

**ECTOPARASITIC WATER MITE LARVAE
OF THE GENUS *ARRENURUS*
ON THE DAMSELFLY *COENAGRION PUELLA* (LINNAEUS)
(ZYGOPTERA: COENAGRIONIDAE)**

R.A. BAKER¹, P.J. MILL¹ and A. ZAWAL²

¹ School of Biological Sciences, University of Leeds, Leeds LS2 9JT, United Kingdom
pabrab@leeds.ac.uk / p.j.mill@leeds.ac.uk

² Department of Invertebrate Zoology and Limnology, University of Szczecin,
Waska 13, PO-71-415 Szczecin, Poland
zawal@univ.szczecin.pl

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Parasitic larval mites of the genus *Arrenurus* have been found on *C. puella*. *A. bicuspidator*, *A. cuspidator* and *A. maculator* make up over 80% of the total mites identified. The other spp. found were *A. bruzelii*, *A. claviger* and members of the *A. affinis* complex. Mites are found mainly between the second and third pairs of legs and behind the third pair. *A. bicuspidator* and *A. cuspidator* share these sites with numbers spread roughly equally on both sites. *A. maculator* is found almost exclusively behind the third pair of legs and on the first abdominal segment of the host. Smaller numbers are found on the abdominal segments where *A. claviger* is the dominant species. The larval mites show a preference for ♀ hosts. Size differences between the *Arrenurus* spp. are considered.

**SITE FIDELITY, SATELLITE TACTICS AND
MATING SUCCESS IN *LIBELLULA FULVA* (MÜLLER)
(ANISOPTERA: LIBELLULIDAE)**

B.H. NAGY^{1*}, N. SZÁLLASSY² and G. DÉVAI¹

¹Department of Hydrobiology, University of Debrecen, Egyetem tér 1, HU-4032 Debrecen, Hungary

²Faculty of Psychology and Science Education, Babeş-Bolyai University, G. Bilişcu 24,
RO-400015 Cluj, Romania

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The site fidelity and satellite behaviour in relation to mating success were investigated in *L. fulva* ♂♂ during 2 reproductive seasons (2002-2003) in eastern Hungary. There was no difference in mating success in ♂♂ that were faithful to 1, 2 or 3 independent territories. Those that were site-faithful had a higher mating success than non site-faithful ♂♂. Site-faithful ♂♂ showed satellite behaviour more frequently than non site-faithful ones. ♂♂ used both of the 2 tactics and this switching ability was independent of ♂ body size. The better mate-rewarding tactic appears to show site fidelity and satellite behaviour alternatively.

RESIDENCE AND TERRITORIAL CHARACTERISTICS OF LIBELLULIDAE SPECIES IN A NEOTROPICAL ASSEMBLAGE (ANISOPTERA)

D.C. RESENDE^{1*} and P. DE MARCO, Jr²

¹ Laboratório de Ecologia e Solos, Curso de Ciências Biológicas,
Centro Universitário do Leste de Minas Gerais, R. Bárbara Heliodora, 725 Bom Retiro,
BR-35160-215, Ipatinga, MG, Brazil
dcresende@ig.com.br

² Laboratório de Ecologia Teórica e Síntese, Departamento de Biologia Geral,
Universidade Federal de Goiás, BR-74001-970, Goiânia, Goiás, Brazil
pdemarco@icb.ufg.br

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During territorial behaviour, aggressive attacks among heterospecific odon. ♂♂ are common and may cause a separation of niches, based on the preferred sites for territorial defence. Here, territorial behaviour and the characteristics of territories in ♂♂ of *Erythrodiplax media*, *Micrathyria catenata* and *M. hesperis* are described and their territorial fidelity, capturing and marking of ♂♂ are discussed. In all spp. studied, there was a clear distinction among the microhabitats defended as territories. In both *Micrathyria* spp., ♂♂ seem to defend territories with defined resources. In *E. media*, the defended resources are less evident. Its ♂♂ are highly aggressive and show high territorial fidelity but, apparently, they lose the territory if they stay away from water for at least one day.

