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The milliped family Anthroleucosomatidae new to North America: *Leschius mcallisteri,* n. gen., n. sp. (Diplopoda: Chordeumatida: Anthroleucosomatoidea)

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Abstract

Leschius mcallisteri, n. gen., n. sp., is described from near Olympia, Washington, USA, as the first North American representative of the milliped family Anthroleucosomatidae, differing from all other species of the family in its small size, low segment number, and distinctive male ninth legs (posterior gonopods) lacking any trace of a telopodite. The new species is highly disjunct; the core distribution of the anthroleucosomatids is in the Balkans, ranging east to the Caucasus, Iran, and central Siberia.

Key words: Diplopoda, Anthroleucosomatidae, new genus, new species

Introduction

One of the least understood assemblages of chordeumatidan millipeds is the family Anthroleucosomatidae. Recent classifications (Hoffman1980; Shear 2000) differ significantly on the full composition of the family, but agree on the inclusion of a core group of genera whose distribution centers in Italy and the Balkan Peninsula, and extends southeast to Iran, the Caucasus Mountains of Russia and Georgia, and to the Altai Mountains in central Siberia. These genera, many of which include troglobitic species, are characterized by a suite of apomorphies in the gonopods and ninth legs of males: 1) gonopod sternum with a large, posterior, median shield-like structure that may be very complex, 2) presence of putative cheirites in the gonopods, 3) strongly reduced ninth legs in which the telopodites may be entirely absent, but which carry complex coxal elements.

Leschius mcallisteri, n. gen., n. sp., was collected by WPL at McAllister Springs, near Olympia, Thurston County, Washington. The new species appears to be more closely

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related to the easternmost Eurasian anthroleucosomatids than to the genera from Bulgaria and the Balkan Peninsula.

Abbreviations

FMNH = Field Museum of Natural History, Chicago
AMNH = The American Museum of Natural History, New York
CAS = California Academy of Sciences, San Francisco
WAS = personal collection of William A. Shear, Hampden-Sydney

Taxonomy

Family Anthroleucosomatidae Verhoeff 1899

At the present time it is not possible to present a concise diagnosis of this family, the compositon of which will undoubtedly change with further study. See the discussion of relationships following the description for hypotheses on the placement of our new taxon. A list of included genera may be found in Hoffman (1980); Anthroleucosomatidae *sensu* Shear (2000) is made up only of those genera Hoffman places in the subfamily Anthroleucosomatinae.

Leschius, new genus

Type species: *Leschius mcallisteri,* n. sp. Monotypic.

Etymology: The genus is named for Chief Leschi (1808–1858) of the Nisqually Indian Tribe of Washington, USA, and is masculine in gender. Chief Leschi worked for peace between the native people and the European settlers, but was tragically and unjustly executed by the territorial authorities. For more information on Chief Leschi, see http://hr.dop.wa.gov/wfd/roots.htm

Diagnosis: Small (3.6–4.2 mm long) anthroleucosomatid with 26 trunk segments; lacking pregonopodal leg modifications in males; anterior gonopods with free coxites anteriorly, large compound sternal process posteriorly carrying two gland channels; posterior gonopods complex, lacking telopodites. Differing from all other anthroleucosomatid genera in the small size, low segment number and the complex posterior gonopod coxites.

Description: As for the single species, below.

Types: Male holotype (FMNH), 4 male and 4 female paratypes (FMNH, AMNH, CAS) from leaf litter at McAllister Springs, near Olympia, Washington, USA, (N47°02.946', W122°43.678'), collected 22 February 2004 by W. P. Leonard; 2 male and 3 female paratypes (WAS) from near the same locality (N47°02.837', W122°43.722'), collected 7 February 2004 by W. P. Leonard and C. Richart.

Etymology: The species is named for Olympia naturalist Kelly R. McAllister (1956–), descendant of Chief Sca-da-wah of the Cowlitz Indian Tribe of Washington, USA, and the McAllister Clan, one the first European families to homestead the Puget Sound Region in 1852, near McAllister Springs.

Description: Male (Figs. 1–5): Twenty-six segments, at least two segments anterior to epiproct legless. Length, 3.6 mm, width 0.32 mm. Third antennomere about 4 times longer than wide. Ocelli 5 or 6, in single row plus single ocellus below anterior ocelli of single row, moderately well-formed, lightly pigmented. Trunk segments with smooth, shining metaterga, segmental setae smooth, acute, about 1/2 width of terga, two outer setae on each side on common tubercle, all setae strongly curved, directed medially, arching over metaterga. Legpairs 1 and 2 with tarsal combs, coxae 2 with vas deferentia opening through coxae on short tubes. Legpairs 3–7 somewhat incrassate compared to more posterior legpairs, podomeres unmodified. Anterior gonopods in anterior view (Fig. 1) with large, blocky coxae (**c**) set on anteriorly projecting sternal shelf, coxites (**cx**) blade-like, about 4 times longer than wide. In posterior view (Fig. 2), sternum greatly enlarged and produced as massive posterior sternal process (**s**), bearing anteriolateral, short, forceps-like projections (these projections grasp posteriorly projecting knobs from coxites), posterior face of process with paired gland channels emerging through pores clearly visible subapically; gland channels continue to large central glandular mass between and dorsal to tracheal apodemes. Posterior gonopods (Figs. 3, 4) with broad sternum, medially excavated to receive sternal process of anterior gonopods. Coxae large, projecting posteriorly; 4 coxites on each side, coxite 1 short, acute, basally fused to coxite 2, latter broader, longer, more blade-like, coxite 3 slightly sinuous acute rod, coxite 4 divided into 3 or 4 fimbria-like parts. *In situ*, anterior gonopods inclined posteriorly, sternal process fits tightly in median sternal excavation of posterior gonopods, posterior gonopod coxites extend laterally and anteriorly around anterior gonopod coxites. Legpair 10 (Fig. 5) with coxae slightly enlarged, bearing large glands; legpair 11 similar but coxae and glands smaller. Coloration white, ocelli black.

