

TAXONOMIC NOTES ON THE GENUS *NOTEOLETHAEUS*
WITH THREE NEW SPECIES FROM MADAGASCAR
(HEMIPTERA: HETEROPTERA: RHYPAROCHROMIDAE)

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Three new species of *Noteolethaeus* Woodward et Slater, 1962 (Hemiptera: Heteroptera: Rhyparochromidae: Rhyparochrominae: Lethaeini) are described: *N. pallens* Zámbo et Kondorosy, **sp. n.**, *N. vasarhelyii* Zámbo et Kondorosy, **sp. n.** and *N. banari* Zámbo et Kondorosy, **sp. n.** The new species are in transitional position between *Noteolethaeus* Woodward et Slater, 1962 and *Sweetolethaeus* Slater, 1972, rendering the genus-level differentiation of the above two genera impossible. However, because the type species of the two genera are rather dissimilar, *Sweetolethaeus* is retained as subgenus of *Noteolethaeus* (**stat. n.**). The following new combinations are accordingly proposed: *Noteolethaeus* (*Sweetolethaeus*) *macchiaensis* (Slater, 1972), **comb. n.** and *Noteolethaeus* (*Sweetolethaeus*) *termiticolus* (Slater, 1972), **comb. n.** *Noteolethaeus leeu* Woodward et Slater, 1962 is recorded for the first time from Tanzania. A key to the identification of the species of *Noteolethaeus* is provided.

Keywords: Lygaeoidea, Lethaeini, *Noteolethaeus*, *Sweetolethaeus*, new status, new species.

INTRODUCTION

Madagascar is a global biodiversity hotspot with a high endemism at species and supraspecific level. Currently 63 species of Rhyparochromidae are known from the island (KMENT *et al.* 2016); and about two-thirds of them are endemic. The most species-rich rhyparochromine tribe in Madagascar is Rhyparochromini with 21 described species (although the status of some names or its tribal assignment must be revised). The second richest is Lethaeini with 10 species (8 listed by KMENT *et al.* (2016), two more are under description (KONDOROSY *et al.*, in prep.). This number places Madagascar into the

fourth place in the continent. 23 species of Lethaeini have been reported from Sudan by LINNAVUORI (1978), 19 from South Africa (mostly by SLATER 1964b, 1998), and 12 from Senegal by SCUDDER (1982) and SLATER and WILCOX (1972).

The known Lethaeini of Madagascar belong to three genera: *Diniella* Bergroth, 1893, *Lethaeus* Dallas, 1852 and *Neolethaeus* Distant, 1909. *Lethaeus marginatus* was described by SIGNORET (1860) and transferred by SLATER (1998) to *Diniella* Bergroth, 1893 who also reported the species from various African countries. *Dinia nitida* Reuter, 1882, was described from Ghana; BERGROTH (1893) proposed the name *Diniella* as a replacement name for the junior homonym *Dinia* Stål, 1874; the species was reported from Madagascar by DISTANT (1910). A third species, *Lethaeus longirostris* Reuter, 1887, was described from Madagascar but widely distributed in Africa. All other species seem to be endemic of the island: *Lethaeus nodulinervis* Bergroth, 1905, described from Nossi-Bé [= Nosy Be] (BERGROTH 1905), and four species described by SLATER and O'DONNELL (1999) (*Lethaeus gigas* Slater et O'Donnell, 1999, *Neolethaeus maculosus* Slater et O'Donnell, 1999, *N. madagascariensis* Slater et O'Donnell, 1999 and *N. polhemi* Slater et O'Donnell, 1999).

However, the actual fauna of Lethaeini in Madagascar is much more species-rich than suggests the relatively low number of described species; many undescribed species are scattered in collections. The present paper treats the small genera *Noteolethaeus* Woodward et Slater, 1962 and *Sweetolethaeus* Slater, 1972 which were supposed either having a disjunct East Australian–South African distribution or being endemic in the Cape region until now. Three new species from Madagascar are described below.

Noteolethaeus has an unusual distribution (WOODWARD & SLATER 1962): its type species, *N. armstrongi* Woodward et Slater, 1962, is known from Eastern Australia, its other included species, *N. leeu* Woodward et Slater, 1962, is from Transvaal, South Africa. *Sweetolethaeus* was proposed by SLATER (1972) for two newly described species from Cape Province, South Africa, *S. macchiaensis* Slater, 1972 and *S. termiticolus* Slater, 1972. None of these species were mentioned since their original descriptions, except in the catalogue of SLATER and O'DONNELL (1995), and in the important paper about male genitalia of Lethaeini by O'DONNELL (1991).

