ODONATOLOGICAL ABSTRACTS

1987

(11336) RIEGLER, R., [1932-1986] reprint 1987. Libelle. *In*: H. Bächtold-Stäubli & E. Hoffmann--Krayer, Handwörterbuch des deutschen Aberglaubens, Vol. 5, pp. 1229-1240, W. de Gruyter, Berlin-New York, ISBN 3-11-011194-2. – Price of the complete 10-vols set: CHF 390.-- net.

A concise but very exhaustive article, dealing mostly with dragonfly folk appellations in European languages. In a brief paragraph on folk medicine, a reference is made to the paper by J. Jühling, 1900, Die Tiere in der deutschen Volksmedizin alter und neuer Zeit, *Mittweida*, no pagination, where the dragonfly is mentioned as a medicament against stomach pains.

1988

(11337) ANDREW, R.J., 1988. *Studies on the developmental changes in the neuroendocrine system, reproductive organs and haemolymph intermediary metabolites in the last instar nymph-adult dragonfly, Tramea virginia (Rambur) (Anisoptera: Odonata).* PhD thesis, P.-G. Dept Zool., Nagpur Univ., Nagpur. viii+306 pp., 300 figs (mostly micrographs) & 38 tabs excl. – (Author: Opp. St John's High School, Mohan Nagar, Nagpur--440001, India).

A very thorough and comprehensive study. The chapters are: "General introduction" (pp. 1-7); "Review of literature" (pp. 8-59); "Material and methods" (pp. 60-67); "Cephalic neuroendocrine system" (pp. 68-106); "The secretory activity of cephalic neuroendocrine system during development (pp. 107-128); "The hormonal control on intermediary metabolites during development" (pp. 129-155); "Development and structure of the male reproductive system" (pp. 156-198); "Development and structure of the female reproductive system" (pp. 199-245); Summary (pp. 246-253); References (pp. 254-306). – The experimental and the descriptive work is outstanding, and the bibliography is exceptionally exhaustive, which is reflected also in the separate "discussions", as incorporated in each of the 5 main chapters.

1989

(11338) KIWEK, F. & G. HOSS, 1989. Fliegende Drachen. *Fliegenfischer* 15(85): 14-18. (Authors' address not stated).

General, with emphasis on tyings, immitating adult and larval dragonflies. Cf. also *OA* 11358. – For more papers on this subject see *OA* 8672.

(11339) SCHWEIGER[-CHWALA], E., A. WARINGER-LÖSCHENKOHL & E. HABERLEHNER, 1989. Projekt Lobau: vorläufige Ergebnisse und Perspektiven. *Aufbau Perspektiven* 1989 (Dec.): 74-76. – (First Author: Kreuzbrunn 6/7, A--3001 Mauerbach).

A preliminary review of the odon. communities, as dealt with in the work listed in *OA* 10929. Cf also *OA* 11372.

1990

(11340) RYAZANOVA, G.I. & G.A. MAZOKHIN--PORSHNYAKOV, 1990. Analiz roli orientiruyushchih stimulov, ispol'zuemyh lichinkami strekoz pri poiske ubezhishcha. – Analysis of the role of orienting stimuli used by dragonflies during a search for shelter. *Zh. obshch. Biol.* 51(6): 809-816. (Russ., with Engl. s.). – (Dept Ent., Fac. Biol., Moscow St.

Univ., RUS-119899 Moscow).
Calopteryx splendens larvae use current, light and geomagnetic field as reference points. The current plays the major role. It defines the behaviour even when it differs from the normal action of light and magnetic field. The possibility of the presence of some other orientation stimuli is discussed.

1992

(11341) ALAM, S., N.J. SARKER & K.Z. HUSAIN, 1992. Food habits of Rana tigrina Daudin. *Bangladesh J. Zool.* 20(1): 113-124. – (Dept Zool., Univ. Dhaka, Dhaka-1000, Bangladesh).
The stomachs of 110 frogs from Dhaka and Kishoreganj districts, Bangladesh, were examined. 94.22% of food items were of animal origin, 81.32% referable to insects. Dragonflies represented 1.82% of the animal food.

(11342) IMHOF, G., E. ZWICKER & P. CHRISTOF--DIRRY, 1992. Charakterisierung anthropogen unterschiedlich beeinflusster Lebensräume an verlandenden Altarmen im Planungsraum des Wasseranreicherungsversuches Obere Lobau. *Österr. Wasserwirt.* 44(11/12): 322-336. (With Engl. s.). – (First Author: Staudgasse 5/4, A-1180 Wien).
Although the character of the former flood plain of the Danube nr Vienna is mainly determined by the dams cutting it off from the main river, it still harbours a substantial variety of spp. and habitats. As demonstrated by the space pattern of the vegetation and the distribution of the selected animal groups, it is not only the progress of terrestrification, but also the increasing number of visitors that lead to impoverishment. – In the present study, the odon. are dealt with (pp. 328-329) by E. Schweiger--Chwala (Kreuzbrunn 6/7, A-3001 Mauerbach). 33 spp. are listed and the odon. communities are briefly described.

(11343) RYAZANOVA, G.I. & G.A. MAZOKHIN--PORSHNYAKOV, 1992. Vzaimodeystviya lichinok strekozy Calopteryx splendens Harris (Odonata: Calopterygidae) v svyazy s vzaimnym opoznaniem i prostranstvennym raspredeleniem. – Interactions of larvae of the dragonfly Calopteryx splendens Harris (Odonata: Calopterygidae) respective to their mutual recognition and spatial distribution. *Zh. obshch. Biol.* 53(5): 736-743. (Russ., with Engl. s.). – (Dept Ent., Fac. Biol., Moscow St. Univ., RUS-119899 Moscow).
In the laboratory, 21 different movements were discerned in the intraspecific contacts. These are here described and analysed per sex, age and social status. The ♀♀ tend to avoid conflicts, while the more developed ♂♂ display the highest frequency of aggressive movements. The system of an intraspecific spatial competition seems to be based on the phenomena described in this paper.

1993

(11344) BEGUM, A., M. KHATUN, A. MATIN & B.K. BAKSI, 1993. Studies on the larval stages and meiotic chromosomes of Sympetrum hypomelus Selys [sic!] (Odonata: Anisoptera). *Bangladesh J. Zool.* 21(2): 37-43. – (First Author: Dept. Zool., Univ. Dhaka, Dhaka-1000, Bangladesh).
The larvae were reared from eggs. In the laboratory, there were 8 larval instars (prolarva incl.), and on average the development was completed in 57 days. The instars are described. – Chromosome number (♂): 2n = 25, n = 13; *m.* – Material originates from Dhaka.

(11345) BERNARD, R., 1993. XII Miedzynarodowe Sympozjum Odonatologii, Osaka (Japonia), 1-11 VIII 1993. *Wiad. Ent.* 12(4): 308-309. (Pol.). – (Dept Gen. Zool., Mickiewicz Univ., Fredry 10, PO-60-701 Poznań).
Detailed impressions from the 12th Int. Symp. Odonatol.

(11346) CHOWDHURY, S.H. & M. MOHIUDDIN, 1993. More dragonflies from the Chittagong University Campus. *Bangladesh J. Zool.* 21(2): 149--150. – (Dept Zool., Chittagong Univ., Chittagong, Bangladesh).
Annotated list of 11 spp. – Cf. also *OA* 4134 and 7755.

(11347) RYAZANOVA, G.I. & G.A. MAZOKHIN--PORSHNYAKOV, 1993. Osobennosti prostranstvennogo raspredeleniya lichinok strekoz Calopteryx splendens (Odonata) v prisutstviiryb. *Zool. Zh.* 72(3): 68-75. (Russ., with Engl. s.). – (Dept Ent., Fac. Biol., Moscow St. Univ., RUS--119899 Moscow).
For an Engl. edn see *OA* 9561.

1994

(11348) GUNKEL, G., 1994. *Bioindikation in*

aquatischen Ökosystemen. Fischer, Jena-Stuttgart. 540 pp. ISBN 3-334-60535-3. – Price: DEM 78.-- net. – (Publishers: Villengang 2, D-07745 Jena).
On p. 61, the mg/l Cd^{2+} lethal concentrations are stated for larval Enallagma cyathigerum (2900) and Calopteryx splendens (3800). On p. 417, the saprobic tolerance is stated for 8 European odon. spp.

(11349) MALICKY, H., 1994. Bestandsaufnahme der Publikationssprachen in der Entomologie. *Entomol. gen.* 18(3/4): 285-292. (With Engl. s.). – (Sonnengasse 13, A-3293 Lunz am See).
Based on various bibliographic information retrieval sources, incl. *OA*, the use of different languages in the entomological publications is assessed and discussed. In 10 randomly selected *Odonatologica* issues, published during 1988-1991, 1350 titles were listed as follows: Engl. (529), Germ. (309), Jap. (106), Fr. (94), Russ. (60), Dutch (55), Ital. (50), Span. (34), Chin. (21), Port. (20), Slovak (17), Serbian/Croat. (10), Hung. (9), Czech (6), Nepali (6), Pol. (5), Norw. (4), Finn., Bulg., Slovene, Swed., Roman. (2 each), and Danish, Galician, Letonian, Korean and Ukrainian (1 each). It is emphasized, the number of non-Engl. papers, authored by non-professioals, is increasing, and an efficient retrieval system is urgently recommended. – (*Abstracter's Note:* The paper contains numerous valuable suggestions and clues, but the following should be noted: (1) The coverage of the existing information retrieval systems is greatly inadequate, therefore any statistics based on these is inevitably unreliable. The coverage of the commercial services depends on their commercial policies, financial possibilities, and on the collaboration of the primary source publishers. The coverage of the privately run services, such as e.g. *Odonatological Abstracts*, depends entirely on the funds of the specialised library on which they are based (Neth. Ent. Soc., in the case of *OA*), and on the cooperation received from the authors. For example, if 10.6 Japanese titles were listed per issue in the examined sample, this would make ca 170 titles in the 16 *OA* issues, published during 1988-1991. However, in the same period, the Japanese odonatol. bibliography lists 1678 Jap. titles. Most of these were not provided for listing in *OA*, therefore they are missing there. If this were not so, statistically, the use of Jap. in odonatol. publications would greatly exceed that of Engl., or any other language. – (2) The dissemination of the information is enhanced if Engl., as the sole universally understood language, is used. The non-Engl. taxonomic papers are often regarded by the readers as "user-unfriendly". There is an increasing trend, therefore, towards the use of Engl. in all papers directed at the "world community". Most professional workers are urged to do so also by their employers. Aside of the obvious advantages of such policy, it inevitably brings also several disadvantages. One of these is the loss/non-development of technical vocabulary in various languages. Ever increasing are also the editorial problems with the linguistically inadequate texts, submitted by authors that are less experienced in Engl. – (3) Most of the international top periodicals do not accept any other language but Engl. In many cases, for non-Engl. manuscripts no qualified reviewers are available. The publication of not adequately reviewed papers brings disadvantages to the authors, readers and publishers alike. The publishers' internal statistics show that the publication of even a limited number of non-Engl. papers in an international periodical inevitably reduces the number of subscribers, which is by no means even remotely compensated by national subscriptions. – (4) The ever increasing possibilities of "gray" publishing facilitate the birth of countless local periodicals and other publications. These are directed at the local readership, and are largely concerned with the local faunistics, field observations and conservation. They are using the respective national language, but their circulation is often restricted to the membership of a small, local organisation. Such publications have seldom an ISSN/ISBN registration, and no copies are deposited in any institutional library, therefore they are practically inaccessible. Their life is usually short or ephemeral, and in many cases no retrieval service is able to get hold of them, though the information they contain occasionally includes various aspects of extralimital interest as well. Some of these publications could be important also because of technical terminology they are developing in the respective national language, provided they would have a normal circulation.)

(11350) RYAZANOVA, G.I. & G.A. MAZOKHIN-PORSHNYAKOV, 1994. K probleme vzaimnogo opoznaniya: syshchestvuet li taksonomicheskaya specifichnost' dvizheniy i poz pri kontaktah lichinok strekoz? – On the problem of mutual recognition:

is there taxonomic specifics of movements and postures during contacts between dragonfly larvae? *Zh. obshch. Biol.* 55(4/5): 623-632. (Russ., with Engl. s.). – (Dept Ent., Fac. Biol., Moscow St. Univ., RUS-119899 Moscow).
On the basis of the available information, relative to the Lestidae, Coenagrionidae and Calopterygidae, the data are insufficient to validate the hypothesis, according to which the specific postures and movements constitute a mechanism preventing cannibalism. However, the larvae of Calopteryx splendens and C. virgo display a different behaviour in case of conspecific and heterospecific contacts.

(11351) RYAZANOVA, G.I. & G.A. MAZOKHIN-PORSHNYAKOV, 1994. Proyavlenie kannibalizma i mezhvidovoe hishchnichestvo u lichinok ravnokrylyh strekoz. – [Cannibalism and intraspecific predation in larval damselflies.] *Dokl. Akad. Nauk* 335(5): 662-663. (Russ.). – (Dept Ent., Fac. Biol., Moscow St. Univ., RUS-119899 Moscow).
Laboratory evidence from Calopteryx splendens and Coenagrion puella indicates that the specific postures are insufficient to prevent larval cannibalism.

1995

(11352) AMBRUS, A., K. BANKUTI & T. KOVÁCS, 1995. A Bereg-Szatmári-sík Odonata faunája. – The Odonata fauna of the Bereg-Szatmári-sík. *Fol. hist. nat. Mus. matraensis* 20: 63-83. (Hung., with Engl. s.). – (Second Author: Mátra Muz., Kossuth u. 40, HU-3200 Gyöngyös).
A checklist, with locality data and collection dates, of 49 spp., 7 of which are here reported for the first time from this region in W Hungary.

(11353) AMBRUS, A., K. BÁNKUTI & T. KOVÁCS, 1995. Az Örség szitakötö faunája. – The Odonata fauna of Örség (western Hungary). *Savaria* (nat. hist.) 22(2): 49-62. (Hung., with Engl. s.). – (Second Author: Mátra Muz., Kossuth u. 40, HU-3200 Gyöngyös).
Locality data for 50 spp., 36 of which are recorded also in larval stage. Aeshna affinis and Stylurus flavipes are new for the region.