* Corresponding author

**SEXUAL SELECTION AS THE POSSIBLE UNDERLYING
FORCE IN CALOPTERYGID WING PIGMENTATION:
COMPARATIVE EVIDENCE
WITH *HETAERINA* AND *CALOPTERYX*
(ZYGOPTERA: CALOPTERYGIDAE)**

M.A. SERRANO-MENESES¹, G. SÁNCHEZ-ROJAS² and A. CÓRDOBA-AGUILAR^{3*}

¹ Department of Biology and Biochemistry, University of Bath, Claverton Down,
Bath BA2 7AY, United Kingdom

² Centro de Investigaciones Biológicas, Universidad Autónoma del Estado de Hidalgo,
Apartado Postal 69-1, Pachuca, MX-42001 Hidalgo, Mexico

³ Departamento de Ecología Evolutiva, Instituto de Ecología, Universidad Nacional Autónoma
de México, Apdo. Postal 70-275, MX-04510 México, D.F., Mexico
acordoba@ecologia.unam.mx

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Five hypotheses for the evolution of conspicuous ♂ wing pigmentation have been proposed: sexual selection, differential niche utilisation, predator warning, social badge and ecological character displacement. Here, the sexual selection and ecological character displacement hypotheses are compared. First, the coefficients of variation (CVs) of pigmentation were compared against the CVs of a selected set of other animals' traits that are known to be maintained by either natural or sexual selection. *Hetaerina americana*, *H. vulnerata*, *Calopteryx aquabilis*, *C. haemorrhoidalis* and *C. xanthostoma* were used in order to compare CVs. Second, it was predicted that pigmentation should not differ in spp. whose populations are in sympatry (compared to allopatry) if sexual selection is driving the evolution of pigmentation (compared, for example, to an ecological character displacement hypothesis in which pigmentation between spp. should differ). Here, the pigmentation of sympatric and allopatric populations of *H. americana* and *H. vulnerata* were compared. The study produced 2 main results. First, the CVs of pigmentation were not different from the CVs of sexually selected traits in other animals; nevertheless, they were different from those of naturally selected traits. Second, the pigmentation of the 2 spp. in sympatry did not differ significantly. The same was true for allopatric populations. Taken together, these results suggest that sexual selection is the main mechanism of maintenance of pigmentation in these animals. Other alternative hypotheses for the evolution of pigmentation (differences in habitat use in both sexes, warning to predators by ♂ ♂ and ecological character displacement) are discussed in the light of these results.

THE FIJIAN *NESOBASIS*: A FURTHER EXAMINATION OF SPECIES DIVERSITY AND ABUNDANCE (ZYGOPTERA: COENAGRIONIDAE)

H. VAN GOSSUM^{1,*}, C.D. BEATTY², M. TOKOTA'A³ and T.N. SHERRATT⁴

¹ Evolutionary Ecology Group, University of Antwerp, Groenenborgerlaan 171,
B-2020 Antwerp, Belgium

² Grupo de Ecología Evolutiva, Departamento de Ecología y Biología Animal,
Universidad de Vigo, EUET Forestal, Campus Universitario, ES-36005 Pontevedra, Galicia, Spain

³ International Conservation, South Pacific Program, 11 Ma'afu Street, Suva, Fiji

⁴ Department of Biology, Carleton University, 1125 Colonel By Drive, Ottawa,
Ontario, K1S 5B6, Canada

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Recently, an overview of the diversity, abundance, distribution and morphological characteristics of spp. of the genus *Nesobasis*, endemic to Fiji, was presented for spp. occurring on the 2 largest islands of the archipelago: Viti Levu and Vanua Levu. Here, this knowledge is extended by providing more extensive diversity and abundance data for the island of Vanua Levu, as well as for 4 smaller islands in Fiji: Taveuni, Koro, Ovalau and Kadavu. Previous research indicated that the *Nesobasis* spp. inhabiting Viti Levu and Vanua Levu are unique, with these islands having no species in common. The new data confirm this proposal and also show that smaller islands in proximity to these 2 larger islands usually contain a subset of the large island's *Nesobasis* fauna. The island of Koro, however, is unusual in that, while its *Nesobasis* spp. are predominantly those found on Vanua Levu, it also harbours *N. rufostigma*, a sp. occurring on Viti Levu. Further, *N. recava* is endemic to Kadavu and is not found on Viti Levu, the nearest large island. Species richness is higher on large than small islands while mean species abundances were consistently higher on large islands compared to small islands. The pattern of distribution and speciation in this genus is quite complex, and is the subject of ongoing research.

