

Ladislav BOCÁK

Phylogeny of the family Lycidae (Insecta, Coleoptera)

HABILITAČNÍ PRÁCE

Oponentský posudek

Neznám zvyklosti Palackého university v Olomouci, a nevím, zda anglicky psaná habilitační práce má mít oponentský posudek anglický či český. Volím tedy - zejména proto, že neznám jméno ani národnost dalšího oponenta (oponentů) - anglickou alternativu.

The thesis is written in English, and has been prepared partly in Olomouc, partly in the Institute of Advanced Science and Technology in Osaka (Japan). In addition to a short concise Introduction (p. i-iii), it consists of three parts, as follows.

- (1) Bocák L.: Phylogeny of the family Lycidae (Insecta, Coleoptera) inferred from multiple DNA sequences. (MS 2003; status and periodical not specified.) 15 pp., 5 figs;
- (2) Bocák L. & Matsuda K.: Review of the immature stages of the family Lycidae (Insecta: Coleoptera). *Journal of Natural History*, accepted, in press (2003 ?), 53 pp., 120 figs (Bocák's share - 66% [see the appended Matsuda's statement]);
- (3) Bocák L. 2002: Generic revision and phylogenetic analysis of the Metriorrhynchinae (Coleoptera: Lycidae). *Eur. J. Entomol.* 99: 315-351, 163 pp., 3 tabs.

All the three parts are scientifically excellent, and clearly show author's ability of original and creative research in alpha- and beta-taxonomy, morphology, ontogenetics and phylogeny of animals, specifically insects. L. Bocák formulates testable and falsifiable phylogenetic and classificatory hypotheses within the paradigm of hennigian phylogenetic systematics as well as moderate version of transformed cladistics based on computer techniques and principle of parsimony. The sources of his data are classical morphological and macroecological characters (including data on juveniles) as well as data obtained by multiple sequencing of rDNA and mtDNA. L. Bocák mastered all the necessary laboratory and computational techniques necessary for modern studies in these directions.

For purposes of this thesis, the author modestly presents only three comprehensive recent papers, all concerning his adopted coleopteran family Lycidae. However, the goal would surely have been equally well achieved by submitting a selection from a plethora of his earlier excellent but topically more restricted papers. The family Lycidae is an excellent subject for a research in "evolutionary entomology" since its anagenesis, particularly that of the females, was obviously influenced by heterochronic, particularly paedomorphic and namely neotentic, alterations of

development. Equally widespread in the family is the most puzzling evolutionary phenomenon of mimetism, warning coloration and aposematism, still largely unknown even on the superficial observational level.

I shall only briefly characterize the papers forming the thesis.

The "molecular one" provides well supported hypothesis on the relationships of genera of the Lycidae representing all the subfamilies and most of the tribes. Data on ribosomal genes of 15 taxa from superfamilies Byrrhoidea, Buprestoidea and Elateroidea were used for rooting, and maximum parsimony criterion was applied. The results largely support classification of the family as suggested by Bocák & Bocáková (1990). The genera most affected by neoteny and previously of *incertae sedis* are found to form the basalmost clades of the family. Rather surprising is a discovery of a great cladistic distance between the Lycidae and Omalisidae. A non-specialist reader would probably welcome a tabular review of the classification of Lycidae including particularly the subfamily hierarchical level.

General morphology of all the known larvae and pupae, and diagnostic and differential characters of suprageneric as well as lower taxa are subjects of the paper co-authored by K. Matsuda. Bionomics and development of individual taxa are treated as well, and a key to mature larvae is included. The paper is accompanied by 120 good and well lettered anatomical illustrations. Most findings and descriptions are new, and are largely based on authors' own findings. The results are discussed within the general morphological and cladistic contexts, and the paper is formatted in the best tradition of students of larval taxonomy of the Coleoptera like R.G. Beutel, A.G. Böving, F.C. Craighead, J.F. Lawrence, and P. Švácha. My only critical comment refers to the title - instead of "Review of the immature stages ..." I would prefer "Review of larvae and pupae ...". Eggs are immature stages as well. Also the wording of title of the thesis as a whole is problematic as well - the parenthesized "... (Insecta, Coleoptera)" with a comma suggests a coordination of the names cited, while (correctly) usage of colon (:) would suggest subordination.

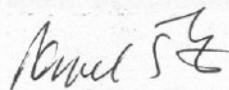
The last included paper is the generic revision and phylogenetic analysis (cladistic, based on morphology) species-richest clade of the Lycidae, the subfamily Metriorrhynchinae. None of the attributes a modern paper of such a nature should have is missing, many new results are included, the paper is kind of complete but still admirably concise, and I particularly appreciate the biogeographical analysis. I have no critical comments.

I should like to stress that all Bocák's (and the tandem's Bocák and Bocáková as well) publications have large impact on the understanding of taxonomy, phylogeny, morphology and development of Coleoptera, and are widely accepted by the World community of entomologists. In addition to enthusiastic, time-consuming and well planned research work I can identify three

factors responsible for that. First, a global approach - often underestimated - necessary for all beta-taxonomic and phylogenetic studies; second, marriage of taxonomy and comparative morphology on global insect scale; third, a recent incorporation of molecular evidence into phylogenetic reasoning.

Na základě předložené habilitační práce, předchozí vědecké publikační činnosti a pedagogické zkušenosti a aktivity Ing. L. Bočáka, Ph.D. bezvýhradně doporučuji přijmout předloženou thési "Phylogeny of the family Lycidae (Insecta, Coleoptera)" jako základ pro příslušné habilitační řízení a udělení pedagogické hodnosti DOCENT s přihlédnutím ke všem zákonným normám a nižším relevantním ustanovením.

Praha, 20.9.2003



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