(11354) CHE SALMAH, M.R. & A. ABU HASSAN, 1995. *Diversity of aquatic insects in rice ecosystem, with emphasis on the Odonata of West Malaysia.* Int. Symp. Workshop Conserv. Biol., Univ. Malaysia Sarawak, Kuching, 10 pp., 4 figs excl. – (Sch. Biol. Sci., 11800 Minden, Penang, Malaysia).
The larval predatory impact of 11 libellulid spp. (some identified to the genus only) was studied in a 40-acre plot in Bandar Baru distr., Kedah, Peninsular Malaysia. Orthetrum sabina and Neurothemis tullia were the most abundant.

(11355) D'ANTONIO, C., 1995. Reperti. Sympetrum depressiusculum (Sélys, 1841). *Boll. Ass. romana Ent.* 50(1/4): 85. – (Via A. Falcone 386/B, I-80127 Napoli).
Records from 2 localities in Calabria, Italy.

(11356) JANECEK, B.F.U., O. MOOG & J. WARINGER, 1995. Odonata. *In*: O. Moog, [Ed.], Fauna aquatica austriaca, (Lief. Mai/95), 13 pp. (Sep.), Wasserwirtschaftskataster, Bundesminist. Land- u. Forstwirtschaft, Wien. ISBN 3-85-174--001-7. – (Third Author: Studienkoordination Ökologie, Formal- u. Naturw. Fak., Univ. Wien, Althanstr. 14, A-1090 Wien).
A checklist of Austrian spp., and their ecol. classification.

(11357) *ODONATOLOGICAL LIBRARY NEWS.* Published by the Kansai Research Group of Odonatology, Osaka, Nos 16 (26 March 1995), 17 (3 Dec. 1995), 18 (20 May 1996), 19 (8 Dec. 1996), 20 (23 March 1997). (Jap., with Engl. title). – (c/o K. Inoue, 5-9, Fuminosato 4-chome, Abeno-ku, Osaka, 545, JA).
In the 5 issues, 2195 titles from Japanese periodicals are listed.

(11358) P[OPP], D., 1995. Libellen. *Fliegenfischer* 20(117): 30-35. – (c/o the Eds: Verlag Joachim Schück, Postfach 1170, D-90543 Stein).
General, with emphasis on tyings, immitating larval dragonflies. – For more references see *OA* 11338.

(11359) RYAZANOVA, G.I. & G.A. MAZOKHIN-PORSHNYAKOV, 1995. Territorial'naya konkurenciya i prostranstvennoe raspredelenie y lichinok ravnokrylyh strekoz (Odonata: Zygoptera). – [Territorial competition and distribution in damselfly larvae (Odonata: Zygoptera)]. *Dokl. Akad. Nauk* 341(1): 137-139. (Russ.). – (Dept Ent., Fac. Biol., Moscow St. Univ., RUS-119899 Moscow).
6 spp. were studied in the laboratory. The territo-

rial competition is widespread in the Zygoptera, and appears one of the mechanisms controlling spatial organisation in the populations. – For the Anisoptera cf. *OA* 10895.

(11360) RYAZANOVA, G.I. & G.A. MAZOKHIN-PORSHNYAKOV, 1995. Territorial'naya konkurenciya v zhizni lichinok strekozy Calopteryx splendens (Odonata, Calopterygidae). *Zool. Zh.* 74(12): 24-30. (Russ., with Engl. s.). – (Dept. Ent., Fac. Biol., Moscow St. Univ., RUS-119899 Moscow).
For an Engl. edn see *OA* 11295.

(11361) SINHA, V. & A. SINHA, 1995. [Photo safari]: Argiope spider catching prey. *Environ, Calcutta* 3(1): 22. – (Authors' address not stated).
A brief description of the Argiope techniques in catching a Pantala flavescens. A col. phot. is also supplied.

(11362) STAUDER, A., 1995. Survey of the Madeiran limnological fauna and their zoogeographical distribution. *Bolm Mus. munic. Funchal* (Suppl.) 4: 715-723. – (Holbeinstr. 19, D-79100 Freiburg).
The odon. spp. listed are: Ischnura pumilio, I. senegalensis, Anax imperator, Sympetrum fonscolombei and S. nigrifemur.

1996

(11363) ADOMSSENT, M., 1996. Zum Vorkommen der Gemeinen Keiljungfer (Gomphus vulgatissimus) an einer norddeutschen Wasserstrasse. *Artenschutzreport* 1996(6): 37-40. (With Engl. s.). – (Inst. Umweltwiss., FB-3, Univ. Lüneburg, Rotenbleicher Weg 42, D-21335 Lüneburg).
The population in a canal in SE Schleswig-Holstein (N Germany), its ecology and the associated odon. fauna are described and discussed in great detail, and some management suggestions are offered.

(11364) AMBRUS, A., K. BÁNKUTI & T. KOVÁCS, 1996. Countrywide survey of Bern Convention dragonflies (Insecta: Odonata) in Hungary. *Coll. conserv. Managem. Restor. Habitats*, Killarney, pp. 120-124. – (Second Author: Mátra Muz., Kossuth u. 40, HU-3200 Gyöngyös).
Aeshna viridis, Stylurus flavipes, Ophiogomphus cecilia, Leucorrhinia pectoralis and L. caudalis are dealt with. Data on the Hungarian habitats, ecology and on the status of the spp. are presented.

(11365) ANDERSON, T.M. & R.W. WISSEMAN, 1996. A northern range extension of Tanypteryx hageni (Odonata: Petaluridae). *J. ent. Soc. Br. Columbia* 93: 127-128. – (First author: Dept Ent., Oregon St. Univ., Corvallis, OR 97331, USA).
An adult ♀ was taken nr the Kowesas R. in western British Columbia (53°18'N), Canada, in Aug. 1995. The record increases the northern range of the sp., and represents the northerlymost collection site of any member of the family. While no larvae were collected, it is likely that the muskegs that occur in the Kowesas R. valley serve as the larval habitat. This record supports the prediction that T. hageni is not restricted to mountain habitats, but rather is a resident in low-elevation coastal forests in the northern part of its range.

(11366) ANDREW, R.J. & D.B. TEMBHARE, 1996. The post-ovarian genital complex in the damselfly Ischnura a. aurora (Brauer) (Insecta: Odonata). *J. adv. Zool.* 17(2): 93-97. – (First Author: Opp. St John's High School, Mohan Nagar, Nagpur-440001, India).
A detailed description, with micrographs. The histological and SEM studies reveal various structural modifications relative to the sperm-storage, transport and egg fertilization in this sp.

(11367) ASAHINA, S., 1996. Records of the Northern Vietnamese Odonata taken by the expedition members from the National Science Museum, Tokyo. 4. Libellaginidae, Euphaeidae, Calopterygidae and Amphipterygidae. *Bull. natn. Sci. Mus., Tokyo* (A) 22(4): 189-198. (Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 169, JA).
Locality data and brief descriptive notes on 11 spp.

(11368) BEDJANIČ, M., 1996. Ogroženost favne kačjih pastirjev (Odonata). – Threat status of dragonfly fauna. *In*: J. Gregori et al., [Eds], Narava Slovenije, stanje in perspektive, pp. 278-284, Dr. ekologov Slovenije, Ljubljana. (Slov., with Engl. s.). – (Fram 117a, SI-2313 Fram).
The status and general trends in the odon. fauna of Slovenia are outlined, and a preliminary list of 13 Red List candidate spp. is provided. The importance of faunistic surveys, documented by voucher specimens, is emphasized. Without precise information on habitat requirements and current distribution of all spp., no effective protective measures can be designed.

(11369) BELLE, J., 1996. Higher classification of the South-American Gomphidae (Odonata). *Zool. Meded., Leiden* 70(21): 297-324. – (Onder de Beumkes 35, NL-6883 HC Velp).
The adults and larvae are classified, and keys to the subfamilies and tribes are provided, followed by detailed tribal descriptions. The existing classification is revised as follows: Octogomphinae comb. nov.: Hemigomphini (Neogomphus, Praeviogomphus), Anomalophlebiini trib. nov. (Anomalophlebia); – Onychogomphinae: Onychogomphini (Erpetogomphus); – Epigomphinae: Archaeogomphini (Archaeogomphus), Agriogomphini trib. nov. (Agriogomphus, Brasiliogomphus, Ebegomphus), Cyanogomphini comb. nov. (Cyanogomphus, Tibiagomphus), Epigomphini (Epigomphus); – Ictinogomphinae comb. nov.: Ictinogomphini comb. nov. (Cacoides, Melanocacus); – Zonophorinae: Zonophorini (Mitragomphus, Zonophora); – Gomphoidinae comb. nov.: Aphyllini trib. nov. (Aphylla, Phyllocycla), Diaphlebiini trib. nov. (Desmogomphus, Diaphlebia), Gomphoidini comb. nov. (Gomphoides, Idiogomphoides, Phyllogomphoides), Peruviogomphini trib. nov. (Peruviogomphus), Progomphini (Progomphus).

(11370) BLADES, D.C.A. & C.W. MAIER, 1996. A survey of grassland and montane arthropods collected in the southern Okanagan region of British Columbia. *J. ent. Soc. Br. Columbia* 93: 49-73. – (2079 Quimper St., Victoria, BC, V8S 2H7, CA).
The arthropods of the Osoyoos-Mt Kobau area were surveyed in the summer of 1991. The list includes 13 odon. spp., from the elevations 300--800, 801-1500 and 1501-1850 m.

(11371) CANNINGS, R.J. & S.G. CANNINGS, 1996. *British Columbia natural history*. Greystone Books, Douglas & McIntyre, Vancouver-Toronto. x+310 pp. (hard cover, 19x26 cm). ISBN 1-55054--497-7. – Price: Can.$ 50.-- net. – (Publishers: 1615 Venables St., Vancouver, BC, V5L 2H1, CA).
A magnificent monograph by 2 of the leading British Columbia naturalists. The main chapters are: "Origins", "The Pacific province", "The legacy of the Ice Age", "Life in the Pacific", "Forests of rain", "Mountaintops", "The spruce kingdom", "Montane forests", "Grasslands" and "The world of fresh water". It presents a superb and complete, well--balanced overview of the subject, incl. valuable information on dragonflies. The book is certainly to become a vademecum for BC naturalists, the amateur or professional alike.

(11372) CHWALA, E. & J. WARINGER, 1996. Association patterns and habitat selection of dragonflies (Insecta: Odonata) at different types of Danubian backwaters at Vienna, Austria. *Arch. Hydrobiol.* (Suppl.) 115: 45-60. – (First Author: Kreuzbrunn 6/7, A-3001 Mauerbach).
Mainly based, though largely modified, on the work listed in *OA* 10929.

(11373) CLARK, T.E. & M.J. SAMWAYS, 1996. Dragonflies (Odonata) as indicators of biotope quality in the Kruger National Park, South Africa. *J. appl. Ecol.* 33(5): 1001-1012. – (First Author: Durban Nat. Sci. Mus., P.O. Box 4085, Durban-4000, RSA).
Monitoring programmes that assess ecosystem changes depend on indicator species or assemblages. Indicators should be sensitive and their response easily measured. This study assessed the suitability of adult ♂ Odon. as indicators of biotope quality along the Sabie River in the Kruger National Park (KNP). – Odonate diversity was investigated at 25 sites along the Sabie River using univariate statistical procedures. The KNP supports 81 spp., 59 recorded during this study (16 for the first time). – Sampling sites were classified by Two Way INdicator SPecies ANalysis (TWINSPAN) and ordinated by DEtrended CORrespondence ANAlysis (DECORANA), based on the abundance of adult ♂ Odon. A predictive model relating odon. species-groups to biotope variables, was formulated. – Classification led to the recognition of 10 ecologically meaningful biotope groups, each with an indicator sp. and a characteristic assemblage of associated spp. – Multiple Discriminant Analysis (MDA) indicated that shade cover, permanency and flow rate could discriminate between biotope types defined by TWINSPAN. Variation in site membership between MDA and TWINSPAN suggests interaction between variables in determining species membership. – Biotope variables were incorporated into a model which predicted the membership of 82% of sites to the TWINSPAN groups; shade cover alone correctly predicted 44% of the sites. – The suitability of the Odon. as indicators of biotope quality, and its consequences for management are discussed.

(11374) COBURGER, K., 1996. Zum Vorkommen der Prachtlibellen Calopteryx splendens und C.

virgo in den ostthüringischen Flusstälern der Weissen Elster und der Weida. *Artenschutzreport* 1996(6): 49-50. (With Engl. s.). – (Landratsamt, Untere Naturschutzbehörde, Dr.-Rathenau-Platz 11, D-07973 Greiz).
C. splendens (incl. larvae) is reported from the Weisse Elster R. valley, and C. virgo from that of the Weida R., Thuringia, E Germany.

(11375) DE GROOT, T., 1996. *Libellen bij Natuurmonumenten. – [Dragonflies and Nature Conservancy].* Ver. Natuurmonumenten, 's-Graveland. vi+54 pp. (Dutch). – (Bolivarstraat 89, NL-3573 ZX Utrecht).
A "Handbook" for the (Netherlands) Nature Conservancy odon. workers, presenting an outline of odon. biology, a review of the types of odon. habitats and their species assemblages, considerations on management requirements for various spp., etc.

(11376) EDA, S., 1996. [A mass-occurrence of Rhyothemis fuliginosa in Toyoshima-machi, Nagano pref.] *New Ent.* 45(3/4): 34. (Jap.). – (3-4--25 Sawamura, Matsumoto, Nagano, 390, JA).
This southern sp. has been recorded in Nagano only very rarely. Early in Aug. 1996, 20 individuals of both sexes were sighted at a pond in the said area.

