

ODONATOLOGICAL ABSTRACTS

2000

- (16148) GARCIA-BERTHOUS, E. & R. MORENO-AMICH, 2000. Food of introduced sunfish: ontogenetic diet shift and seasonal variation. *J. Fish Biol.* 57: 29-40. — (Dept Cien. Abient. & Inst. Ecol. Aquat., Univ. Girona, ES-17071 Girona, Catalonia).
- Lepomis gibbosus* introduced into Lake Banyoles (Spain) were predominantly littoral, but there was a tendency of large fish to use deeper zones. The diet was dominated by littoral macrobenthos, particularly amphipods. There was ontogenetic variation in the diet, with small young-of-the-year feeding on several littoral microcrustaceans, especially the cladocerans, whereas larger fish shifted to freshwater shrimps, snails and Zygoptera larvae (*Pyrrhosoma nymphula* was identified).
- (16149) KUMARA, H.N., M.E. SINGH, A.K. SHARMA, M.R. SINGH & M. ANANDA KUMAR, 2000. Faunal component in the diet of lion-tailed macaque. *Primate Rep.* 58: 57-65. — (Second Author: Biopsychol. Lab., Univ. Mysore, Mysore-570 006, India).
- Macaca silenus* is a habitat specialist, restricted to the climax rainforests of Western Ghats, India. It is primarily a frugivorous sp., but its diet also includes a variety of animals. On dragonflies it is feeding occasionally: head first and the body later. In addition to the wings, the legs are also sometimes rejected.
- (16150) MITRA, A., 2000. New record of *Gynacantha bayadera* Selys (Odonata: Anisoptera: Aeshnidae) from Dehra Dun Valley, India. *Sherub Doenme* 5: 44-46. — (Dept Zool., Sherubtse Coll., Kanglung, Bhutan).
- 2 ♂ and 1 ♀ are brought on record, extending the range of the sp. to the Western Himalaya.
- (16151) OLBERG, R.M., A.H. WORTHINGTON & K.R. VENATOR, 2000. Prey pursuit and interception in dragonflies. *J. comp. Physiol. (A)* 186: 155-162. — (First Author: Dept Biol. Sci., Union Coll., Schenectady, NY 12308, USA).
- Perching libellulids are sit-and-wait predators, which take off and pursue small flying insects. To investigate their prey pursuit strategy, 36 prey-capture flights of ♂ *Erythemis simplicicollis* and *Leucorhinia intacta* were videotaped for frame-by-frame analysis. It was found that dragonflies fly directly toward the point of prey interception by steering to minimize the movement of the prey's image on the retina. This behaviour could be guided by target-selective descending interneurons which show directionally selective visual responses to small-object movement. It was investigated how dragonflies discriminate distance of potential prey, and a peak was found in angular velocity of the prey shortly before take-off which might cue the dragonfly to nearby flying targets. Parallax information from head movements was not required for successful prey pursuit.
- (16152) PLAISTOW, S.J. & Y. TSUBAKI, 2000. A selective trade-off for territoriality and non-territoriality in the polymorphic damselfly *Mnais costalis*. *Proc. R. Soc. Lond. (B)* 267: 969-975. — (Second Author: Biodiv. Conserv. Res. Gr., Natn. Inst. Envir. Stud., Tsukuba, 305-8506, JA).
- In *M. costalis*, ♂♂ occur as territorial orange-winged 'fighter' ♂♂ or non-territorial clear-winged 'sneaker' ♂♂. The morph life histories differ considerably, but the estimated lifetime reproductive suc-

cess is the same for the 2 morphs. In this study, the developmental and reproductive costs associated with the 2 morphs are compared. Orange-winged ♂ and ♀ reproductive costs resulted in a decline in adult fat reserves with increasing age. In contrast, the fat reserves of clear-winged ♂ ♂ remained constant with adult age. Body size was positively correlated with mating success in orange-winged ♂ ♂, but had no influence on the mating success of clear-winged ♂ ♂. The orange-winged ♂ flight muscle ratios (FMRs) were significantly higher than the clear-winged ♂ and ♀ FMRs. However, there was no difference in the size-corrected fat reserves of the 2 morphs; both had higher fat reserves than ♀ ♀. The gain in mass between eclosion and reproduction in orange-winged ♂ ♂ and ♀ ♀ was almost double the mass gained by clear-winged ♂ ♂, suggesting that clear-winged ♂ development is less costly. An experiment in which pre-reproductive levels of nutrition were manipulated confirmed this.

2001

- (16153) HASHIMOTO, H., 2001. Biomimetics research on flying insects for developing high performance, small-sized actuator. *Bull. Fac. Technol. Tohoku Univ.* 41(2): 25-34. (Jap., with Engl. s.). — (Author's address not stated).

Based on a detailed study of wing vibration mechanisms in flying Hymenoptera, Odon. (*Orthetrum albistylum speciosum*, *Pantala flavescens*, *Sympetrum darwinianum*, *S. frequens*) and Homoptera (Cicadae), the application of the gathered evidence is proposed for a construction of a high performance, small-sized actuator.

- (16154) SOARES, C.M., C. HAYASHI & A.C.E.A. DE FARIA, 2001. Influência da disponibilidade de presas, do contraste visual e do tamanho das larvas de *Pantala* sp. (Odonata, Insecta) sobre a predação de *Simocephalus serrulatus* (Cladocera, Crustacea). *Acta Scientiarum*, Maringá 23(2): 357-362. (Port., with Engl. s.). — (First Author: Depto Biol., Univ. Estadual Maringá, Av. Colombo 5790, BR-87020-900 Maringá, Paraná).
The effect of prey availability, visual contrast and size of *Pantala* larvae on the predation on *S. serrulatus* was studied in the laboratory. High prey availability increases predation rate, predation is higher in aquaria with dark walls, and 13.25 mm long larvae have the highest predation rate.

2002

- (16155) ALI, M.B., M.R. ANON & H.H. MOHAMMED, 2002. The seasonal variations of abundance and biomass of the two odonate naiads, *Ischnura evansi* Morton (Odonata: Coenagrionidae) and *Brachythemis fuscopalliata* Selys (Odonata: Libellulidae) in the Qarmat Ali region, Basrah. *Marina mesopotamica* 17(2): 405-410. — (First Author: Marine Sci. Cent., Univ. Basrah, Basrah, Iraq).
Field samples were taken monthly with a plankton net during Dec. 1994-Nov. 1995. In different months, the population structure may be monomodal, bimodal or trimodal. The mean density of *I. evansi* was 196 individuals/m³, that of *B. fuscopalliata* 168 individuals/m³, and 2 density peaks were observed (Dec. 1994, May 1995). Maximum densities were recorded at temperature ranges 26-34°C. The mean monthly biomass for *I. evansi* was 284 mg dry weight/m³ and that of *B. fuscopalliata* was 869 mg dry weight/m³.
- (16156) CASKEY, B.J., B.G. JUSTUS & H. ZAPPIA, 2002. Occurrence of invertebrates at 38 stream sites in the Mississippi Embayment Study Unit, 1996-99. *U.S. geol. Surv. Open-File Rep.* 02/190: tabs 1-6 excl. — (Available from: U.S. Geol. Surv., Inform. Services, Box 25286, Denver, CO 80225-0286, USA).
The Mississippi Embayment Study Unit includes parts of Arkansas, Kentucky, Louisiana, Mississippi, Missouri and Tennessee. The study was conducted as part of the National Water-Quality Assessment Program. Of the 88 spp. identified, only 4 spp. are referable to the odon.
- (16157) COSTA NETO, E.M., 2002. A utilização ritual de insetos em diferentes contextos socioculturais. *Sitientibus* (Cien. Biol.) 2(1/2): 97-103. (Port., with Engl. s.). — (Lab. Etnobiol., Depto Cien. Biol., Univ. Estad. Feira de Santana, BR-44031-460 Feira de Santana, Bahia).
The ritual use of insects in different cultural contexts is briefly described. A recipe from the state of Pernambuco (Brazil) is mentioned, where a toasted and subsequently pulverized dragonfly is used in the matters of love.
- (16158) GIBBONS, L.K., J.M. REED & F.S. CHEW, 2002. Habitat requirements and local persistence of three damselfly species (Odonata: Coenagrionidae). *J. Insect Conserv.* 6: 47-55. — (Dept Biol., Tufts

Univ., Medford, MA 02155, USA).

Habitat requirements and population persistence were investigated in the coastal plain pond specialists *Enallagma recurvatum*, *E. laterale* and *E. pictum*, on Cape Cod, Massachusetts, USA. It was looked for relationships between the presence of each sp. and presence of specific aquatic vegetation, the presence of other congeners, and the number of ponds within various distances of the 72 surveyed ponds. Using stepwise logistic regression, the following significant associations were found: (1) *E. recurvatum* with *Juncus militaris*; (2) *E. laterale* with *Nuphar variegatum* and *Brasenia schreiberi*, *E. pictum* and the number of ponds within 2 km; and (3) *E. pictum* with *Nuphar odorata*, *E. laterale* and the number of ponds within 1.5 km and 2.5 km. Presence/absence data were used to calculate turnover and local extinction rates for each sp. between the 2 yr. *E. recurvatum*'s turnover and local extinction rates (33.3% and 41% respectively) were much higher than either *E. laterale* (9.8%, 11.5%) or *E. pictum* (7.7%, 10.0%). This suggests that *E. recurvatum* occurs in a metapopulation, and that patch colonization rates might be important to local population persistence.

- (16159) LANG, H., C. LANG & R. RAAB, 2002. Insekt des Jahres 2002. Steckbrief Quelljungfer (*Cordulegaster* sp.) (Odonata: Cordulegasteridae). *Beitr. Entomofaunistik* 3: 192-193. — (Third Author: Anton Brucknergasse 2, A-2232 Deutsch Wagram). The biological features of the 3 Austrian *Cordulegaster* spp. are outlined. *C. bidentata* and *C. boltonii* are widespread throughout the country, *C. heros* occurs in Lower Austria, Eastern Styria, Burgenland and Carinthia, and it was recently recorded from Vienna.
- (16160) LAURILA, A., S. PAKKASMAA, P.-A. CROCHET & J. MERILÄ, 2002. Predator-induced plasticity in early life history and morphology in two anuran amphibians. *Oecologia* 132: 524-530. — (First Author: Dept Popul. Biol., Uppsala Univ., Norbyvägen 18D, S-75236 Uppsala). The effects of an egg predator (leech, *Haemopsis sanguisuga*) and 2 tadpole predators (*Aeshna* larvae and three-spine stickleback, *Gasterosteus aculeatus*) on the timing and morphology of hatchings and young tadpoles of *Rana arvalis* and *R. temporaria* were studied in a factorial laboratory experiment. The responses of 2 geographically separated *R. ar-*

valis populations on the Baltic island of Gotland and in Uppland in the Swedish mainland were also compared. Inconsistent evidence was found for the predictions that the presence of an egg predator induces earlier hatching, and the presence of a tadpole predator delays hatching. *R. temporaria* hatched later in the presence of stickleback than in the control treatment, but *R. arvalis* hatched earlier, less developed and at smaller size in the leech, dragonfly and stickleback treatments. There was no indication of predator-induced morphology in hatchings of either of the spp. However, young *R. arvalis* tadpoles had shorter tails and deeper bodies in the stickleback treatment, and *R. temporaria* had shorter tails in the leech, dragonfly and stickleback treatments. Irrespective of treatment, *R. arvalis* from Gotland hatched with relatively longer bodies than Uppland individuals and had relatively deeper and shorter tails as young tadpoles.

- (16161) MITRA, A., 2002. Dragonfly (Odonata: Insecta) fauna of Trashigang Dzongkhag, eastern Bhutan. In: T. Gyeltshen & [?] Sadruddin, [Eds], *Environment and life support systems of the Bhutan Himalaya*, Vol. 1, pp. 40-70, Sherubtse Coll., Kanglung, Bhutan. — (Dept Zool., Sherubtse Coll., Kanglung, Bhutan).
[Not available for abstracting]
- (16162) SCHOLL, C., 2002. *Report of the dragonflies at Store Mosse National Park, 2001*. County Administration, Jönköping [Meddelande 02: 28]. 20 pp. — (c/o J. Rova, Länsstyrelsen i Jönköpings län, S-551 86 Jönköping).
16 spp., recorded in the Park (N of Värnamo, Sweden) during July-Aug. 2001, are listed, their local abundance is stated and habitat requirements are outlined.
- (16163) SUDO, S. & K. TSUYUKI, 2002. Biomechanics of flying insects. *Nagare* 21: 142-152 (Jap., with Engl. title & fig. captions). — (Authors' addresses not transliterated).
Deals with various orders, incl. *Sympetrum frequens* and *S. infuscatum*.