Here we describe three new species from Madagascar. The discovery of the new species implies the downgrading of *Sweetolethaeus* to subgeneric rank and necessitates a redefinition of the genus, therefore a detailed redescription is provided below.

MATERIAL AND METHODS

Materials of several museums have been studied. The following collections contain *Noteolethaeus* specimens discussed in this paper: BMNH – Natural History Museum, Lon-

don, Great Britain; EKKH – Előd Kondorosy collection, Keszthely, Hungary; HNHM – Hungarian Natural History Museum, Budapest, Hungary; MMBC – Moravian Museum, Brno, Czech Republic; MNHN – Museum National d’Histoire Naturelle, Paris, France; NHMW – Natural History Museum, Vienna, Austria; NMPC – National Museum, Prague, Czech Republic; RMCA – Royal Museum of Central Africa, Tervuren, Belgium; ZMHB – Natural History Museum, Berlin, Germany.

Specimens were studied using an Olympus SZ11 stereomicroscope. Measurements were taken using an ocular eyepiece (head and pronotum dimensions were measured in horizontal, most exposed view of these respective body parts). Pictures were taken with a Panasonic Lumix DMC G-6 camera and Zeiss Discovery V8 stereomicroscope.

We follow the morphological terminology of KMENT *et al.* (2016), TSAI *et al.* (2011), and TSAI and RÉDEI (2017), the nomenclature of antennal segments follows ZRZAVÝ (1990).

TAXONOMY

Noteolethaeus Woodward et Slater, 1962

Noteolethaeus Woodward et Slater, 1962: 57. Type species: *N. armstrongi* Woodward et Slater, 1962: 58, by original designation.

Noteolethaeus: SLATER (1964a): 837 (catalogue); O’DONNELL (1991): 463 (male genitalia)

Sweetolethaeus Slater, 1972: 156. Type species: *S. macchiaensis* Slater, 1972: 158, by original designation. Downgraded to subgenus here.

Sweetolethaeus: O’DONNELL (1991): 465 (male genitalia); SLATER & O’DONNELL (1995): 101 (catalogue)

Redescription. Body oval, overall with punctation of various density and strength. Head pentagonal, convex, densely punctate, with head trichobothria and pair of iridescent spots on vertex as characteristic to all Eastern Hemisphere Lethaeini. Mandibular plates with keel reaching clypeus. Compound eyes rather small, adjacent to anterolateral angles of pronotum. Ocelli at level of posterior margin of eyes, closer to eye than to each other. Antenniferous tubercle very short, parallel; scape surpassing tip of head about one-third of its length, only slightly thicker than other segments. Pedicel longest, other antennal segments subequal in length; scape and pedicel rather terete, basi- and distiflagella more or less fusiform. Pronotum (sub)quadrate, anterior collar missing, sometimes with a vestigial V-like medial furrow on anterior lobe. Transverse impression weak or missing. Posterior margin of pronotum concave, lateral margin mostly slightly concave (sometimes straight), well developed, laminate but narrower than thickness of pedicel. Anterolateral pronotal trichobothrium variable (see in discussion). Scutellum triangular, with fine short keels from basilateral angles toward middle, but not reaching middle. Clavus with four entire rows of punctures, sometimes with some additional punctures or both medial rows partly united. Corium with rows of punctures along veins R+M and Cu and with irregular punctures between them, innermost row mostly duplicated in posterior part; lateral and apical margins convex, more evenly in brachypterous specimens. Membrane without transverse veins. Profemora moderately incrassate with 2–4 tiny but thick subapical spines and 1 or 2 long slender setae, metafemora with a single subapical spine; tibiae with long erect stiff setae (protibiae only on inner side). Ostiolar peritreme short, curving posteriad. Evaporative area reaching laterad about 2/3 of metapleuron. Abdomen with fine coriaceous ru-

gosity and sparse superficial punctures (except *N. armstrongi* Woodward et Slater, 1962 with dense punctures), trichobothria, spiracles and sutures as typical in Lethaeini. Last segments without any tooth or other specific modification. Pygophore simple, paramere with short inner projection and long straight outer projection.

Discussion. When describing *Sweetolethaeus*, SLATER (1972) pointed out that it is “quite closely related to *Noteolethaeus*” but the two genera can readily be differentiated (the features will be discussed below at *Sweetolethaeus*). The new species described from Madagascar in the present paper, however, are transitional between *Sweetolethaeus* and *Noteolethaeus*, thus obscuring the limit of the two genera. Consequently, all species are recognized as congeneric, but *Sweetolethaeus* is maintained as a subgenus of *Noteolethaeus*.

