STAPHYLINIDAE Latreille, 1802, subgroup of Staphylinidae), but the relationship of Scydmaenidae to Staphylinidae has not been clearly resolved and previously results are widely divergent on this question. The purpose of the current study (Grebennikov & Newton, submitted) is to provide a new phylogenetic analysis based on a more robust sample of all subfamily- and family-level taxa recently suggested as members of the Staphylinidae Group, based mainly on adult and larval morphology but supplemented with inclusion of 18S rDNA molecular data available for a subset of taxa, with the intention of evaluating the monophyly of the Staphylinidae Group and the relationships among the included groups, with special focus on the “scydmaenid question”. The family Scydmaenidae, or ant-like stone beetles, is itself a large cosmopolitan group with more than 4,800 described species in about 90 genera, and has been consistently maintained as a separate family since 1815 (Newton & Thayer 1995, Newton & Franck 1998).

Analysis

Our analysis included 206 parsimoniously informative larval and adult morphological characters scored for 38 taxa, representing all groups currently placed in or associated with the Staphylinidae Group of subfamilies as well as a broad set of outgroup taxa from other staphylinid subfamilies and from related families of Staphylinidae:

List of 38 terminals included in the phylogenetic analysis of the Staphylinidae Group of subfamilies of Staphylinidae. The larva of Solenius is unknown. Subfamilies in red represent putative members of the Staphylinidae Group; other subfamilies (Staphylinidae) and families represent outgroups.

Twelve analyses utilised three datasets (larval, adult, and combined), each treated under four sets of assumptions (successively weighted/unweighted and multistate characters ordered/unordered). Strict consensus topologies from the shortest trees in all 12 analyses consistently placed Scydmaenidae as monophyletic and as sister to (Steninae + Euasthetinae) in a monophyletic Staphylinidae Group (with Solenius as an outgroup).

At right as representative of these trees is the simplest most parsimonious tree from combined analyses of larval and adult morphological data with all characters unordered and not weighted (analysis C) with and unambiguously optimized evolutionary events plotted along branches. Character states are above circles; newly acquired character states are below circles. Black circles indicate unique evolutionary events; white circles indicate parallelisms or reversals. Eight preliminary analyses of variously aligned 18S rDNA data for 93 members of Staphylinidae under parsimony, neighbour-joining and Bayesian approaches were mainly inconsistent and inconclusive, although generally congruent with the Staphylinidae + (Steninae + Euasthetinae) hypothesis.

The single fully resolved and most consistently supported hypothesis in our morphological trees is represented in the diagram at upper right. Solenius lacks larval data and is ambiguously placed within the Group.

References


Grebennikov, V.V. & A.F. Newton. submitted. Good-bye Scydmaenidae: fully resolved phylogeny of the Staphyliniformes and why the family subfamilies should become 30+4 next subfamilies of the magnifocal Staphylininae Latreille, 1802 (Coleoptera).


Palaeostigus bifoveolatus, a typical-looking scydmaenid adult (above) and its larva (below).