

Geological history of Auchenorrhyncha

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The Hemiptera are known since the beginning of the Permian and the Auchenorrhyncha by the mid-Permian (ca 260 m.y.b.p.). Two phyletic lineages within the suborder, separated as infraorders, are distinct already in the Late Permian. Fulgoromorpha are represented by Surijokocixiidae (oldest Fulgoroidea) and problematic Coleoscytoidea (only Permian). The earliest Cicadomorpha s.l. are Prosboloidea, three more superfamilies descending from this ancestral one (accepted as legitimate along with other paraphyletic taxa) in the Late Permian: Scytinopteroidea, Pereborioidea, and Palaeontinoidea (all extinct). In this epoch of zonal climate, some families show definite geographical distribution patterns: bipolar (Ignotalidae), non-Gondwanan (Serpentivenidae), subtropical (Coleoscytidae) etc. The assemblages of lower latitudes are richer and dominated by Prosbolidae and/or Scytinopteridae, those of subpolar areas are poorer in species (up to monodominant ones) and composed of more derived families.

The Early Triassic insects are virtually unknown. By the mid-Triassic (230 m.y.), the first Cicadomorpha Clypeata appear, Hylcelloidea arising from Prosbolidae and ancestral to extant Cicadoidea, Cercopoidea, and Membracoidea s.l. Leafhopper-like Progonocimicoidea are not Auchenorrhyncha but generalized members of Coleorrhyncha, the suborder evolving parallel to Heteroptera and, like the latter, descending from scytinopteroid stock¹. Progonocimicidae as well as palaeontinoid Dunstaniidae and prosboloid Dymorphoptilidae are first recorded by the end of the Permian, but become abundant and often dominating only in the Triassic, along with Hylcellidae and derived scytinopteroid families.

By the beginning of the Jurassic (210 m.y.), extant Cixiidae (Fulgoroidea; Jurassic subfamily Fulgoridiinae) and Tettigarctidae (Cicadoidea), as well as first froghoppers (Procercopidae) and probably also leafhoppers (Karajassidae²), come into existence. Both the latter differ from more derived members of their superfamilies e.g. by both median ocellus and complete antennal segmentation retained in adult. Jurassic assemblages are dominated by Fulgoridiinae (in Europe) or Procercopidae and Progonocimicidae (in Asia).

In the Earliest Cretaceous (140 m.y.), fulgoroid Achilidae³ and membracoid Cicadellidae s.l. appear, the latter replacing Jurassic dominants in many assemblages. By the early Late Cretaceous (90 m.y.), with the expansion of Cenophytic plants, the entomofauna acquires nearly recent appearance: Dictyopharidae, Aphrophoridae and Cercopidae arise, whereas all Mesozoic families become extinct. Auchenorrhyncha are very rare in Cretaceous ambers.

During the Paleogene, further recent families enter the record: Ricaniidae and Cicadidae in the Paleocene (about 60 m.y.); Delphacidae, Derbidae, Fulgoridae, Issidae, Flatidae in the Eocene (about 45 m.y.); Clastopteridae, Aetalionidae and Membracidae in the Oligocene (about 30 m.y.). The Neogene beds yielded some recent species such as *Cicadella viridis* and *Ptyelus*

grossus. Cenozoic assemblages are dominated either (those which supposedly originate from warmer climate) by planthoppers or (from cooler one) by froghoppers; in the fossil resins, leafhopper nymphs (Baltic amber) or planthoppers (Dominican one) predominate.

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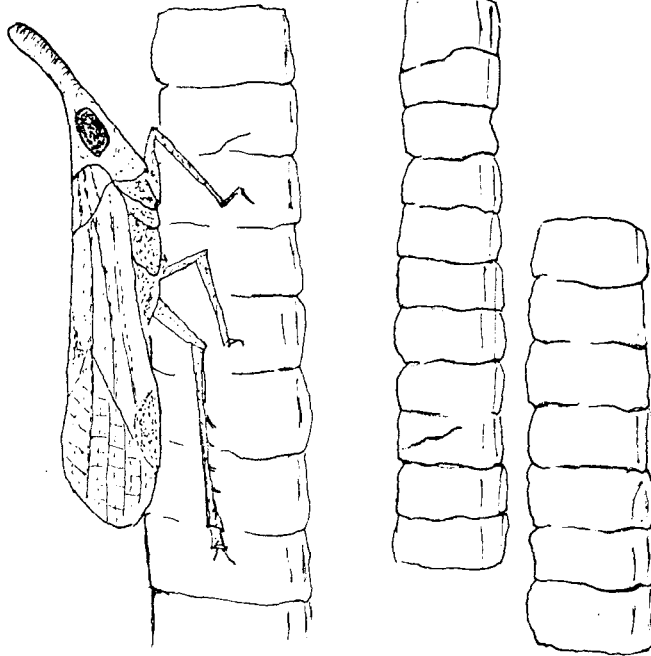
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