

Four chapters about the monophyly of insect ‘orders’: A review of recent phylogenetic contributions

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Abstract. Recent phylogenetic analyses, both morphological and molecular, strongly support the monophyly of most insect ‘orders’. On the contrary, the Blattaria, Psocoptera, and Mecoptera are definitely paraphyletic (with respect of the Isoptera, Phthiraptera, and Siphonaptera, respectively), and the Phthiraptera are possibly diphyletic. Small relictual subclades that are closely related to the Isoptera, Phthiraptera, and Siphonaptera were identified (Cryptocercidae, Liposcelididae, and Boreidae, respectively), which provides an enormous amount of evidence about the origin and early evolution of the highly apomorphic eusocial or parasitic ex-groups. Position of the enigmatic ‘zygentoman’ *Tricholepidion* Wygodzinsky, 1961, remains uncertain. Possible non-monophyly of the Megaloptera (with respect of the Raphidioptera) and the Phasmatodea (with respect of the Embioptera) are shortly discussed.

Key words. Insecta, *Zygentoma*, *Tricholepidion*, Blattaria, Isoptera, *Cryptocercus*, Psocoptera, Phthiraptera, Liposcelididae, Mecoptera, Siphonaptera, Boreidae, Nannochoristidae, *Timema*, phylogeny, monophyly

Introduction

The goal of modern systematics is twofold: to provide a biological ‘*lingua franca*’ that facilitates an exchange of information among researchers, and to provide a hierarchical system that is meaningful in the context of our understanding of phylogenetic history. However, both goals are often in conflict. Phylogenetics is about a nested hierarchy of *clades*, without any privileged ‘rank’ (like ‘order’ or ‘family’). Traditional Linnean hierarchy, though superficially similar, is about *names* and *ranks* of the selected taxa which are ‘so important’ to deserve formal designation. However, there are no absolute ranks (a ‘genus’ of flies is not comparable in any way with a ‘genus’ of mammals), and the recent developments in systematic biology are