



## The position of the Leptoscelini and other taxonomic changes within the family Coreidae (Hemiptera: Heteroptera)

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### Abstract

The coreine tribe Leptoscelini is subsumed under the tribe Anisoscelini, which receives the genera *Leptoscelis* LaPorte, *Malvana* Stål and *Phthia* Stål. The genus *Amblyomia* Stål, lacking numerous characters of the tribe, is placed in *incertae sedis*. Other genera tentatively placed in the tribe include: *Coribergia* Casini, *Dalmatomammurius* Brailovsky, *Kalinckascelis* Brailovsky, *Leptopelios* Brailovsky, *Leptostellana* Brailovsky, *Malvanaoides* Brailovsky, *Onoremia* Brailovsky, *Plunentis* Stål, and *Sephinioides* Brailovsky. *Ugnius* Stål and *Bellamynocoris* Brailovsky are removed from Acanthocephalini to Anisoscelini.

**Key words:** Coreinae, Acanthocephalini, Anisoscelini, Leptoscelini, *Bellamynocoris*, *Coribergia*, *Dalmatomammurius*, *Kalinckascelis*, *Leptopelios*, *Leptostellana*, *Leptoscelis*, *Malvana*, *Malvanaoides*, *Onoremia*, *Phthia*, *Plunentis*, *Sephinioides*, *Ugnius*, tribal synonymy

### Introduction

The family Coreidae has been plagued by a multitude of taxonomic problems, synonyms, and a lack of keys to identify members. As with many taxonomic groups, there are often tribes within subfamilies that become catch basins for new genera and species described within the family or subfamily. Among tribes of the Coreinae, this is certainly true for the Coreini, and it is becoming so for the Leptoscelini. This paper will not clarify those problems, but attempts to produce a natural grouping that may give direction for further work as well as clarify a few taxonomic problems within the Coreidae.

The tribe Leptoscelini was erected by Stål as Leptoscelidida in his key to the genera of American Coreidae (1867). The tribe then comprised three genera: *Leptoscelis* Latreille, *Malvana* Stål, and *Phthia* Stål, and was separated from the tribe Anisoscelini Latreille by the lack of expanded hind tibiae. Packauskas (1994a) used the same character to separate the tribe and also used characters shared with most species found in the Anisoscelini: all femora spinose below, a porrect head, juga and tylus extended forward, and rostrum extending onto abdomen, to further differentiate the tribe from other tribes lacking hind tibial expansions.

Packauskas (1994b, mostly unpublished) examined genera in the tribes Acanthocephalini, Anisoscelini, and Leptoscelini. He produced a phylogeny based on external and internal (genitalic) morphological characters of numerous genera within these tribes. For the Leptoscelini he used the three genera first established for the tribe by Stål (1867) as well as the genus *Amblyomia* Stål (placed in the tribe by Stål, 1870). The outgroup used in the analysis was comprised of members of all three subfamilies: Coreinae, Meropachyinae, and Pseudophloeinae. The members of the Coreinae came from both Old World tribes (Coreini, Homeocerini, and Petascelidini) and New World tribes (Acanthocerini, Coreini, Chariesterini, Chelinideini, Nematopodini, and Spartocerini). One of the inescapable conclusions in polarizing characters was the result that the expansion of

the hind tibia becomes plesiomorphic as it is scattered in occurrence among other tribes of the Coreidae and may, along with expansion of the 3<sup>rd</sup> antennal segment, be an underlying synapomorphy of the family. During analysis of the characters, all those which occurred in both plesiomorphic and apomorphic states within a genus were discarded. Nevertheless, 45 characters were used in the analysis. The data were analyzed using Phylogenetic Analysis Using Parsimony (PAUP) (Swofford 1991). This resulted in 70 equally parsimonious trees. The majority rule consensus tree (Fig. 1) is presented here, but only the genera of Anisoscelini and Leptoscelini are shown. For character data sets, discussion of all character and branches, see Packauskas (1994b). The tribe Stenoscelideini Schaefer has been re-erected elsewhere (Packauskas 2006) from within the Acanthocephalini.

