

A Modern Classification of the Family Caliscelidae Amyot et Serville (Homoptera, Fulgoroidea)

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Abstract—Recent changes in the classification of the family Caliscelidae Amyot et Serville are summarized. All the genera are attributed to tribes and subfamilies. Data on the distribution and the number of genera and species for each tribe are presented. The subfamily Ommatidiotinae is shown to be absent in the recent New World fauna, and only the tribe Peltonotellini represents the subfamily Caliscelinae in the Nearctic and Neotropical regions.

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Caliscelidae Amyot et Serville, 1843 is a small, worldwide distributed fulgoroid family comprising about 200 species in 69 genera.

For the past 100 years, the views of the taxonomic position and volume of Caliscelidae have undergone considerable changes. In particular, Melichar (1906) considered caliscelids as a family, but already Fennah (1954) treated them as a subfamily of the family Issidae Spinola, 1839, with synonymization of Caliscelinae Amyot et Serville and Ahomocnemiellinae Kusnezov, 1929. Emeljanov (1999) resurrected the family Caliscelidae based on the characters of the structure of the ovipositor. The independence of caliscelids as a group separate from issids was also confirmed by bioacoustic and molecular data (Tishechkin, 1998; Urban and Cryan, 2007).

Fennah (1987) expanded the tribe Ommatidiotini Fieber, 1875 by inclusion of genera of Augilini Baker, 1915 in this tribe. The tribe Augilini, originally established within the family Issidae (Baker, 1915), was subsequently considered within the family Lophopidae Stål, 1866 (Muir, 1930; Fennah, 1954, 1963). However, Emeljanov (1999) showed that the tribes Ommatidiotini and Augilini were distinct groups within the subfamily Ommatidiotinae of the family Caliscelidae. Later, I (Gnezdilov, 2011) ascertained that Ommatidiotini was a monotypical tribe. Based on examination of details of the structure of the ovipositor (gonapophyses VIII and IX), I (Gnezdilov, 2003) also proposed that the tribe Adenissini Dlabola, 1980 described by Dlabola in the family Issidae (Dlabola, 1980) should be included in the family Caliscelidae. Recently Adenissini was expanded due to inclusion of

the subtribes Bocrina Emeljanov, 1999, Coinquendina Gnezdilov et Wilson, 2006, and Pteriliina Gnezdilov et Wilson, 2006 (Gnezdilov and Wilson, 2006; Gnezdilov, 2008a). In 2008, Emeljanov suggested a new name of the tribe, Peltonotellini instead of Peltonotidae Fieber, 1872, for the Palaearctic genera which had retained sensory pits at the adult stage (Emeljanov, 2008). My investigations of caliscelids of the New World have shown that all the representatives of the family described from North and South America, except for introduced species (for example, *Caliscelis bonellii* (Latreille, 1807)), are also characterized by the presence of sensory pits in adults on the head, pronotum, mesonotum, and abdomen, and, thus, belong to the tribe Peltonotellini.

As the result of all the changes in the classification of the family Caliscelidae over the last years, the family comprises 2 subfamilies, Caliscelinae Amyot et Serville, 1843 with 2 tribes (Caliscelini Amyot et Serville, 1843 and Peltonotellini Emeljanov, 2008) and Ommatidiotinae Fieber, 1875 with 3 tribes (Ommatidiotini Fieber, 1875, Augilini Baker, 1915, and Adenissini Dlabola, 1980). The lists of genera of the tribes are given below.

Family **CALISCCELIDAE** Amyot et Serville

Subfamily **CALISCCELINAE** Amyot et Serville

Tribe **Caliscelini** Amyot et Serville

Type genus *Caliscelis* Laporte, 1833.

Afronaso Jacobi, 1910

Ahomocnemiella Kusnezov, 1929

Asarcopus Horváth, 1921
Bambusicaliscelis Chen et Zhang, 2011
Bruchoscelis Melichar, 1906
Bulbonaso Emeljanov, 2007
Calampocus Gnezdilov et Bourgoïn, 2009
Caliscelis Laporte, 1833
Chirodisca Emeljanov, 1996
Formiscurra Gnezdilov et Viraktamath, 2011
Gelastissus Kirkaldy, 1906
Griphissus Fennah, 1967
Gwurra Linnavuori, 1973
Homocnemia Costa, 1857
Issopulex China et Fennah, 1960
Madaceratops Gnezdilov, 2011
Myrmissus Linnavuori, 1973
Nenasa Chan et Yang, 1994
Nubianus Gnezdilov et Bourgoïn, 2009
Ordalonema Dlabola, 1980
Patamadaga Gnezdilov et Bourgoïn, 2009
Populonia Jacobi, 1910
Reinhardema Gnezdilov, 2010
Rhinoploeus Gnezdilov et Bourgoïn, 2009
Rhinogaster Fennah, 1949
Savanopulex Dlabola, 1987
Sphenax Gnezdilov et Bourgoïn, 2009
Ugandana Metcalf, 1952

