances of sandal in southern India. *Zoos' Print J.* 22(7): 2765-2767. – (Wood Biodegradation Div., Inst. Wood Sci. & Technol., 18th Cross Malleswaram, Bangalore, Karnataka-560003, India).
21 spp. are reported from sandal ecosystems of 6 localities in Karnataka, Tamil Nadu and Kerala, India.

(17980) SMITH, J., M.J. SAMWAYS & S. TAYLOR, 2007. Assessing riparian quality using two complementary sets of bioindicators. *Biodiv. Conserv.* 16: 2695-2713. – (Second Author: Dept Conserv. Ecol. & Ent., Cent. Agric. Biodiv., Univ. Stellenbosch, P. Bag X1, Matieland-7602, SA).
Bioligical indicators are being increasingly used to rapidly monitor changing river quality. Among these bioindicators are macroinvertebrates. A short-changing river quality. Among these bioindicators are macroinvertebrates. A shortcoming of macroinvertebrate rapid assessments is that they use higher taxa, and therefore lack taxonomic resolution and species-specific responses. One subset of invertebrate taxa is the Odon., which as adults, are sensitive indicators of both riparian and river conditions. Yet adult Odon. are not necessarily an umbrella taxon for all other taxa. Therefore, it was investigated here whether the 2 metrics of aquatic macroinvertebrate higher taxa and adult odon. spp. might complement each other, and whether together they provide better clarity on river health and integrity than one subset alone. Results indicated that both metrics provide a similar portrait of large-scale, overall river conditions. At the smaller spatial scale of parts of rivers, Odon. were highly sensitive to riparian vegetation, and much more so than macroinvertebrate higher taxa. Odon. spp. were more sensitive to vegetation structure than they were to vegetation composition. Landscape context is also important, with the odon. assemblages at point localities being affected by the neighbouring dominant habitat type. Overall, benthic macroinvertebrates and adult Odon. spp. provide a highly complementary pair of metrics which together provide large spatial scale (river system) and small spatial scale (point localities) information on the impact of stressors such as riparian invasive alien trees. As adult Odon. are easy to sample and are sensitive to disturbance at both small and large spatial scales, they are valuable indicators for rapid assessment of river condition and riparian quality.

(17981) SUBRAMANIAN, K.A. & K.G. SIVARAMAKRISHNAN, 2007. *Aquatic insects of India: a field guide.* Ashoka Trust for Ecol. and Envir. (ATREE), Bangalore. 62 pp. ISBN none. – (First Author: Western Reg. Stn, Zool. Surv. India, Pune-411144, India).
An illustrated key to the families; the odon. are treated on pp. 26-29.

(17982) VANAPPELGHEM, C., 2007. Les odonates de la région Nord – Pas-de-Calais: historique de

la connaissance et diversité. *Héron* 40(4): 149-154. (With Engl. s.). – (15 rue brûle-maison, F-59000 Lille).
An outline is presented of the history of odon. exploration in the region "Nord – Pas-de-Calais" (France), and a list is provided of the 53 hitherto recorded spp. The occurrence of Lestes barbarus, Onychogomphus forcipatus, Crocothemis erythraea, Sympetrum depressiusculum and S. meridionale is discussed.

2008

(17983) ABBOTT, J.K. & E.I. SVENSSON, 2008. Ontogeny of sexual dimorphism and phenotypic integration in heritable morphs. *Evol. Ecol.* 22: 103-121. – (Sect. Anim. Ecol., Lund Univ., Ecol. Bldg, S-223-62-Lund).
The developmental basis of adult phenotypes is investigated in the polymorphic Ischnura elegans with 3 ♀ colour morphs. Larvae of different families were risen in individual enclosures in the laboratory and morphological changes during ontogeny were traced, using principal component analysis to examine the effects of sex, maternal morph and own morph on body size and shape. Also investigated were the larval fitness consequences of variation in size and shape by relating these factors to emergence success. ♀ ♀ grew faster than ♂ ♂ and were larger as adults and there was sexual dimorphism in body shape in both larval and adult stages. There were also significant effects of maternal morph and own morph on growth rate and body shape in the larval stage. There were significant differences in body shape but not in body size in the adult ♀ morphs, indicating phenotypic integration between colour, melanin patterning and body shape. Individuals that emerged successfully grew faster and had different body shape in the larval stage, indicating internal (non-ecological) selection on larval morphology. Overall, morphological differences between individuals in the larval stage carried over to the adult stage. Thus, selection in the larval stage can potentially result in correlated responses in adult phenotypes and vice versa.

(17984) BARBIER, G., R. BECAN, J.-F. CLAUDE, C. DUSSAIX & C. KERIHUEL, 2008. Entomofaune sarthoise: nouvelles espèces apparues depuis ving ans. *Troglodyte* 21/22: 9-21. – (Last Author: 2 imp. Ravault, F-72190 Coulaines).
Ophiogomphus cecilia and Leucorrhinia caudalis are listed as new autochthonous spp. in the fauna of the dept of La Sarthe (France).

(17985) BEDJANIČ, M., N. MICEVSKI & B. MICEVSKI, 2008. On the dragonfly collection in the Natural History Museum in Struga, Macedonia (Insecta: Odonata). *Biol. maced.* 61: 97-105. – (Last Author: Bul. ASNOMM br. 58-2/4, MK-1000 Skopje).
23 spp. are listed, most of them from Struga and its vicinity. Somatochlora flavomaculata is new for the fauna of Macedonia. Its occurrence in the Balkan is outlined and mapped. A checklist of the 37 spp. hitherto recorded from the Ohrid Lake is also provided.

(17986) COSEWIC/COSEPAC, 2008. *Evaluation et rapport de situation [...] sur le Gomphe de rapides, Gomphus quadricolor, au Canada.* Committee on the Status of Endangered Wildlife in Canada, Ottawa. vii+39 pp. ISBN 978-0-662-04071-2. – (An Engl. version is also available from: COSEWIC, Ottawa, ON, K1A 0H3, CA, titled: *Assessment and status report on the Rapids Clubtail Gomphus quadricolor in Canada*).

(17987) DE BLOCK, M., S. SLOS, F. JOHANSSON & R. STOKS, 2008. Integrating life history and physiology to understand latitudinal size variation in a damselfly. *Ecography* 31: 115-123. – (First Author: Lab. Aquat. Ecol. & Evol. Biol., Univ. Leuven, Debériotstraat 32, B-3000 Leuven).
The understanding of latitudinal life history patterns may benefit by jointly considering age and mass at maturity and growth rate. Additional insight may be gained by exploring potential constraints through pushing growth rates to their maximum and scoring physiological cost-related variables. Therefore, Enallagma cyathigerum univoltine Spanish and Belgian populations and a semivoltine Swedish population (spanning a latitude gradient of ca 2350 km) were reared in a common environment from the eggs until adult emergence and exposed to a transient starvation period to induce compensatory growth. Besides age and mass at maturity and growth rate, body mass was greater in Spain and Sweden and lower in Belgium, suggesting a genetic component for the U-shaped latitudinal pattern that was found also in a previous study based on field-collected adults. The mass difference between univoltine populations can be explained by the shorter

development time in the Belgian population, and this despite a higher growth rate, a pattern consistent with undercompensating countergradient variation. In line with the assumed shorter growth seasons, Belgian and Swedish animals showed higher routine growth rates and compensatory growth after transient starvation. Despite a strong link with metabolic rates (as measured by oxygen consumption) populations with higher routine growth rates had no lower fat content and had higher immune function (i.e. immune function decreased from Sweden to Spain), which was unexpected. Rapid compensatory growth did, however, result in a lowered immune function. This may contribute to the absence of perfect compensating countergradient variation in the Belgian population and the lowest routine growth rates in the Spanish population. The results underscore the importance of integrating key life historical with physiological traits for understanding latitudinal population differentiation.

(17988) [DE SILVA, M. (= team leader & principal investigator)], 2008. *The study of the faunal diversity in Galle district, southern Sri Lanka.* Wildlife Conserv. Soc., Galle. iii+44 pp. – (Publishers: Biodiv., Educ. & Res. Cent., Hiyare Reservoir, Hiyare, Galle, Sri Lanka).
Includes an annotated list of 62 odon. spp. (2 of which undescribed), recorded during a 6-month survey.