Examination of the majority rule consensus cladogram (Fig. 1) reveals that of the 70 most parsimonious trees, 100 % of the trees show a single branch leading to most of the anisosceline and leptosceline genera and, indeed, 7 characters hold that clade together. Beyond that branch, there is a tritomy in which one branch leads to an unresolved pentatomy leading to seven genera. Among those seven genera we find that none of the genera (underlined) in Stål's original Leptoscelini tribal designation show an affinity for one another, but all share characters with three anisosceline genera, as well as with the genus *Ugnius* Stål (formerly in the Acanthocephalini).

On the basis of this tree, I believe that members of the Leptoscelini should be subsumed under the Anisoscelini; and that the genus *Ugnius* Stål should be removed from the Acanthocephalini and placed within the Anisoscelini.

The genus *Amblyomia* Stål is here placed in *incertae sedis* as it has several characters which exclude it from any of the tribes studied here. Its vesica is uncoiled, and it lacks a posttylar sulcus, characters shared with the Nematopini and Meropachyinae to one of which it is most likely aligned.

### The Tribe Anisoscelini Laporte

Many authorities (Schaefer 1965, Osuna 1984, Froeschner 1988) have attributed the first use of the higher group name Anisoscelini to Amyot & Serville (1843), but the first use was actually by Laporte (1832), who described the family Anisoscélites, differentiating it from his family Coréites. At this time the family contained: *Anisoscelis* Latreille, *Holhymenia* La Peletier & Serville, *Stenocephalus* Latreille (now in Stenocephalidae), *Leptoscelis* Laporte (later in Leptoscelini), *Nematopus* Latreille and *Pachylis* La Peletier & Serville (both now in Nematopodini), *Leptocorisa* Latreille, *Micrelytra* Laporte, and *Alydus* Fabricius (all now in Alydidae), *Acanthocephalus* Laporte (now in Acanthocephalini), *Meropachus* Laporte (now in Meropachyinae), and *Pachymeria* Laporte (= Lycambes Stål). Laporte (1832) also placed *Chondrocera* Laporte (now in Anisoscelini) in his family Coréites.

Costa (1838) described the family Anisoscelini, thus implying that it included *Anisoscelis*, presumably because he had seen Laporte (1832); but Costa included only *Alydus* Fabricius, *Micrelytra* Laporte (both now in Alydidae), and *Stenocephalus* Latreille (now in Stenocephalidae). Costa's description of the family was general, easily fitting all the presently known Coreoidea, without further explanation. Horváth (1911) cited Costa (1838) as the first user of the tribal name, overlooking the earlier use by Laporte (1832).

Amyot & Serville (1843) in their group Anisoscélides included only the genera *Anisoscelis* Latreille, *Diactor* Perty, *Leptoscelis* Laporte, and *Tynotoma* Amyot & Serville, an Old World genus later synonymized under *Serinetha* Spinola (Stål 1873).

Stål in his 1867 key both expanded and restricted his group (not indicating the rank), given as Anisoscelidida, to include: *Anisoscelis* Latreille, *Baldus* Stål, *Chondrocera* Laporte, *Copium* Thunberg, *Diactor* Perty, *Narnia* Stål, *Tarpeius* Stål, and *Theognis* Stål. In Stål's (1867) key, the group Anisoscelidida was distinguished as having the hind tibia more or less expanded as opposed to simple (or terete) in the rest of Stål's Coreida