2003

- (16164) IANNACONE, J., J. MANSILLA & K. VENTURA, 2003. Macroinvertebrados en las lagunas de Puerto Viejo, Lima, Perú. *Ecol. aplicada*

2004

- 2(1): 116-124. (With Engl. s.). — (First Author: Lab. Ecofisiologia, Fac. Cien. Nat. & Mat., Univ. Nac. F. Villarreal, Calle San Marcos 383, Pueblo Libre, Lima-21, Peru).
The unidentified coenagrionid and libellulid larvae are mentioned from the samples.
- (16165) KIPPING, J., 2003. Odonata recorded from the Okavango Delta. *RAP Bull. biol. Assmnt*, Wash. 27: 137-139. — (Author's postal address not stated).
The paper has 4 sections, viz.: (1) list of spp. collected in the Upper Panhandle, — (2) spp. recorded from the Lower Panhandle, NW Moremi Game Reserve (around Xakanaxa Lagoon) and SE Chief's Island (along the Boro R), — (3) checklist of spp. recorded from the Okavango Delta, — and (4) ecological notes on habitat use by odon. at the W end of Chief's Island. — Botswana, S Africa.
- (16166) MÜHLE, R.-U., 2003. Tierleben: ein zoologischer Überblick zur Unteren Havelniederung. *Brandenburg. Umwelt Ber.* 13: 82-97. — (Ökol. Stn Gülpe, Univ. Potsdam, D-15715 Gülpe).
Contains a concise summary review of the odon. community in the Lower Havel Lowlands, Brandenburg, Germany, with brief information on habitats and ecology of 17 spp.
- (16167) THOMPSON, D.J., B.V. PURSE & J.R. ROUQUETTE, 2003. *Monitoring the Southern damselfly, Coenagrion mercuriale*. Conserving Natura 2000 Rivers [Monitoring Ser. 8], English Nature, Peterborough. 17 pp. ISBN 1-85716-728-7. — (Orders to: Enquiry Service, English Nature, Northminster House, Peterborough, PE1 1UA, UK).
The aim of this protocol is to provide a basis for comparing trends in the relative abundance of adult *C. mercuriale* over time, and to draw attention to features indicative of favourable condition in British sites.
- (16168) YAMASAKI, M., T. OGATA & Y. SUGI, 2003. Benthic macroinvertebrates in the small streams in Fukuoka prefecture. *Annu. Rep. Fukuoka Inst. Health Envir.* 30: 148-158. (Jap., with Engl. s.). — (Fukuoka Inst. Health & Envir. Sci., Mukai-zano 39, Dazaifu, Fukuoka, 818-0135, JA).
30 sites in 15 small streams were investigated. The localities are stated for 12 odon. spp.
- (16169) CALE, D.J., S.A. HALSE & C.D. WALKER, 2004. Wetland monitoring in the Wheatbelt of south-west Western Australia: site descriptions, waterbird, aquatic invertebrate and groundwater data. *Conserv. Sci. W. Aust.* 5(1): 20-135. — (First Author: Sci. Div., Dept Conserv. & Land Mngmt, P.O. Box 51, Wanneroo, W. Aust., 6956, AU).
The Wheatbelt contains a range of wetland types with varying salinity, including many naturally saline lakes and playas. Identified Odon. are reported from 14 wetlands, viz. lakes Coomalbidgup (8 spp.), Coomelberrup (3 spp.), Eganu (2 spp.), Fraser (6 spp.), Logue (4 spp.), Pleasant View (7 spp.), Tower-rining (2 spp.), Walyormouring (1 sp.), Wheatfield (3 spp.), swamps Blue Gum (5 spp.), Goonaping (3 spp.), Kulicup (1 sp.), Noobijup (2 spp.), and from the Yaalup Lagoon (5 spp.).
- (16170) FERRERAS-ROMERO, M. & F.J. CANO-VILLEGAS, 2004. Odonatos de cursos fluviales del parque natural Los Alcornocales (sur de España). *Boln As. esp. Ent.* 28(3/4): 49-64. (With Engl. s.). — (Depto Cien. Ambient./Zool., Univ. Pablo de Olavido, Ctra. de Utrera, ES-41013 Sevilla).
The data are presented on 29 rheophile spp., incl. the IUCN vulnerable *Gomphus graslinii*, *Oxygastra curtisii* and *Macromia splendens*. The biogeographic composition of the fauna is analysed.
- (16171) HERBERHOLZ, J., M.M. SEN & D.H. EDWARDS, 2004. Escape behavior and escape circuit activation in juvenile crayfish during prey-predator interactions. *J. exp. Biol.* 207: 1855-1863. — (Dept Biol., Georgia St. Univ., Atlanta, GA 30303, USA).
The encounters between juvenile *Procambarus clarkii* and *Anax junius* larvae were investigated in freely behaving animals using a combination of high-speed video-recordings and measurements of electric field potentials. During attacks, *Anax* larvae rapidly extended their labium to capture small crayfish. *Procambarus* responded to the tactile stimulus by activating neural escape circuits to generate tail-flips directed away from the predator. Tail-flips were the sole defense mechanism in response to an attack and every single strike was answered by tail-flip escape behaviour. Crayfish used all 3 known types of escape tail-flips during the interactions with *Anax* larvae. Tail-flips generated by activity in

the giant neurons were predominantly observed to trigger the initial escape responses to an attack, but non-giant mediated tail-flips were often generated to attempt escape after capture. Attacks to the front of the crayfish triggered tail-flips mediated either by the medial giant neuron or by non-giant circuitry, whereas attacks to the rear always elicited tail-flaps mediated by the lateral giant neuron. Overall, tail flapping was found to be a successful behaviour in preventing predation, and only a small percentage of *Procambarus* were killed and consumed.

- (16172) HUNGER, H., 2004. *Naturschutzorientierte, GIS-gestützte Untersuchungen zur Bestandssituation der Libellenarten *Coenagrion mercuriale*, *Leucorrhinia pectoralis* und *Ophiogomphus cecilia* (Anhang II FFH-Richtlinie) in Baden-Württemberg*. PhD diss., Hochschule Vechta, Vechta. ix+229 pp., App. 1-3 excl. (With Engl. s.). — (c/o Prof. R. Buchwald, INU, Hochschule Vechta, Driverstr. 22, D-49377 Vechta).

The thesis focuses on the current condition and trends of all known populations of the 3 spp. in Baden-Württemberg, SW Germany. Vector- and raster-based GIS methods play an important role in the analysis of the data. A synoptic discussion of the results leads to recommendations for action plans for protection of the spp.

- (16173) MAYBURY, W.J. & F.-O. LEHMANN, 2004.

The fluid dynamics of flight control by kinematic phase lag variation between two robotic insect wings. *J. exp. Biol.* 207: 4707-4726. — (Dept Neurobiol., Univ. Ulm, Albert-Einstein Allee 11, D-89081 Ulm).

Insects flying with 2 pairs of wings must contend with the forewing wake passing over the beating hindwing. Some 4-winged insects, such as dragonflies, move each wing independently and therefore may alter the relative timing between the fore- and hindwing stroke cycles. The significance of modifying the phase relationship between fore- and hindwing stroke kinematics on total lift production is difficult to assess in the flying animal because the effect of wing-wake interference critically depends on the complex wake pattern produced by the 2 beating wings. Here the effect of changing the fore- and hindwing stroke-phase relationship during hovering flight conditions on the aerodynamic performance of each flapping wing is investigated by using a dynamically scaled electromechanical insect model.

By varying the relative phase difference between fore- and hindwing stroke cycles it was found that the performance of the forewing remains approximately constant, while hindwing lift production may vary by a factor of 2. Hindwing lift modulation appears to be due to 2 different fluid dynamic phenomena: leading edge vortex destruction and changes in strength and orientation of the local flow vector. Unexpectedly, the hindwing regains aerodynamic performance near to that of the wing free from forewing wake interference, when the motion of the hindwing leads the forewing by around a quarter of the stroke cycle. This kinematic relationship between hind- and forewing closely matches the phase-shift commonly used by locusts and some dragonflies in climbing and forward flight. The experiments support previous assumptions that active neuromuscular control of fore- and hindwing stroke phase might enable dragonflies and other functionally 4-winged insects to manipulate ipsilateral flight force production without further changes in wing beat kinematics.

- (16174) RAMSAY, L.R. & R.A. CANNINGS, 2004.

Determining the status of British Columbia's dragonflies. In: T.D. Hooper, [Ed.], *Proc. of the Species at Risk 2004 Pathways to Recovery Conf.*, Victoria, BC, pp. 1-12. — (First Author: Brit. Columbia Conserv. Data Cent., Ministry Sustainable Resource Management, 395 Waterfront Crescent, Box 9538, Stn Prov. Govt, Victoria, BC, V8W 9M2, CA).

To demonstrate how inventory provides information for assigning conservation status ranks, it was looked at the changes in these ranks over a 9-yr period. Preliminary conservation status ranks were assigned to BC odon. in 1993. Subsequently, inventory efforts were focused on the spp. considered to be at risk in order to more accurately determine their status. From 1996 to 2003, concentrated surveys were conducted throughout much of the province. During these, known ranges of many spp. were extended, knowledge of habitat requirements increased, and 5 new spp. were confirmed for the province. Many of the targeted spp. were more abundant than previously thought, and their conservation ranks were changed accordingly. Others were found only rarely or not at all. Ranking poorly known spp. is challenging, particularly if samples are small or habitats are difficult to access. By increasing the knowledge of these spp. and their requirements, it is possible to assign them more accurate ranks, thus ensuring that

conservation efforts will target the spp. and habitats that truly require them.

- (16175) ROLFF, J. & M.T. SIVA-JOTHY, 2004. Selection on insect immunity in the wild. *Proc. R. Soc. Lond. (B)* 271: 2157-2160. – (Dept Anim. & Plant Sci., Univ Sheffield, Sheffield, S10 2TN, UK). The strength of selection on immune function in wild populations has only been examined in a few vertebrate spp. Here, the results are reported from a study measuring selection on a key insect immune enzyme, phenoloxidase (PO), in a wild population of *Calopteryx xanthostoma*. Individually marked ♂♂ were followed from the pre-reproductive adult phase and their lifetime mating success was recorded. Positive selection of PO activity was found in response to an immune insult, but no selection occurred on wing-spot quality, a trait actively displayed to ♀♀ during courtship. It is suggested that positive selection on PO activity in the year of study may be explained by annual fluctuations in parasite loads.
- (16176) SICKINGER, C., J. MELCHER, T. STRÖHLEIN, J. NICKEL, C. SCHILLO, M. MAYSER & C. ALTENKIRCH, 2004. Entfaltungsmechanismen für den Leichtbau auf Basis bionischer Elemente. *BMBF-Ideenwettbewerb Bionik – Innovationen aus der Natur* 2004, 4 pp. – (Dt. Zent. Luft- u. Raumfahrt, Inst. für Faserbündelbau und Adaptivität, Lilienthalplatz 7, D-38108 Braunschweig). The principles of wing expansion during metamorphosis in *Aeshna mixta* and *Sympetrum striolatum* were studied and analysed with the objective of their possible application in development of technical lightweight, deployable systems, required in astronautics, tent construction etc.
- (16177) SVENSSON, J.M., J. STRAND, G. SAHLEN & S. WEISNER, 2004. *Utvärdering av våtmarker anlagda inom lokala investeringsprogram och LBU-stöd avseende närsaltsretention och biologisk mångfald*. – [Evaluation of effects of man-made wetlands, created in Sweden by Local Investment Programs, with regard to nutrient retention and biodiversity]. Naturvårdsverket, Stockholm. 114 pp. (main text: pp. 1-56; App. 1-5: 58 pp., separate pagination per Appendix). ISBN 91-620-5362-0.pdf. (Swed., with Engl. s., title not translated). – (Orders to: CM-Gruppen, Box 11093, S-16111 Bromma). The odon. part is presented in App. 4, authored by G. Sahlén (11 pp.). – The number of odon. spp. in a particular wetland was used as indicator of general biodiversity. The total number of spp. (24) is relatively high, resembling that in the more mature aquatic ecosystems (lakes in forests), meaning the man-made wetlands have a potential for high biodiversity. This is supported also by the occurrence of several spp. that are indicative of high biodiversity (cf. OA 14830). Clear positive correlation was found between the structure and abundance of vegetation and the number of odon. spp. Active vegetation management, therefore, is likely to result in the increase of odon. biodiversity. Ecotones in the landscape also seem to be of considerable importance for odon. community structure. On the other hand, no clear evidence was found that the goal of nutrient retention stands opposed to that of biodiversity. It seems perfectly possible to combine efficient nutrient retention with high biodiversity.
- (16178) THOMAS, A.L.R., G.K. TAYLOR, R.B. SRYGLEY, R.L. NUDDS & R.J. BOMPHREY, 2004. Dragonfly flight: free-flight and tethered flow visualizations reveal a diverse array of unsteady lift-generating mechanisms, controlled primarily via angle of attack. *J. exp. Biol.* 207: 4299-4323. – (Dept Zool., Oxford Univ., South Parks Rd, Oxford, OX1 3PS, UK). Based on *Aeshna grandis*, *A. mixta* and *Sympetrum sanguineum*, it is shown, by qualitative free- and tethered-flight flow visualization, that dragonflies fly by using unsteady aerodynamic mechanisms to generate high-lift, leading-edge vortices. In normal free flight, dragonflies use counterstroking kinematics, with a leading-edge vortex (LEV) on the forewing downstroke, attached flow on the forewing upstroke, and attached flow on the hindwing throughout. Accelerating dragonflies switch to in-phase wing-beats with highly separated downstroke flows, with a single LEV attached across both the fore- and hindwings. Smoke visualizations were used to distinguish between the 3 simplest local analytical solutions of the Navier-Stokes equations yielding flow separation resulting in a LEV. The LEV is an open U-shaped separation, continuous across the thorax, running parallel to the wing leading edge and inflecting at the tips to form wingtip vortices. Air spirals in to a free-slip critical point over the centreline as the LEV grows. Spanwise flow is not a dominant feature of the flow field – spanwise flows sometimes run from wingtip to centreline, or vice versa – depending on the degree of sideslip. LEV formation always coin-

cides with rapid increases in angle of attack, and the smoke visualizations clearly show the formation of LEV whenever a rapid increase in angle of attack occurs. There is no discrete starting vortex. Instead, a shear layer forms behind the trailing edge whenever the wing is at a non-zero angle of attack, and rolls up, under Kelvin-Helmholtz instability, into a series of transverse vortices with circulation of opposite sign to the circulation around the wing and LEV. The flow fields produced by dragonflies differ qualitatively from those published for mechanical models of dragonflies, fruitflies and hawkmoths, which preclude natural wing interactions. However, controlled parametric experiments show that, provided the Strouhal number is appropriate and the natural interaction between left and right wings can occur, even a simple plunging plate can reproduce the detailed features of the flow seen in dragonflies. In models, and in dragonflies, it appears that stability of the LEV is achieved by a general mechanism whereby flapping kinematics are configured so that a LEV would be expected to form naturally over the wing and remain attached for the duration of the stroke. However, the actual formation and shedding of the LEV is controlled by wing angle of attack, which dragonflies can vary through both extremes, from zero up to a range that leads to immediate flow separation at any time during a wing stroke.

