

The phylogeny of Fulgoromorpha nymph (Homoptera: Auchenorrhyncha)

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Nymphs of 177 species belonging to 96 genera were examined: these represented all most every exiting fulgoroid family, only Gengidae, Achilixiidae and Kinnaridae were not included. Cladistic analyses were carried out using outgroup comparison and parsimony criteria. A summary cladistic classification of nymphs is presented which defines five major groups.

12 final cladograms and 4 consensus trees were gained from 180 most parsimonious cladograms which were resulted along the cladistic analysis with 20 nymphal characters. Peloridiomorpha, Cicadoidea, Cercopoidea and Membracoidea (= Cicadelloidea) serve as outgroups. According to this result, the five major groups and several subgroups were recognized. The synapomorphies of each group, if present, are given. The five major groups are: 1. Tettigometridae, the sister group of all other taxa of the superfamily; 2. Ricaniidae group, consist of Hypochthonellidae, Ricaniidae, Lophopidae and Eurybrachidae; 3. Tropiduchidae group, consist of Flatidae, Tropiduchidae, Acanaloniidae, Issidae and Nogodinidae; 4. Fulgoridae group, consist of Fulgoridae and Dictyopharidae and 5. Cixiidae group, consist of Delphacidae, Meenoplidae, Cixiidae, Achilidae and Derbidae.

Character state definitions

1. Antenna of first instar nymph: 0) one segment; 1) more than one segment.
2. Antenna of fifth instar nymph: 0) 3 segments, the width of pedicel without developmental arrests; 1) 3 segments, the width of pedicel with developmental arrests; 2) 6-9 segments.
3. Antennae located: 0) between eyes; 1) below eyes.
4. Lora: 0) cone-shaped; 1) flat-shaped.
5. The apex of apical rostrum segment: 0) truncate; 1) pointed.
6. Postclypeus: 0) small; 1) large.
7. Metatrochanter: 0) not ridged; 1) ridged.
8. Mesocoxa: 0) conical; 1) slender.
9. Metatarsus of fifth instar nymph: 0) 2-segmented; 1) 3-segmented.
10. Metatarsus of fourth instar nymph: 0) 2-segmented; 1) 2-3 segmented or 3-segmented.
11. Metatibia: 0) tereted. not longitudinal ridged; 1) compressed, longitudinal ridged.
12. Fifth instar nymph: 0) without 3 segmental second metatarsus; 1) with 3 segmental second metatarsus, apex conical; 2) with 3 segmental second metatarsus, apex truncate.
13. Fifth instar nymph: 0) without 3 segmental second metatarsus; 1) with 3 segmental second metatarsus, without apical tooth, but in adult with 2 apical teeth on each side; 2) with 3 segmental second metatarsus, without apical tooth in fifth instar nymph and adult; 3) with 3 segmental second metatarsus, with 2-3 apical teeth on each side from fourth instar; 4) with 3 segmental second metatarsus, with 5 or more apical teeth in a row.
14. Second instar nymph: 0) without potential second metatarsal apical teeth; 1) with potential second metatarsal apical teeth.
15. Fifth instar nymph: 0) without stigmocalyptrae; 1) with stigmocalyptrae.
16. 10th abdominal segment in fifth instar nymph: 0) tubular; 1) somewhat triangular shape in lateral view; 2) broken-ring; 3) anal combs.
17. Anal combs: 0) without anal combs; 1) lobe-like; 2) comb-like.
18. Arising of anal combs: 0) without anal combs; 1) arising laterad; 2) arising ventrad.
19. Comb-like anal combs: 0) without comb-like anal combs; 1) with teeth at margin; 2) with terete processes at margin; 3) with terete processes at margin and each process with a filament at apex; 4) extremely small.
20. Feeding type of nymphs: 0) vessel-sucking phytophages; 1) tissue-sucking phytophages; 2) mycophages.

PROGRAM & ABSTRACT BOOK



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