New taxonomic assignments of Calisiinae with description of two new genera
(Hemiptera, Heteroptera, Aradidae)

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Abstract

Examination of type species of Calisius pallipes Stål 1860 from Brazil and Calisius ghiliani (A.Costa 1864) from Europe has revealed essential morphological differences warranting their placement into different genera. Stål’s pallipes is the genotype of Calisius, and ghiliani that of Aradosyrtis A.Costa, whose generic status is revived. A neotype is designated for Aradosyrtis ghiliani A.Costa 1864. Clearly distinguished from Calisius sensu Stål are the Neotropical Calisius farri Kormilev 1964 and the African Calisius lativentris Horvath 1913, for which the new genera Caribocalisius n.gen and Afrocalisius n.gen are established, respectively.

Key words: Hemiptera, Heteroptera, Aradidae, Calisiinae, new genera, Neotropics, Palaearctic, Africa

Introduction

Following an invitation by Paul D.N. Hebert (University of Guelph, Canada) to supply specimens of the flat bug family Aradidae for barcoding, 83 taxa from all 8 recognized subfamilies (Aneurinae, Aradinae, Calisiinae, Carventinae, Chinamyersiinae, Isoderminae, Mezirinae, Prosympiestinae) from the collection of the author (CEHI) were sent for further treatment.

The results of standardized sequencing used by BOLD (Barcode of life Data System) for the 5’ region of COI gene were then analysed and displayed as graphic trees (for exact specimen-sequence links visit the “Barcoding World Aradidae [ARAEH]” project at the Barcode of life portal: http://www.boldsystems.org/). When studying the BOLD TaxonID tree [SEARCH2] comprising all currently sampled Aradidae, the two taxa identified as Calisius salicis Horvath 1913 from Bulgaria and Calisius farri Kormilev 1964 from Jamaica showed a considerable sequence divergence of 27.6% (of 658 bp) from each other, a figure usually indicating possible discontinuity in classification heteropteran taxa (Ratnasingham & Hebert, 2007; Park et al., 2013).

Both these species of Calisius were then morphologically reexamined, and several clear differences were highlighted. Therefore, it was necessary to clarify which of them belongs to true Calisius. The genus Calisius Stål 1860 was erected for C. pallipes Stål 1860 from Brazil and used in the past as a “catch-all” for most of the small, similar looking species across all continents. Aradosyrtis A.Costa 1864, with the type species Aradosyrtis ghiliani A.Costa 1864, was also synonymized with Calisius Stål by Bergroth 1894.

Investigation and comparison of the borrowed holotype of C. pallipes, topotype of C. ghiliani (the holotype from Sardinia is lost) and specimens of the congeneric and closely related C. salicis Horvath 1913 with the holotype of C. farri Kormilev 1964 has shown that these taxa belong to 3 different genus-group taxa.

The most obvious morphological difference is the whitish round plaques of antennal segment IV, which in very high magnification (1000x) reveal a half-globular structure with a dorsal opening. These structures are probably olfactory organs (Figs. 15,18), and their size is about 0.01mm They are not observed in Calisius pallipes and Caribocalisius farri n.comb., but are present in Aradosyrtis ghiliani and Afrocalisius lativentris (and mentioned for all other Calisiinae genera: Aradacanthia A.Costa 1864, Calisiopsis Champion 1898, Heissia Kormilev 1986, Paracalisiopsis Kormilev 1963, Paracalisius Kormilev 1974 and Breviscutheissia Jacobs 2006).

Additionally important structural differences concern the development of a dorsally exposed tergite VIII in males and females, the number of tubercles on lateral margins of connexiva, and the position of spiracles (Table 1).