2005

- (16179) BEDJANIĆ, M., 2005. *Globally endangered dragonflies of Sri Lanka. Datasheets for assessing species for the IUCN Global Red List of threatened animals*. Prepared for the IUCN SSC Odonata Specialist Group, Version 1 (Jan. 2005), 42 pp.; Update (Sept. 2005), 16 pp. — (Author: Kolodvorska 21b, SI-2310 Slovenska Bistrica). Status assessment of 20 endemic spp. with information on their range, population circumstances, habitats, threats, the required conservation measures, and a bibliography for each sp.
- (16180) BECKEMEYER, R., 2005. Afrikaan Anisoptera and Zulu Zygotera: a trip to South Africa. *Newsl. Italia Soc.* 16(2): 3-6, photos on col. insert excl. — (957 Perry Ave, Wichita, KS 67203-3141, USA). The impressions are presented from a trip from Durban to Johannesburg and Pretoria, with references to 23 odon. spp. encountered.
- (16181) *The BOGHAUNTER*. Occasional news about the dragonflies and damselflies of Vermont (ISSN none), Vol. 5, No. 1 (winter 2005/2006; mailed 30 Dec. 2005). — (c/o B. Pfeiffer, 113 Bartlett Rd, Plainfield, VT 05667, USA). [Scientific articles:] *Blust, M.*: Seven new Vermont odonate species (pp. 1, 6); — *Pfeiffer, B.*: The case of the missing *Tachopteryx thoreyi* (pp. 1, 7); — The 2005 Vermont season summary (pp. 3, 9); — New respect for odonates (pp. 8-9); — Photo gallery (pp. 10-11).
- (16182) BRIED, J.T., 2005. *Community and conservation ecology of dragonfly and damselfly adults in Mississippi wetlands*. M.Sc. diss., Mississippi St. Univ. x+141 pp. — (Author's address not stated). The dissertation is building on the understanding that odon., in their adult stages, are potentially valuable for conservation of freshwater wetlands. The study was conducted in Noxubee co. and at 3 other areas in N Mississippi. The main subjects examined are the odon. abundance along a wetland buffer gradient, and the wetland patch occurrences of adults and the importance of physical gradients.
- (16183) BUCZYNSKI, P., 2005. [Book review] *Die Libellenfauna Sachsens*, by T. Brockhaus & U. Fischer, [Eds]. *Wiad. ent.* 24(4): 241-242. (Pol.). — (Dept Zool., UMCS, Akademicka 19, PO-20-033 Lublin). A comprehensive book review of the work described in OA 15845, with reference to its importance also for the study of the fauna of W Poland.
- (16184) CHAZAL, A.C., 2005. *Lepidoptera and Odonata surveys of Colonial National Historical Park, James City, Surry and York counties, Virginia*. Nat. Heritage tech. Rep., Richmond/VA 05-05: iv+49 pp., App. A & B excl. — (Virginia Dept Conserv. Recreation, Div. Nat. Heritage, 217 Governor St., Richmond, VA 23219, USA). Between May-July 2003 and Apr.-Oct. 2004, surveys were conducted over 18 days, covering 17 different habitats. 42 odon. spp. were observed, incl. 26 new county records. The field habitats had the highest odon. species diversity and second highest totals (forested wetlands had higher totals). The 3 watchlisted spp. observed are *Ischnura prognata*, *Telebasis byersi* and *Sympetrum ambiguum*. Species accumulation curves indicate that further surveys may increase the known fauna.

- (16185) DE BLOCK, M., S. GEENEN, K. JORDAENS, T. BACKELJAU & R. STOKS, 2005. Spatiotemporal allozyme variation in the damselfly *Lestes viridis* (Odonata: Zygoptera): gene flow among permanent and temporary ponds. *Genetica* 124: 137-144. — (First Author: Evol. Biol. Gr., Dept Biol., Univ. Antwerp, Groenenborgerlaan 171, B-2020 Antwerpen).

Several insect spp. seem to persist not only in permanent but also in temporary ponds where they face particularly harsh conditions and frequent extinctions. Under such conditions, gene flow may prevent local adaptation to temporary ponds and may promote phenotypic plasticity, or maintain apparent population persistence. The few empirical studies on insects suggest the latter mechanism, but no studies so far quantified gene flow including both pond types. Here, the effects of pond type and temporal variation on population genetic differentiation and gene flow were investigated in *L. viridis* in N Belgium. A survey of 2 allozyme loci (*Gpi*, *Pgm*) with polyacrylamide gel electrophoresis is reported in 14 populations from permanent and temporary ponds, and the results are compared with similar data from the same permanent populations one year before. The data suggest that neither pond-drying regime, nor temporal variation have a substantial effect on population genetic structuring and did not provide evidence for stable population differentiation in *L. viridis* in N Belgium. Gene flow estimates were high within permanent and temporary ponds, and between pond types. The data are consistent with a source-sink metapopulation system where temporary ponds act as sinks in dry years, and are quickly recolonized after local population extinction. This may create a pattern of apparent population persistence of this sp. in permanent and temporary ponds without clear local adaptation.

- (16186) DIJKSTRA, K.-D.B., 2005. A review of continental Afrotropical Ceriagrion (Odonata, Coenagrionidae). *J. afrotrop. Zool.* 2: 3-14. — (Gortestraat 11, NL-2311 MS Leiden).

The taxonomy is discussed and a key provided. *C. annulatum* is not synonymous with *C. sanguinostigma*, but *Agriocnemis umbargae* is considered a junior synonym of *C. annulatum*, and *C. platystigma* with *C. sanguinostigma* of *C. varians*. The oriental genus *Agriocnemis* does not occur in Africa. The identities of *C. citrinum* and *C. ignitum* are clarified and the first records of *C. ignitum* and *C. mourae*

since their descriptions are provided. The taxonomy of the complex of species including *C. hamoni*, *C. moorei*, *C. sakejii*, *C. suave* and possibly some Malagasy species remains unresolved, although at least *C. hamoni* and *C. moorei* are suspected to be conspecific with *C. suave*. The variability of *C. glabrum* is addressed in relation to the taxon *longispinum*.

- (16187) DMITRIEW, C. & L. ROWE, 2005. Resource limitation, predation risk and compensatory growth in a damselfly. *Oecologia* 142: 150-154. — (Dept Zool., Univ. Toronto, Toronto, ON, M5S 3G5, Canada).

Periods of poor nutrition during early development may have negative fitness consequences in subsequent periods of ontogeny. In insects, suppression of growth and developmental rate during the larval stage are likely to affect size and timing of maturity, which in turn may lead to reduced reproductive success or survivorship. In light of these costs, individuals may achieve compensatory growth via behavioural or physiological mechanisms following food limitation. In this study, the effects of a temporary period of food restriction on subsequent growth and age and size at maturity in the larval *Ischnura verticalis* were examined, as well as the question whether this temporary period of reduced nutrition affected subsequent foraging behaviour under predation risk. *I. verticalis* larvae exposed to a temporary food shortage suffered from a reduced growth rate during this period relative to a control group that was fed ad libitum. However, increased growth rates later in development ensured that adult body size measurements (head and pronotum widths) did not differ between the treatments upon emergence. In contrast, adult dry mass did not catch up to that of the controls, indicating that the increased growth rates for size dimensions occur at the cost of similar gains in mass. Predators reduced foraging effort of larvae, but this reduction did not differ between control larvae and those previously exposed to poor nutrition.

- (16188) DYATLOVA, E.S., 2005. Dragonflies (Odonata) from the lower Dniestr river. *Ecol. Bull. Black Sea Region* 2005(17/18): 204-212, 3 pls incl. (Russ., with Engl. & Ukr. s's). — (Frantsuzkij bul'var 37, kv. 3, UKR-65044 Odessa).

A commented list of 26 spp., based on adult and larval material (incl. exuviae), collected during 2003-2005; — the Ukraine. The nationally red-listed

Erythromma lindenii and *Anax imperator* are emphasized, and the recent decrease in the abundance of some other spp. is discussed.

- (16189) EMMS, C. & L.K. BARNETT, 2005. *Gambian biodiversity: a provisional checklist of all species (excluding plants) recorded within the Gambia, West Africa*. [First version: Jan. 2005]. Makasutu Wildlife Trust, Serrekunda. 76 pp. — (Publishers: P.O. Box 2164, Serrekunda, Gambia).
78 odon. spp. are listed on pp. 5-6. *Lestes ictericus*, *Aciagrion "harnoni"* (= *hamoni*) and *Gynacantha manderica* are recorded for the first time from the Gambia. — For the 3rd version (May 2005), see *OA* 15988.
- (16190) FEIGE, K.-D., U. JUEG & W. ZESSIN, 2005. Beitrag zur Fauna des Treptow-Sees (Landkreis Rar-chim): Vögel, Weichtiere, Egel und Libellen. *Mitt. naturf. Ges. West-Mecklenburg* 5(1): 54-63. — (Third Author: Lange Str. 9, D-19230 Jasinitz).
10 odon. spp., encountered at Lake Treptow (W Mecklenburg, Germany) on 3 July 2004, are listed.
- (16191) FERLETIČ, U., 2005. *Poskus ugotovitve migracije rdečega voščenca Ceriagrion tenellum (Insecta: Odonata) na območju Strunjana*. — [An attempt towards the assessment of *Ceriagrion tenellum* (Insecta: Odonata) migration potentials in the Strunjan area, Istria, Slovenia]. Raziskovalna naloga, Dept Biol., Univ. Ljubljana, Ljubljana. 10 pp. (Slovene). — (Marežice 1, SI-6273 Marežice).
The capture-mark-recapture method was used in an inquire into the migratory movements of *C. tenellum* between 2 areas. The distance between the 2 metapopulations was about 1 km. In each of these, the individuals were marked at 3 sites (mutual distance ca 30 m). Some migrations were recorded between the nearby sites, but no intercourse could be demonstrated between the 2 metapopulations. The results are discussed in terms of low numbers of marked individuals, and the unfavourable circumstance that heavy traffic on a road between the 2 metapopulations could have an impact on potential migrations.
- (16192) FERRERAS-ROMERO, M., J. FRÜND & J. MARQUEZ-RODRIGUEZ, 2005. Sobre la situación actual de *Lestes macrostigma* (Eversmann, 1836) (Insecta: Odonata) en el área de Doñana (Andalucía, sur de España). *Boln As. esp. Ent.* 29(3/4): 41-50. (With Engl. s.). — (First Author: Depto Cien. Abient./ Zool., Univ. Pablo de Olavide, Ctra. de Utrera, ES-41013 Sevilla).
In the Doñana protected area (S Spain), *L. macrostigma* was frequently recorded in the recent past, but it seems locally extinct now. The possible causes of the current situation are discussed.
- (16193) GANESHAIAH, K.N., 2005. Recovery of endangered and threatened species: developing a national priority list of plants and insects. *Current Science* 89(4): 599-600. — (Dept Plant Genet. & Breeding, Sch. Ecol. & Conserv., Univ. Agric. Sci., Bangalore-560 065, India).
The preliminar list includes 4 odon. spp., viz. *Phylloneura westermanni*, *Davidoides martini*, *Chlorogomphus campioni*, and *C. xanthoptera*. Specialists are invited to send comments and additions to the Author.
- (16194) GONZÁLEZ-SORIANO, E., 2005. The female of *Paltotthemis cyanosoma* Garrison (Odonata: Libellulidae). *Folia ent. mex.* 55(Suppl. 1): 107-110. (With Span. s.). — (Depto Zool., Inst. Biol., UNAM, Apartado Postal 70-153, MX-04510 Mexico, D.F., Mexico).
The ♀ is described and illustrated, and a key to all spp. of the genus is provided.
- (16195) GRONING, E. & C. BRAUCKMANN, 2005. Neue Rekonstruktions-Zeichnungen von ausgewählten paläozoischen Gliederfüßlern (Fluginsekten, Spinnentiere und Arthropodea). *Virgol Mit. Bl. ent. Ver. Mecklenburg* 8(1): 21-25. — (Inst. Geol. & Paläontol., Techn. Univ. Clausthal, Leibnizstr. 10, D-38678 Clausthal-Zellerfeld).
Col. reconstructions of 5 spp. are presented and detailed descriptive annotations on the respective fossils are provided. The odon. are represented by *Namurotypus sippeli* Brauckmann & Zessin, 1989 (see *OA* 6850).
- (16196) HOESS, R. & L. REZBANYAI-RESER, 2005. Libellen aus der Sammlung des Natur-Museums Luzern, insbesondere über Funde von zehn Arten an Lichtfanganlagen (Insecta, Odonata). *Ent. Ber. Luzern* 54: 61-68. — (First Author: Normanenstr. 35, CH-3018 Bern).
301 specimens, referable to 32 spp. from 8 Swiss cantons and Tuscany (Italy), deposited in Nat. Hist.