(17989) EL HAISSOUFI, M., O. LMOHDI, N. BENNAS, A. MELLADO & A. MILLAN, 2008. Les odonates du basin versant Laou (Rif occidental, Maroc). *Trav. Inst. scient.*, Rabat (sér. gén.) 2008(5): 47-59. (With Engl. s.). – (Last 2 Authors: Depto Ecol. & Hidrol., Fac. Biol., Univ. Murcia, Murcia, Spain).
A detailed review is presented of the 32 spp. known to occur in the catchment area of the Oued Laou (W Rif, Morocco). Coenagrion scitulum, Pyrrhosoma n. nymphula and Onychogomphus costae are for the first time reported from the region. The habitats are described and the biogeographic composition of the fauna is analysed.

(17990) ESENKO, I., 2008. *Sto vrtnih živali na Slovenskem.* – *[Hundred garden animals in Slovenia]*. Prešernova družba, Ljubljana. 244 pp. ISBN 978-961-6512-87-9. (Slovene). – (Publishers: Opekarska 4/A, SI-1000 Ljubljana).
The habitat requirements and behaviour of Coenagrion puella and Aeshna cyanea in garden ponds are outlined.

(17991) MACHIDA, K., T. OIKAWA & J. SHIMANUKI, 2008. Structure analyses of the wings of Anotogaster sieboldii and Hybris subjacens. *J. jap. Soc. exp. Mech.* 8(2): 142-146. (Jap., with Engl. s.). – (First Author: Tokyo Univ. Sci., 2641 Yamazaki, Noda-shi, Chiba, 278-8510, JA).
A Jap. version of the paper listed in *OA* 17972. – Note the difference in authorship.

(17992) MUGNAI, R., R.B. OLIVEIRA, A. DO LAGO CARVALHO & D.F. BAPTISTA, 2008. Adaptation of the Indice Biotico Esteso (IBE) for water quality assessment in rivers of Serra do Mar, Rio de Janeiro state, Brazil. *Trop. Zool.* 21: 57-74. – (First Author: Lab. Avaliação Saúde Ambiental, Fund. Oswaldo Cruz, Av. Brasil 4365, Manguinhos, BR-21-45-900 Rio de Janeiro, RJ).
Has a table showing odon. distribution (6 fam., 7 gen.) in the 4 RCE (= Riparian, Channel & Environment Inventory index) quality classes in the rivers of Serra dos Órgãos (RJ, Brazil).

(17993) NIVEN, J.E., C.M. GRAHAM & M. BURROWS, 2008. Diversity and evolution of the insect ventral nerve cord. *A. Rev. Ent.* 53: 253-271. – (Dept Zool., Univ. Cambridge, Cambridge, CB2 3FJ, UK).
Most odon. spp. have 3 thoracic and 7 abdominal ganglia. 3 spp. diverge from this pattern, 2 spp. within the Libellulidae have 2 thoracic ganglia (the meso- and metathoracic ganglia are fused) and in Petalura gigantea A1 is not fused to T3 as it is in all other spp. – The ancestral insect ventral nerve cord probably consisted of a chain of 3 thoracic and 8 abdominal ganglia, though this pattern is rarely observed within the Pterygota.

(17994) POLHEMUS, D.A., R.A. ENGLUND, G.R. ALLEN, D. BOSETO & J.T. POLHEMUS, 2008. Freshwater biotas of the Solomon Islands: analysis of richness, endemism and threats. *Bishop Mus. tech. Rep.* 45: iv+120 pp. – (First Author: Dept Nat. Sci., Bishop Mus., 1525 Bernice St., Honolulu, HI 96817, USA).
Presents lists of Odon. as recorded from 70 stations during the survey, and a complete checklist of spp. known from the archipelago. The latter includes 63

described spp., representing 37 gen. in 9 fam. Of these, 4 gen. and 28 spp. are endemic, representing a 11% rate of endemism at the generic level and a 44% rate at the species level. At least 1 undescribed, endemic Pseudagrion sp. was recorded during the survey.

(17995) REECE, B.A. & N.E. McINTYRE, 2008. Dragonfly (Odonata: Anisoptera) holdings of the Museum of Texas Tech University. *Occ. Pap. Mus. Texas Tech Univ.* 279: 1-13. – (Dept Biol. Sci., Texas Tech Univ., Lubbock, TX 79409-3131, USA).
The Anisoptera specimens are reviewed. Most of these are from the state of Texas (54 new county records), some were collected from other states and countries. The holdings for Texas include some undersampled areas.

(17996) SCIBERRAS, A., 2008. A contribution to the knowledge of Odonata in the Maltese islands. *Cent. Mediterr. Naturalist* 4(4): 275-288. – (131 'Arnest', Arcade St., Paola, Malta).
The observations are presented on the behaviour, prey and predators of 16 spp.

(17997) SCIBERRAS, A. & M. SAMMUT, 2008. On the occurrence of Calopteryx virgo meridionalis (Selys, 1873) (Odonata: Calopterygidae) in the Maltese islands. *Cent. Mediterr. Naturalist* 4(4): 339-342. – (First Author: 131 'Arnest', Arcade St., Paola, Malta).
This sp. has never been seen alive in the Maltese islands, but 3 records exist of dead specimens, of which only that of a specimen collected from a rock pool at Marsascale (1987-1988) is reliable. It is assumed, C. v. meridionalis is not autochthonous in Malta; the specimens on record were either introduced through human-mediated transport (e.g. incidental introduction with plant shipments) or through strong wind drifts.

(17998) SHEBL, M.A., S.M. KAMEL, T.A. ABU HASHESH & M.A. OSMAN, 2008. The most common insect species in alfalfa field in Egypt. *Acad. J. Ent.* 1(2): 27-31. – (Dept Plant Prot., Fac. Agric., Suez Canal Univ., Ismailia, Egypt).
The survey was carried out in alfalfa fields (Medicago sativa) in various areas, such as Ismailia, Suez, Swia Oasis etc. Ischnura senegalensis and Crocothemis erythraea are among the most common natural predators.

(17999) ŠKORNIK, I. & A. GOGALA, 2008. *Spoznajmo soline.* – [*Let us make acquaintance with the salines*]. Soline, Portorož. 160 pp. ISBN 978-961-91550-0-4. (Slovene).
The shallow, warm and during spring and autumn brackish water of the salines in NW Istria (Slovenia) renders a rapid larval development of Sympetrum fonscolombii.

(18000) TCHIBOZO, S., H.-P. ABERLENC, P. RYCKEWAER & P. LE GALL, 2008. Première evaluation de la biodiversité des odonates, des cétoines et des rhopalocères de la forêt marécageuse de Lokali (Sud Bénin). *Bull. Soc. ent. Fr.* 113(4): 497-509. (With Engl. s.). – (First Author: Cent. Rech. Gestion Biodiv. & du Terroir (Cerget), B.P. 04, BJ-0385 Cotonou, Benin).
24 odon. spp. are listed from the swampy rainforest of Lokali in southern Benin, of which 13 spp. are new for the country, including the rare Oxythemis phoenicosceles and the IUCN red listed Ceriagrion citrinum.

(18001) WILLKOMMEN, J., 2008. The morphology of the pterothorax of Ephemeroptera, Odonata and Plecoptera (Insecta) and the homology of wing base sclerites and flight muscles. *Stuttgart. Beitr. Naturk.* (A) (N.S.): 203-300. (With Germ. s.). – (Abt. Ent., Staat. Mus. Naturk., Rosenstein 1, D-70191 Stuttgart).
The aim of this PhD diss. is to homologise the wing base sclerites of Ephemeroptera, usually regarded as sister group of the remaining Pterygota, with that of other basal pterygote lineages and to reconstruct the ground plan of the wing base of Pterygota. The pterothoracic musculature of representatives of the three basal lineages of Pterygota (Ephemeroptera, Odon. and Neoptera) is also described and discussed. Contrary to previous hypotheses, it is shown that most elements of the neopteran wing base are also present in Ephemeroptera and Odon. The wing base in the ground plan of Pterygota is presumably composed of 3 axillary sclerites. The proximal median plate is probably also present in the ground plan of Pterygota. The first axillary is provided with 2 muscles. The third axillary is equiped with a short muscle that originates from the epimeron. This muscle is interpreted as another ground plan character of Pterygota. In Plecoptera a second muscle inserts at the third axillary sclerite. It originates from the episternum and is most likely

an autapomorphic character of Neoptera. The results imply that the wing base of the Plecoptera is close to the pterygote ground plan. It is assumed that the wing base of Ephemeroptera and Odon. is secondarily stiffened. The so-called basalare and its associated muscles in Ephemeroptera and Odon. are probably not homologous to the basalare and respective muscles in Neoptera. The enlarged subalare and associated muscles, the large dorsal longitudinal muscle, the small metathorax and shortened hindwings in Ephemeroptera suggest that mayflies have a derived flight apparatus in many respects. The Odon. on the other hand show different specialisations, namely a synthorax, large direct flight musculature, and a fusion of second and third axillary with the proximal median plate. Though the wing base in both taxa is secondarily stiffened, the specialisations of Ephemeroptera and Odon. may have evolved independently from each other.