Female: length, 4.0 mm, width 0.37 mm. Nonsexual characters as described for male. Cyphopods as in Fig. 6.

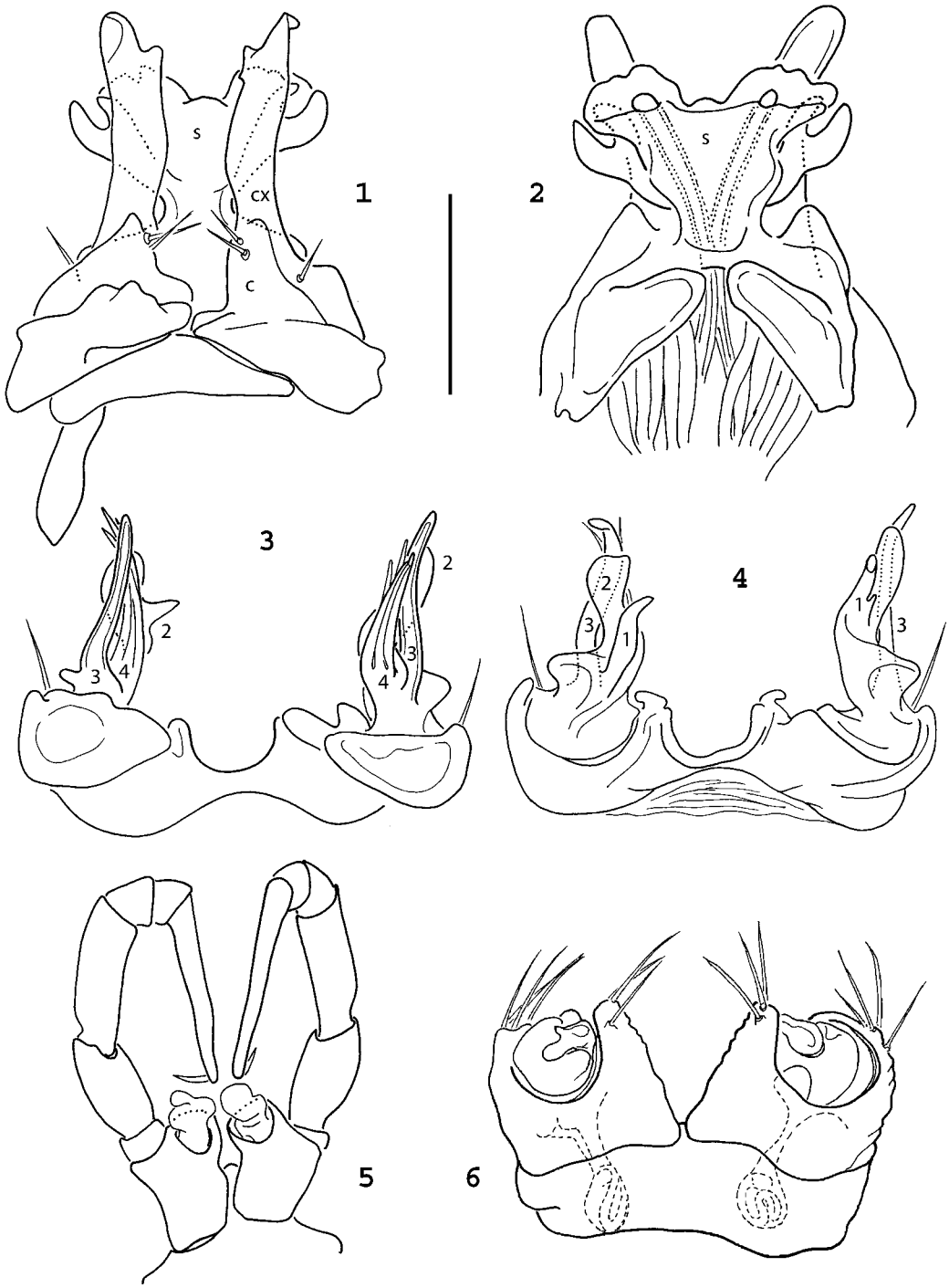
Natural History Observations: Specimens were hand-collected while using an OptiVisor 3X magnifying visor to search leaf litter along a steep, east-facing slope in the lower Nisqually River Valley. *Leschius mcallisteri* appeared to be limited to the forested "bot-

toms" along the base of the slope and near perennial springs which form the headwaters of tributaries to McAllister Creek. The site is vegetated by mature second-growth forest dominated by bigleaf maple (*Acer macrophylum*), red alder (*Alnus rubrum*), western redcedar (*Thuja plicata*), and sword fern (*Polystichum munitum*). We think the presence of perennial spring-fed streams and mature forest at the type locality are important in maintaining habitat conditions necessary for the species' survival.