grouping, the two being differentiated earlier in the key from Stål's Mictidida (now known as the tribes Nematopini and Acanthocerini) and Stål's Placoscelidida (now the tribe Acanthocephalini) by having the space between antenniferous tubercles wider than the width of one tubercle and the head produced or porrect anterior to the tubercles. Stål moved *Leptoscelis* Laporte into a new grouping, his Leptoscelidida, along with *Phthia* Stål and *Malvana* Stål. Within Stål's Coreida, Leptoscelidida were distinguished from Anisoscelidida by the lack of expanded hind tibiae, and from the rest of Stål's Coreida by possessing the combination of: all femora spinose; rostrum extending between or beyond hind coxae, first segment extending past eyes or behind base of head; head porrect or subporrect; bucculae shorter than head by more than half. For the rest of Coreidae Stål gives: femora unarmed and slender, but if spinose, then bucculae extending to middle of head. Stål (1870) subsequently published a list of genera and species in his division Anisoscelidina, synonymizing *Copium* Thunberg under *Holymenia* La Peletier & Serville (an unnecessary emendation, or a misspelling, of *Holhymenia* [the correct name] by Stål), and synonymizing *Theognis* Stål under *Leptoglossus* Guérin. Gibson & Holdridge (1918b) divided the tribe into two groups, the Anisoscelaria and the Chondroceraria, based on the lack, or presence, of antennal dilations, respectively. These divisions may indeed be valid and do show up in my cladistic analysis, but the affinities of the genera involved are not fully resolved at that level and the nymphs of *Anisoscelis* have an expanded third antennal segment (my observation), whereas adults do not. Gibson & Holdridge (1918b) also included two genera now excluded from Anisoscelini: *Uranocoris* Walker (included in the tribe by Lethierry & Severin [1894]) and *Stenoscelidea* Walker. *Uranocoris* has been shown by Osuna (1984) to be an Old World genus and provisionally placed by him in Homoeocerini. The tylar expansion and deflexed juga would clearly place *Stenoscelidea* in Acanthocephalini; however, on the basis of a cladistic analysis, Packauskas (2006) placed it in the re-erected tribe Stenoscelideini Schaefer.

Osuna (1984) revised Anisoscelini, splitting a new genus, *Bitta*, from *Anisoscelis*, and also splitting four new genera, *Fabrictilis*, *Stalifera*, *Theognis* (re-erected), and *Veneza*, from the genus *Leptoglossus*. All these genera were relegated to group status by Packauskas and Schaefer (2001).

Schaefer (1968) discussed *Leptoscelis* and *Phthia*, and their cladistic arrangements with Anisoscelini and Acanthocephalini. However, his paper is flawed, in that he clearly shows (his Fig. 37) a metapleural supra-coxal spine in his *Phthia* sp.; this does not occur in any of the species I have examined of this genus. Reexamination of the specimens used by Schaefer shows them to be of the genus *Petalops* (Acanthocephalini). In his paper Schaefer proposes the removal of *Phthia* from Leptoscelini. On the basis of this paper, Casini (1984) looked at the relationship of his new genus, *Coribergia*, with Leptoscelini sensu strictu (that is, with *Phthia* removed), and noted the closeness of *Leptoscelis* and *Coribergia*. Brailovsky (1989) went one step further and tentatively placed *Coribergia* and *Plunentis* Stål (formerly in Coreini) in the Leptoscelini.