Mus. Luzern, are brought on record. Specimens of *Platynemesis pennipes*, *Aeshna cyanea*, *A. mixta*, *Anax imperator*, *Onychogomphus forcipatus*, *Oxygastra curtisii*, *Orthetrum cancellatum*, *Sympetrum sanguineum*, *S. striolatum* and *S. vulgatum* were collected from light traps and/or were attracted by illuminated screens, though none of these has crepuscular habits. The phenomenon is discussed. — (For other publications on the odon. material from the Luzern Mus., see OA 3138 and 3793)

- (16197) HYNSTEBITER NIEUWS (anonymous), 2005. Libellenweekend Ameland. — [A dragonfly weekend on Ameland island]. *Twirre* 16(3): 119. (Dutch).

A note on the noteworthy records, made during 25-27 June 2005 on Ameland, Northsea, the Netherlands, viz. *Aeshna isosceles*, *Brachytron pratense*, *Leucorrhinia rubicunda* and *Sympetrum fonscolombii*.

- (16198) HYNSTEBITER NIEUWS (anonymous), 2005. Oostelijke witsnuitlibel herontdekt in Fryslân. — [*Leucorrhinia albifrons* rediscovered in Friesland]. *Twirre* 16(3): 119. (Dutch).

A note on the discovery (June 2005) of a small *L. albifrons* population at Delleboersterheide nr Oldeberkoop in Friesland. With close to 40 odon. spp. recorded in the area, Delleboersterheide is one of the odon. hotspots in the Netherlands.

- (16199) HYNSTEBITER NIEUWS (anonymous), 2005. [Records and notes regarding interesting Odonata in Friesland, the Netherlands; 2005]. *Twirre* 16(3): 120-121. (Dutch).

Calopteryx splendens, *Sympetrum paedisca*, *Aeshna subarctica*, *A. viridis* and *Somatochlora flavomaculata*.

- (16200) KOCH, K. & F. SUHLING, 2005. Do behavioural and life-history traits vary with mate-guarding intensity in libellulid odonates? *Can. J. Zool.* 83: 1631-1637. (With Fr. s.). — (First Author: Max Planck Inst. Limnol., August-Thienemann-Str. 2, D-24306 Plön).

It has been demonstrated that in libellulid dragonflies the distribution of eggs during oviposition and the off-spring size vary with the type of mate guarding during oviposition (non-contact guarding and contact guarding). Here, the hypothesis is investigated that oviposition behaviour and life-history

traits also differ between these 2 guarding types. Oviposition behaviour and life-history traits were studied in 6 spp. of an odon. assemblage of Namib Desert. Among the oviposition behaviours, oviposition duration and number of pond changes differed significantly between the guarding types. Clutch size did not differ between the guarding types, whereas some offspring characters, such as egg width, temperature sum to hatch, and larval head width differed between the guarding types. Eggs of tandem spp. (those performing contact guarding) were larger, which might explain differences in all other offspring characters studied; bigger eggs need a lower temperature sum for egg development, result in bigger larvae, and have a faster growth rate, all traits that might be seen as an adaptation to temporary waters, which are major habitats of the tandem species. This observation is discussed in the light of different dispersal strategies between the spp. performing different guarding types.

- (16201) LANGE, L., 2005. Ausgewählte Libellenfunde im Kreis Parchim aus den Jahren 2001-2003. *Virgo MittBl. ent. Ver. Mecklenburg* 8(1): 2-3. — (Deichreihe 21, D-25599 Wewelsfleth).

The records are presented of 30 spp. from various localities in the district of Perchim, Mecklenburg, E Germany.

- (16202) MACHADO, A.B.M., 2005. *Lauromacromia bedei* sp. nov. from the state of Minas Gerais, Brazil (Odonata, Corduliidae). *Revta bras. Ent.* 49(4): 453-456. (With Port. s.). — (Depto Zool., Inst. Cien. Biol., Univ. Fed. Minas Gerais, Caixa Postal 486, BR-31270-901 Belo Horizonte, MG).

The new sp. is described from a single ♂: Minas Gerais, São Gonçalo do Rio Preto, IV-2004; holotype deposition not stated. This is the 5th member of the gen., and the 4th sp. known from Brazil. Main characters separating the Brazilian ♂♂ are reviewed in a tab.

- (16203) MACHADO, A.B.M., 2005. *Schizocordulia* gen. nov. related to *Aeschnosoma* Selys, with description of the female and additional data on the male of *Schizocordulia rustica* (Selys) comb. nov. (Odonata: Corduliidae). *Revta bras. Zool.* 22(3): 775-779. (With Port. s.). — (Depto Zool., Inst. Cien. Biol., Univ. Federal Minas Gerais, Caixa Postal 486, BR-31270-901 Belo Horizonte, MG).

The new (monotypical) gen. is erected for *Aeschno-*

soma rustica Selys, 1871, hitherto known from a single ♂, lacking anal appendages. Based on 33 ♂ and 3 ♀, recently collected in Paraná, detailed descriptions and illustrations of both sexes are provided and the new gen. is erected. Characters separating Aeschnosoma and Schizocordulia are emphasized and summarized in a tab.

- (16204) MACHADO, A.B.M., 2005. Studies on neotropical Protoneuridae, 19: Two new species of Neoneura from southern Brazil (Odonata, Protoneuridae). *Iheringia* (Zool.) 95(4): 405-409. (With Port. s.). — (Depto Zool., Inst. Cien. Biol., Univ. Federal Minas Gerais, Caixa Postal 486, BR-31270-901 Belo Horizonte, MG).

N. anaclara sp. n. (holotype ♂: Paraná, Candido de Abreu, 10-XII-1994) and *N. leonardoi* sp. n. (holotype ♂: Rio Grande do Sul, Erechim, 5-I-1958) are described and illustrated; Brazil.

- (16205) MAJUMDER, S.C. & A. DEY, 2005. Studies on some ethnomedicinal arachnids and insects in relation to their usage as drugs among the tribals of Sundarbans, West Bengal, India. *Rec. zool. Surv. India* (Occ. Pap.) 236: iv + 38 pp. ISBN 81-8171-072-X. Price US \$ 7.- net. — (Authors: Zool. Surv. India, Canning Town, Distr. South 24 Parganas, W. Bengal, India).

Sundarbans is composed of a group of islands between the mouth of the Hoogly R. and the Meghna R., covering districts North and South 24-Parganas within the Indian territory and Khulna and Barisal in Bangladesh. It is populated by the Munda, Oraon and Santhal tribes. 4 drug prescriptions for the medicinal use of *Ceriatagris coromandelianum*, as used by the Munda and Oraon people (distr. 24-Parganas South) are described, viz. (1) Munda, at Amlamethi, Gosaba: the insect dried up and mixed with the stem dust of *Tinospora cardifolia*, to be taken orally and applied in the case of allergy; — (2) Oraon, at Kundakali, Kultali: the insect dust mixed with juice of *Acalypha indica*, to be used orally and applied in the case of pharyngitis; — (d) Munda, at Jalaberia, Kultali: the insect dust mixed with root bark of *Solanum xanthocarpus*, to be taken orally and applied in the case of eye troubles; — and (4) Munda, at Merigunj, Kultali: the insect dust mixed with the root dust of *Trichosanthes dioica*, to be taken orally and applied in the case of vomiting with hepatic hypertrophy.

- (16206) MARTINIA. Revue scientifique de la Société française d'odonatologie (ISSN 0297-0902), Vol. 21, Nos 1 (March 2005), 2 (June 2005), 3 (Sept 2005), 4 (Dec. 2005). (Mostly with Engl. s's). — (c/o J.-L. Dommanget, 7 rue Lamartine, F-78390 Bois-d'Arcy).

[No. 1]: *Leroy, T.*: Nouvel inventaire des odonates des tourbières du Cézallier en Auvergne (départements du Cantal et du Puy-de-Dôme) (pp. 3-15); — *Meurgey, F.*: Impact de la fréquentation dans un parc urbain sur une population de *Coenagrion mercuriale* (Charpentier, 1840) (département de la Loire-Atlantique) (p. 16); — *Ternois, V. & S. Barande*: *Oxygastra curtisii* (Dale, 1834) en région Champagne-Ardenne (Odonata, Anisoptera, Corduliidae) (pp. 17-30); — *Meurgey, F.*: Complément à l'identification d'*Anax junius* (Drury, 1773) après sa récente observation en France métropolitaine (pp. 31-34); — *Kern, D.*: Les libellules des manuscrits enluminés du Moyen Age (pp. 35-42); — *Meurgey, F.*: [analyse d'ouvrage] Les libellules du Rhône, par D. Grand, 2004 (p. 43).

[No. 2]: *Jacquemin, G.*: À propos d'identification à distance des odonates adultes (pp. 47-50); — *Meurgey, F.*: Contribution à la connaissance des odonates de l'archipel guadeloupéen, 4. Faune de l'île de Marie-Galante (Antilles françaises) (pp. 51-58); — *Ternois, V.*: Sur la présence d'*Orthetrum albistylum* (Selys, 1848) dans le Parc naturel régional de la Forêt d'Orient et le Nord-Est au bois (Odonata, Anisoptera, Libellulidae) (pp. 59-68); — *Dommanget, J.-L.*: Une population de *Coenagrion mercuriale* (Charpentier, 1840) à proximité de Saint-Affrique (département de l'Aveyron) (Odonata, Zygoptera, Coenagrionidae) (pp. 69-76); — *Dommanget, J.-L.*: [analyse d'ouvrage] Odonata. Les libellules de Suisse, par H. Wildermuth, 2005 (pp. 77-79); — *Meurgey, F.*: Observation de la ponte d'*Aeshna isosceles* (Müller, 1767) dans une rivière de Charante-Maritime (Odonata, Anisoptera, Aeshnidae) (p. 80); — *d'Aguilar, J.*: Les descriptions originales des odonates d'Europe, 12. Brullé, Gaspard Auguste (1809-1873) (pp. 81-88). — [No. 3]: *Cottureau, V.*: Recherche d'une relation entre odonates, pratiques piscicoles et végétation (pp. 91-107); — *Guerbaa, K. & N. Lolive*: Redécouverte de *Somatochlora flavomaculata* (Vander Linden, 1825) dans le département de la Haute-Vienne (Odonata, Anisoptera, Corduliidae) (p. 108); — *Meurgey, F. & G. Weber*: Eléments d'écologie et de répartition de *Tholymis citrina* Hagen, 1861 dans l'archipel Guadeloupéen (Antilles françaises) (pp. 109-114); — *Jourdain, B.*:

- Première mention de *Trithemis annulata* (Palisot de Beauvois, 1805) en Gironde (Odonata, Anisoptera, Libellulidae) (p. 114); — *Ternois, V.*: *Leucorrhinia caudalis* (Charpentier, 1840): espèce nouvelle pour le Parc naturel régional de la Forêt d'Orient et l'Aube (Odonata, Anisoptera, Libellulidae) (pp. 115-121); — *Picard, L. & F. Meurgey*: Découverte d'une population de *Lestes macrostigma* (Eversmann, 1836) dans le département de Loire-Atlantique (Odonata, Zygoptera, Lestidae) (p. 122); — *Darblade, S. & B. Ducout*: Première observation de *Trithemis annulata* (Palisot de Beauvois, 1805) dans le département des Landes (Odonata, Anisoptera, Libellulidae) (pp. 123-125); — *Dommanget, J.-L. & F. Meurgey*: Rencontres odonatologiques ouest-européennes: Nantes, Vallet (Loire-Atlantique, France), 24-27 juin 2005. Premier bilan (pp. 126-134); — *Meurgey, F.*: Nouvelle observation de *Sympetrum vulgatum ibericum* Ocharan, 1983 en France (Pyrénées-Orientales) (pp. 134-135); — *Boudot, J.-P.*: [analyse d'ouvrage] *Die Prachtlibellen Europas*, par G. Ruppell et al., 2005 (pp. 135-136). — [No. 4]: *Picard, L. & F. Meurgey*: *Lestes macrostigma* (Eversmann, 1836) dans les marais saumâtres de Loire-Atlantique (Odonata, Zygoptera, Lestidae) (pp. 139-150); — *Houard, X. & C. Archeray*: Première observation en Normandie de *Sympetrum pedemontanum* (Alioni, 1766) à Lyons-la-Forêt (Eure) dans le bassin de l'Andelle (Odonata, Anisoptera, Libellulidae) (pp. 151-156); — *Meurgey, F. & G. Weber*: *Tauriphila australis* (Hagen, 1867), *Macrothemis* sp., espèce nouvelle et genre nouveau pour la Martinique (Odonata, Anisoptera, Libellulidae) (pp. 157-166); — *Grand, D.*: Nouvelles observations en France de *Trithemis annulata* (Palisot de Beauvois, 1805) (Odonata, Anisoptera, Libellulidae) (pp. 167-168); — *Thirion, J.-M., F. Beau, M. Moncomble & S. Couturier*: Répartition de *Calopteryx haemorrhoidalis* occisi Capra, 1945 dans le département de la Charente-Maritime (Odonata, Zygoptera, Calopterygidae) (pp. 169-174); — *Dommanget, J.-L.*: Rubrique bibliographique (pp. 175-179); — *Grand, D.*: *Calopteryx haemorrhoidalis asturica* Ocharan, 1983 nouvelle sous-espèce pour la faune de France (Odonata, Zygoptera, Calopterygidae) (p. 180).
- (16207) MAUERSBERGER, R. & P. BUCZYNSKI, 2005. Materials to the knowledge of dragonflies (Odonata) of Pomeranian Lakelands. *Wiad. ent.* 24(4): 243-244. (Pol., with Engl. title). — (First Author: Waldstr. 4, D-16278 Steinhöfel).
- A commented list of 26 spp. from 14 localities; — Pomerania, Poland.
- (16208) MAUSE, M., [Ed.; authorship not stated], 2005. Backyard damselfly and dragons. *Habitat* 11(1): 5. — (Wild Acres Program, Maryland Wildlife & Heritage Service, Gwynnbrook WMA, 3740 Gwynnbrook Ave, Owings Mills, MD 21117, USA).
General; encouraging the construction of dragonfly garden ponds in Maryland.
- (16209) MITRA, A., 2005. Life history pattern and larval development of *Neurothemis fulvia* Drury (Odonata: Libellulidae) from Dehra Dun Valley, India: a comparative analysis with two other species of the genus. *Ann. Forestry* 13(2): 311-322. — (Dept Zool., Sherubte Coll., Kanglung, Bhutan). Based on laboratory rearing of 4 larvae from egg to adult, life history of the sp. is for the first time described and compared to the situation in *N. t. tullia* and *N. intermedia*. Laboratory data are compared to the field data. The development from egg to adult takes approx. 58 days, and *N. fulvia* has 3 generations in a yr. Various structural features of the larva are illustrated.
- (16210) MITRA, T.R., 2005. *Calicnemia miniata* doonensis Sangal & Tyagi a synonym of *Calicnemia carminea* pyrrhosoma Lieftinck (Insecta: Odonata: Platynemididae). *Rec. zool. Surv. India* 104(3/4): 161-162. — (208/K/8 Raja Ram Mohan Roy Rd, Netaji Sarak, Calcutta-700 008, India).
The arguments are presented supporting the view, *C. m. doonensis* Sangal & Tyagi, 1984 (abstract) / 1985 (proper description) is a junior synonym of *C. c. pyrrhosoma* Lieftinck, 1984.
- (16211) MITRA, T.R., 2005. Evolutionary adaptations in morphology and ecology of *Tholymis tillarga* (Fabricius) and *Bradinopyga geminata* (Rambur) (Insecta: Odonata). *Rec. zool. Surv. India* 104(1/2): 101-104. — (208/K/8 Raja Ram Mohan Roy Rd, Netaji Sarak, Calcutta-700 008, India).
The colour patterns and the selection of resting sites in the 2 spp. are analysed. They are considered evolutionary adaptations, protecting them from bird predation.
- (16212) MITRA, T.R., 2005. Taxonomic assessment of insects recorded in Kalidasa's works. *Rec. zool.*

Surv. India 105(1/2): 97-103. — (208/K/8 Raja Ram Mohan Roy Rd, Netaji Sarak, Calcutta-700 008, India).

An attempt is made to provide taxonomic identity of 16 insect appellations used in the *Kālidāsa* works (probably 200 B.C.-415 A.D.). The sanskrit term, *patāṅga*, is usually associated with any flying insect, occasionally also specifically with the dragonfly. Here it is understood to denote an ant.

- (16213) MOYA, C.L.A., 2005. Evaluación físico-química y de macro invertebrados como indicadores de calidad de agua en la microcuenca El Caraño. *Revista institucional Univ. tecnológica Choco* 22: 30-36. (With Engl. s.). — (Grupo Recursos Hídricos, Univ. Tecnológica, Ciudad Universitaria, Quibdó, Chocó, Colombia).

During 12 June 1999-23 June 2000, the environmental conditions and macroinvertebrate fauna were studied at 10 sites (alt. 42-100 m) in El Caranó, Collide dept, Colombia. 4 odon. fam. were identified and 10 gen. are mentioned. For the families, the BMWP (Biological Monitoring Working Party Score System) values were identified, and the abundance of the resp. individuals is discussed.

- (16214) NELSON, B., 2005. Surveys of the insects, spiders and other invertebrates of fens in counties Armagh, Down and Tyrone, Northern Ireland. *Bull. Ir. biogeogr. Soc.* 29: 3-85. — (Dept Zool., Ulster Mus., Bot. Gardens, Belfast, BT9 5AB, Northern Ireland, UK).

Lists records of 11 odon. sp., with precise locality data and collection dates.

- (16215) NOVELO-GUTIERREZ, R., 2005. La larva de *Enallagma novaehispaniae* Calvert, 1902 (Odonata: Zygoptera: Coenagrionidae). *Folia ent. mex.* 44(2): 219-224. (With Engl. s.). — (Depto Ent., Inst. Ecol., A.C., Apartado Postal 63, MX-91070 Xalapa, Veracruz).

The final instar larva is described and illustrated, and a note on its habitat is provided.

- (16216) OLDRINI, B.B. & B.J. de A. MASCARENHAS, 2005. Descrição da larva de *Idiotaphe longipes* (Odonata, Libellulidae, Trameini). *Iheringia* (Zool.) 95(4): 431-433. (With Engl. s.). — (Depto Ent., Mus. Nac., Univ. Fed. Rio de Janeiro, Quinta da Boa Vista, São Cristóvão, BR-20940-040 Rio de Janeiro, RJ).

The last instar larva is described and illustrated from 5 exuviae with associated teneral adults (Concórdia Pond, Valença, RJ, Brazil).

- (16217) ORR, A.G., 2005. *Dragonflies of Peninsular Malaysia and Singapore*. Natural History Publications (Borneo), Kota Kinabalu/Malaysia. vi+127 pp. Softcover (11.4×16.8 cm). ISBN 983-812-103-7. — (Author: Aust. Sch. Envir. Stud., Griffith Univ., Nathan, Qld 4111, AU; — Publishers: A913, 9th Floor, Wisma Merdeka, P.O. Box 15566, 88864 Kota Kanabalu, Sabah, Malaysia).

As the book was going to press, 229 named spp. were known from the region, 226 of these are dealt with here. The only known specimens of *Teinobasis kirbyi*, *Onychogomphus nigrescens* and *Cephalaeschna laidlawi* are housed at institutions in the UK and USA and were not available for study. *Burmagomphus insularis* was recorded only after the completion of the text, and 6 "possibly undescribed" spp. still await identification and description. — All spp. and (where known) their larvae are briefly described and illustrated with original (col.) drawings. Notes on distribution, habitats and behaviour are also provided for all spp. — The field guide is the first of its kind for the region. It will certainly stimulate and greatly facilitate the work of many, professionals and others alike. The handy size of the book, the concise style, and the high quality of art work enhance its value.

- (16218) SANCHEZ-GUILLEN, R.A., H. VANGOSUM & A. CORDERO RIVERA, 2005. Hybridization and the inheritance of female colour polymorphism in two ischnurid damselflies (Odonata: Coenagrionidae). *Biol. J. Linn. Soc.* 85: 471-481. — (Third Author: Grupo Ecol. Evolutiva, Depto Ecol. & Biol. Animal, Univ. Vigo, EUET Forestal, Campus Universitario, ES-36005 Pontevedra, Galicia). ♀-limited polychromatism is frequent in many odon. spp. *Ischnura elegans* has 3 colour morphs: a ♂-like coloured (androchrome) and 2 additional gynochrome brown morphs (infuscans and rufescens-obsoleta). A total of 19 progenies obtained from once-mated ♀♀ were reared in the laboratory in 3 generations. Results indicate that the colour morphs are controlled by the same genetic system as previously described for *I. graellsii*, i.e. an autosomal locus with ♀-limited expression and with 3 alleles with a hierarchy of dominance ($p^* > p' > p^0$). 5 interspecific crossings between ♀ *I. graellsii* and ♂ *I. elegans*, 5

crossings between hybrid ♀♀ and ♂ *I. elegans* and 1 crossing between ♀ *I. graellsii* and a hybrid ♂ further confirmed that the genetic system is the same in both spp. A survey of morph frequencies in NW Spain revealed that *I. elegans* shows high variability in androchrome frequency (4-91%) between nearby populations, whereas in *I. graellsii* androchromes never are the majority morph (5-40%). The highest androchrome frequency in *I. graellsii* was found in populations closest to a locality where both spp. have hybridized, and that now has the highest androchrome frequency of *I. elegans*. It is hypothesized that *I. elegans* genes have been incorporated into the genome of *I. graellsii* resulting in increased androchrome frequency in the latter sp. Low androchrome frequency in *I. elegans* seems also related to the influence of *I. graellsii* genes. Therefore, it is suggested that hybridization between both taxa is contributing to the temporal maintenance of contrasting androchrome frequencies in nearby populations.

- (16219) SCHLUPMANN, M., R. FELDMANN & A. BELZ, 2005. Stehende Kleingewässer im Südwestfälischen Bergland: Charakteristik und Fauna am Beispiel der Libellen und der Wirbeltiere. *Abh. westf. Mus. Naturk.* 67(3): 201-222. (With Engl. s.). — (First Author: Hierseier Weg 18, D-58119 Hagen).

An account is provided of the distribution, status and (pond) habitats of 39 odon. spp. in the hill area of S Westphalia, Germany. With the increased elevation the biodiversity is decreasing.

- (16220) SONNENBURG, H. & K. HANNIG, 2005. Die Libellen (Insecta, Odonata) der Truppenübungsplatzes Haltern-Platzteil Lavesum (Kreis Recklinghausen und Kreis Borken). *Abh. westf. Mus. Naturk.* 67(4): 65-75. — (First Author: Am Solling 100, D-37671 Hörter).

A commented list of 31 spp. recorded in the military training area Haltern-Platzteil Lavesum, distr. Recklinghausen & Borken, Westfälische Bucht, Germany. The biodiversity is considered high, but it is the result of human impact rather than being due to the (lacking) pristine fen- and heath condition.

- (16221) SPEIGHT, M.C.D. & J.A. GOOD, 2005. Farms as biogeographical units, 5. The response of Odonata to increased habitat availability on a farm in Co. Cork, Ireland. *Bull. Ir. biogeogr. Soc.* 29: 262-277. — (First Author: Res. Br., Natn. Parks

& Wildlife Serv., 7 Ely Pl., Dublin-2, Ireland).

The odon. fauna of the case study farm was observed to increase from 1 to 9 spp. within 3 yr, following installation of a pond and 2 areas of wetland. Data are presented confirming successful breeding by 6 of these spp. in the areas of new habitat, and showing that breeding of 2 of the others is very probable. These results show that, for a taxonomic group like Odon., to which the Irish farmland landscape is still permeable, introduction of wetland/freshwater habitat can result in an almost immediate increase in biodiversity and can potentially provide for approximately 50% of the regional fauna of that taxonomic group.

- (16222) SUHLING, F., G. SAHLEN, J. KASPERSKI & D. GAEDECKE, 2005. Behavioural and life history traits in temporary and perennial waters: comparisons among three pairs of sibling dragonfly species. *Oikos* 108(3): 609-617. — (First Author: Inst. Geoökol., Tech. Univ. Braunschweig, Langer Kamp 19 c, Raum 303, D-38106 Braunschweig). Identifying and examining traits that influence the distribution of spp. is crucial to the understanding of community structure. Theory predicts that traits should differ between spp. that live in temporary and permanent waters because of differing major environmental variables; viz. drying out and predator presence, respectively. Spp. however, will also be influenced by their evolutionary history, i.e. by the traits of their common ancestors. Differences in life history and behaviour traits were studied in a series of laboratory experiments using pairs of odon. spp. out of 3 genera of Namibian Libellulidae, with 1 sp. from each type of habitat. As predicted, growth rates were significantly higher in the temporary water spp. compared to the permanent water spp. Activity and foraging, in contrast, differed between the genera, but did not differ between the habitat types. Hence, the study implies that the behavioural traits are influenced by phylogenetic inertia rather than by the habitat variables, while growth rate is adapted to the habitat. It is argued that in all 3 genera 1 sp. has diverged recently from a sister sp. that lives in the original habitat of the genus, which may be temporary waters in *Crocothemis* and in *Orthetrum*, and permanent waters in *Trithemis*. The behavioural traits may therefore be less well adapted. Rapid growth may be the more relevant trait because it is crucial to survival in temporary waters.