(18002) ZHANG, J.-J. W. WU & R.-X. HUANG, 2008. Investigation on beneficial insects in Xinjiang, 3: Predacious insects and insects for enjoy. *Xinjiang Agric. Sci.* 45(1): 98-101. (Chin., with Engl. s.). – (Coll. Life Sci. & Technol., Xinjiang Univ., Urumqi-830046, China).
9 odon. spp. are listed among the "insects to enjoy" in the Sinkiang Uighur Autonomous Region, China.

2009

(18003) ABILHOA, V., H. BORNATOWSKI & G. OTTO, 2009. Temporal and ontogenetic variations in feeding habits of Hollandichthys multifasciatus (Teleostei: Characidae) on coastal Atlantic rainforest streams, southern Brazil. *Neotrop. Ichthyol.* 7(3): 415-420. (With Port. s.). – (GPIc, Mus. Hist. Nat. Capão da Imbuia, Rua Benedito Conceição 407, BR-82810-080 Curitiba, PR).
The characin is omnivorous, its diet is composed of autochthonous (mainly oligochaetes) and allochthonous (plants and terrestrial insects) material. Odon. larvae are among the 23 food items identified in the stomach contents of 191 specimens examined (March 2004-Febr. 2005).

(18004) ALBERTI LUBERTAZZI, M.A. & H.S. GINSBERG, 2009. Persistence of dragonfly exuviae on vegetation and rock substrates. *NEast Nat.* 16(1): 141-147. – (First Author: Dept Plant Sci./ Ent., Univ. Rhode Island, Woodward Hall, Kingston, RI 02881, USA).
Surveys of Anisoptera exuviae have been used to assess rare spp. habitats, lake water quality status, and wetland restoration programs. Knowledge of the persistence of exuviae on various substrates is necessary to accurately interpret exuvial surveys. In 2006, exuvial persistence was recorded at defined areas in a variety of small freshwater wetlands in Rhode Island. Exuviae were field-identified, labelled with small daubs of nail polish, and observed every 3 weeks (June-Sept.). Overall, exuvial persistence displayed exponential decline, disappearing rapidly during the first few weeks, and more slowly thereafter. The initial rate of decline was similar for most spp., but differed in some taxa. There was no significant difference in exuvial retention on emergent vegetation vs. rock substrate.

(18005) ALTAMIRANDA SAAVEDRA, M., 2009. Dragonfly (Insecta: Odonata) diversity in two use of soils in a tropical dry forest. *Revta Fac. nac. Agron. Medellin* 62(2): 5071-5079. (Span., with Engl. s.). – (Mus. Ent. Francisco Luis Gallego, Apto Aéro 3840, Medellin, Colombia).
The adult odon. were systematically sampled on 200×8 m plots in a secondary forest and in a Mango plantation (Mangifera indica) at Santafé de Antioquia (Colombia). 20 spp were recorded. In the forest, their abundance and diversity were higher. The list of spp. is provided and commented upon.

(18006) BAKER, R.L. & M.E. McGUFFIN, 2009. Technique and observer presence affect reporting of behaviour of damselfly larvae. *Jl N. Am. benthol. Soc.* 26(1): 145-151. – (Dept Ecol. & Evol. Biol., Univ. Toronto, Toronto, ON, M5S 3B2, CA).
It is tested experimentally for systematic biases in techniques commonly used to study behaviour of larval aquatic insects and it is determined whether larval Zygoptera respond to the presence of an observer and whether live observation missed some behaviours. Significant differences were found between behaviours recorded during live observations and behaviours videotaped in the absence of an observer. All behaviours except Rotate, were exhibited less frequently in the presence of an observer. These results suggest that larvae respond to the presence of observers as if they were predators. Live observation also missed some behaviours. The duration of Crawl Forward, which can be very subtle, and the

frequency of Rotate, which can be very rapid and is easily missed, were greater when recorded from the videotape than by a live observer. Wherever possible, use of video recording systems is preferable over reliance on live observations.

(18007) BECKEMEYER, R.J., 2009. First record of the dragonfly Miathyria marcella (Selys) for Kansas (Odonata: Anisoptera: Libellulidae). *Trans. Kans. Acad. Sci.* 112(1/2): 130-132. – (957 Perry Ave, Wichita, KS 67203-3141, USA).
1 mature ♂ (Wichita St. Univ. Ninnescah Fld Stn, Sedgewick co., ca 35 mi SW Wichita, 26-IX-2008) is brought on record. The specimen was taken in prairie, perched on vegetation. The locality is approx. 200 mi from the previously recorded M. marcella range. Nevertheless, based on meteorological conditions, the record is considered to be an accidental occurrence of the sp. rather than an extension of its range.

(18008) BEDJANIČ, M., 2009. Kačji pastirji, letalski virtuosi. – [Dragonflies, great masters of the air]. *In*: Bedjanič, M., [Ed.], *Narava v občini Poljčane*, pp. 58-65, Občina Poljčane. ISBN 978-961-269-171-4. (Slovene). – (Kolodvorska 21/B, SI-2310 Slovenska Bistrica).
A visit to the dragonfly world of the municipality of Poljčane (Slovenia). Out of the over 30 local spp., only some selected taxa are dealt with, and short sections on biology and conservation are included. In view of the language and style, the book is almost a work of literary art rather than a traditional natural history publication.

(18009) BEDJANIČ, M., M. CULIBERG et al. [35 joint authors], 2009. *Okoljsko poročilo z dodatkom za širitev igrišča za golf v Lipici.* – [*Environmental report with a supplement on the extension of the golf playground in Lipica*]. ZRC SAZU, Ljubljana. 200 pp. ISBN 978-961-254-135-4. (Slovene). – (Publishers: Scient. Res. Cent., Slovenian Acad. Sci. Arts, Novi trg 2, SI-1000 Ljubljana).
From the Lipica area (Slovenia) 17 odon. spp. are reported; 12 of these occur on the Lipica Stud Farm territory. – See also *OA* 17176 and 17251.

(18010) BOTS, J., C.J. BREUKER, A. VAN KERKHOVE, S. VAN DONGEN, L. DE BRUYN & H. VAN GOSSUM, 2009. Variation in flight morphology in a female polymorphic damselfly: intraspecific, intrasexual and seasonal differences. *Can. J. Zool.* 87: 86-94. (With Fr. s.). – (Evol. Ecol. Gr., Univ. Antwerp, Groenenborgerlaan 171, B-2020 Antwerpen).
In aerial animals, flight morphology needs to be designed to allow daily behavioural activities. Within species differences in behaviour can therefore be expected to relate to differences in flight morphology, not only between ♂♂ and ♀♀ but also between same-sex members when they use different behavioural strategies. In ♀ polymorphic Zygoptera, one ♀ morph is considered a ♂ mimic that resembles the ♂'s body colour and behaviour (andromorph), whereas the other is dissimilar (gynomorph). Here, it is questioned whether ♂♂, andromorphs and gynomorphs of Enallgama cyathigerum differ in flight morphology, with andromorphs being more similar to ♂♂ than gynomorphs. In addition, it is 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 ♂♂ and both ♀ morphs, which could only partly be explained from allometry. Consistent with high manoeuvrability in flight, ♂♂ had broader wings and lower wing loading than ♀♀. Variation between ♀ morphs was less pronounced, with no consistent differences in length, aspect ratio, total surface, and wing loading. However, morph-specific differences were detected in shape and width, with andromorphs having broader wings than gynomorphs similarly to ♂♂.

