

ZOOGEOGRAPHY OF THE AMISEGINAE AND
A REMARKABLE NEW CHRYSIDID WASP
FROM CHILE (HYMENOPTERA)*

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INTRODUCTION

Members of the chrysidid subfamily Amiseginae are small, ant-like wasps, with slender mandibles and a long needle-like ovipositor. Although hosts are known for only a few amisegine species, the morphology of the female mandibles, used to open the host egg, and the structure of the ovipositor are remarkably consistent throughout the subfamily, suggesting that all species probably parasitize walking stick eggs.

Amisegines occur in most zoogeographic regions. In the Western Hemisphere they are found east of the 100th meridian in North America and as far south as northern Argentina. No amisegines were previously known from Chile. In the Eastern Hemisphere amisegines are not found north of Zimbabwe in Africa, nor in the palearctic except in Japan. This subfamily is widespread in the Oriental and Australian Regions.

ZOOGEOGRAPHY

As with the rest of the Chrysididae (Kimsey and Bohart, 1990), the Amiseginae appear to have evolved in the Northern Hemisphere. The oldest fossils are in Eocene amber from the northern USSR (Krombein 1986, Evans 1973), indicating that there were species in the Palearctic Region at one time. Extinction of this group in the continental palearctic may have been due to the Pleistocene glaciations. Cladistic analysis of the amisegine genera (Kimsey and Bohart, 1990) indicates 3 basic lineages, which clearly show continental relationships. The American genera, *Amisega*, *Adelphe*, *Anadelphe Duckeia* and *Nesogyne*, are far more closely related to each other than to the Afrotropical or Indoaustralian ones, except

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for the enigmatic genus, *Anachrysis*, from southern Africa. *Anachrysis* has many of the primitive character states seen in the American genera. The Oriental genera, *Atoposega*, *Baeosega*, *Bupon*, *Cladobethylus*, *Colocar*, *Exopapua*, *Imasega*, *Indothrix*, *Isegama*, *Kryptosega*, *Magdalium*, *Mahinda*, *Perissosega*, *Rohweria*, *Saltasega* and *Serendibula*, are all closely related. The Australian genera, *Exova* and *Myrmecomimesis* are also part of this oriental lineage. The afrotropical genera, *Afrosega*, *Alieniscus*, *Leptosega*, *Obenbergarella*, and *Reidia*, are far closer to the oriental lineage than the American one since both the African and oriental genera have a round, deep pit on the side of the pronotum, a long metanotum, and the propodeum with a carinate horseshoe-shaped enclosure or ecarinate. The American lineage is the sister group of the others as it lacks the pronotal pit, the metanotum is considerably shorter than the scutellum, and the propodeum is transected by vertical medial and horizontal carinae or sulci.

The presence of an amisegine in Chile raised a number of interesting biogeographic questions. This species could have shown a transantarctic link with Australia, as so many Chilean insects do, or it could reaffirm the theory that even the Western Hemisphere amisegines had northern origins. Since the Chilean species described below is congeneric with *Amisega*, the largest and most widespread American genus, it is supporting evidence for the northern origins of this subfamily.

Based on available phylogenetic and fossil data the evolution of the Amiseginae is relatively clear. Since the American, African and Indoaustralian lineages are quite distinct phylogenetically, and the American and Australian lineages are particularly divergent, amisegines must have originated in Laurasia, since there are no Gondwanaland relationships indicated, for example between Africa and eastern South America or Australia and southern South America. Therefore, amisegines must have independently colonized each of the southern "corridors", these corridors being: 1. the western palearctic to Africa, or perhaps the southeastern palearctic to Africa via India and the Middle East; 2. the eastern palearctic to Australia, and 3. North America to South America. Subsequent extinction events eliminated amisegines from the palearctic, except Japan, and from western North America, thus isolating these 3 lineages in more equatorial or southern latitudes.

AMISEGA Cameron

Amisega Cameron 1888:457. Type: *Amisega cuprifrons* Cameron 1888:457. Monotypic.

Microsega Krombein 1960:31. Type: *Microsega bella* Krombein 1960:32. New Synonymy.

Description. *Amisega* is distinguished as a genus by the short malar space (generally less than one-fourth eye height); presence of a malar sulcus and partial occipital carina; scapal basin finely cross-ridged, or less commonly smooth; flagellum slender and cylindrical in both sexes; pronotum without lateral pit; scutum with or without notauli, parapsides usually present; mesopleuron anterior part punctate, posteriorly impunctate, without scrobal sulcus or carinae; metanotum less than one-third as long as scutellum with medial disk linear and obscure, or absent; propodeum broadly rounded posteriorly and laterally; hindcoxa with dorsobasal carina; tarsal claws with medial tooth perpendicular, and forewing with R₁ clearly indicated, R_s extended by evenly curved remnant, and medial vein arising before m-cu.

Distribution. This genus occurs from southern Ontario, Canada, to northern Argentina, Peru and central Chile.

