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Morphology of the rear of the chalcidoids associated with Ficus. Do they have a postgenal or a gular bridge?

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Abstract

Until recently, the classification of Chalcidoidea was based on morphological similarities and differences rather than on shared apomorphies. Furthermore, the morphology of the rear of the head of the chalcidoids has not been used in taxonomic classifications. However it has been noted that the occipital foramen is continuous with the oral cavity, or the two are separated by medial inflections of the postgenae to form a postgenal bridge. According to the classical taxonomy of the phytophagous wasps associated with Ficus (Moracea), the Agaonidae family has six subfamilies: Agaoninae (the pollinators), and the none-pollinating Epichrysomallinae, Otitesellinae, Sycoryctinae, Sycophaginae, and Sycoecinae. It has been noted that Agaonidae s.s. have the rear of the head below the occipital foramen closed by a postgenal bridge, which separates them and Torymidae from Pteromalidae; however the conformation of the rear of the head of other wasps associated with Ficus e.g.: Pteromalinae, Ormyridae, Eurytomidae and Braconidae, is unknown. The gular bridge of the Agaonidae s.s. has been called the hypostomal, the post occipital, postgenal bridge and the gula. A gula has been described and illustrated for other none-sycophilous wasps, e.g.: Harmolita graminicola (Eurytomidae), Monodontomerous dentipes (Torymidae), Mymaridae and a Chalcididae s.p. We found that the Agaonidae subfamiles as well as those of Pteromalinae, Toryminae, Ormyridae, Eurytomidae and Braconidae (Doryctinae) associated with the fig inflorescences or other tissues, have a gular bridge instead of a postgenal bridge. The bridge unscupltured and laterally bounded by dorsal carinate extensions of the hypostoma that reaches the occipital foramen. Morphologically the bridge is a de novo structure derived from the upward expansion of the oral cavity. The Pteromalinae associated with Ficus seem to have the most archaic gular bridge, which is membranous and completely felted and seem to represent the ground plan for the Agaonidae, Torymidae, Ormyridae and Eurytomidae. It is suggested that the Chalcidoid wasps associated with Ficus evolved from some pteromalidae-like primordial gal-inducer of the pre-Ficus plant. The study of the morphology of the rear of the head of the Agaonidae wasps and other chalcidoid families and subfamilies with Ficus may resolve the relationships among other families and subfamilies and to find and test hypothesis that might conciliate the current classification of Chalidoidea.