(11377) GIMBUTAS, M., 1996. *Die Sprache der Göttin. Das verschüttete Symbolsystem der westlichen Zivilisation.* Zweitausendeins-Verlag, Frankfurt/Main. xxiii+416 pp. ISBN 3-86150-120-1. – (Publisher: Postfach, D-60381 Frankfurt/Main).
This is the 2nd German edn of the comprehensive monograph on the pre-Indo-European elements (ca 5000-1500 BC) in European mythological arts. (Original title: *The language of the Goddess. Unearthing the hidden symbols of western civilization*, Harper Collins, 1989). On p. 109 appear the description and fig. of the "Life-giving Goddess", wearing a necklace with the representations of ducks and dragonflies; Akrotiri, Thera Is.; 1600 BC. – (*Abstracter's Notes*: This is the oldest European dragonfly picture so far known; cf. *OA* 6308. – The indigenous pre-Indo-European society was a matriarchate, the main diety was the "Life-giving Goddess", whose attributes were plants and animals, incl. the friendly, life-power giving snake. She was often worshipped at water sites, hence her particular association with the aquatic animals. Death was followed by reincarnation. – The Proto-Indo--Europeans [Kurgan Culture] invaded ancient Europe in 3 waves from southern Russia, during 4400-4300, 3500-3300 and 3100-2900 BC. Their society was a patriarchate, the main diety was the Sun, and death was followed by an earthly-like life in the spirit world, for which the deceased, particularly the men, were supplied in the grave with the objects of daily use and with personal arms. Rather than worshipped, the game and domestic animals served in offerings to the dieties. – It is not unlikely that the dragonfly-snake association in dragonfly folk appellations in various European languages, restricted to a certain, geographically well-defined area, represents a remnant from the pre-Indo-European cultural tradition; cf. *OA* 10630).

(11378) GIMBUTAS, M., 1996. *Die Zivilisation der Göttin. Die Welt des alten Europa.* Zweitausendeins--Verlag, Frankfurt/Main. xi+560 pp. ISBN 3-86150-121-X. – (Publisher: Postfach, D-60381 Frankfurt/Main).
This is the 1st German edn of the monograph, *The civilisation of the Goddess. The world of Old Europe*, Harper Collins, 1991. For the first part of this series cf. *OA* 11377. On p. 247 appear the reproduction and description of an anthropomorph (woman) picture, from the Late Neolith of southern Spain, with very characteristic zygopteran eyes. The exact locality is not stated.

(11379) HATCH, J., 1996. *The dragonfly of Lookout Mountain.* Earth Heart, Mount Shasta/CA. 128 pp. ISBN 0-934747-42-3. – Price: US $14.95 net. – (Publishers: Earth Heart, Box 7, Mount Shasta, CA 96067, USA).
A children's book, the result of 6 summers the Author spent as a fire lookout near Mt Shasta in N California. – A dragonfly is born in a pond and flies to a mountain top where it meets a young woman who is a fire lookout. A journey is outlined through the seasons and the dragonfly's life cycle.

(11380) HEITZ, A., S. HEITZ, K. WESTERMANN & S. WESTERMANN, 1996. Verbreitung und Bestandsdichte der Gemeinen Keiljungfer (Gomphus vulgatissimus) am südlichen Oberrhein: Dokumentation der Larven- und Exuvienfunde. *NatSchutz südl. Oberrhein* 1: 187-210. (With Engl. s.). – (First Author: Moosweg 15, D-77749 Hohberg).
210 localities are reported along a 130 km section of the southern Upper Rhine lowlands (E bank), where G. vulgatissimus exuviae and larvae were

evidenced during 1987-1996. The habitats in 11 regions are described and discussed from the point of view of the sp. occurrence, its habitat requirements, etc.

(11381) HIRUKAWA, N., 1996. [Dragonfly records from Kiso-gun and Yasuoka-mura, Shimoina-gun, Nagano pref.]. *New Ent.* 45(3/4): 90. (Jap., with taxonomic nomencl.). – (6457-3, Aza Miyazaki, Matsushiro-machi, Toyosaka, Nagano, 381-12, JA).
Annotated list of 29 spp., with locality data and collection dates.

(11382) HOLUŠA, O., 1996. Nálezy vzácných druhů vážek (Odonata) na území Slovenska. – Finding some rare species of dragonflies in Slovakia. *Entomofauna carpath.* 8: 151-153. (Czech, with Engl. & Slovak s's). – (Jungmannova 444, CZ-738-02 Frýdek-Mistek).
Records of 9 spp., 1992-1995.

(11383) HOLUŠA, O., 1996. Výskyt vážky čárkované v ČR a SR a barevné formy jejich samic. – The occurrence of the Hatched Dragonfly in the Czech and Slovak Republics [sic!]. *Živa* 44: 173. (Czech, with Engl. s.). – (Jungmannova 444, CZ-738-02 Frýdek-Mistek).
Leucorrhinia dubia is reported from Moravia, Silesia and Bohemia (all Czech Rep.) and from Orava (Slovakia). An androchrome ♀ from Suchá Hora (Slovakia) is described and illustrated as f. zbarveni forma n. The latter has no status under the Code.

(11384) HREN, A. & M. KLUN, 1996. *Prispevek k poznavanju kačjih pastirjev (Odonata) na ribniško-kočevskem območju. – Contribution to the present known material on dragonflies (Odonata) in the area around Ribnica and Kočevje.* Raziskovalna naloga. Gimnazija Kočevje. 41 pp. (Slovene, with Engl. & Germ. s's). – (First Author: Šolska ul. 1, SI-1331 Dolenja vas).
A review of all the known regional records; 31 spp., 7 of which recorded here for the first time; – Lower Carniola, Slovenia. – Cf. also *OA* 9871.

(11385) KIELB, M.A., 1996. Occurrence of libellulid dragonflies (Odonata: Libellulidae) in southeastern Michigan and adjacent Essex County, Ontario. *Gr. Lakes Ent.* 29(1): 1-6. – (Insect Div., Mus. Zool., Univ. Michigan, Ann Arbor, MI 48109-1079, USA).
During 1994-1995 extensive field work was conducted in SE Michigan, USA, and on SW Ontario dragonflies, Canada, migrating into SE Michigan. Comparisons were made with the spp. listed for this area by E.J. Kormondy (1958, *Misc. Publs Mus. Zool. Univ. Mich.* 104: 1-43), anticipating changes due to wetland reductions and the effects of pesticides. With 1 exception, all spp. listed by Kormondy were observed. Additionally, Pantala hymenaea is new for the area.

(11386) KIENE, S., 1996. Vergleichende limnofaunistische und morphologische Untersuchungen an renaturierten, naturnahen und begradigten Flachlandbächen in der Oberrheinebene. *TagBer. dt. Ges. Limnol.* 1995(2): 548-552. – (Inst. Wasserbau & Kulturtechnik, Univ. Karlsruhe, Kaiserstr. 12, D-76128 Karlsruhe).
Ischnura elegans and Platycnemis pennipes are listed as the characteristic spp. of the restored stream habitats in the Upperrhine Lowlands, Germany.

(11387) KRACH, J.E., 1996. Bemerkenswerte Libellenfunde aus dem Schuttermoos. *Globulus* 3: 23-34. – (Oberstimmer Str. 62, D-85051 Zuchering).
With much circumstantial evidence, Coenagrion ornatum, Aeshna affinis, Crocothemis erythraea and Libellula fulva are listed from a locality in the distr. of Eichstätt, Bavaria, S Germany. 7 other, locally interesting spp. are also discussed, and a comprehensive bibliography is added.

(11388) KRANJC, M., 1996. Tisti dan je bil naš. *In:* I. Šinkovec, [Ed.], Zakladi narave. Ekološki raziskovalni tabor "Gora 96", p. 17, Zveza prijateljev mladine, Ajdovščina. (Slovene). – (c/o Ms A. Pirnat, Vošnjakova 4a, SI-1000 Ljubljana).
Brief impressions by a young participant in a dragonfly field trip, conducted in the framework of the survey, as listed in *OA* 11406.

(11389) KRAUS, O., 1996. Das System der Insekten. *NachrBl. bayer. Ent.* 45(1/2): 38-45. – (Rotbuchenstieg 15, D-22297 Hamburg).
The paper is important for the order-level apomorphies indicated for the 2 palaeopteran orders and the Neoptera.

(11390) KRISTIANSEN, J., 1996. Dispersal of freshwater algae: a review. *Hydrobiologia* 336:151-157. – (Dept Phycol., Bot. Inst., Univ. Copenhagen, Øster Faromagsgade 2D, DK-1353 Copenhagen-K).

The odon. are briefly mentioned with reference to the 3 principal primary papers on the subject, by E.L. Messikommer (1943, *Schweiz. Z. Hydrol.* 9: 310-316), B. Maguire (1963, *Ecol. Monogr.* 33: 161-185) and, above all, W.M. Parsons et al. (1966, *Trans. am. microsc. Soc.* 85: 520-527).

(11391) LANDI, F. & F. BERGHELLA, 1996. Reperti. (Odonata: Corduliidae, Libellulidae). *Boll. Ass. romana Ent.* 50(1/4): 83-84. – (First Author: Via G. Mameli 14, I-62100 Macerata).
Records of Somatochlora meridionalis, Trithemis annulata and Selysiothemis nigra from various localities in Marche, Italy.

(11392) LARSEN, J., H.J.B. BIRKS, G.G. RADDUM & A. FJELLHEIM, 1996. Quantitative relationships of invertebrates to pH in Norwegian river systems. *Hydrobiologia* 328: 57-74. – (First Author: Bot. Inst., Univ. Bergen, Allégatan 41, N-5007 Bergen).
The invertebrate fauna has been surveyed for 21 unlimed, generally acid river systems (180 samples, 127 taxa) and the associated water chemistry data are presented. The odon. are dealt with suborder-wise only, and have significant sigmoidal curves where abundances increase with decreasing pH.

(11393) LATVIAN ENTOMOLOGICAL SOCIETY, 1996. A list of insects of the Red Data Book of Latvia. *Latv. Ent.* 35: 53-56.
Lists 13 odon. spp. in 4 IUCN categories.

(11394) LEE, S.-M., 1996. Dragonflies (Odonata) of Korean peninsula. *Bull. KACN* 15: 73-114. (Korean, with Engl. s.). – (620-48, Gil-Eum-2 Dong, Seong-Bug-Gu, Seoul 136-112, Korea).
An excellent review of the 96 spp. hitherto known to occur in Korea, with synonymies, bibliographic annotations, and locality and distribution data for each sp.

(11395) LOTZING, K., 1996. Die Verbreitung der Gebänderten Prachtlibelle (Calopteryx splendens Harris) im Bereich der Bodenniederung des Altkreises Stassfurt: die Chronik einer Wiederbesiedlung? *Ent. Mitt. Sachsen-Anhalt* 4(1/2): 32-35. – (Str. d. Deutschen Einheit 7, D-39418 Stassfurt).
In the early 1980s, C. splendens occurred very sporadically in the Bode R. lowlands, Sachsen-Anhalt, E Germany. Since about 1991, however, the sightings significantly increased, and by 1995 the populations in the Stassfurt area appear large. The developments are described, analysed and discussed, with emphasis on the 1991-1995 period.

(11396) LOUTON, J.A., R.W. GARRISON & O.S. FLINT, 1996. The Odonata of Parque Nacional Manu, Madre de Dios, Peru: natural history, species richness and comparisons with other Peruvian sites. *In*: D.E. Wilson & A. Sandoval, [Eds], Manu: the biodiversity of southern Peru, pp. 431-449, Smithsonian Instn, Washington, D.C. ISBN 1-56098-710-3. – (Second Author: 1030 Fondale St., Azusa, CA 91702-0821, USA).
Collections were made during 1987-1989 in the vicinity of the park headquarters at Pakitza, at Cocha Salvador and along the road that follows the park boundary between Puente Morro Leguia 2200 m approx.) and Salvacion (550 m approx.). A few specimens collected along the Rio Alto Madre de Dios are included, although the area is outside the Reserved Zone boundary. The collections thus include material from Andean montane wet forest, mid-elevation transition zone, upper Andean tropical wet forest, humid Andean foothills forest and tropical lowland forest, although 85% of the material listed below is from tropical lowland forest at Pakitza or nearby. Specimens were hand-netted, taken by Malaise traps, mist nets, from larval rearings and from canopy-fogging collections. All collections were made during the transitional dry-to-wet season in late Aug. through early Oct. The entire transect yielded 136 spp., with 117 spp. taken from the lowland study area around Pakitza. The data for the Pakitza collections were subjected to species richness estimation techniques and the results clustered around 130 spp. (probably a low estimate biased by lack of adequate collecting in standing-water habitats). Comparisons with a similar nearby site, the Tambopata Reserved Zone (250 km distant), and a site near Iquitos (1060 km distant) indicated that differences in collection emphasis or habitat diversity obscured comparisons, with Tambopata having highest overall species richness but with Pakitza having greater diversity among "non-weed" groups. Pakitza-Tambopata and Tambopata-Iquitos had similar beta-diversity while Pakitza-Iquitos had higher beta-diversity as measured by Jaccard's similarity coefficient and percent similarity.

(11397) MALAVASI, D., 1996. Contributo alla

conoscenca degli odonati dell'isola di Ustica (Odonata). *Boll. Ass. romana Ent.* 50(1/4): 1-2 (With Engl. s.). – (Via San Faustino 23, I-41037 Mirandola, MO).
Annotations on Aeshna affinis, Anax imperator, Hemianax ephippiger and Sympetrum sanguineum, recorded in Aug. 1995 on the island of Ustica, Tyrrhenian Sea, Italy.

(11398) MARTÍNEZ-DELCLÒS, X., 1996. Origen y diversificacion de los insectos su registro fosil. *Boln Soc. ent. aragon.* 16: 125-138. – (Depto Geol. dinàmica, Geofis. & Paleont., Fac. Geol., Univ. Barcelona, ES-08071 Barcelona).
A review, by an active odon. palaeontologist.

(11399) MENARD, B., 1996. Liste annotée des odonates de la Vallée de l'Outaouais. *Fabreries* 21(2): 29-61. (With Engl. s.). – (58 Smith, Gatineau, QC, J8T 3A1, CA).
A commented list of 107 spp., collected in the Ottawa Valley, Quebec, Canada, during 1991-1995.

(11400) [MILLER, P.L.] CONSTANTINE, D., 1996 (published Apr. 1997). [Obituary] Peter L. Miller. *Queen's Coll. Rec., Oxford* 7(2): 14-17, portrait incl. – (c/o Mrs A.K. Miller, 68 Blenheim Drive, Oxford, OX2 8DQ, UK).
A very personal text, by a very special friend and colleague at Queen's, with a poem. The Author is not a scientist, but a well-known and appreciated British (Cornish) poet of German extraction.

(11401) MITRA, A., 1996. A note on dragonfly predation by the garden lizard, Calotes versicolor (Daudin). *Ann. Forestry, Dehra Dun* 4(1): 113--115. – (North. Regn. Stn, Zool. Surv. India, 218 Kaulagarh Rd, Dehradun-248195, India).
Half emerged Orthetrum sabina, teneral Crocothemis servilia, and teneral and mature Ischnura aurora are recorded as prey of the said lizard (Dehra Dun, India), and statistical data are presented.