(18011) BUCZYNSKI, P., R. BERNARD & L. PIETRZAK, 2009. Dragonflies (Odonata) of selected dystrophic water bodies in the vicinity of Złocieniec (north-western Poland). *Chrońmy Przyr. ojcz.* 65(5): 353-364. (Pol., with Engl. s.). – (First Author: Dept Zool., MCSU, Akademicka 19, PO-20-033 Lublin).
The odon. fauna (27 spp.) was surveyed at 3 localities (all acid habitats). Species composition was mostly typical of the habitats: predominated by the tyrphobiontic (Aeshna subarctica elisabethae, Leucorrhinia dubia) and tyrphophilous spp. (Coenagrion hastulatum, Lestes virens, Leucorrhinia albifrons, L. rubicunda). Of interest is a large population of Nehalennia speciosa and the occurrence of some other red-listed spp.

(18012) CÓRDOBA-AGUILAR, A., 2009. A female

evolutionary response when survival is at risk: male harassment mediates early reallocation of resources to increase egg number and size. *Behav. Ecol. Sociobiol.* 63: 751-763. – (Depto Ecol. Evolutiva, Inst. Ecol., UNAM, Circuito esterior s/n, Apdo Postal 70-275, Ciudad Universitaria, MX-04510 México, DF).

One unexplored area in sexual conflict studies is the ♀ physiological costs and possible resource reallocation that accompany evolutionary costs due to ♂ harassment. Using Hetaerina americana ♀♀, it was first investigated whether ♂ harassment affected ♀ mating rate and survival and explored whether such effects induced a resource allocation from immunity (in the form of phenoloxidase activity) and muscular fat reserves to egg number and size. Using 2 seasons that differed in ♂ harassment, the fewer are the ♀ matings and the lower is the ♀ survival. These results were corroborated using an experimental approach in which a situation of high ♂ harassment was induced. It was also found that when the first mating takes place and at high ♂ harassment, ♀♀ had more reduced phenoloxidase activity and fat reserves and tended to lay most of the eggs they produce in their lifetime and these were considerably large. However, at low ♂ harassment, egg number and size were more equally produced across matings. ♀♀ under high ♂ harassment seemed to suffer the survival costs but may show a plastic evolutionary response of reallocating resources to egg traits to maximize fitness.

(18013) CORDOBA-AGUILAR, A., M.A. SERRANO-MENESES & A. CORDERO-RIVERA, 2009. Copulation duration in nonterritorial odonate species lasts longer than in territorial species. *Ann. ent. Soc. Am.* 102(4): 694-701. – (First Author: Depto Ecol. Evolutiva, Inst. Ecol., UNAM, Circuito esterior s/n, Apdo Postal 70-275, Ciudad Universitaria, MX-04510 México, DF).

It was tested whether long copulation duration is more likely to have evolved in nonterritorial Odon. spp. than in territorial spp., given that nonterritorial ♂♂ do not incur the costs of territory defense. A phylogenetic comparative method that controls for the phylogenetic nonindependence of spp. was used to compare copulation duration among 46 spp. of Anisoptera and Zygoptera. Copulation duration of nonterritorial anisopteran spp. was longer than for territorial dragonflies; however, this relationship was not found for Zygoptera. Long copulations in Anisoptera may be related to a ♂'s ability to manipulate a ♀'s stored sperm It is suggested that constraints that prevent a territorial ♂ from lengthening copulation do not seem to operate in Zygoptera. Other selective processes (i.e., cryptic ♀ choice and/or sexual conflict) may also be important determinants of copulation duration in the Zygoptera. This is probably the first exploration of the relation copulation duration and mating systems in insects.

(18014) COUCEIRO, S.R.M., N. HAMADA, B.R. FORSBERG & C. PADOVESI-FONSECA, 2009. Effects of anthropogenic silt on aquatic macroinvertebrates and abiotic variables in streams in the Brazilian Amazon. *J. Soils Sediments* 2009: 15 pp.; – DOI: 10.1007/s11368-009-0148-z. – (First Author: Inst. Nac. Pasquisas Amazônia, Av. André Araújo 2936, CP 478, BR-69060-001 Manaus, Amazonas).

The impacts are evaluated of anthropogenic silt derived from the construction of roads, borrow pits and wells during the development of gas and oil on invertebrate communities in streams in the Urucu Petroleum Province in Central Brazilian Amazon. 10 impacted and 9 non-impacted streams were sampled. Anthropogenic suspended silt had a significant impact on aquatic macroinvertebrate diversity and density. 10 odon. fam. and 7 gen. were identified. Aeshnidae, Dicterias and Phyllogomphoides did not occur in impacted streams.

(18015) DAVID, S. & M. ŠMIGA, 2009. Dragonflies (Insecta: Odonata) of Považské Podolie region in the vicinity of the town of Trenčin. *Folia faun. slovaca* 14(16): 107-112. (Slovak, with Engl. s.). – (Katedra Ecol. & Envir. Stud., Univ. Nitra, Hlinku 1, SK-94974 Nitra).

A commented list of 21 spp.; – Slovakia.

(18016) DE SOUZA-FRANCO, G.M., I. de F. ANDRIAN & R.M. FRANCO, 2009. Community of aquatic insects associated with Eichhornia azurea (Schwartz) Kunth in a varzea lagoon in the floodplain of the High Paraná river, Mato Groso do Sul state, MS, Brazil. *Biológico* 71(1): 83-91. (Port., with Engl. s.). – (First Author: Cent. Ciênc. Agro-Ambientales, Univ. Comun. Regional Chapecó, Av. S.A. Fontana 591-E, BR-89809-000 Chapecó, SC).

Lists Coryphaeschna adnexa and 5 other odon. taxa (genera only).

(18017) DOMMANGET, J.-L., B. PRIOUL, A. GAJDOS & J.-P. BOUDOT, 2009. *Document préparatoire à une Liste Rouge des odonates de France métropolitaine complétée par la liste des espèces à suivi prioritaire.* Soc. fr. Odonatol., Bois-d'Arcy. 47 pp. – (Société française d'Odonatologie, 7 rue Lamartine, F-78390 Bois-d'Arcy).

(18018) DONOSO, D.A., F. SALAZAR, F. MAZA, R.E. CARDENAS & O. DANGLES, 2009. Diversity and distribution of type specimens deposited in the Invertebrate Section of the Museum of Zoology QCAZ, Quito, Ecuador. *Annls Soc. ent. Fr.* (NS) 45(4): 437-454, App. 1 incl., App. 2 (34 pp.) excl. (With Fr. s.). – (Second Author: Mus. Zool., Sch. Biol. Sci., Pontifical Catholic Univ. Ecuador, Apdo 17-01-2184, Quito, Ecuador).
1902 type specimens of 326 sp./spp. taxa are reviewed. The Odon. are represented by Lestes jerelly Tennessen, 1997 (2 paratypes), Oxyagrion tennesseni Mauffray, 1999 (paratype), and Aeshna (Marmaraeschna) brevicercia Muzón & von Ellenrieder, 2001 (holotype, paratype series). The text from the labels is reproduced and bibliographic references are provided.

(18019) EBRAHIMI, A., S.M. MADJDZADEH & H. MOHAMMADIAN, 2009. Dragonflies (Odonata) from south-eastern Iran. *Caspian J. envir. Sci.* 7(2): 107-112. – (First Author: Dept Biol., Fac. Sci., Shahid Bahonar Univ., Kerman, Iran).
The records (2006-2008) are presented of 27 spp. from 20 localities (alt. 429-2848 m a.s.l.) in the prov. of Kerman.

(18020) EROUKHMANOFF, F., D. OUTOMURO, F.J. OCHARAN & E.I. SVENSSON, 2009. Patterns of phenotypic divergence in wing covariance structure of calopterygid damselflies. *Evol. Biol.* 36: 214-224. – (First Athor: Sect. Anim. Ecol., Ecol. Bldg, Lund Univ., S-223-62 Lund).
Comparing species differences in covariance patterns of traits subject to divergent selection pressures can increase the understanding of the mechanisms of phenotypic divergence. Different calopterygid spp. have diverged in the melanised wing patch of ♂♂. This trait serves multiple ecological functions and has behavioural consequences in terms of sexual selection interspecific interactions and reproductive isolation. Here, the phenotypic variance-covariance matrices (P) of wing traits is compared among 9 populations of 4 European spp. A modest divergence in covariance structure was found among populations of the same sp., but strong divergence occurs between spp. Interestingly, the orientation of the first eigenvector of P (P_{max}) differed more between closely related than between distantly related spp., although this pattern was absent when overall covariance structures were compared. It was also found that distantly related but geographically closer spp. had converged towards a similar covariance structure. Finally, divergence in covariance structure was correlated with divergence in wing patch length, but not with other wing traits. This last finding suggests that divergent selection on wing patch length might have affected the stability of P. These results indicate that P might not only reflect ancestral developmental pathways but might also be influenced by current ecology.

