Odonatologica 36(4): 339-347 *December 1, 2007*

MITES ON ZYGOPTERA, WITH PARTICULAR REFERENCE TO *ARRENURUS* SPECIES, SELECTION SITES AND HOST PREFERENCES

R.A. BAKER[1]*, P.J. MILL[1] and A. ZAWAL[2]
[1] School of Biological Sciences, University of Leeds, Leeds LS2 9JT, United Kingdom
[2] Department of Invertebrate Zoology and Limnology, University of Szczecin,
Waska 13, PO-71-415 Szczecin, Poland
zawal@univ.szczecin.pl

Received February 26, 2007 / Reviewed and Accepted April 4, 2007

Larval mites of several *Arrenurus* spp. are found as parasites on Zygoptera. Data from Poland on prevalence, loads, and host specificity are presented. The larval mites are identified and their site selection and host preferences recorded. 7 Zygoptera spp. and 7 spp. of arrenurid mite have been studied. Particular attention has been paid to *Coenagrion puella* and its parasites. New host records are included.

* **Corresponding Author**: pabrab@leeds.ac.uk

Odonatologica 36(4): 349-364 *December 1, 2007*

A REVIEW OF THE ODONATA OF KAZAKHSTAN

I.A. CHAPLINA[1], H.J. DUMONT[2], A.Yu. HARITONOV[1] and O.N. POPOVA[1]*

[1] Institute of Animal Systematics and Ecology, Siberian Division of Russian Academy of Sciences, Frunze 11, RUS-630091 Novosibirsk, Russia; pc@eco.nsc.ru

[2] Animal Ecology, Ghent University, Ledeganckstraat 35, B-9000 Ghent, Belgium; Henri.Dumont@UGent.be

Received August 7, 2006 / Revised and Accepted March 22, 2007

The odonate fauna of Kazakhstan (86 spp.) is reviewed, using literature data, miscellaneous collections and the results of an expedition by the authors in July 2004. *Aeshna caerulea, A. subarctica, Somatochlora graeseri* (all from the S Altai mountains), *Macromia amphigena fraenata* (Sibinskie Lakes near Ust'-Kamenogorsk), *Calopteryx samarcandica, Coenagrion hylas* and *Anormogomphus kiritchenkoi* (all based on specimens in Zool. Inst. Russ. Acad. Sci., St. Petersburg) are first records for the country.

* Author names are in alphabetical order

Odonatologica 36(4): 365-372 *December 1, 2007*

A REVISED MOLECULAR PHYLOGENY OF THE CALOPTERYGINAE (ZYGOPTERA: CALOPTERYGIDAE)

H.J. DUMONT, A. VIERSTRAETE and J.R. VANFLETEREN
Department of Biology, Ghent University, Ledeganckstraat 35, B-9000 Gent, Belgium
Henri.Dumont@UGent.be

Received June 16, 2007 / Reviewed and Accepted August 2, 2007

An updated version of an ITS-based phylogeny of the Calopteryginae, using sequences of 31 ingroup taxa, is given. The subfamily consists of 3 main clades, each with 2 subclades. Only clade 1 (*Calopteryx* s. s.) is not exclusively Asian but extends to Europe and North America. In the East-Asian clade 2, the genus *Matrona* is found to be descended from an *Atrocalopteryx*-like ancestor. Several so-called South-East Asian *Calopteryx* probably either belong to *Atrocalopteryx* or to as yet unnamed genera near *Atrocalopteryx*. *Archineura* consists of 2 spp., limited to China and Indo-China, and is rather basal to clade 3. The subclade *Neurobasis-Matronoides* is worthy of further analysis.

Odonatologica 36(4): 373-379 *December 1, 2007*

ULTRASTRUCTURAL ORGANIZATION OF THE LARVAL SPIRACLES IN *LIBELLULA DEPRESSA* L. (ANISOPTERA: LIBELLULIDAE)

E. GAINO*, S. PIERSANTI and M. REBORA
Dipartimento di Biologia Cellulare e Ambientale, Università degli Studi di Perugia, Via Elce di Sotto, I-06123 Perugia, Italy

Received February 9, 2007 / Revised and Accepted March 17, 2007

In the last larval instar (F-0) of *L. depressa*, 2 paired spiracles, in the form of elongated eye-shaped structures, are located in the anterior region of the mesothorax segment. A fine structural analysis of these spiracles under the scanning and electron microscopes reveals that each spiracle consists of a well-developed cuticular peritreme with a dorsal-anterior lip bearing a thin laminar coat and a ventral-posterior lip bearing a filter apparatus. The filter apparatus derives from a series of folds forming discrete groups adhering to one another to delimit empty spaces and producing a honeycomb-like structure. This structure is coherent with the need to avoid entry of water when the larva is submerged. The function of these spiracles during the insect development is discussed, noting that in anisopteran larvae the rectal epithelium, forming the so called branchial basket, is the main respiratory organ.