(11402) MITRA, A., 1996. Reproductive ethobiology of Pseudagrion rubriceps Selys (Zygoptera: Pseudagriinae) at Asan Reservoir (Dehra Dun: India). *Ann. Forestry, Dehra Dun* 4(2): 139-144. – (North Regn. Stn, Zool. Surv. India, 218 Kaulagarh Rd, Dehradun-248195, India).
The ♂ defends a territory with a radius of 40-70 cm and grasps the ♀ entering into his territory to form the precopulatory tandem. Intramale sperm translocation occurs just after a short precopulatory tandem flight, lasting 2-5 min. Soon after, a courtship wheel is formed. As the sperm transfer from ♂ to ♀ is over, the wheel breaks and the post-copulatory tandem goes for oviposition after a short exploratory flight. The oviposition is endophytic in nature and generally floating plants of Potamogeton are preferred. Oviposition at surface and under water level, has been noticed.

(11403) NORMA-RASHID, Y., M. ZAKARIA--ISMAIL & M. HÄMÄLÄINEN, 1996. Odonate fauna from Kelantan, Pahan and Muar drainages, Malaysia. *In*: A.H. Zainal Abidin & A. Zubaid, [Eds], Conservation and faunal diversity in Malaysia, pp. 129-139, Penerbit Univ. Kebangsaan Malaysia, Bangi, ISBN 967-942-356-5. – (Third Author: Sunankalliontie 13, FIN-02760 Espoo).
52 spp. are listed and briefly annotated. Neurobasis longipes is a new record for Peninsular Malaysia. Acrogomphus malayanus and Burmagomphus plagiatus are endemic. Only a few earlier records are known of Libellago semiopaca, L. stigmatizans, Rhinagrion mima, Indothemis l. limbata, Onychothemis testacea and O. coccinea.

(11404) *ODONATA-STUDIUM LARVALE*, Vol. 1 (1996), ISSN 1416-8308. Edited by A. Ambrus, K. Bánkuti & T. Kovács. (Engl. & Hung., all papers with Engl. s's). – (Orders to: Dr K. Bánkuti, Mátra Múzeum, Kossuth u. 40, HU-3200 Gyöngyös).
The journal is to appear at unspecified dates, annually. It serves as a vehicle for publication of papers on larvae, a scope that makes it unique in the existing odonatol. periodical literature. The first issue (78 pp., A5 size, nicely produced and bound) is devoted to the memory of Dr S. Ujhelyi (1902-1996; cf. *OA* 11317). – C o n t e n t s: *Ambrus, A., K. Bánkuti & T. Kóvacs*: Breeding of Hemianax ephippiger (Burmeister, 1839) in Hungary (pp. 5--11); – *Ambrus, A., K. Bánkuti, P. Juhász & T. Kovács*: Larval and imaginal data to the Odonata fauna of the Hortobágy (pp. 13-23); – *Ambrus, A., K. Bánkuti & T. Kovács*: The Odonata fauna of the Kis-Balaton (pp. 25-37); – Data to the Odonata fauna of Kisalföld and the West-Hungarian marginal zone (pp. 39-50); – Larval and imaginal data to the Odonata fauna of Hungary (pp. 51-68); – Larval and adult data on the Odonata fauna of Burgenland (Austria) (pp. 69-77).

(11405) PENALVER, E., 1996. Tecnicas y metodos de obtención, preparación, conservación y estudio de insectos fósiles. *Boln Soc. ent. aragon.* 16: 157-174. – (Dept Geol., Fac. Biol., Univ. Valencia, c/ Dr. Moliner 50, ES-46100 Burjassot/Valencia).
Includes instructions and figs re the process of the preparation of odon. fossils.

(11406) PIRNAT, A., 1996. Hitri lepotci. Poročilo odonatološke skupine. *In*: I. Šinkovec, [Ed.], Zakladi narave. Ekološki raziskovalni tabor "Gora 96", pp. 14-17, Zveza prijateljev mladine, Ajdovščina. (Slovene). – (Vošnjakova 4a, SI-1000 Ljubljana).
The 1996 records are listed from 34 localities in Vipavska Valley, W Slovenia. These include 6 spp. that were not recorded from there in the work cited in *OA* 10793.

(11407) REDER, G., 1996. Gehäuftes Auftreten der Südlichen Binsenjungfer – Lestes barbarus (Fabricius, 1798) – im südlichen Rheinhessen (Insecta: Odonata). *Fauna Flora Rheinland-Pfalz* 8: 543-551. (With Engl. s.). – (Am Pfortengarten 37, D-67592 Flörsheim-Dalsheim).
Various 1995 breeding sites of L. barbarus in Rhineland-Palatinate, Germany, are described, and the regional occurrence of the sp. is discussed.

(11408) REDER, G., 1996. Tandem der Hufeisen-Azurjungfer – Coenagrion puella (L., 1758) – mit verstümmeltem Männchen (Insecta: Odonata). *Fauna Flora Rheinland-Pfalz* 8: 552-554. – (Am Pfortengarten 37, D-67592 Flörsheim-Dalsheim).
A tandem, where of the ♂ only the larger part of the wingless abdomen was left, is described.

(11409) REINHARDT, K., 1996. Libellen (Odonata) aus der Saaleniederung zwischen Geisel und Weisser Elster. *Mauritiana* 16: 41-44. – (August-Bebel-Str. 7, D-07743 Jena).
27 spp. are listed from the Merseburg area, and the ecological aspects of the assemblage are discussed; – E Germany.

(11410) ROTHMUND, D. & U. HAHN, 1996. Sympetrum fonscolombei-Beobachtung (Odo., Libellulidae). *Mitt. ent. Ver. Stuttgart* 31: 111. – (Rupert-Mayer-Str. 20, D-73765 Neuhausen).
Records of adults and exuviae: Herrenbachsee, Göppingen distr., Schwarzwald, S Germany, 31-V, 13-VII, 17-VIII-1996.

(11411) ROTHMUND, D., U. HAHN, A. KONIG & K. ZINTZ, 1996. Die Libellenfauna eines württembergischen Hochwasserrückhaltbeckens (Herrenbachsee, Landkreis Göppingen). *Jh. Ges. Naturk. Württemberg* 152: 267-279. (With Engl. s.). – (Inst. Zool., Univ. Hohenheim, D-70593 Stuttgart).
The odon. assemblage (17 spp.) of the man-made Herrenbach lake nr Göppingen, SW Germany, is described, analysed and discussed. Gomphus pulchellus is among the 8 spp. breeding there in 1994.

(11412) SAMWAYS, M.J., R. OSBORN & I. VAN HEERDEN, 1996. Distribution of benthic invertebrates at different depths in a shallow reservoir in the KwaZulu-Natal Midlands. *Koedoe* 39(2): 69-76. – (Dept Zool. & Ent., Fac. Sci., Univ. Natal, Private Bag X01, Scottsville, Pietermaritzburg-3209, SA).
Lists 5 odon. spp., all from the depths 0.5-1.0 m. Elodea seems the major determinant for the presence of invertebrates. It did not occur much beyond 1 m.

(11413) SARKER, N.J., S. ALAM & K.Z. HUSAIN, 1996. Food habits of Bufo melanostictus Schneider. *Bangladesh J. Zool.* 24(1): 81-87. – (Dept Zool., Univ. Dhaka, Dhaka-1000, Bangladesh).
The stomachs of 143 toads from Dhaka and Kishoreganj districts, Bangladesh, were examined. 92.24% of food items were of animal origin, 81.59% referable to insects, incl. "a few odonates".

(11414) SAVARD, M. & C. GIRARD, 1996. Première mention de Libellula (Plathemis) lydia Drury (Odonata: Libellulidae) dans le Bas-Saint-Laurent et note sur sa répartition au Québec. *Fabreries* 21(3/4): 88-90. (With Engl. s.). – (1665 des Engoulevents, Chicoutimi, QC, G7H 5Y2, CA).
The first record for the Lower St Lawrence Region, with a discussion of its occurrence in the St Lawrence and Ottawa R. lowlands, Quebec, Canada.

(11415) SCHLEUTER, M., 1996. Das Makrozoobenthos der Mosel als Indikator für die ökologische Situation. *TagBer. dt. Ges. Limnol.* 1995(2): 612-616. – (Bundesanstalt Gewässerkunde, Kaiserin-Augusta-Anl. 15, D-56068 Koblenz).
Platycnemis pennipes and Ischnura elegans are listed from the German section of the Meuse; 1994. – (*Abstracter's Note*: E. Mauch, 1961, *Untersuchungen über das Benthos der deutschen Mosel unter*

besonderer Berücksichtigung der Wassergüte, Diss. Univ. Frankfurt/Main, listed also Coenagrion armatum, C. mercuriale, C. pulchellum and Anax parthenope; 1958. The first of these was certainly misidentified.)

(11416) SCHRODER, H., 1996. Aus den wissenschaftlichen Abteilungen. Entomologie II. *Natur & Museum* 126(11): 370. – (Senckenberg, Senckenberganlage 25, D-60325 Frankfurt/Main). Contains a reference to the current Philippine work of Dr M. Hämäläinen, and to the huge Philippine Odon. collections of R.A. Müller. Cf. also *OA* 8374, 10728.

(11417) SHAFFER, L.R. & J.V. ROBINSON, 1996. Do damselfly larvae recognize and differentially respond to distinct categories of macroinvertebrates? *J. Insect Behav.* 9(3): 407-419. – (Second Author: Dept Biol., Univ. Texas, Box 19498, Arlington, TX 76013, USA).
Zygopteran larvae normally encounter other aquatic macroinvertebrates that are predators, competitors, and prey and should therefore demonstrate varied responses when faced with different categories of opponent. In a laboratory experiment individual final-instar Ischnura posita larvae were observed in interactions with 6 categories of invertebrate opponents. The opponent categories were a nonconspecific damselfly and a small crayfish, which represented threatening opponents because they were larger than the I. posita subject larva, and a mayfly and a stonefly, which constituted nonthreatening opponents because they were smaller than the subject larva. The levels of threat posed by conspecific larvae of final and penultimate instar were inferred by comparison to the other opponent categories. Multivariate analysis showed I. posita's response differed between the 2 larger opponents, but responses were statistically indistinguishable between the 2 smaller opponents. Larvae retreated, moved around the stalk, and struck their opponents with their lamellae more often in the presence of a crayfish than the nonconspecific zygopteran. In contrast, they assumed an S-bend posture frequently with the zygopteran. Responses toward final-instar conspecifics differed from responses toward the larger opponents. Effectively, larvae wagged their abdomens only in the presence of final-instar conspecifics and retreated and moved around the stalk less frequently in these trials. Responses toward the smaller conspecifics differed from the responses to the small opponents. Larvae struck penultimate-instar conspecifics with their lamellae more frequently than the other small opponents. The results suggest that larval zygopteran behaviors (such as S-bend and SCS) that have previously been described as intraspecific displays are of a more general nature and used toward a variety of opponents, whereas wag is unique to intraspecific interactions in I. posita.

(11418) SILVERBERG, H., 1996. Entomofaunistics in Finland. *Memo. Soc. Fauna Flora fenn.* 72(3/4): 135-146. – (Zool. Mus., P.O. Box 17, FIN-00014 Helsingfors).
The work on the Finnish insect fauna is traced from 1747 until present and a comprehensive bibliography is presented. The earliest comprehensive study of Finnish Odon. is that of E Hisinger (1861, *Notis. Sällsk. Fauna Flora fenn. Förh.* 6: 109-121). The latest national list is that listed in *OA* 5655.

(11419) TAYLOR, P.D. & G. MERRIAM, 1996. Habitat fragmentation and parasitism of a forest damselfly. *Landscape Ecol.* 11(3): 181-189. – (Dept Biol., Acadia Univ., Wolfville, NS, B0P 1X0, CA).
The Calopteryx maculata populations were compared in 2 kinds of landscapes. In fragmented landscapes, forested foraging patches were separated from streams (where oviposition and mating occur) by up to 500 m of pasture. In non-fragmented landscapes, there was continuous forest cover adjacent to streams. The prevalence and intensity of midgut infections of a gregarine parasite were significantly lower in the fragmented landscapes than in the non-fragmented landscapes. It is shown elsewhere that in the fragmented landscapes, damselflies move over greater areas to forage than in the non-fragmented landscapes. It is postulated that these movements lower the rate of encounter between damselflies and oocysts, thus lowering the prevalence and intensity of infection. The differences suggest that actual habitat fragmentation events would alter the relationship between host and parasite, but that populations of both spp. would persist after fragmentation. Prevalence of parasitism is related to age but we found no residual effects of size on parasitism.

(11420) THORNTON, I., 1996. *Krakatau. The destruction and reassembly of an island ecosystem.*

Harvard Univ. Press, Cambridge/MA-London. xiv+346 pp. ISBN 0-674-50568-9. – Price: NLG 82.-- net.
Contains several references to the odon., and cites some of the less known odon. literature. – For the odon. reviews and older bibliography cf. *OA* 5638, 7702.

(11421) TRAJANO, E., 1996. Biologia da gruta Olhos d'Água, Itacarambi, MG. *Carste* 8(4): 85--89. (Port., with Engl. s.). – (Depto Zool., Inst. Biociên., Univ. São Paulo, Caixa Postal 11294, BR--05422-970 São Paulo, SP).
A not identified odon. specimen (stage not stated either) is recorded from the Olhos d'Água cave, Minas Gerais, Brazil.

(11422) WASSERMANN, G. & A. SCHMIDT--KLOIBER, 1996. Die Eintagsfliegen- und Libellenfauna eines künstlich geschaffenen Hinterlandsbewässerungssystems der Donau. *TagBer. dt. Ges. Limnol.* 1995(2): 722-726. – (Abt. Hydrobiol., Inst. Wasservorsorge, Univ. Bodenkultur, Max-Emmanuel-Str. 17, A-1180 Wien).
For a slightly modified Engl. version see *OA* 11035.