The presence of anterolateral trichobothria on the pronotum is an important character of Lethaeini, however, they are missing in some species of certain genera, e.g., *Neolethaeus* Distant, 1909 (WOODWARD 1968) or *Aristaenetus* Distant, 1901 (KONDOROSY *et al.* 2019). WOODWARD and SLATER (1968) did not describe this character in *Noteolethaeus*, but it was clearly figured on the habitus drawing of *N. armstrongi*. SLATER (1972) used the absence of the trichobothria in *Sweetolethaeus termiticolus* as a diagnostic character to differentiate this species from other members of *Sweetolethaeus*; Dawid Jacobs (pers. comm.) confirmed that the accessible type specimens of this species, deposited in the South African National Collection of Insects (Pretoria), indeed lack anterolateral trichobothria. We studied a specimen of *N. leeui* and found no trichobothrium on its pronotum (the original description of this species does not mention this character); however, the trichobothrium can break off easily, and the dense punctation of the pronotum of *N. leeui* does not allow us to exclude its eventual presence. To our present knowledge this character is variable within the genus.

SLATER (1972) described *Sweetolethaeus termiticolus* from termite nests. He gave no etymology but the name was evidently given in allusion of its special microhabitat, meaning “dwelling with termites”. Latin epithets containing the suffix -cola are either substantives (to be treated as they were nouns in apposition, in the same way for all genders), or adjectives (ending to be changed to agree in gender with the generic name, but declined in First Declension). Following HARBACH (2018) we recognize *termiticolus* as intentionally proposed as an adjective, therefore its ending to be changed; accordingly *Sweetolethaeus termiticolus* is used in its original form.

Noteolethaeus (Noteolethaeus) armstrongi Woodward et Slater, 1962

Material examined. AUSTRALIA: N.S.W / Cassilis, “Kuloo” / Station, 900 m / 31°50'9"S; 150°8'E // 25.x.2000 / Hung. Entom. Exped. / leg. A. Podlussány / G. Hangay & I. Rozner (1 ♀, HNHM).

Noteolethaeus (Noteolethaeus) leeu Woodward et Slater, 1962

Material examined. TANSANIA [sic!] 03°23'S 36°43'E / Arusha, Massai Camp / 1360 m, 13. x. 2002 / leg. U. Göllner (1 ♂, ZMHB).

Distribution. South Africa (Transvaal) (type locality), Tanzania (new country record).

***Noteolethaeus (Noteolethaeus) pallens* Zámbo et Kondorosy, sp. n.**
(Figs 1, 4A, C, 5)

Type locality. Madagascar, Ankarafantsika National Park, near lake Ravelobe, S16°18'35" E46°48'59".