*__Corresponding Author__: Prof. Elda Gaino, Tel.: ++390755855729; fax: ++390755855733; E-mail: gaino@unipg.it

Odonatologica 36(4): 381-397 *December 1, 2007*

ENERGY EXPENDITURE IN PATROLLING MALES OF *CORDULIA AENEA AMURENSIS* SELYS (ANISOPTERA: CORDULIIDAE)

N. ISHIZAWA
1644-15 Yamaguchi, Tokorozawa, Saitama, 359-1145, Japan
sieba4318@rivo.mediatti.net

Received June 16, 2006 / Revised and Accepted February 9, 2007

The ♂♂ hover frequently during patrolling flight, and fiercely chase rival ♂♂. Their patrolling flight was videotaped and analyzed. The average net-patrol flight speed (except hovering) was 161.6±30.6 cm/s faster in the morning and the evening than during the day. Also, hovering frequency was more frequent and the duration of hovering bouts was longer in the morning and the evening than during the day, and was synchronized with patrolling flight speed. However, chasing flight was not related to patrolling or hovering and the duration of chasing bout was about 4-5 seconds with an average flight speed of 274.6±64.7cm/s. The body temperatures of patrolling flight and chasing flight were significantly different; the former, 39.8±1.4ºC, the latter was 40.4±1.0ºC. The time budget of patrolling males based upon video pictures was calculated and the relative energy expenditure of patrolling ♂♂ was estimated by standardizing the average net-patrolling flight speed as 1. Energy expenditure of the ♂♂ was greater in the morning and the evening than during the day. It is assumed that energy expenditure was affected by ambient temperatures, with ♂♂ changing the flight speed and duration of hovering. The ♂♂ are inferior in their sex recognition and it is assumed that their frequent hovering with concurrent large energy expenditure is to enable ♂♂ to distinguish ♀♀.

Odonatologica 36(4): 399-403 *December 1, 2007*

SHORT COMMUNICATIONS

THE LARVA OF *GOMPHIDIA T-NIGRUM* SELYS FROM NEPAL (ANISOPTERA: GOMPHIDAE)

S.G. BUTLER
Red Willow, All Stretton, Shropshire SY6 6HN, United Kingdom
sgbutler15@btopenworld.com

Received November 10, 2006 / Revised and Accepted March 22, 2007

The final instar exuviae from the Phewa Tal lake at Pokhara, Nepal is described and illustrated and comparison is made with *Ictinogomphus rapax* larvae, inhabiting the same water body. Mention is made of the more noted differences between the SE Asian Lindeniinae genera.

Odonatologica 36(4): 405-414 *December 1, 2007*

THE LARVA OF *HETAERINA MENDEZI* JURZITZA, WITH COMMENTS ON *H. ROSEA* SELYS (ZYGOPTERA: CALOPTERYGIDAE)

N. VON ELLENRIEDER
Instituto de Bio y Geociencias, Museo de Ciencias Naturales, Universidad Nacional de Salta,
Mendoza 2, AR-4400 Salta, Argentina
odo_nata@hotmail.com

Received September 1, 2006 / Reviewed and Accepted October 3, 2006

H. mendezi larva is described and illustrated for the first time based on specimens from Misiones Province, Argentina. Larvae of *H. rosea* from NW Argentina are found to partially differ from its original larval description, and that species is re-diagnosed. A comparative table for all known larvae of *Hetaerina* and related calopterygid genera is provided.

Odonatologica 36(4): 415-419 *December 1, 2007*

OBITUARY

IMATO SONEHARA

A brief biography of I. Sonehara (28 January 1921-12 May 2000), a science teacher and the author of "*The life history of* Epitheca bimaculata sibirica *on Mt. Yatsugatake*" is followed by his odonatological bibliography (1962-1996; 66 titles).