***Amisega chilensis*, new species**

Figure 1

Holotype female. Body length 3.5 mm. Face with dense, nearly contiguous punctures, punctures separated by polished interspaces on vertex; scapal basin with fine dense transverse striae extending from eye to eye; malar space one-fourth eye height, 4.5 midocellus diameters; pedicel length 2.8 times breadth; flagellomere I length 3.6 times breadth; flagellomere II length 2.6 times breadth; pronotum, scutum and scutellum polished, with small punctures separated by more than 4 puncture diameters; scutum with no indication of notauli, posterolateral corners ending in small tooth; wings reduced to small, tegula-sized pads; mesopleuron anterior half densely and nearly contiguously punctate, posterior half polished and nearly impunctate; propodeum smooth, with widely scattered punctures, 4 or more puncture diameters apart, and without enclosures delimited by carinae or sulci; terga I and II highly polished with punctures 4 or more puncture diameters apart. Head black with brassy tints,

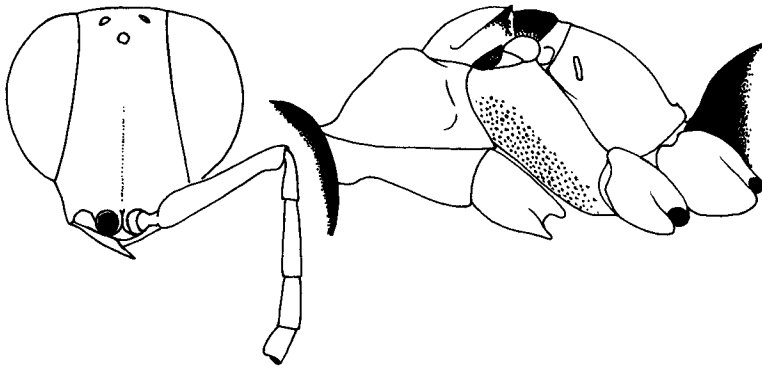


Figure 1. *Amisega chilensis*, front view of face (left) and lateral view of thorax, with legs removed (right).

pedicel and flagellum dark brown; scape yellowish; pronotum, scutum, mesopleuron, propodeum and most of legs yellowish orange, scutellum, tegula, abdomen, hindtibia and hind-tarsi black.

Paratype females. Body length 2.5–3.5 mm, same as holotype except several individuals entirely dark brown to black, and the scutellum ranging from black to orange in otherwise orange marked individuals.

Paratype males. Body length 2.5–3.0 mm. Similar to type female, except malar space one-fifth eye height; pedicel 3.3–3.5 times as long as broad; flagellomere I length 4.5–4.8 times breadth; flagellomere II twice as long as broad. Coloration as in type, except two individuals entirely dark brown to black, also scutellum varying from black to orange in orange marked males.

Holotype female: CHILE: Region VII, Palhué, in *Pinus radiata* plantation, 35° 11' E 72° 12' S, reared from eggs of *Bacunculus phyllopus* Gray (Phasmatidae), collected 18–21 June 1989, wasps emerged between 26 October 1989 to 27 January 1990 (Museo Nacional, Santiago, Chile). Paratypes: 19 males, 17 females, same data as type (Museo Nacional, Santiago, Chile; University of California, Davis; U.S. National Museum, Washington, D.C. and Canadian National Collection, Ottawa).

Discussion. This unusual species does not closely resemble any other in *Amisega*. The greatly reduced wings in *chilensis* are unique in the genus, except for the inclusion of *Microsega bella*. Diagnostic features of *chilensis* are the non-metallic red (or less often black)

thorax, undivided propodeum, absence of notauli, and the long malar space. Most of these features might be used as an argument for placing this species in its own genus; however, all of them are reductions and do not adequately justify a new genus.

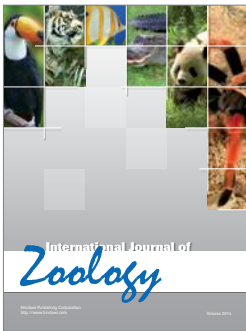
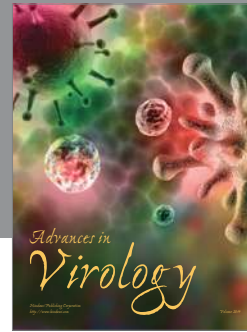
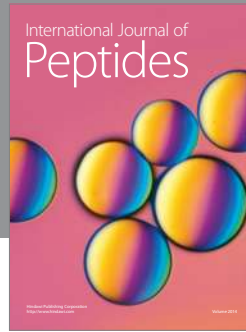
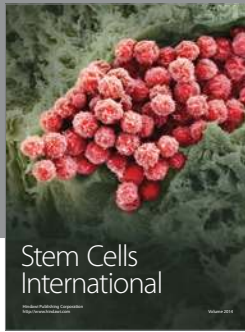
There is a strong structural similarity between this species and *Microsega bella* Krombein. Both have the wings reduced to small pads, lack subdivision of the propodeum by sulci or carinae, the malar sulcus is faintly indicated (*chilensis*) or lost (*bella*), the notauli are not indicated, the arolium is enlarged, and the metanotum is narrowed. The reduced metanotum, enlarged arolium and absence of notauli may all be directly or indirectly related to the brachypterous condition of these species. Otherwise both of these species exhibit the diagnostic features of *Amisega*. Therefore, the morphology of this new species provides ample evidence that *Microsega* is actually a junior synonym of *Amisega*.

ACKNOWLEDGMENTS

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