(11423) WESTERMANN, K. & S. WESTERMANN, 1996. Neufunde der Gelben Keiljungfer (Gomphus simillimus) und Grünen Keiljungfer (Ophiogomphus cecilia) am Oberrhein bei Basel. *NatSchutz südl. Oberrhein* 1: 183-186. (With Engl. s.). – (Buchenweg 2, D-79365 Rheinhausen).
In 1995 and 1996, 20 exuviae and 1 larva of G. simillimus were found on the Rhine R., N of Basel. This is only the second currently known locality for this sp. in Germany. 21 exuviae of O. cecilia were at the same time evidenced, indicating the occurrence of this sp. on the Upper Rhine and in the Badian Rhine valley.

(11424) XYLANDER, W.E.R., 1996. Erstnachweis der Pokal-Azurjungfer, Cercion lindeni (Selys, 1840) (Insecta, Odonata, Coenagrionidae) im Raum Giessen. *Oberhess. naturw. Z.* 58: 47-55. (With Engl. s.). – (Staatl. Mus. Naturk., Postfach 300154, D--02806 Görlitz).
A small adult population is recorded from a former manganese mining site, ca 5 km S of Giessen, central Hessia, Germany (Aug. 1994). The locality is described and the local odon. assemblage is listed.

1997

(11425) *AESCHNA*. Published by the Odonatological Society of Osaka, No. 33 (7 Feb. 1997). (Jap., with Engl. titles & s's). – (c/o K. Inoue, 5-9, Fuminosato 4-chome, Abeno-ku, Osaka, 545, JA).
Katatani, N. & A. Muraki: Records of the Odonata taken in Palay, pt 1 (pp. 1-10); – *Kitagawa, K.*: Records of the Odonata from Penang island, Malaysia (pp. 11-18); – *Kohama, T.*: Odonata from Kohama island, the Ryukyus (pp. 19-20); – Odonata from Shimoji island of Aragusaka Islands, the Ryukyus (pp. 21-22); – *Sugimura, M.*: Migrant species of the Odonata into Kochi prefecture recorded in the first half of the 1990's (pp. 23-26); – *Fujimoto, K.*: New record of Neurothemis from Iriomote island of the Ryukyus (pp. 27-28); – *Tabata, O.*: New record of Zyxomma obtusum Selys from Iriomote island of the Ryukyus (pp. 29-30); – *Moriyasu, T.*: Larval development of Macromia daimoji Okumura in nature (pp. 31--36); – *Yoshida, M.*: A study of the migration of Odonata for extending their habitats (pp. 37-43).

(11426) ANHOLT, B.R., 1997. Sexual size dimorphism and sex-specific survival in adults of the damselfly Lestes disjunctus. *Ecol. Ent.* 22(2): 127--132. – (Dept Biol., Univ. Victoria, P.O. Box 3020, Victoria, BC, V8W 3N5, CA).
Mass at sexual maturity and activity rates of individuals were measured in a population in E Ontario, Canada. Population density was estimated on transects, while survival rates and population size were estimated using mark-recapture methods. There was no difference in mass of mated and unmated ♂♂. ♀♀ were more than 50% heavier than ♂♂ and were also more active than ♂♂. ♂♂ were almost 8 times more abundant on transects than ♀♀, but Manly-Parr estimates of ♂ population size were only a maximum of 2.5 times larger than estimates for ♀♀. ♂♂ were 2.5 times more likely to be resighted after marking than were ♀♀. This accounts for much of the discrepancy between transect estimates and mark-recapture estimates of relative population size. Daily survival rates of sexually mature ♀♀ were not significantly less than those of ♂♂ and therefore cannot account for a change in sex-ratio from 1:1 at emergence to more ♂♂ than ♀♀ in sexually mature adults. Differences in mortality must occur prior to sexual maturity, coincident with the time during which differences in mass gain are also taking place.

(11427) ARENA, J. & C. CALVER, 1997. Biological control potential of three species of nymphal odonates against Polypedilum nubifer (Skuse), a nuisance midge (Diptera: Chironomidae). *Aust. J. Ent.* 35(4): 369-371. – (Second Author: Sch. Biol. & Environ. Sci., Murdoch Univ., Murdoch, W.A. 6150, AU).
Predation rates of the 3 odon. spp. attacking the midge were determined in the laboratory. Hemicordulia tau was the most voracious, consuming up to 55 midge larvae/day at a prey density of 10,000/m^2 after 48 h starvation. Under similar conditions, Orthetrum caledonicum consumed up to 29 midge larvae/day, and Xanthagrion erythroneurum took up to 43 midge larvae/day. However, on the third successive trial these figures fell considerably to 12, 10 and 2 midge larvae/day, respectively. Overall, the laboratory trials show sufficient promise to justify fieldstudies of these predators to assess their potential for containing midge larvae numbers in natural wetlands, in conjunction with procedures to control nutrient enrichment.

(11428) BAAIJENS, A., 1997. Libellen in Zeeland. – [Dragonflies in Zeeland prov.]. *Nieuwsbr. Vlinderwerkgroep Midden-Zeeland* 5(2): 8-12. (Dutch). – (Grote Abeele 4, NL-4388 VW Oost Souburg).
A commented list of 14 spp.; – Zeeland prov., the Netherlands.

(11429) BAKER, R.L. & B.P. SMITH, 1997. Conflict between antipredator and antiparasite behaviour in larval damselflies. *Oecologia* 109(4): 622-628. – (First Author: Dept Zool., Erindale Coll., Univ. Toronto, Mississauga, ON, L5L 1C6, CA).
Larval Zygoptera resist infestation by parasitic larval mites by exhibiting behaviours such as grooming, crowling, swimming, and striking at host-seeking mites. They are known to increase time spent in these behaviours in the presence of mites, but they reduce it in the presence of fish predators. The presence of both fish and larval mites presents an obvious conflict: a larva may actively avoid parasitism by mites, thus increasing its risk of predation, or it may reduce its activity when fish are present, thus increasing its risk of parasitism. The behaviour of larval Ischnura verticalis was analysed in an experiment, where the presence and absence of fish was crossed with presence and absence of larval mites. Presence of mites induced a large increase in dragonfly activity, but fish had no effect and there were no interpretable interactions between effects of mites and fish. Subsequent experiments indicated that larvae in the presence of both mites and fish were more likely to be attacked and killed by fish than those exposed only to fish. The high activity level of larvae in the presence of both fish and mites may suggest that costs of parasitism are high, or that under field conditions it is rare for larvae to be in the immediate presence of both fish predators and potentially parasitic mites.

(11430) BECKEMEYER, R.J. & D.G. HUGGINS, 1997. Checklist of Kansas dragonflies [Anisoptera]. *Ks School Naturalist* 13(2): 1-16. – (First Author: 957 Perry St., Wichita, KS 67203-3141, USA; – Publishers: Box 4050, Emporia St. Univ., 1200 Commercial St., Emporia, KS 66801-5087, USA).
The very beautifully produced, as a pamphlet available paper includes 26 col. phot. by the first Author and Dr S.W. Dunkle, as well as 5 black-and-white figs. The checklist includes only those spp. for which one of the authors has seen an extant specimen; some historical spp. for which material has been lost are not listed. The entries include the information on abundance and distribution, probable flight dates, habitat, and the relative bibliographic references. A simplified key to the main taxa (including also some behavioural features) is added.

(11431) BEDJANIČ, M., 1997. Žival meseca aprila: prisojni zimnik (Sympecma fusca). – The creature of the month of April: the dragonfly Sympecma fusca. *Proteus, Ljubljana* 59(8): 387-389, 399. (Slovene, with Engl. title). – (Fram 117a, SI-2313 Fram).
A "portrait" of the sp., with emphasis on its occurrence in Slovenia, where it was recorded from over 60 localities.

(11432) BEDJANIČ, M., S. PETERLIN & A. SELIŠKAR, 1997. *Rastlina, žival in biotop leta 97. – [The plant, the animal and the biotope of 1997].* Sklad za varstvo narave & Prirodoslovno društvo Slovenije, Ljubljana, 8 pp. (Slovene). – (First Author: Fram 117a, SI-2313 Fram).
The rush (Juncus spp.), the libellulid dragonflies, and the (man-made, freshwater) pond ecosystem were declared in Slovenia as the respective subjects of the year. The illustrated brochure gives a good general outline of dragonfly biology. Among the various objectives of the designation is also a na-

tion-wide collection of dragonfly folk names and folk superstitions.

(11433) BERNARD, R. & J. SAMOLAG, 1997. Analysis of the emergence of Aeshna affinis Vander Linden, 1823 in the vicinity of Poznań, western Poland (Odonata: Aeshnidae). *Opusc. zool. flumin.* 153: 1-12. – (First Author: Dept Gen. Zool., A. Mickiewicz Univ., Fredry 10, PO-61-701 Poznań). The studies were conducted during June-July 1996. The habitat is described and the data are presented on population strength, sex ratio, changes in daily emergence rate, differences between the sexes, time of emergence, height of climbing and on mortality. The emergence in this sp. is highly synchronized (EC_{50} = 7); this is probably related to the mechanism of a lower temperature threshold in larval development. The status of the sp. in this part of Europe in relation to climatic conditions, and temporal segregation with the coexisting A. mixta are discussed.

(11434) BERNIER, C., 1997. Odonata 44-85: l'atlas contemporain. *Lettre Atlas ent. rég. Nantes* 8: 107--109. – (8, allée des Tilleuls, F-44230 Saint--Sébastien-sur-Loire).
A summary of the odon. atlas Loire-Atlantique--Vendée, 1990-1996 (52 spp.).

(11435) BOHM, F.M., 1997. Bestandsaufnahme ausgewählter Tiergruppen in verschiedenen Lebensräumen des Allgäus. *Ber. naturf. Ges. Augsburg* 56: 18-32. – (Bachschmidstr. 4, D-87600 Kaufbeuren).
Lists 39 odon. spp., from 3 localities; – Allgäu, S Germany.

(11436) *BRACHYTRON*, Vol. 1, No. 1 (May 1997). Published semiannually by the Netherlands Dragonfly Society [= Nederlandse Vereniging voor Libellenstudie]; edited by F. Bos, N. Dingemanse, K.-D. Dijkstra, J. Hermans & V. Mensing. ISSN 1386-3460. – Annual subscription 1997: NLG 25.-- (inland), NLG 30.-- (foreign). (Dutch, with Engl. s's). – (Eds & Administration: c/o K.-D. Dijkstra & V. Kalkman, Oude Rijnsburgerweg 38, NL-2342 BC Oegstgeest; – Subscriptions to: W. Hoeffnagel, Hilversum, Postal Giro Account 76.15.700).
Dijkstra, K.-D. & V. Kalkman: [Editorial] (p. 2); – *Habraken, J.M.P.M. & B.H.J.M. Crombaghs*: Discovery of a larva of Gomphus flavipes along the Waal (pp. 3-5); – *Baarspul, A.N.J. & J.-P. de Krijger*: The role of damselflies and dragonflies and other insects in the chick-diet of Black Tern (Chlidonias niger) (pp. 6-10); – *Both, C.*: Career-decisions of Calopteryx species (pp. 11-15); – *Dijkstra, K.-D. & M. van der Weide*: The Red-veined Darter, Sympetrum fonscolombii (Sélys), in the Netherlands in 1996 (pp. 16-21); – *Hermans, J.T. & R.E.B.M. Gubbels*: The Scarlet Dragonfly, Crocothemis erythraea (Brullé), in Limburg (pp. 22-26); – *de Groot, T.*: Leucorrhinia pectoralis in De Wieden (pp. 27-28). – The issue also contains 4 book reviews (pp. 28-30) and a symposium announcement (p. 30), all by *M. Wasscher*. – Cf. also *OA* 11165 and 11467.

(11437) BURKART, W., 1997. Neue Reproduktionsnachweise der Frühen Heidelibelle (Sympetrum fonscolombei Selys, 1840) (Odonata: Libellulidae) in Niedersachsen. *Beitr. Naturk. Niedersachs.* 50(1): 48. – (Am Emel 7, D-27412 Wilstedt).
Records from Rotenburg distr., Lower Saxony, Germany.

(11438) CARLETTI, B. & F. TERZANI, 1997. Descrizione di Pseudagrion simplicilaminatum spec. nov. della Repubblica del Congo (Odonata: Coenagrionidae). *Opusc. zool. flumin.* 152: 1-7. (With Engl. s.). – (Mus. Zool. "La Specola", Univ. Firenze, Via Romana 17, I-50125 Firenze).
The new sp. is described and illustrated, and its affinities with P. flavipes leonensis Pinhey, 1964 and P. thernathum Fraser, 1955 are outlined and discussed. Holotype ♂: Kintele, 6-IX-1978, paratypes ♂: Kintele, 5-I-1980, II-1980, III-1980, XII-1980; – Voka, I-1980; – Djili, XII-1979; – Loufoula, I-1980.

(11439) CHEVIN, H., 1997. Les insectes des dépressions humides dunaires du Cotentin. *Insectes* 104(1): 25-28. – (Author's address not stated).
7 odon. spp. are listed; – France.

(11440) DE GROOT, T., 1997. *De libellenfauna van het Fochteloërveen. – [Dragonfly fauna of the Fochteloërveen].* Ver. Natuurmonumenten, 's-Graveland. vi+66 pp. – [O & B Rep. No. 97--12]. (Dutch). – (Bolivarstraat 89, NL-3573 ZX Utrecht).
The Author is well known for her meticulous and thorough work on the odon. fauna in various parts of the Netherlands. This is the report on the 1996 survey in the said moorland, on the Friesland/

Drenthe border. 32 spp. were evidenced, incl. 5 that were not recorded during the 1982 survey (cf. *OA* 5037).

(11441) DE GROOT, T., 1997. *Libellen in de Wieden. – [Dragonflies in De Wieden].* Ver. Natuurmonumenten, 's-Graveland. Vol. 1 (text) vi+68 pp., Vol. 2 (maps): 2 pp. + 25 maps [O & B Rep. No. 97--01]. (Dutch). – (Bolivarstraat 89, NL-3573 ZX Utrecht).
A thorough report on the 1996 survey of a part of the lowland moor De Wieden, Overijssel prov., the Netherlands. The habitats, their species assemblages and local ecology of the 25 encountered spp. are described in great detail. Aeshna viridis is among the noteworthy taxa.