- (16223) TABER, S.W. & S.B. FLEENOR, 2005. *Invertebrates of central Texas wetlands*. Texas Tech Univ. Press, Lubbock. xii+322 pp. Softcover (22.4×15.2 cm). ISBN 0-89672-542-1. — (Publishers: Box 41037, Lubbock, TX 79409-1037, USA).
The book deals with the Ottine Wetlands, situated along the San Marcos R, in and surrounding Palmetto State Park in south central Texas, USA. This ecosystem of swamps, marshes and ponds (surface ca 2 mi²) is particularly notable for its geographic isolation from other wetlands of SE Texas. The odon. are dealt with on pp. 34-60. Field notes are presented for 30 spp.
- (16224) TABORSKY, I., 2005. 7. gesamtstaatliches Zusammentreffen der Odonatologen im Regionalmuseum in Most. *Sb. oblast. Muz. Most* 27: 10. (Czech). — (Oblastni Muzeum, Ceskoslovenské armády 1360, CZ-43438 Most).
A report of the 7th Czech national meeting of odonatologists at the District Museum of Most (22-25 July 2004), with titles of the oral presentations, and a brief description of the symposium field trips.
- (16225) TYNKKYNNEN, K., 2005. *Interspecific interactions and selection in secondary sexual characters in damselflies*. Acad. Diss., Univ. Jyväskylä, Jyväskylä. [Jyväskylä Stud. biol. & envir. Sci. 151], 26 pp. ISBN 951-39-2106-9. — (Author: Dept Biol. & Envir. Sci., P.O. Box 35, FI-40014 Univ. Jyväskylä).
Interspecific interactions related to species recognition can cause selection and affect the evolution of secondary sexual characters. Such interactions include, e.g. the avoidance of maladaptive hybridization and interspecific aggression. This thesis is focused on interspecific aggression and on selection which it may cause on sexual characters of *Calopteryx splendens*. *C. splendens* ♂♂ have pigmented wing spot as a sexual character in the middle of their wings. Large-spotted ♂♂ resemble *C. virgo* ♂♂, which have almost completely pigmented wings. In *C. splendens* ♂♂ the wing spot size decreases with increasing relative abundance of *C. virgo*. Territorial *C. virgo* ♂♂ react more aggressively and from greater distance towards large- than small-spotted *C. splendens* ♂♂. This suggests that the character displacement may have evolved because of the interspecific aggression, arising from mistaken species recognition. Interspecific aggression causes negative survival selection on wing spot size in *C. splendens* ♂♂. In addition, interspecific aggression leads to interspecific territoriality in which large-spotted *C. splendens* ♂♂ seem to have reduced ability to obtain or keep a territory. Reduced territory holding ability may have negative effects on mating success of large-spotted *C. splendens* ♂♂. This is because, in contrast to other studies on *Calopteryx* spp. in wild sympatric populations, ♀♀ did not mate with large-spotted ♂♂. The results show that interspecific aggression tends to cause a selection on sexual characters and thus has the potential of affecting the evolution of secondary sexual characters.
- (16226) VAN DIJK, A.J. & H.D. HEINEMEIJER, 2005. *Ontwikkeling van vegetatie en broedvogels in relatie tot het beheer op het Doldersummer Veld*. — [Development of vegetation and breeding birds in relation to the management in the Doldersummer Veld]. Drentse Landschap, Assen. 71 pp. ISBN none. (Dutch). — (Distributor: Het Drentse Landschap, P.O. Box 83, NL-9400 AB Assen).
This is a heath area, situated in co. Westerveld, SW Drenthe, the Netherlands. A reference is made to *Sympetma paedisca* (recorded in Nov. 2003), and to *Lestes virens*, *Leucorrhinia dubia* and *L. rubicunda* (all 2004).
- (16227) VASILENKO, D.V., 2005. New damselflies (Odonata: Synlestidae, Hemiphlebiidae) from the Mesozoic Transbaikalian locality of Chernovskie Kopi. *Paleont. J.* 39(3): 280-283. — (Chita St. Univ., ul. Aleksandro-Zavodskaya 30, RUS-672039 Chita).
Gaurimacia sophiae gen. n., sp. n. (Synlestidae) and *Mersituria ludmilae* gen. n., sp. n. (Hemiphlebiidae) are described from Doronino Formation (Upper Jurassic-Lower Cretaceous), Chita distr. (left bank of the Ingoda R), E Transbaikalia, Russia.
- (16228) YOSHIMURA, M. & I. OKOCHI, 2005. A decrease in endemic odonates in the Ogasawara islands, Japan. *Bull. Forestry Forest Products Res. Inst.*, Kyoto 4(1): 45-51. (With Jap. s.) — (First Author: Kansai Res. Cent., Forestry & Forest Products Res. Inst., 68 Nagaikyutaro, Momoyama, Fushimi, Kyoto, 612-0855, JA).
Boninagrion ezoin, *Boninthemis insularis*, *Hemiscordulia ogasawarenis*, *Indolestes boninensis* and *Rhinocypha ogasawarenis* are endemic to the archipelago. Due to the reduction of habitats and introduction of alien spp., all of them are considered "at risk". The construction of artificial ponds and the

extermination of invasive spp. (such as *Gambusia affinis* and *Anolis carolinensis* on Chichi-jima) are advocated.

- (16229) ZHA, L.-S., D.-Z. ZHANG & Z.-M. ZHENG, 2005. The genus *Gomphidia* Selys in China (Odonata, Gomphidae). *Acta zootaxon. sin.* 30(4): 812-814. (With Chin. s.). — (First Author: Inst. Zool., Shaanxi Normal Univ., Xi'an-710062 P.R. China). 4 spp. and 1 ssp. are treated. *G. interruptistria* sp. n. is described, illustrated, and compared with *G. k. kruegeri* and *G. k. fukiensis*. Holotype ♂: Yunnan, Mengla, Yaoqu, alt. 1000 m, 28-VII-2004; deposited at Inst. Zool., Shaanxi Normal Univ., Xi'an. A key to the Chinese *Gomphidia* spp. is provided.

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- (16230) [BEATTY, G. & A. BEATTY], 2006. Addition of the Beatty Odonata collection. *Friends Frost ent. Mus. Newsl.* 5(1): 1. — (Editor: Dept Ent., 501 ASI Bldg, University Park, PA 16802, USA). An anonymous note, informing that in 2005-2006 the Frost Ent. Mus. welcomed the addition of G. & A. Beatty Odon. collection and funds from the Beatty estate (etc.) to integrate it in the Museum. The funds have been used to establish an online accessible database and to begin cataloging the Beatty specimens, the accompanying labels and information from their field notebooks.
- (16231) BEDJANIČ, M., 2006. *Distributional atlas of the dragonflies of Sri Lanka. First preliminary results of the work on the odonatological database.* ii+16 pp. Bedjanič, Slovenska Bistrica. — (Kolodvorska 21b, SI-2310 Slovenska Bistrica). In 2005, an odonatol. database was set up for Sri Lanka, based on the existing museum collections, literature and unpublished results of field surveys (ca 3300 records). It gives an evidence of the current knowledge for each sp., and generates the outputs such as odon. locality lists, species lists per locality, district or province etc. Here, distribution maps (per district) are provided for 21 selected spp., 16 of which are endemic. Also presented is the information on status of the respective taxa and on the number of available records. A fairly exhaustive bibliography is appended. — (See also OA 16179).
- (16232) BONADA, N., N. PRAT, V.H. RESH & B. STATZNER, 2006. Developments in aquatic insect biomonitoring: a comparative analysis of recent approaches. *Annu. Rev. Ent.* 51: 495-523. — (Third Author: Dept Envir. Sci., Policy & Mngmt, Univ. California, Berkeley, CA 94720-3112, USA). Aquatic insects and other benthic invertebrates are the most widely used organisms in freshwater biomonitoring of human impact. Because of the high monetary investment in freshwater management, decisions are often based on biomonitoring results, and a critical and comparative review of different approaches is required. 12 criteria were used that should be fulfilled by an "ideal" biomonitoring tool, addressing the rationale, implementation, and performance of a method. After illustrating how the century-old but still widely used Saprobian system does not meet these criteria, these are applied to 9 recent approaches that range from the suborganismal to the ecosystem level. Although significant progress has been made in the field, no recent approach meets all 12 criteria. Given that the use of biomonitoring information has important financial consequences, it is suggested that societies and governments prioritize how these criteria should be ranked.
- (16233) BUCZYNSKI, P., E. BUCZYNSKA & A. KASJANIUK, 2006. Dragonflies (Odonata) and caddisflies (Trichoptera) of the nature reserve "Magazyn" (Western Polesie). *Parki nar. Rezerw. Przyr.* 24(1/4) [2005, published Apr. 2006]: 117-130. (Pol., with Engl. s.). — (First Author: Inst. Zool., UMCS, Akademicka 19, PO-20-033 Lublin). The Reserve is situated on the edge of the Sobibór Forests and the Bug R. valley. 33 odon. spp. were recorded during 1999 and 2002-2003. The most important habitat is a dystrophic water body, dammed by a dike. Its fauna is similar to that of peat bog lakes. Odonatologically, the Reserve has a rather low significance, but it may play an important role as a component of the aquatic networks of middle-E Poland, since its marshy and other aquatic habitats are well preserved.
- (16234) DIJKSTRA, K.-D.B., 2006. Taxonomy and biogeography of *Porpax*, a dragonfly genus centred in the Congo Basin (Odonata, Libellulidae). *Tijdschr. Ent.* 149: 71-88. — (Gortestraat 11, NL-2311 MS Leiden). The tropical African genus *Porpax* is revised, 5 spp. are recognised, including the new sp., *P. sentipes*, from Congo-Kinshasa. All spp. are fully diagnosed for both sexes and new records are included. A key

to the spp. and illustrations of important characters are provided. The peculiarities of the genus are discussed, but little is known of its ecology. *P. garbambensis* and *P. sentipes* sp. n. are confined to the Congo Basin, while *P. asperipes* is also present in the adjacent Lower Guinean forest. *P. risi* is spread out across highlands in S-central Africa. *P. bipunctus* is known from four disjunct rainforest regions from Liberia to E. Congo and has different markings in each region. This distribution coincides with Africa's main rainforest refugia and is the best example of such disjunction seen in afrotropical Odon. so far. The species' isolation appears to be linked to an ephemeral habitat, confining it to areas with perennial and predictable rainfall.

- (16235) DIJKSTRA, K.-D.B., V. CLAUSNITZER & G.S. VICK, 2006. Revision of the three-striped species of *Phyllogomphus* (Odonata, Gomphidae). *Tijdschr. Ent.* 149: 1-14. — (First Author: Gortestraat 11, NL-2311 MS Leiden).

The taxonomy of the *Phyllogomphus* spp. occurring from Cameroon eastwards, characterised by 3-striped sides of the thorax, has been confused by misinterpretation of the identity of the most widespread sp., *P. selysi*, and substantial variation in the spp. Of 16 named taxa, only 4 are considered valid spp. after clarifying the identity of *P. selysi*, matching ♀♀ to the correct ♂♂, and accounting for variation, particularly of size, colour and the morphology of the vulvar scale: *P. annulus* is not a synonym of the true *P. selysi* but of Fraser's interpretation of the latter sp.; *P. dundomajoricus* and *P. dundominusculus* are junior synonyms of *P. annulus*; *P. montanus*, *P. hartwigi*, *P. perisi* and *P. margaritae* of *P. coloratus*; *P. orientalis*, *P. edentatus*, *P. latifasciae*, *P. symoensi*, *P. brunneus* and *P. corbetiae* of *P. selysi*. Keys to the spp. and distribution maps are provided, and the taxonomy of the genus is discussed.

- (16236) FISHAR, M.R. & W.P. WILLIAMS, 2006. A feasibility study to monitor the macroinvertebrate diversity of the river Nile using three sampling methods. *Hydrobiologia* 556: 137-147. — (Second Author: Dept Life Sci., King's Coll., Univ. London, Franklin Wilkins Bldg, 150 Stamford St., London, SE1 9NN, UK).

Ekman Grab, macrophyte sweep netting and Artificial Substrate Samplings were used to sample 15 sites along a 1035 km stretch of the Nile R, between Aswan and Cairo, Egypt and 859 samples were tak-

en. These include 9 odon. genera, pertaining to 4 families. Incomprehensibly, the North American literature was apparently used for taxonomic identification, therefore all taxa are wrongly named. Consequently, the sole odonatol. information that can be gathered from this paper is that the Gomphidae were restricted to Artificial Substrate Samplers, while some coenagrionids and libellulids were collected only by the macrophyte sweep netting.

- (16237) FLECK, G. & J. LEGRAND, 2006. La larve du genre *Nesocordulia* McLachlan, 1882, conséquences phylogénétiques (Odonata, Anisoptera, Corduliidae). *Revue fr. Ent.* (N.S.) 28(1): 31-40. (With Engl. s.). — (Dépt Syst. & Evol., USM 602, Entomologie, Mus. natn. Hist. nat., CP 50, 45 rue Buffon, F-75231 Paris cédex-05).