(18021) *ERJAVECIA*. Bulletin of the Slovenian Odonatological Society (ISSN 1408-8185), No. 24 (31 Oct. 2009). (Slovene). – (c/o M. Bedjanič, Kolodvorska 21/B, SI2310 Slovenska Bistrica).
M. Bedjanič (pp. 1-14) is describing odon. inventory in the 9th vol. of J.W. Valvasor's graphic collection from 1684 (for that in the 18th vol., see *OA* 16079). Some local records and observations are provided by *D. Vinko* (pp. 14-16), *N. Erbida* (pp. 16-18) and *M. Bedjanič* (pp. 18-21). 3 anonymous notes deal with the novelties on dragonflies in the Slovenian arts (vine bottle labels, literature, architecture), whereas the 24th addition to the Slovenian odonatol. bibliography concludes the issue (*M. Bedjanič*, pp. 28-32, Nos 725-760).

(18022) FRANKOVIĆ, M. & T. BODANOVIĆ, 2009. *Vretenca. Priručnik za inventarizacijo i praćenje stanja.* – [*Dragonflies. A handbook for inventory and monitoring*], Državni zavod za zaštitu prirode, Zagreb. 43 pp. ISBN 978-953-7169-71-8. (Croatian). – (First Author: Oboj V, odvojak 10/1, HR-10000 Zagreb).
Includes a brief outline of dragonfly biology and illustrated family keys to larvae and adults. The address where the Croatian records and observations are to be sent is not provided. – From the list of species, it seems there appears in Croatia an undescribed Lindenia taxon, the Croatian vernacular name of which is different from that of L. tetraphylla.

(18023) GONZÁLEZ-TOKMAN, D.M. & A. CÓRDOBA-AGUILAR, 2009. Survival after experimental manipulation in the territorial damselfly Hetaerina titia (Odonata: Calopterygidae): more ornamented males are not more pathogen resistant. *J. Ethol.* 2009: 5 pp.; – DOI: 10.1007/s10164-009-0151-2. – (Depto Ecol. Evolutiva, Inst. Ecol., UNAM, Apdo Postal 70-275, Ciudad Universitaria, MX-04510 México, DF).
It has been hypothesized that sexual ornaments communicate pathogen resistance ability. Here, the relationship between the expression of a ♂ ornamental trait (wing pigmentation) of H. titia and survival after a bacterial challenge is experimentally explored. ♂ ♂ were infected with Serratia marcescens (a Gram-negative bacteria typical of insects) and their survival compared against a group infected with dead bacteria and a non-infected group. Wing pigmentation was entered as a predictor of survival in this comparison. The study indicate: that wing pigmentation is not a good predictor of immune ability against bacteria. This contradicts previous findings in the same and other calopterygid spp. in which wing pigmentation intensity inversely correlated with gregarine infection levels. It also contradicts the general idea that ornaments are honest indicators of pathogen defense.

(18024) HACET, N., 2009. The easternmost record of Somatochlora borisi Marinov, 2001 from Turkish Thrace, with a zoogeographic assessment on the distribution of the species (Odonata: Corduliidae). *J. ent. Res. Soc.* 11(2): 51-56. – (Dept Biol., Fac. Arts & ci., Trakya Univ., TR-22030 Edirne).
The easternmost known locality (Istanbul-Catalea, 1 ♂, 24-VI-1998) is brought on record, the distribution of the sp. is mapped, and its generic status is discussed.

(18025) HENTZ, J.-L. & C. BERNIER, 2009. *Macromia splendens, une libellule remarquable dans le département du Gard. Synthèse des connaissances.* Gard Nature, Beaucaire. 16 pp. ISBN none. – (Publishers: Mas du Boschet Neuf, F-30300 Beaucaire).
The current knowledge on M. splendens in the department of Gard (France) is outlined. The adult and larva are briefly described, the maps of its distribution in France and of the known localities in the dépt are presented, notes are supplied on its biology and local status and a fairly exhaustive bibliography is appended.

(18026) IDRIS, A.B., S. ISMAIL, Y. HARON & Y. SUHANA, 2009. Insects of Tasik Chini with special emphasis on ichneumonid wasps. *Sains malaysiana* 38(6): 813-816. (With Malay s.). – (Cent. Insect Syst., Fac. Sci. & Technol., Univ. Kebangsaan Malaysia, 43600 UKM Bangi, Selangor D.E., Malaysia).
Tasik Chini is the second largest natural lake in the state of Pahang (Malaysia). 9 odon. spp. are listed (Aeshnidae, Libellulidae).

(18027) JOVIC, M., L. ANDJUS & S. SANTOVAC, 2009 New data on some rare and poorly known Odonata species in Serbia. *Bull. nat. Hist. Mus.* Belgrade 2: 95-108. (With Serb. s.). – (First Author: Nat. Hist. Mus., Njegoseva 51, RS-11000 Belgrade).
New information on the distribution of 10 spp. in Serbia is provided. All published records of Somatochlora metallica are actually referable to S. meridionalis, therefore the former sp. is to be deleted from the list of Serbian fauna.

(18028) JOVIĆ, M. & B. MIHAJLOVA, 2009. Catalogue of the Odonata collection in the Macedonian Museum of Natural History. *Acta ent. serb.* 14(2): 133-146. (With Serb. s.). – (Second Author: Maced. Mus. Nat. Hist., Blvd Ilinden 86, MK-1000 Skopje).
1344 specimens, referable to 46 spp., are catalogued (with locality data and dates), almost all from Macedonia, a few specimens also from Bosnia and Herzegovina, Greece, Serbia and Turkey. Lestes parvidens is new for the fauna of Macedonia.

(18029) KAIZE, J. & V. KALKMAN, 2009. Records of dragonflies from Kabupaten Maerauke, Papua, Indonesia collected in 2007 and 2008 (Odonata). *Suara Serangga Papua* 4(2): 40-45. (With Bahasa Indonesian s.). – (First Author: d/a Kelompok Entomologi Papua, Kotakpos 1078, Jayapura-99010, Indonesia).
Records of 37 spp.; – southern New Guinea.

(18030) KALNINS, M., 2009. Lesser Emperor Anax parthenope (Selys, 1839) (Odonata: Aeshnidae): a new dragonfly species in Latvia. *Latv. Ent.* 47: 16-20. – (Nature Prot. Agency, Baznicas iela 7, LV-2150 Sigulda).
The sp. is brought on record from 5 localities (2008, 2009).

(18031) KHROKALO, L.A., V.V. SAVCHUK & E.S. DYATLOVA, 2009. New records of rare dragonflies (Insecta, Odonata) in Ukraine. *Vest. Zool.* 43(4): 378. (Russ.). – (First Author: Dept Envir. Biotechnol. & Bioenergy, Natn. Tech. Univ. Ukraine, Kyiv, Ukraine).
Records of Erythromma lindenii, Coenagrion scitulum and Selysiothemis nigra.

(18032) KORTELLO, A.D. & S.J. HAM, 2009. Movement and habitat selection by Argia vivida (Hagen) (Odonata, Coenagrionidae) in fuel-modified forest. *J. Insect Conserv.* 2009: 8 pp.; – DOI: 10.1007/s10841-009-9233-2. – (First Author: Banff Natn. Park, Fire & Vegetation Mngmt Program, Box 900, Banff, AB, T1L 1K2, CA).
Fuel management for wildfire protection is becoming increasingly common in the wildland-urban interface and may have conservation implications for spp. with restricted distributions and limited dispersal abilities. To evaluate the impact of forest fuel management on A. vivida at the northern margin of its range, terrestrial movements and habitat associations were examined using capture-mark-recapture and point count techniques. It was found that habitats away from the springs were particularly important for ♀♀. Most individuals travelled at least 50 m between capture and recapture and patches of cleared forest up to this size did not pose a barrier to movement. Although A. vivida typically roosts in trees at night, cleared fuel treatment areas were preferred over unmodified or thinned forest as daytime basking and foraging sites. Preferred sites were also characterized by heterogeneous canopy closure, i.e., a clearing adjacent to unmodified forest with a closed canopy. It is speculated that this behaviour derives from the species' thermoregulation requirements; the use of sunspots for thermal basking during the day and the use of forest cover at night to slow the radiant loss of heat. The findings demonstrate the scale of movements that define available habitat and the importance of both daytime and night time habitat requirements in considering terrestrial foraging and movement corridors. Consequently, conservation efforts for this sp. in fuel management areas should focus on maintaining unmodified stands of dense trees in association with cleared patches of appropriate dimension, rather than a uniformly thinned forest.