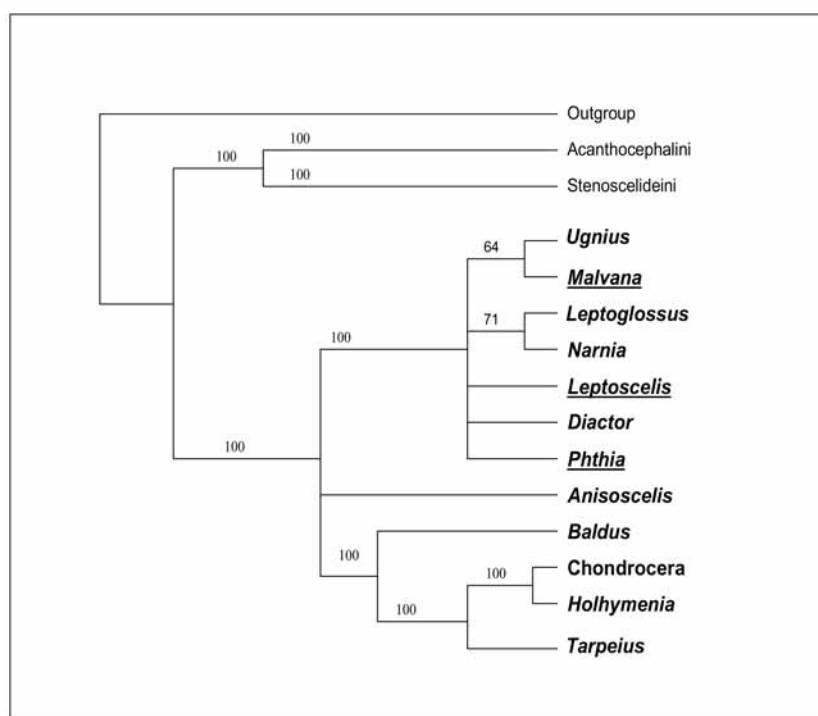
During the course of this work, Brailovsky described six new genera which he placed in the Leptoscelini: *Dalmatomammurius* Brailovsky 1982, *Kalinckascelis* Brailovsky 1990, *Leptopelios* Brailovsky 2001, *Leptos-tellana* Brailovsky 1997b, *Malvanaoides* Brailovsky 1990, *Onoremia* Brailovsky 1995, and *Sephinioides* Brailovsky 1996. I have not had the opportunity to examine these for characters that actually place them in Anisoscelini, but they all are tentatively placed under Anisoscelini until they can be further analyzed with respect to their proper placement.

The genus *Ugnius* was removed from the Coreini and placed in the Acanthocephalini by Casini (1983). *Ugnius*, however, shares a number of synapomorphies with Anisoscelini: the juga extend past the antenniferous tubercles, the extended tylus is more like an extended spine, the rostrum reaches the abdomen, the vesica has three long, tight coils, and there is a median lateral lobe on the conjunctiva (not found in the Acanthocephalini). I have, on the basis of these shared apomorphies and as previously discussed in the tree, placed *Ugnius* in the Anisoscelini.

In addition, Brailovsky (1997a) also described the genus *Bellamynocoris* with two species and placed this genus in the Acanthocephalini. This genus also belongs in the Anisoscelini. The first antennal segment is shorter than the head (always longer in Acanthocephalini), the juga extend past the antenniferous tubercles

(not so in Acanthocephalini), and the tylar expansion is similar to that of members of the genus *Ugnius* and *Leptoglossus clypealis*. The paramere shape is unknown, but all members of the Acanthocephalini have an apical tooth (see Packauskas 1994b). The species of *Bellamynocoris* are also the smallest in the tribe Acanthocephalini and very similar in shape and aspect to members of the genus *Leptoglossus* (Anisoscelini). The tibial expansions constitute less than 55 % of the length of the tibia while among Acanthocephalini species the expansions are over 75% of the length of the tibiae.

The following description of the tribe does not take into account the genera listed above as tentatively placed in the Anisoscelini.



**FIGURE 1.** Majority consensus tree produced from 70 equally parsimonious trees during analysis of leptosceline (underlined) and anisosceline genera. Numbers on branches = percentage of trees in which the branch occurs.