(11442) The *DRAGON-FLIER*. Newsletter of the Ohio Odonata Society, Columbus, Vol. 7, No. 2 (Apr. 1997). – (c/o B. Glotzhober, Ohio Hist. Soc., 1982 Velma Ave., Columbus, OH 43211-2497, USA).
The former informal Ohio Dragonfly Survey has now been reorganised into a formal Society, as stated in the modified subtitle of this issue. Dr R.W. Alrutz has been nominated for the Honorary Life Membership of the new Society, and E. Chapmann was hired as its new field worker. – *Note*: For 1997 the newsletter is mailed free to any Ohio resident requesting it. Subscriptions outside Ohio are US $ 5.-- annually. The membership rates of the Society will be announced by the end of 1997. The membership is open to anyone, from anyplace.

(11443) *DRAGONFLY RECORDER*. Newsletter of the ORS, No. 17 (Spring, 1997). – (c/o D. Winsland, 2 Stourfield Rd, Bournemouth, BH5 2AR, UK).
This, apparently, is the new title of the British serial, known previously as the "*Odonata Recording Scheme Newsletter*". No. 10 (1988) of the latter is listed in *OA* 6400, whereupon no issues were supplied for the bibliographic evidencing in *Odonatologica*, therefore the date of the introduction of the new title is unknown to the *OA* Ed. – C o n t e n t s: [*Winsland, D.*] Editorial (p. 1); – *McGeeny, A.*: Benefits of recording and the RDP (p. 2); – *Hold, A.*: How to complete the recording card (Ra 70) (pp. 2-5); – *Parr, A.J.*: Migrant dragonflies and the Odonata Recording Scheme (pp. 5--6); – *Winsland, D.*: Rare dragonfly project: an overview and a personal message (pp. 7-8); – *Cham, S.*: A review of key species in the Mid-East region (pp. 8-9); – *Winsland, D.*: Recording in the South West (pp. 9-10); – *Averill, M.*: An introduction [regional recording in the Midlands] (p. 10); – *Clarke, D.*: North England regional trends during 1996 (pp. 10-11); – *Smith, B.*: Scotland, un update from 1993 (pp. 11-12); – *Clarke, D.*: Chart of Leucorrhinia dubia at Chartley Moss 1996 (p. 12).

(11444) [DUNN, G.A.], 1997. The Green Darner dragonfly. *Insect World* 9(3): 6-8, lay-in chart excl. – (Young Entomologists' Soc., 1915 Peggy Pl., Lansing, MI 48910-2553, USA).
Incidental article on Anax junius, on the occasion of its designation as Michigan's official state insect. The article includes also 2 dragonfly poems, and a useful bibliography of the American children books on dragonflies.

(11445) *ERJAVECIA*. [Newsletter of the Slovene Odonatological Society], Ljubljana, No. 3 (27 Feb. 1997). (Slovene). – (c/o Ms A. Pirnat, Vošnjakova 4 a, SI-1000 Ljubljana).
With the present issue, the Editor (*M. Bedjanič*, Fram 117 a, SI-2313 Fram) introduced a series of Editorials, each of which is to present a feature from the history of the odon. exploration in Slovenia. The first of these deals with the 1685 odon. illustrations of Baron J.W. von Valvasor (cf. *OA* 7316). – On 24 pp., the issue presents reports on the 1996 activities of the Soc. (incl. some records from previously unexplored areas), projects for 1997, dragonfly texts from Slovene poetry and belletristics, a review of the national and international legislation applicable to the Slovene odon. fauna, additions to the odonatol. bibliography of Slovenia (Nos 151-162), etc.

(11446) FINCKE, O.M., 1997. Conflict resolution in the Odonata: implications for understanding female mating patterns and female choice. *Biol. J. Linn. Soc.* 60(2): 201-220. – (Dept Zool., Univ. Oklahoma, Norman, OK 73019, USA).
Predictions of mating patterns in animals have focussed on ♂♂ and how they compete for fertilizations by controlling ♀♀. With reference to the Odon., a taxon in which mating requires cooperation of the ♀, the active role that ♀♀ play in mating decisions is often ignored, leading to the premature conclusion that ♂ coercion of ♀♀ is common. A critical review of the outcome of sexual conflict among odon. leads to alternative explanations of ♀ mating patterns that need to be refuted

before concluding that ♂♂ coerce matings. Because Anisoptera ♂♂ have greater control over tandem formation, they have a greater potential for coercion than Zygoptera ♂♂. However, Anisoptera ♀♀ may simply be willing to remate more often if they receive insufficient sperm to fertilize an entire egg clutch. Contrary to prior assumptions, in both suborders, ♂ defence of oviposition sites does not preclude ♀♀ from choosing among sites or among ♂♂. The evolution of non-aggressive sexual signals by ♂♂ is a reliable indication that sexual conflict has been resolved in favour of ♀♀ interests. Although the Author predicts that the benefits to ♀♀ of choice of ♂ phenotype should rarely exceed the cost of such discrimination in Odon., ♀♀ choice is most likely to evolve in territorial spp., whose ♂♂ must endure high physiological stress in order to mate, and when site quality is not a reliable predictor of the genetic quality of a potential mate.

(11447) FROBEL, K. & J. WERZINGER, [Eds], 1997. *Tagungsband 16. Jahrestagung der Gesellschaft deutschsprachiger Odonatologen, 14.-16. März 1997, Nürnberg*. GdO, Mönchengladbach. 28 pp. – (c/o Mrs U. Krüner, Gelderner Str. 39, D-41189 Mönchengladbach).

[Abstracts of papers:] *Bechly, G.*: Zu Geschichte und aktuellen Entwicklungen in der Grossgruppen-Systematik der Libellen (p. 6); – *Bissinger, V.*: Cordulegaster boltonii und Onychogomphus forcipatus: Entwicklungsunterschiede in unterschiedlich temperierten Waldbächen (p. 6); – *Brockhaus, T.*: Der Einfluss der Larven auf ihre Imagines am Beispiel der Federlibelle Platycnemis pennipes (Pallas, 1771) (p. 7); – *Burbach, K. & K. Kuhn*: Libellenatlas Bayern: Auswertungen zu Bestand, Verbreitung und Lebensräumen (p. 7); – *Frobel, K.*: Regionale Rasterkartierung in Nordwest-Oberfranken: naturschutzfachliche Bewertungsunterschiede beim Vergleich mit anderen Artengruppen (p. 8); – *Grimmer, F.*: Einige Ergebnisse mehrjähriger Untersuchungen an der Grünen Keiljungfer (Ophiogomphus cecilia) an der Schwäbischen Rezat (Mittelfranken) (p. 8); – *Hoffmann, J.*: Odonatenfauna und Klima in Schleswig Holstein: Veränderungen von 1917 bis heute (p. 9); – *Königsdorfer, M.*: Die Bedeutung von Kiesabbaugebieten für den Artenschutz am Beispiel der Libellenfauna im Donauried (p. 9); – *Krach, E.*: Libellen des Schuttereinzugsgebiet im Bereich der südlichen Frankenalb/Donau (p. 10); – *Leipelt, K.-G.*: Untersuchungen zum Fortpflanzungsverhalten von Gomphus vulgatissimus und Ophiogomphus cecilia (p. 10); – *Lempert, J.*: Zur Einwanderung von Sympetrum fonscolombii nach Mitteleuropa im Jahre 1996 (p. 12); – *Lindeboom, M.*: Die Bedeutung des Artkonzeptes für eine Revision der Calopteryx-Arten (p. 12); – *Mauersberger, R.*: Direkte Auswirkung winterlicher Ausstickung auf die Libellenfauna von Seen (p. 12); – *Müller, J.*: Zur Bedeutung der indigenen Neubürger Aeshna affinis und Gomphus flavipes im Biosphärenreservat Mittlere Elbe/Flusslandschaft Elbe (p. 13); – *Ott, J.*: Libellen in der Stadt: welche Zielvorstellungen gibt es für eine zukünftige Stadtentwicklung aus Sicht der Odonatologie? (p. 13); – *Samu, S.*: Zum Habitatschema der Mond-Azurjungfer (Coenagrion lunulatum) in Nordwest-Mecklenburg (p. 14); – *Schmidt, E.G.*: Zur Biotoppräferenz und Verbreitung von Platycnemis pennipes in nordwestdeutschen Regionen (p. 14); – *Stoks, R.*: Are there more males than females in a mature damselfly population? (p. 15); – *Suhling, F. & O. Müller*: Wandelnde Blätter, Sandwühler und Opportunisten: Körperform und Verhalten von Gomphiden-Larven als Anpassung an den Lebensraum (p. 15); – *Wildermuth, H.*: Paart sich Somatochlora flavomaculata abseits vom Wasser? (p. 16); – *Zessin, W.*: Die Liassogomphidae Tillyard, 1935, aus dem Lias von Dobbertin in Mecklenburg (p. 16).

(11448) *GOMPHUS*. Mededelingsblad van de belgische libellenonderzoekers – Bulletin de liaison des odonatologues belges, Vol. 13, No. 1/2 (Apr. 1997). (Dutch & Fr.). – (c/o G. De Knijf, Hofstraat 58, B-9000 Gent).

Goffart, P. / Tailly, M.: Editorial (pp. 1-2); – *De Knijf, G.*: [The set-up of a monitoring network for the dragonflies of Flanders: background, method and discussion proposal] (pp. 3-7); – *Stoks, R., G. De Knijf & G. Jannis*: [The status of Lestes barbarus in Belgium] (pp. 8-13); – *Andries, T.*: [Invasion of Aeshna affinis] (pp. 14-18); – *De Knijf, G. & A. Anselin*: [Presentation of "De gedocumenteerde Rode Lijst van de libellen van Vlaanderen"] (pp. 19-25); – *Goffart, P.*: Constitution d'une Liste rouge des libellules de Wallonie (pp. 26-34); – *De Block, M. & R. Stoks*: [The impact of plumb pollution of acid bogs on larval Enallagma cyathigerum] (pp. 35-38); – *Wasscher, M. & T. De Groot*: [Dragonflies in the lowland moor areas] (pp. 39-42); – *Van de Vijver, B., M. Santens, R. Stoks & S. De Vocht*: [Emergence features in dragonflies in the Groot

Schietveld bogs in Brasschaat] (pp. 43-49); – *Stoks, R. & M. Santens*: [Warming-up strategies in teneral Aeshna mixta] (pp. 50-55); – *Dommanget, J.-L.*: Conference: "Ecologie de Macromia splendens dans la vallée du Tarn" (pp. 56-57); – *Excursions* (pp. 58-60).

(11449) *GRACILE*. [Newsletter of Odonatology]. Published by the Kansai Research Group of Odonatology, Osaka, No. 57 (23 March 1997). (Jap., with Engl. titles). – (c/o K. Inoue, 59, Fuminosato 4-chome, Abeno-ku, Osaka, 545, JA).
Yagi, T.: The relations between the individual number of immature Sympetrum frequens and the weather (pp. 1-3); – *Sasamoto, A.*: Lyriothemis pachygastra caught on October 20 (p. 4); – *Hirake, T.*: Recent situation of the dragonflies in Kawanishi city, Hyogo pref. (pp. 5-7); – *Tabata, O.*: Report of the survey trip on the odonate fauna of North Kyoto, 7: Fukuchiyama area (pp. 8-9); – *Nagase, K.*: Odonate fauna of Misaki-cho, Osaka pref. (pp. 10-13).

(11450) GRETHER, G.F., 1997. Survival cost of an intersexually selected ornament in a damselfly. *Proc. R. Soc. Lond.* (B) 264: 207-210. – (Dept Ecol., Evol. & Marine Biol., Univ. California, Santa Barbara, CA 93106, USA).
Ornaments could evolve as honest indicators of fighting ability, provided they have costs that make deceptive signalling unprofitable. By manipulating the size of the intersexually selected wing spots of ♂ Hetaerina americana and monitoring survival in the field, such costs were tested. ♂♂ with enlarged spots had higher mortality than both unmanipulated and sham-manipulated controls. Natural wing spot size correlated positively with longevity, suggesting that higher quality ♂♂ develop larger spots.

(11451) HOFFMANN, F., 1997. Mareld & Drakguld. *Amoeba, Amst.* 71(1): 13. (Dutch). – (Verlengde Nieuwstraat 36 A, NL-9724 HD Groningen).
Brief impressions from Sweden, with a note on Swedish vernacular names for dragonflies.

(11452) HORVÁTH, G. & D. VARJÚ, 1997. Polarization patterns of freshwater habitats recorded by video polarimetry in red, green and blue spectral ranges and its relevance for water detection by aquatic insects. *J. exp. Biol.* 200(7): 1155-1163. – (Lehrst. Biokybernetik, Univ. Tübingen, Auf der Morgenstelle 28, D-72076 Tübingen).
No taxonomic names are mentioned. Through the citation of papers listed in *OA* 10692 and 10751, only some indirect references are given to the odon.

(11453) JODICKE, R., 1997. Die Verbreitung von Sympetrum sinaiticum tarraconense Jödicke (Odonata, Anisoptera: Libellulidae). *Opusc. zool. flumin.* 155: 1-7. (With Engl. s.). – (Grossenging 14, D-49699 Lindern).
A map is provided which demonstrates the occurrence of this Iberian taxon in the Mediterranean parts of Spain. 18 localities are compiled, ranging from Andalusia to the Pyrenees. There seems to be no recent contact with the nominotypical ssp. from northern Africa.

(11454) *JOURNAL OF THE BRITISH DRAGONFLY SOCIETY*, Vol. 13, No. 1 (Apr. 1997). – (c/o Dr W.H. Wain, Haywain, Holywater Rd, Borden, Hants GU35 0AD, UK).
Corbet, P.: Obituary Peter Miller (1931-1996) (pp. 1-3); – *Beynon, T.G.*: Leucorrhinia dubia (Vander Linden) at Chartley Moss NNR, Staffordshire, in 1995 (pp. 4-14); – *Silsby, J. & J. Ward-Smith*: The influx of Sympetrum flaveolum (L.) during the summer of 1995 (pp. 14-22); – *Phillips, J.*: Lesser Emperor Dragonfly Anax parthenope (Sélys) in Gloucestershire; the first British record (pp. 22--24); – *Chelmick, D.G.*: The rediscovery of Ceriagrion tenellum (De Villers) in West Sussex (pp. 24--26); – *Smith, P.H.*: The Ruddy Darter Sympetrum sanguineum (Müller) in South Lancashire (pp. 27--29); – *Prendergast, E.D.V.*: Evidence of breeding in Odonata; a personal view (pp. 29-30); – *Paine, A.*: Notes and observations (pp. 31-32).