(18033) LANDMANN, A., 2009. Die Höhenverbreitung als Indikator der Gefährdung von Insekten in Alpenraum. *Contr. nat. Hist., Berne* 12: 829-856. (With Engl. s.). – (Inst. Zool., Univ. Innsbruck, Technikerstr. 25, A-6020 Innsbruck).
The listings of "valley, lowland", and "mountain" odon. spp. in the recent national (Austria, Switzerland) and regional (Tyrol, Carinthia, Lower Austria, Bavaria) Red Lists are analysed. Overall, the percentage of spp. regarded as "safe" (LC = Least concern) is significantly higher in the "mountain" species group than in that of the "lowland" taxa. The "lowland" and "mountain" groups also strongly differ in dimensions of threat, the former group exhibiting a much higher proportion of taxa within the highest categories (CR = Critically endangered, EN = Endangered). Differences between the "lowland" and "mountain" groups are higher in the central parts of the Alps than at their northern edge in Lower Austria and Bavaria (Germany).

(18034) LEVINE, T.D., B.K. LANG & D.J. BERG, 2009. Parasitism of mussel gills by dragonfly nymphs. *Am. Midl. Nat.* 162(1): 1-6. – (First Author: Hancock Biol. Stn, Murray St. Univ., 561 Emma Dr., Murray KY 42071, USA).
During a mark-recapture study of the critically endangered unionoid mussel Popenaias popeii, a Gomphus militaris larva was discovered eating the gills of a gravid mussel; larvae and gill material were found in the odon. 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. popeii.

(18035) LI, Z.-x., W. SHEN, G.-s. TONG, J.-m. TIAN & L. VU-QUOC, 2009. On the vein-stiffening membrane structure of a dragonfly hind wing. *J. Zheijang Univ.* (Sci. A) 10(1): 72-81. – (First Author: Inst. Structural Engineering, Zheijang Univ., Hangzhou-310058, China).
Aiming at exploring the excellent structural performance of the vein-stiffening membrane structure of dragonfly Pantala flavescens) hindwings, 2 planar computational models and three 3D computational

models with cambered corrugation were analyzed 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 reticulately stiffening thin-walled roof systems and flapping wings in novel intelligent aerial vehicles.

(18036) LOTZING, K., 2009. Kurzübersicht der seit 1980 nachgewiesenen Libellen (Insecta: Odonata) im Bereich der Bode und ihrer Nebenarme innerhalb des ehemaligen Landkreises Aschersleben-Stassfurt (Sachsen-Anhalt). *Halophila* 53: 15-18. – (Am Hollschen Bruch 4/c, D-39435 Unseburg).
5 wetland localities in the former district of Aschersleben-Stassfurt (Sachsen-Anhalt, Germany) are described in detail and their recorded odon. fauna (29 spp.) is listed.

(18037) McPEEK, M.A., L. SHEN & H. FARID, 2009. The correlated evolution of three-dimensional reproductive structures between male and female damselflies. *Evolution* 63(1): 73-83. – (First Author: Dept Biol. Sci., Dortmouth Coll., Hanover, NH 03755, USA).
For many taxa, spp. are defined by the morphologies of reproductive structures. In many odon., these structures are the cerci of ♂♂ (used to hold ♀♀ during mating) and the thoracic plates of ♀♀ where the ♂ cerci contact the ♀ bodies. A previous study showed that the shapes of cerci of Enallagma ♂♂ 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, the evolution of shape change in the corresponding ♀ plates is examined. It was found that, like ♂ cerci, the shapes of Enallagma ♀ 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 ♂ cerci and ♀ thoracic plates were positively related across the history of the clade, demonstrating that they evolve in a correlated fashion. This pattern of evolution suggests that these structures are primary signals of sp. identity during mating.

(18038) MULLER, J. & R. STEGLICH, 2009. Fundort- und Artenliste eigener Libellen-Nachweise im Jahre 2008 in Sachsen-Anhalt: odonatologischer Jahresbericht 2008. *Halophila* 53: 7-13. – (First Author: Frankefelde 3, D-39116 Magdeburg).
The 2008 annual report on Odon. recorded in the federal state of Sachsen-Anhalt (Germany), with localities, dates and brief annotations where appropriate.

(18039) MULLER, J. & R. STEGLICH, 2009. Zum Vorkommen der Scharlachlibelle Ceriagrion tenellum in Sachsen-Anhalt. *Halophila* 53: 14. – (Second Author: Zollstrasse 1/128, D-39104 Magdeburg).
The recent occurrence of C. tenellum in the federal state of Sachsen-Anhalt (Germany) is briefly reviewed and the expansion of its range in NE direction is confirmed.

(18040) PAULSON, D.R., 2009. A new species of Leptobasis from Costa Rica (Odonata: Coenagrionidae). *Zootaxa* 2239: 62-68. – (Slater Mus. Nat. Hist., Univ. Puget Sound, Tacoma, WA 98416, USA).
L. guanacaste is described from seasonal wetlands in dry forest. Holotype ♂: Hacienda Taboga, Guanacaste prov., Costa Rica, 2-VIII-1967; deposited in FSCA). It is unique among the 5 spp. of the gen. in thoracic colour pattern and the structure of the ♂ terminal appendages and ♀ mesostigmal laminae and appears to be closest to L. candelaria through similarities in genital ligula, ♂ metafemur and ♀ ovipositor.

(18041) PIRNAT, A., 2009. Inventarizacija kačjih pastirjev v glinokopu Pristava pri Mengšu. – [Dragonfly inventory of the Pristava clay-pit near Mengeš]. *In*: T. Gregorc & I. Nekrep, [Eds], *In-*

ventarizacija habitatnih tipov, kačjih pastirjev (Odonata), dvoživk (Amphibia), plazilcev (Reptilia) in ptic (Aves) na območju Jezera v Pristavi ter predlog naravovarstveno pomembnih delov na območju raziskav, 8 pp., Lutra, Ljubljana. (Slovene). – (Publishers: Opekarska 11, SI-1000 Ljubljana; – Author: Groharjeva 18, SI-1241 Kamnik).
A commented list of 37 spp.; – central Slovenia. – See also *OA* 16599.

(18042) QUADROS, G., G. GURAV, K. BHAGAT, A. CHORGHE, A. DHAMORIKAR, K. KHOT & M. NAGARKAR, 2009. *Report of the study of the biodiversity of Indian Institute of Technology Bombay Campus*. WWF-India, Maharashtra St. Office, Mumbai. v+158 pp., map & 44 pls excl. – (Publishers: World Wide Fund for Nature-India, Maharashtra State Office, Dr D.N. Rd, Fort Mumbai-400 001, India).
36 odon. taxa were recorded, of which 30 spp. are identified and presented on pls 24-25.

(18043) SCHULTZ, T.D., 2009. Diversity and habitats of a prairie assemblage of Odonata at Lostwood National Wildlife Refuge, North Dakota. *J. Kans. ent. Soc.* 82(1): 91-102. – (Dept Biol., Denison Univ., Graville, OH 43023, USA).
26 spp. were recorded from 32 wetlands sites. The fauna consists primarily of widespread, common spp. that are adapted to fishless lentic communities and tolerant of alkaline and impermanent water regime. The odon. communities of semipermanent, oligosaline ponds are the most diverse. Long-term monitoring of odon. 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.

(18044) SHAALAN, E.A.-S. & D.V. CANYON, 2009. Aquatic insect predators and mosquito control. *Trop. Biomed.* 26(3): 223-261. – (First Author: Zool. Dept, Aswan Fac. Sci., South Valley Univ., Aswan-81528, Egypt).
A review paper, including annotated odon. lists and their respective mosquito prey. Although odon. larvae have been investigated less compared to other predaceous aquatic insects, their long life cycle, predation capacity and sharing of habitats with mosquito immatures are advantageous for their being potential biological control agents.