Tribe **Peltonotellini** Emeljanov

Type genus *Peltonotellus* Puton, 1886.
Acromega Emeljanov, 1996
Aphelonema Uhler, 1876
Bergrothora Metcalf, 1952
Bruchomorpha Newman, 1838
Ceragra Emeljanov, 1996
Concepcionella Schmidt, 1927
Fitchiella Van Duzee, 1917

Homaloplasis Melichar, 1906
Itatiayana Metcalf, 1952
Nenema Emeljanov, 1996
Ohausiella Schmidt, 1910
Papagona Ball, 1935
Paranaso Schmidt, 1932
Peltonotellus Puton, 1886
Peripola Melichar, 1907
Plagiopsis Berg, 1883
Plagiopsola Schmidt, 1927
Protrocha Emeljanov, 1996
Semiperipola Schmidt, 1910

Subfamily OMMATIDIOTINAE Fieber

Tribe **Ommatidiotini** Fieber

Type genus *Ommatidiotus* Spinola, 1839.
Ommatidiotus Spinola, 1839

Tribe **Adenissini** Dlabola

Type genus *Adenissus* Linnavuori, 1973.

Subtribe Adenissina Dlabola

Type genus *Adenissus* Linnavuori, 1973.
Adenissus Linnavuori, 1973
Perissana Metcalf, 1952

Subtribe Bocrina Emeljanov

Type genus *Bocra* Emeljanov, 1999.
Bocra Emeljanov, 1999

Subtribe Coinquendina Gnezdilov et Wilson

Type genus *Coinquenda* Distant, 1916.
Coinquenda Distant, 1916
Delhina Distant, 1912
Lasonia Melichar, 1903

Subtribe Pteriliina Gnezdilov et Wilson

Type genus *Pterilia* Stål, 1859.
Distantina Gnezdilov et Wilson, 2006
Phusta Gnezdilov, 2008

Pterilia Stål, 1859

Pterygoma Melichar, 1903

Tribe **Augilini** Baker

Type genus *Augila* Stål, 1870.

Augila Stål, 1870

Augilina Melichar, 1914

Augilodes Fennah, 1963

Cano Gnezdilov, 2011

Cicimora Emeljanov, 1998

Pseudosymplanella Che, Zhang et Webb, 2009

Signoreta Gnezdilov et Bourgoïn, 2009

Symplana Kirby, 1894

Symplanella Fennah, 1987

Symplanodes Fennah, 1987

Tubilustrium Distant, 1916

The above lists of genera in the tribes demonstrate two important facts disregarded in the literature until now: first, the current distribution of the subfamily Ommatidiotinae is restricted exclusively to the Old World and, second, all the Caliscelinae of the New World belong to the tribe Peltonotellini and probably form a monophyletic group (the molecular data on three American genera (Urban and Cryan, 2007, figs. 3, 4) partly confirm this hypothesis).

The structure and distribution of the family on the whole appears as follows: Caliscelini, the Old World, 28 genera, 64 species; Peltonotellini, the Palaearctic Region, Taiwan, and the New World, 19 genera, 83 species; Ommatidiotini, the Palaearctic Region, 1 genus, 13 species; Adenissini, the Palaearctic Region, the northeastern Afrotropical Region and the Oriental Region, 10 genera, 22 species; Augilini, the Oriental Region and Madagascar, 11 genera, 21 species. The family comprises a great number of monotypical genera (43). The largest genera comprising from 22 (*Caliscelis*) to 26 (*Bruchomorpha*) species belong to the tribes Caliscelini and Peltonotellini, correspondingly.

It should be emphasized that the regional caliscelid faunas have been very irregularly studied. For example, the Australian fauna of the family remains undescribed: at present, only one genus and one species,

Gelastissus albolineatus Kirkaldy, 1906, is known there (Gnezdilov, 2008b).

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