### Description of the Tribe Anisoscelini

Head correct in most species; tylus and juga never deflexed, both usually extending well beyond antenniferous tubercles. Head usually longer than scutellum (except *Baldus* and *Anisoscelis*). Ocellar tubercle pronounced (except *Diactor*). Distance between antenniferous tubercles greater than width of one tubercle. Small postocular tubercle in some species. Ratio of length of head anterior to ocellar line to length posterior to ocellar line greater than 1.0. Shortest antennal segment I, II, or III, never IV; longest antennal segment II or IV; antennal segment IV longer than III, less than 2 times longer. Antennal segment I usually longer, rarely shorter, than head. Antennal segment II and/or III widened in some species. Antennal segment IV longer than III. Bucculae extending to level of anterior margin of eye or not. Rostral segment III shortest; longest segment may be any other. First two segments of rostrum longer than last two segments. Rostrum extending to at least metacoxae, usually onto abdomen. Degree of pronotal rise, anterior to posterior, 45-70°. Pronotum with distinct collar, punctate, occasionally rugose, never tuberculate; humeral angles acute to obtusely angled, rarely rounded; posterior angles obtuse to rounded (angles acute in *Baldus*); callar region usually raised. Usually lacking metapleural supracoaxal spine. Metapleural scent gland opening separated, with two auricles; anterior

auricle larger. Abdomen rarely wider than thorax. Spiracle of abdominal segment IV closer to lateral edge of segment than to anterior or posterior edge. Abdominal segments never spined posterolaterally. Connexivum VI separated from dorsum or slightly fused at apex; connexivum VII fused to dorsal plate. Scutellum longer than wide or subequal, rarely wider than long. Hind tibia often expanded, but not in all genera. All femora spined below, at least distally. Hind femora rarely incrassate or spined above (exceptions: *Leptoglossus*, *Narnia*, *Ugnius*). Ratio of body length to width greater or equal to 3, less than 4. Parameres without apical tooth on ventral arm (except *Diactor*).

**Synapomorphies:** Juga porrect (level with tylus) and extending past antenniferous tubercles, rostrum reaching abdomen (reversed in a few species of *Leptoglossus*), abdominal spiracle placement closest to lateral edge, vesica forming three long, tight coils, median lateral lobe on conjunctiva.