(18045) STEVENS, L.E. & R.A. BAILOWITZ, 2009. Odonata biogeography in the Great Canion ecoregion, southwestern USA. *Ann. ent. Soc. Am.* 102(2): 261-274. – (First Author: Mus. Northern Arizona, 3101 N. Ft. Valley Rd, Flagstaff, AZ 80001, USA).
The odon. fauna of the Great Canion ecoregion (GCE) includes 89 spp. Three biogeographic hypotheses account for the relatively high regional species richness: (i) faunal affinity (origin), (ii) elevation effects on range, and (iii) landform impacts across spatial scale. The GCE odon. assemblage is the result of mixing of taxa from adjacent neotropical and nearctic regions. Although no GCE odon. previously have been considered rare or at risk, 15 spp. are restricted to 3 or 4 localities, 4 spp. are known from a single locality, and 4 high-elevation nearctic spp. may be at risk of extirpation through climate change impacts on their habitats.

(18046) WILLKOMMEN, J., 2009. The tergal and pleural wing base sclerites – homologous within the basal branches of Pterygota? *Aquat. Insects* 31 (Suppl. 1): 443-457. – (Abt. Ent., Staat. Mus. Naturk., Rosenstein 1, D-70191 Stuttgart).
The Ephemeroptera are usually regarded as the sister group of the remaining Pterygota. Their wing base sclerites and pterothoracic musculature are compared with those of other basal pterygote lineages. It is shown that most elements of the neopteran wing base are also present in Ephemeroptera and Odon. The wing base in the ground plan of Pterygota is presumably composed of 3 axillaries and a proximal median plate. The first axillary is provided with 2 muscles. The third axillary is equipped with 1 short muscle in the ground plan of Pterygota. A second muscle, which inserts at the third axillary and originates from the episternum, is most likely an autapomorphic character of Neoptera. The results imply that the wing base of Plecoptera is close to the pterygote ground plan. It is assumed that the wing bases of Ephemeroptera and Odon. are secondarily stiffened. The so-called basalare and its associated muscles in Ephemeroptera and Odon. are probably not homologous to the basalare and respective muscles in Neoptera. Though the wing bases of both Ephemeroptera and Odon. show similar modifications their specialisations may have evolved independently from each other.

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(18047) ABBOTT, J.K. & E.I. SVENSSON, 2010. Morph-specific variation in an inter-specific mimicry system. *Evol. Ecol. Res.* 12: 105-118. – (First Author: Dept Anim. Ecol., Evol. Biol. Cent., Uppsala Univ., Norbyvägen 18D, SE-75236 Uppsala).
Positive intersexual genetic correlations are typically viewed as constraining the evolution of sexual dimorphism, when traits are subject to sexually antagonistic selection. Here, Ischnura elegans was studied that has a ♀-limited colour polymorphism, with 3 ♀ colour morphs (♂ ♂ are monomorphic), one of which is considered a ♂ mimic. The question was whether there are morph-specific differences in the magnitude of intersexual genetic correlations, i.e. do androchromous ♀ ♀ have higher intersexual genetic correlations for morphological traits than non-mimic ♀ ♀. The offspring of in the field collected copulating pairs was risen in the laboratory, 5 morphological traits in parent and offspring generations were measured, and their heritabilities and genetic correlations were investigated. It was found a negative overall relationship between the degree of sexual dimorphism for a trait and its intersexual genetic correlation. But the magnitude and direction of intersexual genetic correlations depended on the ♀ morph. As expected, androchromous ♀ ♀ had higher intersexual genetic correlations. In addition, the genetic correlations between the morphs were in all cases significantly lower than unity. Androchromous ♀ ♀ had higher mother-son covariances than the non-mimic morph, and this difference is the proximate explanation for the difference in intersexual genetic correlations between the I. elegans morphs.

(18048) BERTI, J., J. GONZALEZ, E. NAVARRO-BUENO, E. ZOPPI, E. GORDON & L. DELGADO, 2010. Larval seasonality of the mosquito Anopheles aquasalis (Diptera: Culicidae) and other insects associated to its habitat in Suere, Venezuela. *Revta Biol. trop.* 58(2): 777-787. (Span., with Engl. s.). – (First Author: Inst. Altos Estudios 'dr A. Gabaldon', Lab. Ent. Malaria, Calle Dr A. Gabaldon, Las Delicias, Maracay, Venezuela).
Familywise, monthly abundance is shown of larval Coenagrionidae, Aeshnidae and Libellulidae in the Rio Chiquito Abajo mangrove (Paria peninsula, Sucre, NE Venezuela).

(18049) *BULLETI d'OXYGASTRA*. Periodical of the Grup d'Estudi dels Odonats de Catalunya. (ISSN none). Nos 1 (Jan. 2007), 2 (Feb. 2007), 3 (March 2007), 4 (Oct., 2007), 5 (Feb. 2008), 6 (March 2008), 7 (Aug. 2008), 8 (March 2010). Catalan. – (c/o R. Martin, C./Marti Juliá 19-23, 1° 1a, ES-08911 Barcelona).
The address of the publisher and that of the Editor are not stated in the journal. – [No. 8]: *Escolà, J.*: Odonata of the Odena basin (pp. 1-8); – Odonata of Estany d'Ivars in Vila-sana (pp. 9-14); – *Martin, R.*: The description of Oxygastra curtisii (Dale, 1834) (pp. 15-17).

(18050) CHASE, J.M., A.A. BURGETT & E.G. BIRO, 2010. Habitat isolation moderates the strength of top-down control in experimental pond food webs. *Ecology* 91(3): 637-643. – (Dept Biol., Washington Univ., Saint Louis, MO 63130, USA).
Habitat isolation is well known to alter patterns of spp. abundance, richness and the ratios of predator : prey. Less clear is, however, how isolation alters interactions within food webs. Here, the results are presented from an experiment performed in artificial ponds (mesocosms) manipulating habitat isolation crossed with a predator reduction treatment to disentangle how isolation mediates the top-down effect of predators. The 3 larger predator groups (Anisoptera, large diving beetles and hemipterans) were negatively affected by isolation, whereas Zygoptera and small beetles were positively affected.

(18051) ELTJON, H., P. ANILA, T. DRITAN & M. KASTRIOT, 2010. The impact of environmental conditions on the biodiversity of aquatic insects, Odonata, from aquatic ecosystems of Karavasta and Spillea in Albania. *BALWOIS*, Ohrid, 2010, pp. 1-6. – (Dept Biol., Fac. Nat. Sci., Univ. Tirana, Tirana, Albania).
26 spp. are recorded from Karavasta lagoon and from the delta of the Shkumbini river. The Albanian vernacular names of all the taxa are also provided.

(18052) *INTERNATIONAL JOURNAL OF ODONATOLOGY* (ISSN 1388-7890), Vol. 13, No. 1 (1 Apr. 2010).
Von Ellenrieder, N.: Odonata biodiversity of the Argentine Chaco biome (pp. 1-25); – *Sánchez-Herrera, M. & E. Realpe*: Population structure of

Polythore procera at a Colombian stream (Odonata: Polythoridae) (pp. 27-37); – *Bernard, R. & B. Daraż*: Relict occurrence of East Palaearctic dragonflies in northern European Russia, with first records of Coenagrion glaciale in Europe (Odonata: Coenagrionidae) (pp. 39-62, pl. 1 excl.); – *Michalski, J. & S. Oppel*: Two new species of Argiolestes from Papua New Guinea (Odonata: Megapodagrionidae) (pp. 63-74); – *Kalkman, V.J., S.J. Richards & D.A. Polhemus*: Three new species of Argiolestes, with a key to the males of Argiolestes s. str. (Odonata: Megapodagrionidae) (pp. 75-88, pls 2-3a excl.); – *Tennessen, K.J. & J.T. Johnson*: Archaeopodagrion armatum sp. nov. from Ecuador (Odonata: Megapodagrionidae) (pp. 89-95, pl. 3b excl.); – *Kalkman, V.J. & K.D.P. Wilson*: Calilestes and Lestomima, junior synonyms of Rhipidolestes (Odonata: Megapodagrionidae) (pp. 97-102); – *Schütte, K.*: The larva of Nesolestes sp. from Madagascar (Odonata: Megapodagrionidae) (pp. 103-108); – *Choong, C.Y. & A.G. Orr*: The larva of Podolestes orientalis from West Malaysia, with notes on its habitat and biology (Odonata: Megapodagrionidae) (pp. 109-117, pl. 4 excl.); – *Kalkman, V.J., C.Y. Choong, A.G. Orr & K. Schütte*: Remarks on the taxonomy of Megapodagrionidae with emphasis on the larval gills (Odonata) (pp. 119-135); – *Muzón, J., S. Weigel Muñoz & R.E. Campos*: The larva of Mecistogaster amalia (Odonata: Pseudostigmatidae) (pp. 137-144); – *Xu, Q.*: The larvae of Macromia flavocolorata and M. septima from Fujian, China (Odonata: Macromiidae) (pp. 145-152).