The *Nesocordulia* larva, identified on the larval wing pad venation, is described and illustrated for the first time. The study of the larval stage suggests that the genus is related to the African *Idomacromia*, while a close relationship with the neotropical *Neocordulia* is less probable. It shares some derived characters of the head with the remarkable archaic S American *Lauromacromia*. A generic diagnosis is proposed.

- (16238) GARRISON, R.W., 2006. A synopsis of the genera *Mnesarete* Cowley, *Bryoplathanon* gen. nov., and *Ormenophlebia* gen. nov. (Odonata: Calopterygidae). *Contr. Sci.* 506: 1-84. — (California Dept Food & Agric., 3294 Meadowview Rd, Sacramento, Ca 95832-1448, USA).

The synopsis includes diagnoses, diagnostic illustrations, distribution maps and keys to both sexes. As new are described *Bryoplathanon* gen. n. (type sp. *Lais globifer* Hag.), *Ormenophlebia* gen. n. (type sp. *Lais imperatrix* McL.), *Mnesarete drepane* sp. n., *M. ephippium* sp. n., *M. lencionii* sp. n., *M. loutoni* sp. n., *M. machadoi* sp. n., *M. rhopalon* sp. n., and *M. williamsoni* sp. n. The following nomenclatural changes are proposed: *M. regina* (Ris), *M. rollinatti* (Martin) and *M. saltuum* (Ris) are transferred to *Ormenophlebia*; and *Hetaerina borchgravi* Sel. and *H. fuscibasis* Calv. are transferred to *Mnesarete*. A generic key to all New World Calopterygidae and a discussion on the generic concepts of *Hetaerina* and the 24 *Mnesarete* spp. are presented, and the descriptions of the last larval instar of *M. grisea* and *O. imperatrix* are provided.

- (16239) GONZÁLEZSORIANO, E. & S. MONTIEL

BARRON, 2006 [?, not dated]. Odonata de Calakmul. In: A. Contreras Ramos et al., *Reconocimiento de la biodiversidad de la Reserva de la Biosfera Calakmul: Odonata, Psocoptera y Diptera acuáticos (Insecta)*, pp. 6-13, Inst. Biol., UNAM, Mexico. – (First Author: Depto Zool., Inst. Biol., UNAM, Apdo Postal 70-153, MX-04510 Mexico, D.F.).

The Reserve is situated SE of Campeche, and it is one of the largest of its kind in Mexico. A list is provided of 74 recorded spp. and the fauna is discussed in some detail.

- (16240) GYSSELS, F. & R. STOKS, 2006. Behavioral responses to fish kairomones and autotomy in a damselfly. *J. Ethol.* 24: 79-83. – (Second Author: Lab. Aquat. Ecol., Univ. Leuven, Charles de Bériotstraat 32, B-3000 Leuven).

The threat-sensitivity hypothesis predicts that prey spp. assess and adjust their behaviour in accordance with the magnitude of the threat posed by a predator. A largely overlooked characteristic of a prey that will affect its sensitivity to predators is its history of autotomy. Threat-sensitive behaviour to fish kairomones was studied in *Ischnura elegans* larvae, which had undergone autotomy, from a fishpond and from a fishless pond. In agreement with their higher perceived risk, larvae from the fishpond showed fewer rigid abdomen bends, foraged less and walked more slowly than larvae from the fishless pond. In line with their higher vulnerability to predators, larvae without lamellae spent less time foraging than larvae with lamellae. There was a decrease in swimming activity in the presence of fish kairomones except for larvae with lamellae from the fishless pond. This may reflect differences in vulnerability of larvae without lamellae between pond types. Such context-dependent responses in activity to kairomones should be kept in mind when evaluating the ability of a prey to recognize kairomones.

- (16241) HASEGAWA, E. & E. KASUYA, 2006. Phylogenetic analysis of the insect order Odonata using 28S and 16S rDNA sequences: a comparison between data sets with different evolutionary rates. *Ent. Sci.* 9(1): 55-66. – (First Author: Dept Ecol. & Syst., Graduate Sch. Agric., Hokkaido Univ., Kita-ku, Sapporo, 060-8587, JA). Molecular phylogenetic analyses were conducted with a focus on testing the effectiveness of a slowly evolving gene to resolve deep branching and also to examine: (i) the monophyly of the Zygoptera; and

(ii) the phylogenetic position of the relict Epiophlebia superstes. 2 independent molecular sources were used to reconstruct phylogeny: the 16S rRNA gene on the mitochondrial genome and the 28S rRNA gene on the nuclear genome. A comparison of the sequences showed that the obtained 28S rDNA sequences have evolved at a much slower rate than the 16S rDNA, and that the former is better than the latter for resolving deep branching in the Odon. Both molecular sources indicated that the Zygoptera are paraphyletic, and when a reasonable weighting for among-site rate variation was enforced for the 16S rDNA data set, E. superstes was placed between the Zygoptera and Anisoptera. Character reconstruction analysis suggests that multiple hits at the rapidly evolving sites in the 16S rDNA degenerated the phylogenetic signals of the data set.

- (16242) *INTERNATIONAL JOURNAL OF ODONATOLOGY* (ISSN 1388-7890), Vol. 9, No. 1 (1 Apr. 2006).

Corbet, P.S., F. Suhling & D. Soendergerath: Volutinism in Odonata: a review (pp. 1-44); – Baird, I.R.C. & C. Ireland: Upright emergence in *Petalura gigantea* (Odonata: Petaluridae) (pp. 45-50); – Dijkstra, K.-D.B. & G.S. Vick: Inflation by venation and the bankruptcy of traditional genera: the case of *Neodythemis* and *Micromacromia* with keys to the continental African species and the description of two new *Neodythemis* species from the Albertine Rift (Odonata: Libellulidae) (pp. 51-70); – Koch, K.: Effects of male harassment on females' oviposition behaviour in Libellulidae (Odonata) (pp. 71-80); – Oppel, S.: Using distance sampling to quantify Odonata density in tropical rainforests (pp. 81-88); – Comparison of two Odonata communities from a natural and a modified rainforest in Papua New Guinea (pp. 89-102); – Reinhardt, K.: Open questions in the evolution of open wing perching in the Zygoptera (Odonata): a comment on Paulson (pp. 103-110); – Paulson, D.R.: Openwing perching in some Zygoptera (Odonata): a response to Klaus Reinhardt (pp. 111-118).

- (16243) KHROKALO, L.A. & P.M. SHESHURAK, 2006. Flight seasonality of dragonflies (Insecta, Odonata) in northeastern Ukraine. *Vest. Zool.* 40(2): 145-154. (With Russ. s.). – (First Author: Dept Ecol. of Agrosphere & Ecol. Control, Natn. Agric. Univ., vul. Geroiv Oborony 19, UKR-03041 Kyiv).

55 spp. were recorded from 5 administrative regions of NE Ukraine. Data on their flight periods are tabulated and the information on the regional status is provided for each sp. A case of adult hibernation in *Sympetrum sanguineum* (6-V-1997; Yaduty, Chernigiv region; 1 ♂) is brought on record.

- (16244) KIRK, D., *De wijde wereld in*. (Original title: *I'll fly away*). Big Balloon, Heemstede. ii+30 pp. Softcover (14.7×23.0 cm). ISBN 90-5425-520. Price: € 2.99 net. (Dutch).
A (fiction) dragonfly booklet for children, based on a TV presentation.

- (16245) MEYER, M., R. PROESS & N. SCHNEIDER, 2006. Entomologische Notizen aus Luxemburg, 2000-2004. *Bull. Soc. Nat. luxemb.* 106: 105-112. (With Engl. s.). — (First Author: Mus. Natn. Hist. Nat., 25 rue Munster, L-2160 Luxembourg). Includes annotations on the occurrence in Luxemburg of *Lestes sponsa*, *Coenagrion mercuriale*, *Oxygastra curtisii* and *Orthetrum coerulescens*.

- (16246) The *MIGRANT SKIMMER*. Bulletin of the Dragonfly Project (ISSN none), No. 4 (not numbered; May 2006). — (c/o Dr R. Mackenzie Dodds, East Ardttrasgairt, Fortingall by Aberfeldy, Perthshire, PH15 2LN, UK).

A small issue, reporting on the activities during the 3rd season at Wicken Fen (2005): 18 half-day Dragonfly Safaris, one-day Education Courses, the Gift Shop etc.

- (16247) MITRA, A., 2006. Current status of the Odonata of Bhutan: a checklist with four new records. *Bhutan JI RNR* 2(1): 136-143. — (Dept Zool., Sherbutse Coll., Kanglung, Bhutan).
A list of 16 spp. collected in the districts of Tashi-yangtse (July 2003) and Pemagatsel (Sept. 2003), with a checklist of 31 spp. so far recorded from Bhutan, based on literature and unpublished records.

- (16248) MULLER, J., R. STEGLICH, J. LOTZING & W. HAHN, 2006. Vorläufige Mitteilung über bemerkenswerte Beobachtungen im Jahre 2005 (Odonata, Saltatoria, Aves). *Halophila* 49: 9-10. — (First Author: Frankefelde 3, D-39116 Magdeburg).
A report on the discovery of a *Cordulegaster bidentata* larval population in Nature Reserve "Grosser Ronneberg-Bielstein". Since 1992, this is the 5th known record of this sp. in Harz (Sachsen-Anhalt,

E Germany). *Calopteryx splendens*, *Ophiogomphus cecilia*, *Crocotthemis erythraea* and *Orthetrum cancellatum* were noticed as swallow prey. The parent birds caught them, but the nestlings were unable to consume them.

- (16249) MUZON, J., G.R. SPINELLI, P. PESSACQ, N. VON ELLENRIEDER, A.L. ESTEVEZ, P.I. MARINO, P.J. PÉREZ GOODWYN, E.B. ANGRISANO, F. DIAZ, L.A. FERNÁNDEZ, S. MAZZUCCONI, G. ROSSI & O.D. SALOMÓN, 2006. Insectos acuáticos de la Meseta del Somuncura, Patagonia, Argentina: inventario preliminar. *Revta Soc. ent. Argent.* 64(3/4): 47-67. (With Engl. s.). — (First Author: Inst. Limnol. "Dr R.A. Ringuelet", CC 712, AR-1900 La Plata).

Based on collection material and on literature, 12 odon. spp. are listed from the Somuncura plateau, Patagonia, Argentina. The topographic positions of the localities are stated and their ecological descriptions are provided.

- (16250) *ODONATOLOGICAL ABSTRACT SERVICE* (ISSN 1438-0269), No. 18 (June 2006), 60 pp. — (Distributor: M. Schorr, Schulstr. 7b, D-54314 Zerf).
Abstracts Nos 5336-5747, of the works published in 1997-2006.

- (16251) *ODONATRIX*. Bulletin of the Odonatological Section of the Polish Entomological Society (ISSN 1733-8239), Vol. 2, No. 1 (Jan. 2006). (Pol., with Engl. s's). — (c/o Dr P. Buczyński, Dept Zool., UMCS, Akademicka 19, PO-20-033 Lublin).
Mielewicz, S.: Curriculum vitae (pp. 1-2; autobiography); — *Bernard, R., P. Buczyński & G. Tończyk*: Dr Stefan Mielewicz (4.II.1933-12.VIII.2005) (pp. 2-8; biography, appreciation of work & complete bibliography); — *Buczyński, P. & B. Daraż*: Interesting records of *Leucorrhinia caudalis* in secondary habitats (pp. 8-12); — *Cios, S.*: References to Odonata in Polish literature of 18th and 19th centuries (pp. 12-17); — *Wybraniec, K.*: Preliminary results of studies on the dragonflies of the Kierbieszów community (pp. 17-19); — *Tończyk, G. & P. Buczyński*: Dragonflies recorded in Białowieża [...] (pp. 20-21); — *Bernard, R.*: 4th WDA International Symposium of Odonatology, Pontevedra (Spain) (pp. 21-22); — *Buczyński, P. & G. Tończyk*: Keys useful for identification of Polish dragonflies, 2: Larvae and exuviae (pp. 22-25); — *Buczyński, P.*: Corbet's monograph:

a "bible" for odonatologists (pp. 25-26); – Worth to know, worth to have: the monograph of European Calopterygidae (pp. 26-27); – Polish and to Poland dedicated odonatological papers published in the 2nd half of 2005 [...] (pp. 27-29); – *Varia* (pp. 29-30); – *Letters to and from the Editorial Office* (p. 31); – *Corrigenda* (pp. 31-32).

- (16252) SFORMO, T. & P. DOAK, 2006. Thermal ecology of Interior Alaska dragonflies (Odonata: Anisoptera). *Funct. Ecol.* 20: 114-123. – (First Author: Dept Biol. & Wildlife, Univ. Alaska, Fairbanks, AK 99773, USA).

The relationships between mass and passive cooling rate, wing loading, minimum flight temperature (MFT) and thermoregulating ability were examined. These properties were also compared between the behavioural classes: perchers and fliers. All factors with the addition of seasonal and daily flight activity were related to generalized thermal strategies. Passive cooling rate decreased while wing loading and MFT increased with mass. While all spp. were able to elevate thoracic temperature, larger spp. were better able to maintain a constant temperature. Both the smallest and largest spp. were capable of activity at ambient temperatures of approximately 14°C by employing different thermal strategies: low MFT and physiological heat production, respectively. For small spp. active in cool conditions low MFT may be favoured even if accompanied by poor thermoregulating ability. By contrast, thermoregulation and specialization for high-temperature performance may be favoured in both small and large spp. during the warmer summer flight season. The smallest and largest Anisopt. in Interior Alaska have the shortest and longest daily activity periods, respectively. However this pattern does not hold for the intermediate-sized dragonflies. Thermal strategy displays no clear relationship to daily activity pattern.