## Literature cited

- Amyot, C.J.B. & Serville, A. (1843) Histoire Naturelle des Insectes—Hémiptères. In “Suites à Buffon.” Fain et Thunot. Paris. Lxxvi + 675 + 8 [Atlas]pp., 12 plates.
- Brailovsky, H. (1989) Nuevos arreglos tribales dentro de la familia Coreidae y descripción de dos especies nuevas Sudamericanas (Hemiptera-Heteroptera). *Anales de Instituto de Biología Universidad Nacional Autónoma de México, Serie Zoología*, 59, 159–180.
- Brailovsky, H. (1990a) Generos nuevos y especies nuevas de Coreidos neotropicales (Hemiptera-Heteroptera-Coreidae: Acanthocerini, Leptoscelidini y Anisoscelidini). *Anales de Instituto de Biología Universidad Nacional Autónoma de México, Serie Zoología*, 61, 107–123.
- Brailovsky, H. (1990b) Nuevos arreglos nomenclatoriales y descripción de dos especies nuevas del género *Dalmatomammurius* Brailovsky (Hemiptera-Heteroptera-Coreidae-Leptoscelidini). *Anales de Instituto de Biología Universidad Nacional Autónoma de México, Serie Zoología*, 61, 343–355.
- Brailovsky, H. (1996) A new genus and a new species of Leptoscelidini (Heteroptera: Coreidae) from Costa Rica. *Proceedings of the Entomological Society of Washington*, 98, 215–220.
- Brailovsky, H. (1997a) One new genus and two new species of Acanthocephalini (Hemiptera: Coreidae: Coreinae). *Annals of the Entomological Society of America*, 90, 550–554.
- Brailovsky, H. (1997b) *Leptostellana parva* gen.nov. et spec. nov. from Costa Rica (Insects: Heteroptera: Coreidae: Leptoscelidini). *Reichenbachia Staatliches Museum für Tierkunde Dresden*, 32, Nr. 5, 19–24.
- Brailovsky, H. (2001) A new genus and a new species of Leptoscelidini (sic) (Heteroptera: Coreidae: Coreinae) from Brazil. *Proceedings of the Entomological Society of Washington*, 103, 917–921.
- Casini, C. (1983) Reubicación sistemática del género *Ugnius* (Hemiptera-Coreidae). *Boletín de Societe Zoologie, Uruguay*, 1, 73–80.
- Costa, A. (1838) Cimicum regni Neapolitani centuriae. Napoli. Cent. I. 76 pp.
- Froeschner, R.C. (1988) Family Coreidae Leach, 1815. In T. J. Henry & R. C. Froeschner (eds.). 1988. Catalog of the Heteroptera, or true bugs, of Canada and the continental United States. E. J. Brill, New York, pp 69–92.
- Gibson, E.H. & Holdridge, A. (1918b) The genus *Narnia* Stål and a key to the genera of Anisoscelini A. & S. (Coreidae: Heteroptera). *Psyche*, 25, 1–4
- Horváth, G. (1911) Nomenclature des familles des Hémiptères. *Annales Musei Nationalis Hungarici*, 9, 1–34.
- Laporte, F.L.De. (1832) Essai d'une classification systématique de l'ordre des Hémiptères. (Hémiptères Hétéroptères, Latr.) Family Anisoscelites, Lygites, and Coréites. *Magasin de Zoologie, France*, 52, 23–47.
- Lethierry, L. & Severin, G. (1894) Catalogue Général des Hémiptères. Tome II. Hétéroptères. Brussels. F. Hayez, Imprimeur de l'Académie Royale de Belgique. 277 pp.
- Osuna, E. (1984) Monografía de la tribu Anisoscelidini (Hemiptera, Heteroptera Coreidae) I. Revisión Genérica. *Boletín de Entomología Venezolana*, 3, 77–148.
- Packauskas, R.J. (1994a) Key to the subfamilies and tribes of the New World Coreidae (Hemiptera), with a checklist of published keys to genera and species. *Proceedings of the Entomological Society of Washington*, 96, 44–53.
- Packauskas, R.J. (1994b) A revision of the Tribes Acanthocephalini, Anisoscelini, and Leptoscelidini (Heteroptera; Coreidae: Coreinae). Unpublished Doctoral Dissertation, Univ. CT, Storrs, CT, 341 pp.
- Packauskas, R.J. (2006) On the Re-erection of the Tribe Stenoscelideini Schaefer (Heteroptera: Coreidae: Coreinae). *Denisia*, 19, 239–242.
- Packauskas, R.J. & Schaefer, C.W. (2001) Clarification of some taxonomic problems in Anisoscelini and Leptoscelini (Hemiptera: Coreidae: Coreinae). *Proceedings of the Entomological Society of Washington*, 103, 249–256.

- Schaefer, C.W. (1965) The morphology and higher classification of the Coreoidea (Hemiptera-Heteroptera). Part III. The families Rhopalidae, Alydidae, and Coreidae. *Miscellaneous Publications of the Entomological Society of America*, 5, 1–76.
- Schaefer, C.W. (1968) The morphology and higher classification of the Coreoidea (Hemiptera-Heteroptera). Part IV. The *Acanthocephala* group and the position of *Stenoscelidea* Westwood (Coreidae). *University of Connecticut Occasional Papers. (Biol. Sci. Ser.)*, 1, 153–199.
- Stål, C. (1867) Bidrag till Hemipterernas sytematik. *Öfversigt af Kongliga Vetenskaps-Akademiens Förhandlingar*, 24, 491–560.
- Stål, C. (1870–1876) Enumeratio Hemipterorum. Bidrag till en företeckning öfver alla hittils kända Hemiptera, jemte systematiska middelanden. Parts.1–5. *Kongliga Svenska Vetenskaps-Akademiens Förhandlingar*, 1870, part 1, 9, 1–232.
- Swofford, D.L. (1991) *Phylogenetic Analysis Using Parsimony. Version 3.0s*. Computer program distributed by Illinois Natural History Survey, Champaign, IL.