(18053) KUTERA, M. & A. WOZNIAK, 2010. New locality of Common goldenring, Cordulegaster boltonii (Donovan, 1807) near Strochowice on the Kielce Upland. *Chrońmy Przyr. ojcz.* 66(2): 121-124. (Pol., with Engl. s.). – (First Author: Rudka 30, PO-27-415 Konów).
A ♂ was recorded (11-VII-2007) from a site populated by a beaver community, nr Lubienia (UTM EB15, Poland). The status of C. boltonii in Poland appears at present rather favourable, therefore the sp. was recently deleted from the Polish national Red List.

(18054) *ODONATRIX*. Bulletin of the Odonatological Section of the Polish Entomological Society (ISSN 1733-8239), Vol. 6, No. 1 (31 Jan. 2010). (Pol., with Engl. s's). – (c/o Dr P. Buczyński, Dept Zool., UMCS, Akademicka 1 9, PO-20-033 Lublin).
Buczyński, P. & E. Buczyńska: Another record of dragonflies (Odonata) in a light trap (pp. 1-2); – *Koleczek, D. & G. Tończyk*: Ischnura elegans (Zygoptera: Coenagrionidae) as a prey of Machimus sp. (Diptera: Asilidae) (p. 3); – *Tończyk, G.*: Area of Poland as locus typicus for some dragonfly species (pp. 4-6); – *Zawal, A.*: New locality of Crocothemis erythraea in western Poland (pp. 6-8); – *Tończyk, G. & K. Zemko*: Preliminary estimation of population total abundance of Leucorrhinia caudalis and L. pectoralis in 'Zdreczno Lake' nature reserve (Tuchola Forest, Poland) (pp. 9-14); – *Michalczuk, W. & P. Buczyński*: The second recent locality of Coenagrion ornatum (Odonata: Coenagrionidae) in the southeastern Poland (pp. 15-21); – *Tatarkiewicz, D.*: Sites of the emergence of Libellula fulva (Odonata: Libellulidae) in the forest of Puszcza Notecka (pp. 21-29); – *Zurawlew, P., S. Pawlak & P.T. Dolata*: Data on the occurrence of Sympetrum meridionale and S. pedemontanum in the southern Great Poland and in the Wieluń Land (pp. 30-32).

(18055) NESEMAN, H., R.D.T. SHAH, D.N. SHAH & S. SHARMA, 2010. First records of Rhicnoda natatrix and Rhicnoda rugosa (Blattodea: Blaberidae) from Nepal and India (Maharashtra) with notes on habitat quality. *J. threatened Taxa* 2(1): 648-652. – (First Author: Aquat. Ecol. Cent., Kathmandu Univ., Dhulikhel, Nepal).
Epiophlebia laidlawi and (familywise) the representatives of 9 other odon. fam. are reported from 5 habitats of the aquatic Rhicnoda cocroaches in Nepal. E. laidlawi is recorded from the metarhithron of the Sim Khola midstream and from epirithron of its first tributary.

(18056) PETRIN, Z., E.G. SCHILLING, C.S. LOFTIN & F. JOHANSSON, 2010. Predators shape distribution and diversification of morphological defenses in Leucorrhinia, Odonata. *Evol. Ecol.* 2010, 14 pp.; – DOI 10.1007/s10682-010-9361-x. – (First Author: Norw. Inst. Nature Res., N-7485 Trondheim).
Predators strongly influence species assemblages and shape morphological defences of prey. Adaptations that constitute effective defences against one type of predator may render the prey susceptible to other types of predators. Hence, prey may evolve different strategies to escape predation, which may

facilitate adaptive radiation of prey organisms. Larvae of different Leucorrhinia spp. have various morphological defences. The distribution of these larvae was studied in relation to the presence of predatory fish. The variation in morphological defences within species was examined with respect to the occurrence of fish. It was found that well-defended spp., those with more and longer spines, were more closely associated with habitats inhabited by predatory fish and that spp. with weakly developed morphological defences were more abundant in habitats without fish. The spp. predominantly connected to lakes with or without fish, respectively, were not restricted to a single clade in the phylogeny of the genus. The data is suggestive of phenotypic plasticity in morphological defence in 3 of the studied spp. since these showed longer spines in lakes with fish. It is suggested that adaptive phenotypic plasticity may have broadened the range of habitats.

(18057) PINTO, A.P. & A.L. CARVALHO, 2010. A new species of Lauromacromia (Odonata: Corduliidae) from southwestern Brazil, with a cladistic analysis of the genus and comments on neotropical dragonfly biogeography. *Zootaxa* 2425: 45-68. (With Port. s.). – (Second Author: Depto Ent., Mus. Nac., UFRJ, Quinta de Boa Vista, São Cristóvão, BR-20940-040, Rio de Janeiro, JR).
L. melanica sp. n. is described and illustrated, based on 2 ♂. Holotype ♂: Brazil, Espirito Santo, Conceição da Barra, 1/6-XII-1969; deposited in MNRJ. It is similar to L. picinguaba. Cladistical analysis, encompassing 43 external morphological ♂ characters, is carried out. A key for ♂♂ of all known congeneric spp. is provided. A vacariance hypothesis is proposed to explain spatial evolution of Lauromacromia. Based on current biogeographical classification, Gomphomacromia and Rialla are considered apart from neotropical biota. Some aspects of Lauromacromia biology and ecology are also discussed.

(18058) POPOVA, O.N. & Yu.A. SMIRNOVA, 2010. Community of aquatic insects in forest-steppe-lakes of Baraba (South of West Siberia). *Contemporary Probl. Ecol.* 3(1): 50-54. [Originally published in Russian in *Sibir. ekol. Zh.* (2010) 17(1): 69-74]. – (Inst. Anim. Syst. & Ecol., Russ. Akad. Sci., Frunze 11, Novosibirsk-630091, Russia).
The studies were conducted (2004-2006) on the drainage lake of Fadikha (Barabinsk region, Russia). At the lake and its vicinity, 41 odon. spp. were recorded. The composition of their larval communities in various habitats is thoroughly analysed.

(18059) RANGNEKAR, P., M. BORKAR & O. DHARWADKAR, 2010. Additions to the Odonata (Insecta) of Goa. *J. threatened Taxa* 2(4): 805-814. – (First Author: Bldg 4, S-3, Technopark, Chogm Rd, Alto-Porvorim, Goa-403001, Tamil Nadu, India).
A report is presented of a 19-month odon. survey (2007-2008) of the state of Goa, India. 66 spp. are documented, with 34 new records for the state.

(18060) SHAFROTH, P.B., A.C. WILCOX, D.A. LYTLE, J.T. HICKEY, D.C. ANDERSEN, V.B. BEAUCHAMP, A. HAUTZINGER, L.E. McMULLEN & A. WARNER, 2010. Ecosystem effects of environmental flows: modelling and experimental floods in a dryland river. *Freshw. Biol.* 55: 68-85. – (First Author: US Geol. Surv., Fort Collins Sci. Cent., 2150 Centre Ave, Bldg C, Fort Collins, CO 80526, USA).
The work was conducted on the Bill Williams River (Arizona, USA). After an experimental flood, Gomphidae experienced flood-induced mortality, but rebounded in numbers after 2 weeks. Their rapid return is attributed to their ability to move back to the active stream channel even when they were displaced into high flow channels that dried out postflood.

(18061) THEISCHINGER, G., 2010. Der GSI-Clade (Odonata, Libelluloidea) in Australien: Systematik im Fluss. *Entomologica austriaca* 17: 49-66. (With Engl. s.). – NSW Dept Envir. & Climate Change, 480 Weeroona Rd, Lidcombe, NSW-2141, AU).
"Gomphomacromia-Synthemis-Idionyx" (GSI), a taxon recently established for a monophyletic group (clade) of higher Libelluloidea (see *OA* 17061), is discussed. Details are presented on the history of the discovery and systematic integration of the Australian members of the group. Information is also given on morphological characters of adults and larvae, distribution, biology, behaviour, conservation, collecting and preparation, and pressing research priorities are pointed out.