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N. Papavero: The world Oestridae (Diptera), mammals and continental drift.

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This monograph by the Brazilian entomologist N. Papavero deals with the classification and geographical distribution of botflies (family Oestridae), their relationship to hosts, and problems of evolutionary history due to continental drift.

The book is divided into four main parts. Part one, entitled "History, Folklore, Biology" deals with the history of knowledge about botflies from antiquity to the present, the utilization of botfly larvae as food by the Eskimos and gives a list of popular names applied to oestrids. This list is very unbalanced, partly giving a number of names in dialects of some languages (French, Italian, German and English) and partly omitting a considerable number of European and other languages. Many popular names are distorted and are incorrectly applied to the adult or larva (e. g. most Russian names adopted from Grunin's papers).

In Part two, entitled "Systematics and phylogeny of Oestridae", the author proposes modified systematics of this family. For relevant monotypic genera he adds two more subfamilies, Pharyngobolinae and Tracheomyiinae, to the present two subfamilies Cephenemyiinae and Oestrinae. In the subfamily Oestrinae he promotes genera to tribes and erects new genera by dividing the present ones which he includes in subtribes. For example, he divides the morphologically united genus *Cephenemyia* into the subtribe Acrocomyiina (for *C. auribarbis*), the subtribe Cephenemyiina including the genera *Procephenemyia* (for *C. stimulator*) and *Cephenemyia* (other species of genus). As distinguishing characters he considers the degree of carina development on clypeus and yellow or red colouring of hairs on genae. Similarly, in the subfamily Oestrinae the author promotes genera to tribes and erects new subtribes and genera on the basis of adaptive characters.

In modern systematics, however, subgenera let alone genera cannot be distinguished according to the degree of development of a certain morphological character, i.e. according to a purely quantitative feature, or according to colouring. There may be groups of closely related species, each indicated as "group of a given species", as currently known in other insect families. A similar unfounded fragmentation of the present taxa would create a confusing situation, especially in the families abundant in species, and was overcome long ago as atomistic tendency in systematics. In harmony with nomenclatoric rules new taxa should be correctly designated by relevant Latin abbreviations (e.g. "gen.n.", and not only "new"). The chapter devoted to the phylogeny of oestrids covers theoretical developmental trees of genera and species. According to the colouring of adults, this being quite an adaptive feature, the "primitivism" or "advancement" of individual species of the genus *Cephenemyia* can be judged with great difficulty. For example, the morphology of first instar larvae, also dealt with by Grunin from phylogenetical aspect, would be a more suitable distinguishing character. All figures in the systematic part are adopted from the books by Grunin and Zumpt.

Part three entitled "Characteristics of the hosts of Oestridae" presents a survey of hosts, with a vague and incomplete list of common names of mammal hosts, in which the language of the name's origin is not indicated. In the second chapter of this section the development of individual mammal groups is discussed on the basis of the paleontologic literature cited.

In Part four entitled "Hypothetical history of Oestridae evolution" the author presents his views on the phylogeny of oestrids. He presents a number of interesting paleontologic data on mammals, though discrepant and hardly explicable, accompanied by well-organized graphs showing the occurrence of individual mammal groups during the geological periods. He places the origin of oestrids at the Jurassic or Cretaceous of the Mesozoic era, basing his hypothesis on the data of the supposed period of separation of the continental crusts. He does not discuss the paleontology of higher Diptera at all. He assumes that since those ancient times the ancestors of oestrids have been parasites of the unknown predecessors of ungulates and that they gradually transferred to other, phylogenetically higher hosts. He does not compare his theories with the existing views on the development of oestrids, although Grunin, whose work the author cites in the references, has convincingly proved that Oestridae started a fully parasitic life on mammals only after the separation of main phylogenetic groups of ungulates and that the probability of their transfer to new hosts was very low. In the older family of gadflies (Gasterophilidae) a certain joint development with the individual families of Perissodactyla may be noted, but even these originated much later — in early Tertiary, so that the origin of specific parasitism of oestrids in a much earlier period seems to be less probable.

In the subsequent chapter of this section the author discusses the fact that at present the

family Oestridae is not represented in South America due to extinction of its hosts, the original ungulates of that continent. He presupposes again a very early specialization in parasitism and assumes that the present limited distribution of oestrids is due to a great number of extinctions of their hosts. However, the author himself admits that his conclusions are "highly speculative" (p. 208). These words may be also applied to his hypothesis about the hosts from which the oestrids of the genus *Tracheomyia* transferred to a relatively late developed large species of kangaroos in Australia, whose small omnivorous ancestors could not have been suitable hosts of oestrids. The author speculates that the oestrids transferred to kangaroos from unknown extinct ungulates which cannot be verified paleontologically, although it is obvious that in the hypothetical case of penetration of higher placental mammals into Australia, no marsupials could have survived there.

The author tried to treat a paleozoogeographically very interesting topic. His treatise is a compilation of data which he was not able to assess correctly from his own experience of systematist and paleontologist. From his suggestions for a new systematics of the family Oestridae the proposed higher taxonomic rank for the genera *Tracheomyia* and *Pharyngobolus* might be considered; the other suggestions, including all newly erected genera must be rejected for the above mentioned reasons. The comprehensive bibliography, comprising over 1000 references may be regarded as a valuable part of the monograph. The book is very well arranged graphically.

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