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On the family-level systematics of the Pterophoridae

Józef Razowski

Institute of Systematic and Experimental Zoology,
Polish Academy of Sciences, Sławkowska 17, 31-016 Kraków, Poland

Pending the revision of the Pterophoridae for the "Monographs of the Polish Fauna" series, I have drawn the following conclusions regarding the systematics of the Pterophoridae at the family level based on the assessment of certain morphological characters.

Past works encompassing the systematics of the Pterophoridae were accurately summarized by Yano (1963), who began with the work of Tutt (1907) and finished with the revised edition of Beirne (1954). Yano proposed the subdivision of the Pterophoridae into 3 subfamilies, i.e. Agdistinae, Platyptiliinae and Pterophorinae, thereby essentially following Spuler (1910). In addition to the external characters of the adult utilised by earlier authors, Yano took some larval and pupal features into account. Wasserthal (1970) erected a fourth subfamily, the Ochyroticinae, and proposed that the Agdistinae and Platyptiliinae constitute the sister group to the Pterophorinae and Ochyroticinae (fig. 1). This was based mainly on the

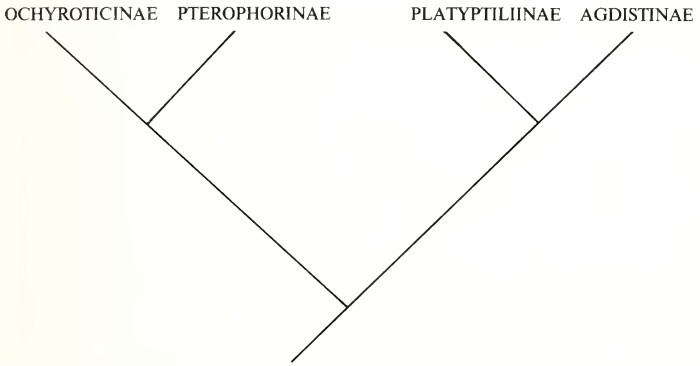

Fig. 1. Dendrogram of the subfamily-level taxa of the Pterophoridae (Wasserthal, 1970).

fact that pore DbI in the first instar larva was absent in the former group. In 1974, WASSERTHAL presented data on the folding of the wings and the venation which confirmed the close affinity between the subfamilies within the two sister groups. In the Ochyroticinae and Pterophorinae, the hind edge of the fold of the hindwing does not reach vein CuP, while in the Agdistinae and Platyptiliinae it runs along that vein. HANNEMANN (1979) summarized this data. Then KUZNETSOV and STEKOLNIKOV (1979) noticed that in the Platyptiliinae the protractor of the aedeagus (m5) is attached to the tegumen, while in the Pterophorinae it is attached to the vinculum. They interpreted this difference as being due to a secondary change of the position caused by a reduction of the vinculum as observed in all Pyraloidea, in which they placed the Pterophoridae.

In addition to these facts, I realised that muscle m5 in the Agdistinae is attached as in the Platyptiliinae and that some minor genital characters may correspond with that arrangement. Unfortunately, I have had no chance to examine any representative of the Ochyroticinae. So, basically, the arrangement proposed by WASSERTHAL, i.e. the splitting of 4 subfamilies into 2 sister groups, is accepted. However, due to a different assessment of the characters, I propose a rearrangement of the subfamilies within the sister groups (fig. 2). First, the reduction of pore DbI is insufficient to support the main division of the family as supposed originally. Its absence is treated (cf. also HANNEMANN, 1977) as an autapomorphy, despite HANNEMANN himself mentioning that the character is common to all Ditrysia. As all reductions, it is of limited value. A convergent specialisation of the wings appeared in the two sister

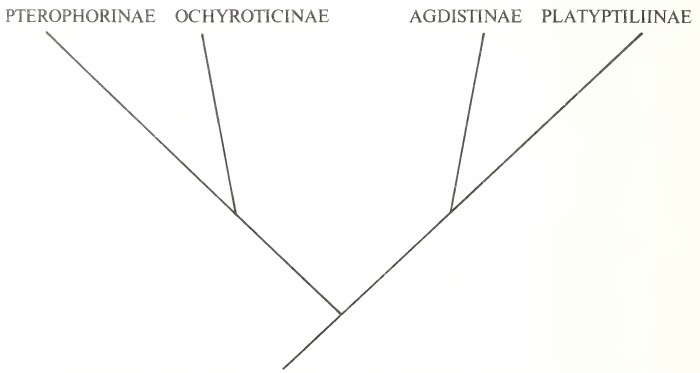

Fig. 2. Proposed new arrangement of the subfamilies of the Pterophoridae.

groups, from normally developed, to divided into "plumes". However, the method of folding the wings differed, which lead to a different venation. In the Ochyroticinae + Pterophorinae, the hind margin of the fold of the hindwing does not reach vein CuP which terminates at the tip of the third plume. This character can be regarded either as a plesiomorphy or autapomorphy equivalent to the presence of a single vein (An) in the third plume of the Agdistinae + Platyptiliinae. The attachment of the protractor of the aedeagus on the vinculum is certainly of plesiomorphic importance. Further plesiomorphies are a non-specialised structure of the male subgenital sternite, the presence of the pore DbI and the occurrence of a setal pattern which corresponds to that of the hypothetical Ditrysian type reconstructed by HASENFUSS (1963). The latter character, as already realised by WASSERTHAL (1970), directly depends on the life history of the larva and is thus of little importance.

The sister group Agdistinae + Platyptiliinae exhibits the following autapomorphies : the hind edge of the hindwing fold extends along vein CuP ; in the third plume of the hindwing only vein An is preserved, while vein CuP is strongly reduced, reaching the base of the cleft between the two posterior plumes ; the specialised, long, apically concave subgenital sternite of the male ; the attachment of the protractor of the aedeagus inside the tegumen. In addition, and due to a process of reduction, pore DbI is absent from the prothorax of the larva.

In the first group, the more derived subfamily is the Pterophorinae, as the wings are subdivided into plumes, with a simplified venation. Other characters are difficult to compare, as the Ochyroticinae are insufficiently known.

In the second group, the Agdistinae are more generalised than the Platyptiliinae, as they have non-divided wings and complete venation ; the male subgenital sternite is rather simple. The probable autapomorphies of the Platyptiliinae are the structure of the uncus and its junction with the tegumen, the presence of the outer sclerites at the base of the subgenital sternite in the male and the occurrence of the club-shaped process at the base of the valva dorsally. The Platyptiliinae developed plumate wings similar to the Pterophorinae, but they have different venation and another mode of folding the wings. The hindwing veins M_3, Cu_1 and Cu_2 are stalked and M_3 reaches the tip of the plume.

The probable autapomorphies of the Platyptiliinae, apart from the abovementioned plumate wings, are the presence of a single vein (An) in the hindwing and the presence of a strong ventral process of the aedeagus that functionally replaces the caulis. The strong development of the dorsal lobe or a pair of lobes of the tegumen may also be of apomorphic importance.

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