(11455) KETELAAR, R., 1997. *Handleiding libellenmonitoring. – [Dragonfly monitoring manual]*. De Vlinderstichting, Wageningen. 14 pp. (Dutch). – (Publishers: Postbus 506, NL-6700 AM Wageningen).
A revised and greatly enlarged edn of a similar work, listed in *OA* 10744.

(11456) KETELAAR, R., 1997. *Handleiding waarnemingen Nederlandse libellen. – [Manual for dragonfly observations in the Netherlands]*. De Vlinderstichting, Wageningen. 30 pp. (Dutch). – (Publishers: Postbus 506, NL-6700 AM Wageningen).
Guide lines for inventarisation and various kinds of field work, with a bibliography of identification

works, and with the addresses, where the records from Belgium, Eire, France, Luxemburg, Slovenia and the United Kingdom are to be sent. The booklet will be useful to all field naturalists, aiming at serious work with dragonflies, whether incidental observations, local records, or larger research projects are concerned.

(11457) *KIMMINSIA*. Newsletter of the U.K. National Office of the International Odonatological Society (SIO), vol. 8, No. 1 (May 1997). – (Orders to: Mrs J. Silsby, 1 Haydn Ave., Purley, Surrey, CR8 4AG, UK).
10 members briefly report on their current activities, 5 are needing or offering help, *A. Davies* and *S. Jones* are providing "Conservation news", and brief information is provided on odonatological activities at Cambridge Univ. and at the Oxford Univ. Mus. – Signed articles: *Butler, S.G.*: Return to Nepal (pp. 5-6); – *Mackenzie Dodds, R.*: We actually see foreign dragonflies (p. 6); – *Pryce, D.J.*: An ancient reference to dragonflies (pp. 6-7).

(11458) KOPERSKI, P., 1997. Changes in feeding behaviour of the larvae of the damselfly Enallagma cyathigerum in response to stimuli from predators. *Ecol. Ent.* 22(2): 167-175. – (Dept Hydrobiol., Univ. Warsaw, Banacha 2, PO-02-097 Warszawa).
The feeding rates, diet composition and diel periodicity in feeding activity among larvae exposed to chemical, visual and mechanical stimuli from the predators Ranatra linearis, Notonecta glauca and Rutilus rutilus were investigated. In response to chemical cues produced by all the predator species, larvae reduced their rate of feeding significantly (especially on large, sedentary prey). Small larvae reacted more strongly than large ones to the kairomone produced by N. glauca. The fish kairomone induced a reduction in feeding activity during daylight hours only. This reaction was more intense than the reaction to non-chemical cues. Observed predator-induced changes in diet composition, caused directly by reduced activity during feeding, are discussed as an antipredator behaviour of damselfly larvae.

(11459) LAND, M.F., 1997. Visual acuity in insects. *Annu. Rev. Ent.* 42: 147-177. – (Sussex Cent. Neurosci., Sch. Biol. Sci., Univ. Sussex, Brighton, BN1 9QG, UK).
The acuity of compound eyes is determined by interommatidial angles, optical quality, and rhabdom dimensions. It is also affected by light levels and speed of movement. In insects, interommatidial angles vary from tens of degrees in Apterygota, to as little as 0.24° in dragonflies. Resolution better than this is not attainable in compound eyes of realistic size. The smaller the interommatidial angle the greater the distance at which objects – prey, predators, or foliage – can be resolved. Insects with different lifestyles have contrasting patterns of interommatidial angle-distribution, related to forward flight, capture on the wing, and predation on horizontal surfaces.

(11460) *La LETTRE DES SOCIETAIRES Société française d'odonatologie*, No. 10 (15 March 1997). – (c/o J.-L. Dommanget, 7 rue Lamartine, F-78390 Bois-d'Arcy).
The issue mainly contains the material for the 12 Apr. 1997 General Meeting of the SFO. Several other brief reports and announcements are also useful. A new national Red List is in preparation.

(11461) MATSUKI, K. & Y. HIROSE, 1997. Morphological notes on larval labia of Libellula quadrimaculata asahinai in Hokkaido, Japan. *Nature & Insects* 32(2): 27-32. (Jap., with Engl. title). – (First Author: 1575-14, Hazama 3-chome, Funabasi, Chiba, 274, JA).
[Abstract not available.]

(11462) MATTILA, K., 1997. Hyönteistiedonannot 1996. – [Insect records 1996]. *Diamina* 6: 39-41. (Finn.). – (Lukonmäenkatu 18B/13, FIN-33700 Tampere).
Some Finnish records of Calopteryx splendens, Epitheca bimaculata and Libellula depressa are listed.

(11463) McCOLLUM, S.A. & J.D. LEIMBERGER, 1997. Predator-induced morphological changes in an amphibian: predation by dragonflies affects tadpole shape and color. *Oecologia* 109(4): 615-621. – (First Author: Dept Biol., Univ. Michigan, Ann Arbor, MI 48109-1048, USA).
Predator-induced defenses are well studied in plants and invertebrates, but have only recently been recognized in vertebrates. Hyla chrysoscelis tadpoles reared with Aeshna umbrosa larvae differ in shape and colour from tadpoles reared in the absence of dragonflies. By exposing tadpoles to tail damage and the non-lethal presence of starved and fed dragonflies, we determined that these phenotypic dif-

ferences are induced by non-contact cues present when dragonflies prey on Hyla. The induced changes in shape are in the direction that tends to increase swimming speed; thus, the induced morphology may help tadpoles evade predators. Altering morphology in response to predators is likely to influence interactions with other species in the community as well.

(11464) MUZÓN, J., 1997. Redescripción de Lestes auritus y L. paulistus y descripción del último estadio larval de L. undulatus (Odonata: Lestidae). *Revta Soc. ent. argent.* 56(1/4): 159-166. (With Engl. s.). – (Inst. Limnol. 'Dr R.A. Ringuelet', C.C. 712, AR-1900 La Plata).
♀ L. auritus, ♀ L. paulistus and the last larval instar of L. undulatus are described for the first time. ♂ L. auritus is redescribed, based on the here designated lectotype. L. auritus and L. paulistus are recorded for the first time for Argentina and Uruguay, respectively.

(11465) MUZON, J. & N. VON ELLENRIEDER, 1997. Estadios larvales de Odonata de la Patagonia. 1. Descripción de Aeshna variegata (Odonata: Aeshnidae). *Revta Soc. ent. argent.* 56(1/4): 143-146. (With Engl. s.). – (Inst. Limnol. 'Dr R.A. Ringuelet', C.C. 712, AR-1900 La Plata).
The last instar of A. variegata larva is described and illustrated, based on reared specimens from Patagonia. It is compared with the known larvae of the other regional Aeshna spp. In addition, the status of A. peralta is reviewed, and the distinctive larval features of the sp. are pointed out.

(11466) *NEWSLETTER [OF THE] BRITISH DRAGONFLY SOCIETY*, No. 31 (Spring 1997). – (c/o Mrs J. Silsby, 1 Haydn Ave., Purley, Surrey, CR8 4AG, UK).
31 news items, concise reports, announcements and other useful information, on 16 pp., incl. the address list of the 34 BDS local groups, some interesting field observations, etc.

(11467) *NVL NIEUWSBRIEF*. Mededelingenorgaan van de Nederlandse Vereniging voor Libellenstudie, Vol. 1, No. 1 (May 1997); edited by V. Mensing & K.-D. Dijkstra. ISSN none. (Dutch). – (Subscription orders to: NVL, Oude Rijnsburgerweg 38, NL-2342 BC Oegstgeest).
This is the new quarterly newsletter of the Netherlands Dragonfly Society, NVL (see also *OA* 11165 and 11436), bringing various management news, activity reports, publication schedule of the Society, etc. Generally, the contents of the first issue reflects perfectly the numerous activities and initiatives in the Netherlands homestead odonatology.

(11468) OTT, J., 1997. Pianificazione del paesaggio in Germania: metodi, risultati e problemi. *Atti Convegno Ingegneria naturalistica*, Pesaro, pp. 11-29, 93 (figs). – (L.A.U.B., Hölzengraben 2, D-67667 Kaiserslautern).
General considerations, and concise descriptions of 5 examples of different types of landscape planning in Germany. Where appropriate, the odon. are carefully considered.

(11469) PILON, J.-G., 1997. Le monde des libellules: un groupe d'insectes mal perçu, mais combien utile. *Bull. Entomofaune* 19: 5-7. – (576 Terrasse Magnan, Sainte-Thérèse, QC, J7E 4Z4, CA).
General article on dragonflies, with emphasis on the fauna of Quebec, Canada.

(11470) *PLANAESCHNA*. Newsletter for the members of the Odonatological Society of Osaka, No. 1 (1 March 1997). (Jap.). – (c/o K. Inoue, 5-9, Fuminosato 4-chome, Abeno-ku, Osaka, 545, JA).
The first issue of this internal Society's newsletter contains the summaries and various illustrative material, distributed at the meeting of the Society, on 24 Nov. 1996. The authors are *A. Muraki, N. Katatani, A. Moriyasu, H. Karube, K. Inoue, A. Muraki* and *M. Yoshida*.

(11471) PRASAD, M., 1997. Additions to the odonate fauna of Mizoram, northeastern India. *Opusc. zool. flumin.* 154: 7-10. – (Zool. Surv. India, M Block, New Alipore, Calcutta-700053, India).
12 spp. are added to the fauna of Mizoram, which consists now of 44 known spp. Descriptive notes are provided for some of them.

(11472) PRASAD, M., 1997. Further additions to the odonate fauna of Arunachal Pradesh, eastern India. *Opusc. zool. flumin.* 154: 1-6. – (Zool. Surv. India, M Block, New Alipore, Calcutta-700053, India).
21 spp. are added to the fauna of the state, bringing the status of the Arunachal Pradesh odon. fauna to the 77 spp. mark. For some of the recorded spp. descriptive notes are provided.

(11473) RAMIREZ, A., 1997. Lista de especies costaricenses del orden Odonata (Insecta) de las que se conoce la náyade. *Revta Biol. trop.* 44(3)/45(1): 225-232. (With Engl. s.). – (Inst. Ecol., Univ. Georgia, Athens, GA 30602-2202, USA).
Close to 280 spp. are known from Costa Rica, for 142 of which the larva has been described. A checklist of these and the bibliography of the descriptions are given.

(11474) RETTIG, K., 1997. Verbreitung und Flugzeiten der Libellen Ostfrieslands. *Beitr. Vögel-Insektenwelt Ostfrieslands* 102: 2-12. – (Danziger Str. 11, D-26725 Emden).
An updated edn of the work listed in *OA* 10045.

(11475) ROBINSON, J.V. & K.L. NOVAK, 1997. The relationship between mating system and penis morphology in ischnuran damselflies (Odonata: Coenagrionidae). *Biol. J. Linn. Soc.* 60(2): 187-200. – (Dept Biol., Univ. Texas, Box 19498, Arlington, TX 76019, USA).
Amongst Zygoptera, the Ischnura spp. are unusual because of the variety of mate guarding techniques of different spp. The lack of post-copulatory guarding combined with lengthy copulations in one group of spp. suggest that these guard in copula. An examination of the accessory penes of spp. in this group indicates that all but 1 sp. have considerable microspination on the distal end (the flagella) of their penes that can function in sperm displacement. The flagella are long and thin compared to those of other ischnurans. This is likely an adaptation to gain access to the spermatheca. 2 spp. tandem guard their mates during oviposition. These are the only ischnurans missing a stout pair of basal spines on the penultimate segments of their penes. They have considerable microspination over much of their penes but their flagella are of only moderate length and stout. Ischnurans that do not mate guard have short, stout flagella and most spp. examined from this group (5 of 7) have little microspination on their flagella tips. It is proposed that ♀♀ of these mate only once and therefore their ♂♂ do not displace sperm.

(11476) SCHAEFER, M., 1997. Die Mannigfaltigkeit von Flora und Fauna: Zur ökologischen Bedeutung der Biodiversität. *Jb. Akad. Wiss. Göttingen* 1995: 58-79. – (Author's address not stated).
Contains sparse references to the Odon.

(11477) SELIŠKAR, M., 1997. *Fragmenti o očetu. – [Fragments of my father's life].* Prir. Dr. Slovenije, Ljubljana. 145 pp. (Slovene). ISBN none. – Price: SIT 2600.-- net. – (Orders to: Nat. Hist. Soc. of Slovenia, Novi trg 2, SI-1000 Ljubljana).
A "portrait" of Dr Albin Seliškar (1896-1973), Professor of Comparative Animal Physiology at the Univ. of Ljubljana, by his daughter. A brief chapter on dragonflies appears on pp. 125-126.

(11478) *SIOJA.* [Information bulletin of the SIO Japan Branch Office], Osaka, 1997, No. 1 (13 Feb. 1997); No. 2 (8 May 1997); No. 3 (23 May 1997). (Jap.). – (c/o K. Inoue, 5-9, Fuminosato 4-chome, Abeno-ku, Osaka, 545, JA).
No. 1 is providing information on the 1997 and 1999 Int. Symp. Odonatol. – Nos 2 and 3 are related to the constitutional confusion in SIO, triggered by H. Lohmann and Dr W. Schneider, to whom a group of German members has pointed out their various violations of the SIO Constitution, German Civil Code and German Electoral Law.

(11479) SLAATS, J. & H. RAMACKERS, 1997. Waarnemingen van de Zwervende Pantserjuffer in de Meinweg en de Groote Peel. – Observations on Lestes barbarus at the Meinweg and Groote Peel areas. *Natuurh. Maandbl.* 86(3): 55-57. (Dutch, with Engl. s.). – (First Author: Astenseweg 6, NL-5768 PD Meyel).
In 1995, the sp. was sighted in small numbers in the said areas. In spite of the extensive search in the previous decades, it has not been recorded there, therefore it is postulated that in the hot 1995 summer L. barbarus has reached the area from the S. the habitat and the biology are briefly described.

(11480) SPARRIUS, L., 1997. Libellen van Ameland. – [Dragonflies of Ameland island]. *Amoeba, Amst.* 71(1): 19-21. (Dutch). – (Kongsbergstraat 1, NL-2804 XV Gouda).
A checklist of 17 spp., evidenced during 1995-1996, on the Northsea island of Ameland, the Netherlands. Several of them were not known from there previously. Concise annotations on the localities, types of habitats, etc. are also provided for most spp.

