Cutting the knot: Untangling a paraphyletic Eristalinae (Diptera: Syrphidae) using phylogenomics

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Abstract

Next generation sequencing, in combination with the dataset preparation pipeline PhyMMR, cuts through the stubborn knot represented by the paraphyletic subfamily Eristalinae (Diptera: Syrphidae) to reveal a new hypothesis of Syrphidae relationships. Eristalinae is revealed as a paraphyletic assemblage of five monophyletic clades: Eristalinae, Merodontinae, Cerioidinae, Volucellinae and Alipumilinae.

The study utilizes probes developed specifically for use with Syrphidae and samples 1302 orthologous genes. 136 of 145 described genera within Eristalinae are sampled, with the use of pinned museum specimens allowing for inclusion of rarer genera, for a total sampling of more than 300 taxa.

Multiple independent Australian-Chilean relationships are revealed, raising the question of whether Syrphidae underwent Trans-Antarctic dispersal or Gondwanan vicariance.

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