- (16253) SLOS, S. & R. STOKS, 2006. Behavioural correlations may cause partial support for the risk allocation hypothesis in damselfly larvae. *Ethology* 112: 143-151. – (Second Author: Lab. Aquatic Ecol., Univ. Leuven, Charles de Bériotstraat 32, B-3000 Leuven).

Prey animals are often confronted with situations that differ in predation risk. According to the risk allocation hypothesis, prey animals should adaptively allocate antipredator behaviour in accordance with the magnitude and frequency of those risk situa-

tions. According to the first prediction, prey animals should increase foraging in the safe situations and decrease foraging in the dangerous situations as these situations become relatively more dangerous. The second prediction is that with increased time spent in the dangerous situations, progressively more foraging effort is shown in both the dangerous and safe situations, especially in the safer ones. Prey animals may, however, show maladaptive behaviour due to behavioural correlations across risk situations. Here for the first time both predictions generated by the risk allocation hypothesis are tested while considering behavioural correlations. *Ischnura elegans* larvae were reared from the egg stage, under 5 rearing risk conditions: (i) in isolation, (ii) in the presence of conspecific larvae, (iii) in the presence of 1 fish, (iv) in the presence of 2 fish, and (v) in the presence of 2 fish for 50% of the time. For each rearing risk condition their behaviour was scored in the absence and in the presence of fish. In accordance with the first prediction, in the absence of a predator, larvae reared under increasing risk conditions increased their level of foraging. In accordance with the second prediction, in the absence of a predator, larvae that were more frequently exposed to fish during rearing, increased foraging. However, opposite to the predictions from the risk allocation hypothesis, foraging increased both with increasing rearing risk, and with increased predator exposure frequency. The observed positive behavioural correlation of foraging activity across test situations with and without fish, may generate the combination of adaptive patterns in the absence of fish and the maladaptive patterns in the presence of fish. Former studies of the risk allocation hypothesis also found, at best, mixed support, and it is hypothesized that behavioural correlations across risk situations, if present, will likely cause partial deviations from model predictions.

- (16254) SUHLING, F., G. SAHLEN, A. MARTENS, E. MARAIS & C. SCHÜTTE, 2006. Dragonfly assemblages in arid tropical environments: a case study from western Namibia. *Biodiv. Conserv.* 15: 311-332. – (First Author: Inst. Geoökol., Tech. Univ. Braunschweig, Langer Kamp 19c, Raum 303, D-38106 Braunschweig).

The odon. species composition of 133 localities in the arid environment of W Namibia was examined. An analysis of nestedness indicated that distinct and predictable patterns of spp. associations can be

expected. Discriminant analyses revealed that most of the 9 habitat types, separated by structural and hydrological parameters, are well discriminated by their odon. assemblages. Spring brooks in particular host a specific assemblage, which is threatened due to the habitat restriction of several spp., as well as by recent habitat loss and degradation. Using a hierarchical method of several criteria, the selection of a set of potential indicator spp. from the spp. set is demonstrated. Most of these are useful indicators for spring brook assemblages. The conservation status of certain habitats and spp. is discussed. It is proposed that odon. will have a high indicator potential for threatened freshwater wetlands in such areas and may also serve as an indication of the sustainable use of water resources including evaluating measures to rehabilitate environments.

A series of experiments showed that there was no gender difference in the submergence potential. This was about 120 min if a ♀ was allowed to change its position while under water. The submergence potential was shorter if the ♀ were kept motionless, if air bubbles trapped on the wing surfaces were removed by coating with Vaseline or if the water was hypoxic. By contrast, submergence potential was longer if a part of the wings were kept above the water surface, or if the water was agitated using a magnetic stirrer. These results suggest that ovipositing *C. cornelia* ♀ depend for oxygen on the physical-gill action of the thin air layer trapped on the body and wing surfaces. Respiration capacity under water is not likely to be a limiting factor during the production of a single clutch.

- (16255) TROCKUR, B., 2006. Zum aktuellen Kenntnisstand der Libellenfauna im Bereich Heinitz (Saarland). *Delattinia* 31: 57-78. (With Engl. & Fr s's). — (Schulstr. 4, D-66636 Tholey-Scheuern).
A review and comprehensive considerations on the odon. fauna (47 spp.) of the Heinitz area, Saarland, W Germany. Among the highlights are the discovery of 7 spp. new for the province and the evidence on the local autochthony of *Aeshna affinis*.
- (16256) TROCKUR, B. & A. DIDION, 2006. Libellen im Bereich der Steinkohlen-Bergehalde der Grube Reden. *Delattinia* 30: 1887-190. (With Engl. & Fr s's). — (Second Author: Am Ohligberg 12, D-66424 Homburg-Schwarzenacker).
An annotated list of 22 spp. recorded from the Reden coal mine area. Saarland, W Germany.
- (16257) TSUBAKI, Y., C. KATO & S. SHINTANI, 2006. On the respiratory mechanism during underwater oviposition in a damselfly *Calopteryx cornelia* Selys. *J. Insect Physiol.* 52: 499-505. — (First Author: Biodiv. Conserv. Res. Gr., Natn. Inst. Envir. Stud., Tsukuba, 305-8506, JA).
C. cornelia oviposits almost exclusively underwater in forest streams. Field observation showed that the duration of uninterrupted submerged oviposition ranged between 20 and 120 min and the number of eggs laid was linearly related to the time spent underwater. By holding the damselfly under water in a small jar, the maximum 'submergence potential', defined as the time elapsed between placing the insect underwater and asphyxiation, was measured.
- (16258) VAN TOL, J., 2006. *Catalogue of the Odonata of the world (version 1.1, Nov. 2005)*. In: F.A. Bisby et al., [Eds], *Species 2000 & ITIS Catalogue of life. 2006 Annual checklist*. CD-ROM, Species 2000, Reading, UK. — (Free copy available from: Species 2000 Secretariat, Plant Science Laboratories, University of Reading, Reading, RG6 6AS, UK).
The Global Species Database of Odon. is a list of all names of extant spp. of the world. The present list is based on a database built during a period of 20 yr. The original information was derived from the Davies & Tobin published catalogue (1984, 1985). However, original publications were consulted to check the spelling and original combination of (virtually) all names. The present taxonomic status of every name in this list is based on published authoritative sources. Addition of the names of fossil taxa, and setting up a management committee for this database, are to be expected in the near future.
- (16259) WATTS, P.C., I.J. SACCHERI, S.J. KEMP & D.J. THOMPSON, 2006. Population structure and the impact of regional and local habitat isolation upon levels of genetic diversity of the endangered damselfly *Coenagrion mercuriale* (Odonata: Zygoptera). *Freshw. Biol.* 51: 193-205. — (Sch. Biol. Sci., Liverpool Univ., Crown St., Liverpool, L69 7ZB, UK).
This is one of Europe's most threatened zygopterans. There is concern for the long-term persistence of many of its UK colonies because adult lifetime movement is limited, making isolated populations susceptible to extinction. Using 14 microsatellite loci levels of genetic diversity, evidence for a recent decline and the spatial genetic structure for *C. mer-*

curiale population in Wales, UK were characterised. Spatial isolation is not an absolute predictor of low genetic diversity at either local or regional scales. One population inhabiting a remote, edge of range site is genetically impoverished with levels of variability (at microsatellite loci) among the lowest reported for any insect species. Agricultural land and high ground are physical barriers to dispersal by adults. Consistent with work from elsewhere, movement by mature *C. mercuriale* in Pembrokeshire is sufficient to prevent significant genetic differentiation throughout a habitat matrix of some 3-4 km if the suitable habitat sites are <2 km apart and lack barriers to movement. Even within a good habitat matrix, however, genetic isolation by distance develops within 10 km.

- (16260) WIKELSKI, M., D. MOSKOWITZ, J.S. ADELMAN, J. COCHRAN, D.S. WILCOVE & M.L. MAY, 2006. Simple rules guide dragonfly migration. *Biol. Lett.* [published online] 5 pp. — doi: 10.1098/rsbl.2006.0487 — (First Author: Dept Ecol. & Evol. Biol., Princeton Univ., Princeton, NJ 08544, USA).

Every year billions of odon. and other insects migrate across continents, and considerable progress has been made in understanding population-level migratory phenomena. However, little is known about destinations and strategies of individual insects. Here, miniaturized radio transmitters (ca 300 mg) were attached to the thoraxes of 14 *Anax junius* individuals which were followed during their autumn migration for up to 12 days, using receiver-equipped Cessna airplanes and ground teams. The dragonflies exhibited distinct stopover and migration days. On average, they migrated every 2.9 ± 0.3 days, and their average net advance was 58 ± 11 km in 6.1 ± 0.9 days (11.9 ± 2.8 km d⁻¹) in a generally southward direction ($186 \pm 52^\circ$). They migrated exclusively during the daytime, when wind speeds were less than 25 km h⁻¹, regardless of wind direction, but only after 2 nights of successively lower temperatures (decrease of $2.1 \pm 0.6^\circ\text{C}$ in minimum temperature). The migratory patterns and apparent decision rules of *A. junius* are strikingly similar to those proposed for songbirds, and may represent a general migration strategy for long-distance migration of organisms with high self-propelled flight speeds.

- (16261) WILLIAMSONIA. Newsletter of the Michigan Odonata Survey (ISSN none). Vol. 9, No. 4

(Winter 2005/2006; precise date not stated). — (c/o Dr M.F. O'Brien, Insect Div., Mus. Zool., Univ. Michigan, Ann Arbor, MI 48109-1079, USA).

O'Brien, M.: 2005 collecting summary (pp. 1-3); — Michigan Odonata Survey celebrates 10 years! (pp. 3, 6); — *Craves, J. & D. O'Brien*: Great spreading: first state record (pp. 1, 4: *Archilestes grandis*); — O'Brien, M.: [book review] A dazzle of dragonflies, by F.L. Mitchell & J.L. Lasswell (p. 5); — *Anonymus*: Checklist of Michigan Odonata (pp. 7-9); — *Craves, J. & D. O'Brien*: First Michigan specimens of Great blue skimmer (p. 10; *Libellula vibrans*); — 2005 in Wayne county (p. 12; records of 7 spp.).

- (16262) WILSON, K., 2006. Jagen op jagers [Hunting the hunters]. *National geographic Junior* 2006 (June): 4-7. [Dutch edn]. — (18 Chatsworth Rd, Brighton, BN1 5DB, UK).

General on dragonflies, by a well-known odonatologist. A portrait of the Author is included.

- (16263) WOHLFAHRT, B., D.J. MIKOLAJEWSKI, G. JOOP & F. SUHLING, 2006. Are behavioural traits in prey sensitive to the risk imposed by predator fish? *Freshw. Biol.* 51: 76-84. — (Second Author: Lab. Aquat. Ecol., Katholieke Univ. Leuven, Charles de Bériotstraat 32, B-3000 Leuven). Behavioural differences among prey spp. may result from evolutionary adaptations that facilitate coexistence with different predators and influence vulnerability to predators. It has been hypothesised that prey spp. modify their behaviour in relation to the risk posed by particular predators. The relationship was examined between anti-predator behaviour and predation risk in 5 spp. of larval odon. in combination with 3 predatory fish spp. (perch, gudgeon and rudd) that differ in foraging behaviour. The odon., *Platycnemis pennipes*, *Coenagrion puella*, *Lestes sponsa*, *Sympetrum striolatum* and *Libellula depressa*, differ with regard to their life cycle and habitat, including water depth, occurrence in temporary ponds and co-existence with fish. The odon. spp. differed in their response to fish: (i) 2 spp. showed a flexible response: larval *C. puella* reduced activity in the presence of fish, regardless of species, whereas *L. depressa* altered their activity only in the presence of gudgeon. (ii) Independent of fish spp., all odon., except *L. depressa*, exhibited spatial avoidance of fish. This was interpreted as a more general anti-predator response. (iii) In some cases the odon. showed no response to predators and

their behaviour was thus independent of predation risk. The results confirm that all odon. responded to the presence of at least some predatory fish, and that some odon. spp. discriminated between fish spp. However, no significant correlation was found between behavioural modifications and predation risk, indicating that anti-predator responses and predation risk depend on the particular predator and the sp. being preyed on.

(16264) ZHOU, X. & W.-b. ZHOU, 2006. Two new

species of the family Chlorocyphidae (Odonata) from China. *Entomotaxonomia* 28(1): 13-16. (Chin., with Engl. s.). — (Dept Ent., Zhejiang Mus. Nat. Hist., Choukong ou 71, Hangzhou-310012, P.R. China).

Heliocypha huai sp. n. (holotype ♂: Hainan prov., Jianfengling, 21-IX-1981) and *Indocypha chishuiensis* sp. n. (holotype ♂: Guizhou prov., Chishui city, Jinshagou, 31-VII-2000) are described and illustrated. The type specimens are deposited in the Zhejiang Mus. Nat. Hist., Hangzhou, China.