* Corresponding author: hans.vangossum@ua.ac.be

**A STUDY OF THE GENUS *CALICNEMIA* STRAND IN CHINA,
WITH THE DESCRIPTIONS OF TWO NEW SPECIES
(ZYGOPTERA: PLATYCNEMIDIDAE)**

X. YU & W. BU*

Institute of Entomology, College of Life Sciences, Nankai University,
Tianjin, 300071 China

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C. gulinensis sp. n. (holotype ♂: Gulin, Sichuan, China, 2-VII-2001), *C. porcata* sp. n. (holotype ♂: Mt Emei, Sichuan, China, 4-VII-1957), are described and a brief synopsis of the Chinese spp. of the genus *Calicnemia* Strand, 1928 is presented.

SHORT COMMUNICATIONS

**THE LAST INSTAR LARVA OF
GYNACANTHA VILLOSA GRUENBERG
AND *G. MANDERICA* GRUENBERG
(ANISOPTERA: AESHNIDAE)***

G. CARCHINI and M. DI DOMENICO
Dipartimento di Biologia, Università "Tor Vergata",
Via della Ricerca Scientifica snc, I-00133 Roma, Italy

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The larval morphology of the 2 spp. is described for the first time from specimens collected in East Africa, and a comparison between the spp. is given.

* Dedicated to the memory of the recently deceased Professor Dr Philip S. CORBET. Aside of his exceptional contribution to the study of the Odonata, we are in debt to him for the kind gift of his African Odonata exuviae collection. Both the present paper and our previous publication on *Hadrothemis* are based on his specimens and we hope to honour his memory with other descriptions of his material in the future.

**THE LARVA OF *ARGIA CROCEIPENNIS* SELYS
(ZYGOPTERA: COENAGRIONIDAE)**

J. M. COSTA¹, C.T. RAVANELLO² and G.M. SOUZA-FRANCO²

¹ Museu Nacional, Universidade Federal do Rio de Janeiro, Quinta da Boa Vista,
São Cristovão, BR-20940-040 Rio de Janeiro, RJ, Brazil
jcosta@globo.com

² Centro de Ciências Agro-Ambientais e de Alimentos,
Universidade Comunitária Regional de Chapecó, BR-89809-000 Chapecó, SC, Brazil
gfranco@unochapeco.edu.br

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The larva is described and illustrated for the first time, based on a specimen from southern Brazil. The features separating *A. croceipennis* from *A. insipida*, *A. pulla* and *A. sordida* are outlined.

**DESCRIPTIONS OF THE FULL-GROWN *CEPHALAESCHNA*
PATRORUM NEEDHAM AND *PLANAESCHNA SHANXIENSIS*
ZHU & ZHANG LARVAE FROM CHINA
(ANISOPTERA: AESHNIDAE)**

Y.-H. JIANG¹ and H.-M. ZHANG²

¹ Yuntaixiang Culture Station, Xinpu District, Lianyungang City, Jiangsu-222064, China
jiangyh26@yahoo.com.cn

² Dalian Light Industry University, Dalian City, Liaoning-16034, China

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The ♂ and ♀ ultimate instar larvae of the 2 spp. from the Beijing area are described and illustrated. Differential characters with other species from Taiwan, Hong Kong, China and Japan are summed up.

**DESCRIPTION OF THE LARVA OF
PROTONEURA AILSA DONNELLY
(ZYGOPTERA: PROTONEURIDAE)**

F. MEURGEY

Muséum d'Histoire Naturelle, 12 rue Voltaire, F-44000 Nantes, France
Francois.Meurgey@mairie-nantes.fr

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The last instar larva is described and illustrated for the first time based on specimens from Martinique in the Lesser Antilles. Additional notes on its ecology and larval habitat are included.