Type material. HOLOTYPE: AKF/Jan 2015/21 NW Madagascar / circuit "Source de vie" marking / "1500 m" sifting forest litter by big tree, Winkler apparatus extraction, 90 m a.s.l. / P. Baňář & E. M. Rabotoson lgt. (1 ♂, MMBC). PARATYPES: AKF/Jan 2015/23 NW Madagascar / Ankarafantsika N. P., 25.1.2015 / marking "300 m" sifting forest litter Winkler app. extraction 95 m a.s.l. / P. Baňář & E. M. Rabotoson lgt. (1 ♀, MMBC); AKF/Jan 2015/21 NW Madagascar / Ankarafantsika N. P., 25. 1. 2015 / sifting forest litter by big tree / Winkler apparatus extraction, 90 m a.s.l / P. Baňář & E. M. Rabotoson lgt. (1 ♂, MMBC); AKF/Jan 2015/21 NW Madagascar / circuit "Source de vie" marking / "1500 m" sifting forest litter by big tree / Winkler apparatus extraction, 90 m a.s.l / P. Baňář & E. M. Rabotoson lgt. (1 ♀, MMBC); ISL/Jan 2013/21, Madagascar / Isalo N. P., Namazaha forest / 776m, S22°32'22.2" E45°22'46.0", 22. i. 2013 / sifting litter, Winkler app. extr., L. S. Rahanitriniaina & E. M. Rabotoson lgt. (1 ♀, MMBC); ISL/Jan 2013/22, Madagascar, Isalo N. P. / Namazaha forest, 768 m, S22°32'23.2" E45°22'53.1", 22. i. 2013 / sifting litter, Winkler app. extr., L. S. Rahanitriniaina & E. M. Rabotoson lgt. (1 ♀, MMBC); ISL/Jan 2013/12 / Madagascar / Isalo N. P. / Analalava forest, 755m, S22°35'00.80" E45°08'20.3", 19.i.2013 / sifting litter, Winkler app. extr., L. S. Rahanitriniaina & E. M. Rabotoson lgt. (1 ♂, 1 ♀, MMBC); ISL/Jan 2013/04, Madagascar, Isalo N. P. / Analalava forest / 725m, S22°35'05.0" E45°07'51.8", 17. i. 2013 / sifting litter, Winkler app. extr., L. S. Rahanitriniaina & E. M. Rabotoson lgt. (1 ♀, MMBC, 1 ♂, NMPC); ISL/Jan 2013/07, Madagascar, Isalo N. P. / Analalava forest, 747 m, S22°35'53.5" E45°08'13.7", 18. i. 2013, sifting litter / Winkler app. extr., L. S. Rahanitriniaina & E. M. Rabotoson lgt. (1 ♂, MMBC); ZOM/Jan 2013/14 Madagascar / Zombitse N. P. / Miliokakely, 823 m, S22°52'38.1" E44°42'48.6", 28. i. 2013 / sifting litter, Winkler app. extr. / L. S. Rahanitriniaina & E. M. Rabotoson lgt. (1 ♂, MMBC); ZOM/Jan 2013/15 Madagascar / Zombitse N. P. / Miliokakely, 834 m, S22°52'41.2" E44°42'40.1", 28. i. 2013 / sifting litter, Winkler app. extr., L. S. Rahanitriniaina & E. M. Rabotoson lgt. (1 ♂, MMBC); ZOM/Jan 2013/11 Madagascar / Zombitse N. P., Andalabiby, 769 m, S22°53'00.8" E44°42'11.4", 26. i. 2013 / sifting litter, Winkler app. extr., L.S.Rahanitriniaina & E.M. Rabotoson lgt. (1 ♂, MMBC); ZOM/Jan 2013/10 Madagascar, Zombitse N. P. / Andalabiby, 778 m, S22°53'02.9" E44°42'18.3", 26. i. 2013, sifting litter / Winkler app. extr, L. S. Rahanitriniaina & E. M. Rabotoson lgt. (1 ♀, MMBC); ZOM/Jan 2013/09 Madagascar / Zombitse N. P. / Andalabiby, 772 m, S22°53'04.6" E44°42'25.6", 26. i. 2013, sifting litter / Winkler app. extr., L. S. Rahanitriniaina & E. M. Rabotoson lgt. (1 ♂, 3 ♀, MMBC, 1 ♂, 1 ♀, HNHM); ZOM/Jan 2013/04 Madagascar, Zombitse N. P. / "Circuit Lobo", 751 m, S22°53'21.6" E44°41'58.5", 24. i. 2013 / sifting litter, Winkler app. extr., L.S.Rahanitriniaina & E.M. Rabotoson lgt. (1 ♂, MMBC, 1 ♀, NMPC); Tanandava (lumière) / 1963 /1964 G. Schmitz (2 ♂, 3 ♀, RMCA); [hw:] Réserve natu- / relle nr 8 / Vilanandro // ix. 52 (R. P.) // [pr:] Institute / Scientifique / Madagascar (1 ♂, MNHN).

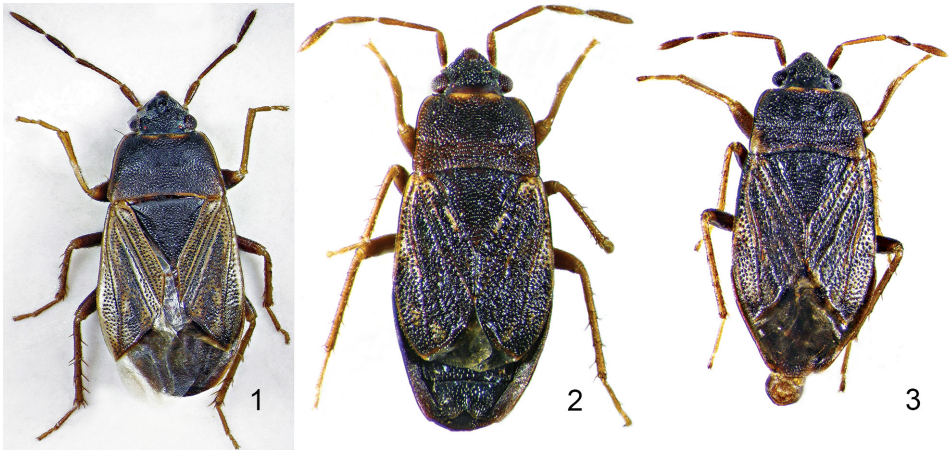
Description. Colour: Body fuscous; clypeus brightening towards apex; scape and pedicel yellow, basi- and distiflagellum yellowish brown to fuscous (sometimes segments concolorous brown); labium creamy except brown tip; anterior margin of pronotum except sublateral part yellow; lateral margin of pronotum creamy; posterior lobe of pronotum sometimes paler brown; scutellum fuscous; clavus and corium pale (almost unicolorous or posteriorly with variable darker spots); membrane fumose, veins translucent (sometimes base partly darker coloured); legs brown, tibiae and tarsi yellow; prothoracic supracoxal lobe, posterior margin of proepimeron and metepimeroid at least laterally yellowish.