Discussion: Among sympatric or nearly sympatric millipeds, *L. mcallisteri* may be confused only with the recently described *Microlympia echina* Shear and Leonard, which has 28 segments, up to 8 ocelli arranged in 2 rows, and entirely different gonopods (Shear and Leonard 2003). Undescribed new species of minute, white Caseyidae are also found in the region, but have 28 or 30 segments, much shorter segmental setae not set on tubercles, and only 2 ocelli.

The Anthroleucosomini (*recte:* Anthroleucosomatini) was set up in 1899 by Verhoeff as a tribe; he raised it to a family in 1910. It has been incorrectly spelled as "Antroleucosomatidae" by some authors (i.e., Strasser 1970, Golovatch 1981, 1984); Jeekel (1970) and Hoffman (1979) establish the correct spelling. Hoffman (1979) proposed an expanded version of the family, including Origmatogonidae, Anthogonidae, Haasiidae, Scutogonidae, Brachychaetumatidae, Macrochaeteumatidae and Chaemosomatidae as subfamilies. Shear (2000) moved some of these families to the superfamily Brannerioidea and restored others to full family statuses in the Superfamily Anthroleucosomatoidea. The superfamily remains poorly studied, and we anticipate a wholesale rearrangement in the future. A core group of genera originally included in the family occurs from Italy to Greece, Bulgaria and western Turkey (*i.e.*, Strasser 1960). More recently, genera and species have been described that extend the family's distribution to Iran (Mauriès 1982, Shear 1988), the Georgian Caucasus (Strasser 1970, Golovatch 1981, 1984), and the Novosibirsk region of Siberia (Shear 1988).

Of the described genera, *Leschius* seems closer in gonopod design to three monotypic genera known from the Caucasus: *Caucaseuma* Strasser 1971, *Adshardicus* Golovatch 1981, and *Ratcheuma* Golovatch 1985. All feature a large, backward projecting sternal lobe, and in both *Adshardicus* and *Ratcheuma*, there is evidence of a glandular complex, with paired ducts entering the sternal lobe. However, in each of these three genera, the posterior gonopods are closely appressed to one another, not widely separated as in *L. mcallisteri.* The posterior gonopods, or ninth legpair, of *Adshardicus* and *Caucaseuma* have very small telopodite remnants; these are entirely absent in *Ratcheuma* and *Leschius*, with *Leschius* having much more complex posterior gonopod coxites than any other anthroleucosomatids. Because of the presence of these coxites, it seems appropriate to postulate that the ninth legs have a role to play in spermatophore transfer, and thus accurately can be referred to as "posterior gonopods."



FIGURES 1–6. *Leschius mcallisteri*, n. sp. 1. Anterior gonopods, anterior view; 2. The same, posterior view; 3. Posterior gonopod (legpair 9), anterior view.; 4. The same, posterior view; 5. Legpair 10 of male, anterior view; 6. Cyphopods, posterior view. Scale line for figures 1–5 = 0.1 mm, for figure 6, 0.5 mm.

The geographically nearest occurring anthroleucosomatid species to *L. mcallisteri* are *Ghilarovia kygae* Gulicka (Altai Mountains) and *G. novosibirica* Shear (Novosibirsk; Shear 1988). Both species have complex coxites in the posterior gonopods, but with prominent, 2-articled telopodites as well. A variety of pregonopodal leg modifications occur in all the mentioned genera, but not in *Leschius*.

An intriguing possible connection exists between the aforementioned genera with glands opening on the sternal process, *Leschius,* and the enigmatic Speophilosomatidae of Japan. Speophilosomatids have simple anterior gonopods, with separate free coxites on either side and a large, median sternal process bearing apical gland pores (Shear, Tsurusaki and Tanabe 1994). If these features are homologous, it may be that Speophilosomatidae belongs in Anthroleucosomatoidea. However, speophilosomatids have uniquely modified seventh legpairs that suggest an alliance with Chordeumatidae (Shear 2000).

Thus while we are confident that *Leschius* is best placed in the Family Anthroleucosomatidae, it is disjunct both geographically and morphologically from the rest of the family. A complete restudy and reclassification of the present Anthroleucosomatidae, restricted as it now is (Shear 2000) from Hoffman's much expanded version (Hoffman, 1980) will, we think, result in at least four new family-level taxa. But with this whole group of millipeds so imperfectly known, we are presently content just to include our new genus and species, and leave the settlement of its exact taxonomic position for the future.

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