(11481) *SULZBACH-ROSENBERGER LIBELLEN-RUNDBRIEF*, No. 4 (Apr. 1997); No. 5 (May 1997); No. 6 (June 1997). – (c/o R. Seidenbusch,

Klenze Str. 5, D-92237 Sulzbach-Rosenberg).
No. 4: *Seidenbusch, R.*: Wingspot variability of Calopteryx splendens intermedia Selys, 1890 in hybrid populations in South Turkey (pp. 1-3); – Comparison of wing features in selected European and Mediterranean specimen out of the species Calopteryx virgo Linnaeus, 1758 [sic!] (pp. 4-9); – Variability in the occurrence of dorsal spines in larvae of Leucorrhinia dubia Vander Linden, 1825 and Leucorrhinia rubicunda Linnaeus, 1758 (pp. 9-10); – Structural larval features in the genus Zygonyx Hagen, 1867 (pp. 11-12); – Larval comparison: Erythromma viridulum Charpentier 1840, Erythromma lindeni Selys, 1848 (pp. 13-16). – No. 5: *Seidenbusch, R.*: Wingspot variability in males of Calopteryx splendens Harris, 1782 within a population in the Vils River in Bavaria (pp. 1-2); – Comparison: Structural imaginal features for discrimination in Gomphus vulgatissimus Linnaeus, 1758 and G. schneideri Selys, 1850 (pp. 3-6); – New results from the South East Caspian territory: Gomphus amseli Schmidt, 1961 versus G. schneideri amseli Schmidt, 1961; Gomphus schneideri transcaspicus ssp. nov. (pp. 7-14). – No. 6: *Seidenbusch, R.*: Comparison of the exuviae in Enallagma cyathigerum Charpentier, 1840, E. boreale Selys, 1875, E. risi Schmidt, 1961 (Zygoptera: Coenagrionidae) (pp. 1-3); – Need in solving taxonomic puzzles: Leucorrhinia orientalis Selys, 1887 versus L. dubia orientalis Selys, 1887, Sympetrum imitans Selys, 1886 versus S. vulgatum imitans Selys, 1886, S. sinaiticum arenicolor Jödicke, 1994 versus S. deserti arenicolor Jödicke, 1994 (= decoloratum Selys, 1884 sensu Bartenef, 1915) (pp. 4-6); – Variability in the structure of the lamina anteriores in Orthetrum coerulescens Fabricius, 1798 and O. c. anceps Schneider, 1845 (pp. 7-9); – Morphological comparison in the Enallagma deserti-complex: E. deserti Selys, 1871, E. boreale Selys, 1875, E. circulatum Selys, 1883, E. belyshevi Haritonov, 1975, E. risi Schmidt, 1961 (pp. 10-15).

(11482) *SYMPETRUM, GRENOBLE.* Revue d'odonatologie, No. 10 (Spécial 10 ans; March 1997). – (c/o C. Deliry, G.R.P.L.S., La Paulette, 2338 rte de Belley, F-38490 Aoste).
This is an anniversary issue; the articles are mostly retrospective, related to the history of the G.R.P.L.S. and the journal, and they are unsigned.

(11483) *SYMPETRUM HYOGO*, Vol. 4 (16 Feb. 1997) (Jap., with Engl. s's). – (c/o: S. Nishu, 247, Gunge Shohnomoto, Higashinada-ku, Kobe, 658, JA; – distribution outside Japan: K. Inoue, 5-9, Fuminosato 4-chome, Abeno-ku, Osaka, 545, JA). *Nishu, S.*: A male Libellula angelina at Okegaya-numa Pond, Iwata city, Shizuoka pref. (p. 1; cover phot.); – *Aoki, T.*: Odonata fauna of Kobe city, pt 5 (Lestidae) (pp. 2-4); – Lanthus fujiacus (Fraser) was discovered in Kobe city, Hyogo pref. (p. 4); – *Wada, N. & K. Inoue*: First record of Zyxomma obtusum from Kuroshima Island, Taketomi-cho, Okinawa pref. (pp. 5-7); – *Nishu, S.*: Report of the survey trip of the Hyogo Society of Odonatology, pt 1 in 1996 (pp. 8-13); – *Sogame, S.*: A male Sympetrum pedemontanum elatum with an aberrant wing brown marking (p. 14); – *Aoki, T.*: Dragonflies inhabiting Shijimi River in Shijimi-cho, Miki city, Hyogo pref. (p. 15); – *Muraki, A.*: A case of oviposition of Epiophlebia superstes in Gifu pref. (pp. 16-17); – *Nishu, S.*: Report of the survey trip of the Hyogo Society of Odonatology, pt 2 in 1996 (pp. 18-24); – *Aoki, T.*: Odonata fauna of Kobe city, pt 6 (Calopterygidae) (pp. 25-27); – *Nishu, S.*: Report of the survey trip of the Hyogo Society of Odonatology, pt 3 in 1996 (pp. 28-31).

(11484) UREMOVIĆ, M. & G. TALIĆ, 1997. *Utvrđivanje taksonomske pripadnosti dviju populacija roda Calopteryx (Insecta, Odonata) s područja Nacionalnog parka Krka. – [A study on the taxonomic status of two Calopteryx populations (Insecta, Odonata) from the Krka National Park].* Učenički rad za susret i natjecanje mladih biologa Hrvatske, Zagreb, iv+26 pp., 1 fold. map incl. (Croatian). – (c/o Prof. R. Halapir-Franković, Barutanski breg 30, CRO-10000 Zagreb).
The C. splendens population of Roški slap is characterised by androchrome ♀♀ (a feature of balcanica), while these are heterochromous in the Skradinski bug population (resembling ancilla). The analysis of wing features revealed that the Krka splendens-complex does not represent 2 different taxa, but rather a mixed population, with the features of both of them. Croatia.

(11485) VALTONEN, P., 1997. Suku Aeshna Suomessa ja Pirkanmaalla. 1. – Das Geschlecht Aeshna in Finnland und in Pirkanmaa, 1. *Diamina* 6: 6-12. (Finn., with Germ. s.). – (Kaukolankija 2, FIN-33820 Kangasala).
8 spp. are represented in Finland; caerulea, cyanea, grandis and viridis are dealt with in the present

paper. The synonymy, diagnostic features, biology and the national status and distribution (maps incl.) are stated for each sp.

(11486) VAN DER WEIDE, M. & R. KETELAAR, 1997. *Haalbaarheid van een monitoringprogramma van libellen in Nederland. – [Feasibility of a dragonfly monitoring programme in the Netherlands.]* Vlinderstichting, Wageningen, [Report No. VS 97.06], ii+58 pp. ISBN none.(Dutch). – (Orders to: J.G. van der Made, De Vlinderstichting, P.O. Box 506, NL-6700 AM Wageningen).
The possibilities for, and the requirements of a reliable odon. monitoring system are outlined, and some examples are presented.

(11487) VERBEEK, P.J.M. & J.T. HERMANS, 1997. Libellen in een landbouwgebied (Relatienota Gebied Lilbosch). – Dragonflies of the Lilbosch area. *Natuurh. Maandbl.* 86(4): 93-97. (Dutch, with Engl. s.). – (Second Author: Hertestraat 21, NL-6067 ER Linne).
The odon. fauna of several man-made ponds in Zuid Limburg prov., the Netherlands, is described and discussed in terms of pond morphology and cattle grazing impact. The ponds are up to 1 m deep, and have very gentle slopes (1:5). Ca 20 spp. have colonized the area and 29 spp. were hitherto sighted. The ponds are not fenced, and the moderate grazing (1 cow or horse/ha) seems to have a very positive effect on the respective dragonfly communities.

(11488) WAKELING, J.M. & C.P. ELLINGTON, 1997. Dragonfly flight. 1. Gliding flight and steady-state aerodynamic forces. *J. exp. Biol.* 200(3): 543-556. – (First Author: Gatty Marine Lab., Sch. Biol. & Med. Sci., Univ. St Andrews, Fife, KY16 8LB, UK).
The free gliding flight of Sympetrum sanguineum was filmed in a large flight enclosure. Reconstruction of the glide paths showed the flights to involve accelerations. Where the acceleration could be considered constant, the lift and drag forces acting on the dragonfly were calculated. The maximum lift coefficient (C_L) recorded from these glides was 0.93; however, this is not necessarily the maximum possible from the wings. Lift and drag forces were additionally measured from isolated wings and bodies of S. sanguineum and Calopteryx splendens in a steady air flow at Reynolds numbers of 700-2400 for the wings and 2500-15000 for the bodies. the maximum lift coefficients ($C_{L\,max}$) were 1.07 for S. sanguineum and 1.15 for C. splendens, which are greater than those recorded for all other insects except the locust. The drag coefficient at zero angle of attack ranged between 0.07 and 0.14, being little more than the Blassius value predicted for flat plates. Dragonfly wings thus show exceptional steady-state aerodynamic properties in comparison with the wings of other insects. A resolved-flow model was tested on the body drag data. The parasite drag is significantly affected by viscous forces normal to the longitudinal body axis. The linear dependence of drag on velocity must thus be included in models to predict the parasite drag on dragonflies at non-zero body angles.

(11489) WAKELING, J.M. & C.P. ELLINGTON, 1997. Dragonfly flight. 2. Velocities, accelerations and kinematics of flapping flight. *J. exp. Biol.* 200(3): 557-582. – (First Author: Gatty Marine Lab., Sch. Biol. & Med. Sci., Univ. St Andrews, Fife, KY16 8LB, UK).
The free flapping flight of Sympetrum sanguineum and Calopteryx splendens was filmed in a large flight enclosure at 3000 frames s^{-1}. The wingtip kinematics are described for these flights. Despite the two species being similar in size, the damselfly flew with wingbeat frequencies half those of the dragonfly. The damselfly could perform a clap and fling, and the proximity to which the wings approached each other during this manoeuvre correlated with the total force produced during the wingstroke. The dragonfly beat its wings with a set inclination of the stroke planes with respect to the longitudinal body axis; the damselfly, in contrast, showed a greater variation in this angle. Both spp. aligned their stroke planes to be nearly normal to the direction of the resultant force, the thrust. In order to achieve this, the dragonfly body alignment correlated with the direction of thrust. However, the damselfly body alignment was independent of the thrust direction. Velocities and accelerations were greater for the dragonfly than for the damselfly. However, non-dimensional velocities and accelerations normalised by the wingbeat periods were greater for the damselfly.

(11490) WAKELING, J.M. & C.P. ELLINGTON, 1997. Dragonfly flight. 3. Lift and power requirements. *J. exp. Biol.* 200(3): 583-600. – (First Author: Gatty Marine Lab., Sch. Biol. & Med. Sci.,

Univ. St Andrews, Fife, KY16 8LB, UK).
A mean lift coefficient quasi-steady analysis has been applied to the free flight of Sympetrum sanguineum and Calopteryx splendens. The analysis accommodated the yaw and accelerations involved in free flight. For any given velocity or resultant aerodynamic force (thrust), the damselfly mean lift coefficient was higher than that for the dragonfly because of its clap and fling. For both spp., the maximum mean lift coefficient C_L was higher than the steady $C_{L\,max}$. Both spp. aligned their strokes planes to be nearly normal to the thrust, a strategy that reduces the C_L required for flight and which is different from the previously published hovering and slow dragonfly flights with stroke planes steeply inclined to the horizontal. Owing to the relatively low costs of accelerating the wing, the aerodynamic power required for flight represents the mechanical power output from the muscles. The maximum muscle mass-specific power was estimated at 156 and 166 Wkg^{-1} for S. sanguineum and C. splendens, respectively. Measurements of heat production immediately after flight resulted in mechanical efficiency estimates of 13% and 9% for S. sanguineum and C. splendens muscles, respectively.

(11491) WILDERMUTH, H., 1997. *Systematik und Biologie der Libellen.* Zool. Inst. Univ. Zürich, Zürich. 102 pp., 20 app. excl. – (Haltbergstr. 43, CH-8630 Rüti).
A revised text of the work as listed in *OA* 10333.

(11492) *WILLIAMSONIA*, Vol. 1, No. 2 (March 1997). Published by the Michigan Odonata Survey. – (c/o M.F. O'Brien, Insect Div., Mus. Zool., Univ. Michigan, Ann Arbor, MI 48109-1079, USA).
[Signed articles:] *O'Brien, M.*: MOS cataloguing project (p. 1); – *Kielb, M.A.*: Additions and corrections to the Odonata of Michigan (pp. 1-2); – *O'Brien, M.*: Records of spring Odonata (pp. 2-3); – *Beckemeyer, R.*: A letter to the Editor (p. 3); – *Kielb, M.A.*: Nannothemis bella (Uhler) in Michigan (Libellulidae) (p. 4); – *O'Brien, M.*: Tachopteryx thoreyi status changed (p. 5); – Proposal to have Anax junius named as Michigan's state insect (pp. 6-7); – *Bright, E.*: New larval Odonata records for Michigan (p. 10). – The issue also contains information on the MOS and various announcements and notes of local and general interest alike.

(11493) WISENDEN, B.D., D.P. CHIVERS & R.J.F. SMITH, 1997. Learned recognition of predation risk by Enallagma damselfly larvae (Odonata, Zygoptera) on the basis of chemical cues. *J. chem. Ecol.* 23(1): 137-151. – (First Author: Cent. Ecol., Evol. & Behav., Morgan Sch. Biol. Sci., Univ. Kentucky, Lexington, KY 40506-0225, USA).
2 populations of E. boreale larvae were studied: one of these cooccurred with a predatory fish (northern pike, Esox lucius); the other did not. Damselflies that cooccurred with pike adopted antipredator behavior (reduced activity) in response to chemical stimuli from injured conspecifics, and to chemical stimuli from pike, relative to a distilled water control. Damselflies from an area where pike do not occur responded only to chemical stimuli from injured conspecifics. In a second set of experiments, we conditioned pike-naive damselflies to recognize and respond to chemical stimuli from pike with antipredator behavior. Damselfly larvae that were previously unresponsive to pike stimuli learned to recognize pike stimuli after a single exposure to stimuli from pike and injured damselflies or pike and injured fathead minnows (Pimephales promelas). The response to injured fathead minnows was not a general response to injured fish because damselfly larvae did not respond to chemical stimuli from injured swordtails (Xiphophorus helleri), an allopatric fish. Taken together, these data suggest a flexible learning program that allows damselfly larvae to rapidly acquire the ability to recognize local predation risk based on chemical stimuli from predators, conspecifics, and heterospecific members of their prey guild.