Vestiture: Body with extremely fine decumbent pubescence; abdomen, antennae and legs with sparse longer decumbent fine setae, antennae also with longer semierect setae, scape with about 5 stiff setae thicker than other setae but more slender than strong stiff setae of tibiae. Profemora with 2–3 strong setae in posterior half, sitting on hump tubercles and 2–3 tiny teeth subapically, metafemur with a subapical seta posteroventrally. Tibiae besides fine pubescence with strong stiff setae around (protibiae bearing them on inner side only); tarsi with well visible pilosity.

Structure: Body moderately elongate, subshiny. Head and thorax densely punctate with moderately fine punctures; punctures of head partly confluent; anterior lobe of pronotum except medial part with finer punctures leaving larger distances between each other than size of punctures; abdomen very finely rugose with some tiny shallow punctures. Membrane shiny, finely rugose.

Labium attaining mesocoxae, segment I not reaching base of head, segment II reaching procoxae.

Pronotum subquadrate with anterolateral trichobothria; surface slightly convex, almost flat (except strongly declivent anterolateral part), with a trace of usual transverse impression and a wide slightly impressed medial part anterior of it, anterior margin narrow and concave, lateral margin moderately explanate and more or less straight except anterior one-fifth being convex, posterior margin of pronotum evenly and slightly concave anterior of scutellum. Scutellum almost flat, anterior corners with short fine keels orientated centrally; clavus with four regular rows of punctures (middle ones often irregular



Figs 1–3. *Noteolethaeus* (s. str.) species: 1 = *N. pallens* Zámbo et Kondorosy, paratype, female; 2 = *N. vasarhelyii* Zámbo et Kondorosy, paratype, female; 3 = *N. banari* Zámbo et Kondorosy, paratype, male

posteriorly, with further punctures), row adjacent to claval furrow containing about 40 punctures; corium with two regular posteriad diverging rows of punctures along vein Cu and further inserted punctures on posterior half between them, vein R+M also followed on both side with rows of punctures, between rows and toward costa from vein R with further irregular punctures; membrane attaining apex of abdomen, four veins well visible, not anastomosing. Profemora moderately incrassate, much thicker than the other femora, middle and hind femora slightly incrassate.

Male genitalia: pygophore posteriad of posterior aperture transversely impressed, posterior margin of aperture sharp, dorsal sinus without tooth (Fig. 4A). Paramere triangular (similar to *N. macchiaensis*, see O'DONNELL 1991), inner projection acute, outer margin straight, apex blunt (Fig. 4C).

Measurements (all in mm, 10 males and 16 females, holotype in parentheses). Total body length: 2.95–4.08 (3.00); head: length 0.33–0.52 (0.36); width 0.63–0.80 (0.65); interocular space 0.35–0.50 (0.35); length of antennal segments: I 0.20–0.35 (0.28), II 0.35–0.65 (0.45), III 0.25–0.48 (0.30), IV 0.15–0.45 (0.35); length of labial segments: I 0.42–0.59 (0.46), II 0.39–0.55 (0.44), III 0.33–0.43 (0.35), IV 0.30–0.38 (0.32); pronotum: length 0.53–0.85 (0.60); width 1.05–1.40 (1.05); scutellum: length 0.63–1.00 (0.73); width 0.65–1.00 (0.70).

Diagnosis. *Noteolethaeus* (*N.*) *pallens* sp. n. seems to be somewhat transitional between *Noteolethaeus* (*Noteolethaeus*) and *N.* (*Sweetolethaeus*). It is rather similar to *N.* (*Sweetolethaeus*) *macchiaensis* but paler, with an almost unicolorous corium. In *N.* (*S.*) *macchiaensis* the punctures on the dorsum are much finer and sparser; the pubescence of the abdomen is shorter; the mandibular plates are convex in dorsal view (straight in *N. pallens*) and the paraclypeal lobes are much longer than clypeus, in lateral view almost as large as eye. The other species of the subgenus *Sweetolethaeus*, *N.* (*S.*) *termicolus*, also differs in its finer punctures, missing anterolateral trichobothria on pronotum, scape lacking spines, and less setose metatibiae. *N.* (*N.*) *pallens* is also very similar to the other two new species, *N.* (*N.*) *vasarhelyii* and *N.* (*N.*) *banari*, see discussions below.

Etymology. The name of the species is the Latin adjective *pallens*, referring to the fact that this is the palest species in the genus.

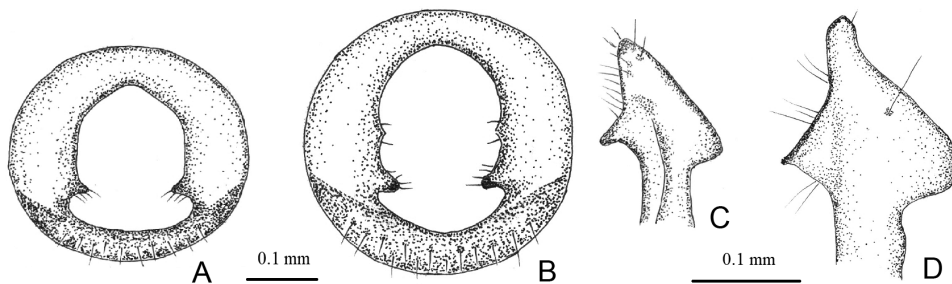


Fig. 4. Male genitalia of *Noteolethaeus* spp; A–B: pygophore, dorsal view; C–D: paramere, ventral view; A+C: *Noteolethaeus* (*N.*) *pallens*; B+D: *Noteolethaeus* (*N.*) *banari*

Habitat and distribution. Specimens from Ankarafantsika National Park were sifted from wet leaf litter close to big tree in evergreen lowland tropical forest. Specimens from Isalo and Zombitse-Vohibasia National Parks were sifted from leaf litter of seasonal forest of SW Madagascar. Widely distributed in Madagascar, at least in the western part (Fig. 5).

Noteolethaeus (Noteolethaeus) vasarhelyii Zámbo et Kondorosy, sp. n.
(Fig. 2, 5)

Type locality. Madagascar, Zombitse National Park, Andalabiby, S22°53'05" E44°42'26".

Type material. HOLOTYPE: ZOM/Jan 2013/09 Madagascar, Zombitse N.P. / Andalabiby / 772 m S22°53'04.6" E44°42'25.6", 26. i. 2013 / sifting litter, Winkler app. extr., L. S. Rahanitriniaina & E. M. Rabotoson lgt. (1 ♂, MMBC). PARATYPES: ZOM/Jan 2013/14 Madagascar / Zombitse N. P. / Miliokakely, 823 m, S22°52'38.1" E44°42'48.6", 28. i. 2013 / sifting litter, Winkler app. extr., L. S. Rahanitriniaina & E. M. Rabotoson lgt. (1 ♂, MMBC); ZOM/Jan 2013/16 Madagascar / Zombitse N. P. / Miliokakely, 832 m, S22°52'44.2" E44°42'36.7", 28. i. 2013 / sifting litter, Winkler app. extr., L. S. Rahanitriniaina & E. M. Rabotoson lgt. (1 ♀, MMBC); ZOM/Jan 2013/07 Madagascar / Zombitse N. P. / "Circuit Mandresy", S22°52'43.8" E44°41'36.5", 25. i. 2013 / 807 m, sifting litter, Winkler app. extr., L. S. Rahanitriniaina & E. M. Rabotoson lgt. (1 ♂, MMBC); ZOM/Jan 2013/05 Madagascar / Zombitse N. P. / "Circuit Mandresy", S22°52'57.5" E44°41'34.1", 25. i. 2013, 805 m / sifting litter, Winkler app. extr., L. S. Rahanitriniaina & E. M. Rabotoson lgt. (1 ♂, MMBC); ZOM/Jan 2013/11 Madagascar / Zombitse N. P. / Andalabiby, 769 m, S22°53'00.8" E44°42'11.4", 26. i. 2013 / sifting litter, Winkler app. extr., L. S. Rahanitriniaina & E. M. Rabotoson lgt. (2 ♂, MMBC); ZOM/Jan 2013/10 Madagascar / Zombitse N. P., Andalabiby / 778 m, S22°53'02.9" E44°42'18.3", 26. i. 2013 / sifting litter, Winkler app. extr., L. S. Rahanitriniaina & E. M. Rabotoson lgt. (1 ♂, 2 ♀, MMBC, 1 ♂, 1 ♀, NMPC); ZOM/Jan 2013/09 Madagascar / Zombitse N. P. / Andalabiby, 772 m, S22°53'04.6" E44°42'25.6", 26. i. 2013 / sifting litter, Winkler app. extr., L. S. Rahanitriniaina & E. M. Rabotoson lgt. (1 ♂, 1 ♀, MMBC, 1 ♂, 1 ♀, HNHM, 1 ♂, EKKH); ZOM/Jan 2013/01 Madagascar / Zombitse N. P. / "Circuit Lobo", 785 m, S22°53'06.0" E44°41'55.4", 24. i. 2013 / sifting litter, Winkler app. extr., L. S. Rahanitriniaina & E. M. Rabotoson lgt. (2 ♂, 1 ♀, MMBC); ZOM/Jan 2013/02 Madagascar / Zombitse N. P. / "Circuit Lobo", 771m, S22°53'10.9" E44°42'01.5", 24. i. 2013 / sifting litter, Winkler app. extr., L. S. Rahanitriniaina & E. M. Rabotoson lgt. (1 ♂, MMBC).

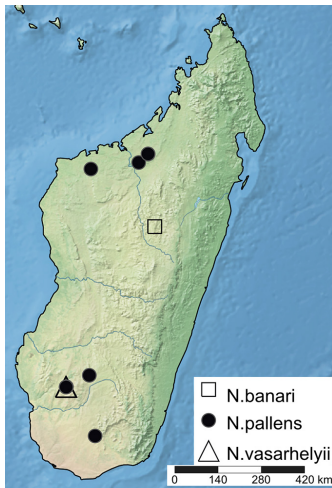


Fig. 5. Distribution of the new species in Madagascar

Description. Colour: Body chocolate brown; clypeus reddish brown; anterior margin of pronotum submedially and lateral margin cream coloured (but sometimes brown); scape and distiflagellum dark, pedicel often, basiflagellum always yellowish; labium yellowish; clavus and corium chocolate brown with hardly visible cream coloured spots; membrane fumose with

translucent base and two dark spots in inner angle and at corial vein M; metepimeroid laterally mostly pale; supracoxal lobes and coxae paler brown (on prothorax yellow), apex of femora, tibiae and tarsi yellowish.

Vestiture: Body with extremely fine decumbent pubescence, abdomen, antennae and legs with sparse longer decumbent fine setae, antennae also with long semierect setae, scape with at least some erect setae slightly thicker than other ones. Ventral surface of profemora with 3 short teeth subapically and 1 stiff seta near middle sitting on hump tubercle, protibiae bearing stiff setae on inner side only. Metafemur with long erect subapical posteroventral seta, meso- and metatibiae with strong stiff setae around.

Structure: Body moderately elongate, subshiny. Head and thorax densely punctate with strong punctures, on callar region punctures smaller.

Labium attaining mesocoxae, segment I not reaching base of head. Pronotum subquadrate with anterolateral trichobothria; surface slightly convex with extremely weak transverse impression and a hardly visible flat spot anterior of it; lateral margin moderately explanate (stronger on anterior half); posterior margin of pronotum rather concave. Scutellum with surface uneven, anterior corners with short fine keels orientated centrally. Clavus with four regular rows of punctures, median rows placed closer to one another than to lateral rows, posteriorly irregular. Corium with costal and apical margins strongly convex, with rather fine rugosity, subshining. Cu nearly straight, anteriorly followed by one regular row of punctures, posteriorly along claval furrow with second row. R+M followed with more or less regular rows of punctures, poorly separated from dense punctures of corium, being not finer in posterior part. Brachypterous species, membrane very shortened, leaving last abdominal segment and part of previous one free, slightly reaching over apex of corium, veins not visible. Profemora more strongly, meso- and metafemora slightly incrassate. Abdomen finely rugose, with some hardly visible tiny shallow punctures.

Male genitalia: pygophore and paramere similar to *N. pallens* (see Figs. 4A, D).

Measurements (all in mm, 12 males and 7 females, holotype in parentheses). Total body length: 2.8–3.58 (3.03); head: length 0.33–0.45 (0.45); width 0.60–0.70 (0.65); interocular space 0.38–0.50 (0.48); length of antennal segments: I 0.20–0.30, (0.28), II 0.40–0.50, (0.43), III 0.20–0.28 (0.28), IV 0.30–0.33 (0.30); length of labial segments: I 0.40–0.49 (0.43), II 0.38–0.47 (0.43), III 0.30–0.35 (0.32), IV 0.28–0.32 (0.30); pronotum: length 0.55–0.70 (0.60); width 0.90–1.15 (0.95); scutellum: length 0.50–0.75 (0.55); width 0.55–0.75 (0.60).

Diagnosis. *Noteolethaeus vasarhelyii* sp. n. is similar to *N. leeui*, but it has a longer head, lacks V-like furrow on the anterior lobe of the pronotum, its punctuation is sparser and stronger with ~10 punctures between ocelli (on *leeui* ~20). *N. pallens* sp. n. is also similar but it is macropterous, its punctures are finer and sparser (about 40 punctures in a row on clavus at claval furrow while in *N. vasarhelyii* with 20–25 only), and the hemelytra are much paler and smooth (on *N. vasarhelyii* sp. n. they are finely rugose). The other similar species is *N. banari*, see the differences under its diagnosis.

Etymology. This species is dedicated to Tamás Vásárhelyi, excellent Hungarian heteropterist, specialist of Aradidae, and former deputy general director of the HNHM, on the occasion of his 70th birthday. Tamás introduced the third author into the world of true bugs and was always a helpful friend.

Habitat and distribution. All known specimens were sifted from leaf litter of seasonal forest in Zombitse-Vohibasia National Park (Southwestern Madagascar) (Fig. 5).

Noteolethaeus (Noteolethaeus) banari Zámbo et Kondorosy, sp. n.
(Figs 3, 4B, 4D, 5)

Type locality. Madagascar, Ambohitantely Special Reserve, S18°11'02" E47°17'13".

Type material. HOLOTYPE: ABT/Sept. 2011/16 Madagascar / Ambohitantely Spec. Res., 4. ix. / 2011, S18°11'02.2" E47°17'13.4" / 1565m, sifting forest litter under / Pandanus Winkler app. extraction / L. S. Rahanitriniaina lgt. (1 ♂, MMBC). PARATYPES: ABT/Sept. 2011/13 Madagascar, Ambohitantely Spec. Res. 3. ix. / 2011, S18°10'58.4" E47°17'22.6", / 1525 m, sifting forest litter under / Pandanus and by big tree Winkler / app.extr., L. S. Rahanitriniaina lgt. (2 ♂, 2 ♀, MMBC); ABT/Sept. 2011/17 Madagascar / Ambohitantely Spec. Res., 4. ix. / 2011, S18°11'04.8" E47°17'11.8" / 1598 m, sifting forest litter by big / tree Winkler app. extraction / L. S. Rahanitriniaina lgt. (1 ♂, 1 ♀, MMBC); ABT/Sept. 2011/16 Madagascar / Ambohitantely Spec. Res., 4. ix. / 2011, S18°11'02.2" E47°17'13.4" / 1565 m, sifting forest litter under / Pandanus Winkler app. extraction / L. S. Rahanitriniaina lgt. (17 ♂, 19 ♀, MMBC, 1 ♂, 1 ♀, BMNH, 1 ♂, 1 ♀, HNHM, 1 ♂, 1 ♀, EKKH, 1 ♂, 1 ♀, MNHN, 1 ♂, 1 ♀, NHMW, 1 ♂, 1 ♀, NMPC).

Description. Colour: Body very dark brown; antenna brown, pedicel yellowish, labium yellow as well; posterior lobe of pronotum paler brown with well visible yellow spots on anterior margin submedially and on humeral angles; lateral pronotal margin mostly cream coloured (sometimes dark chocolate brown); clavus and corium dirty brown with irregular pale spots; membrane fumose with dark brown spots in inner angle and at end of corial vein M, translucent on veins; posterior margin of proepimeron and metepimeroid paler brown (sometimes partly yellowish); legs brown, protibiae yellowish brown (often rather yellow); meso- and metatibiae and tarsi darker ochre yellow.

Vestiture: Pubescence like in previous species.

Structure: Body elliptical, subshiny. Head and thorax densely punctate with rather big punctures (on callar area punctures often sparser and much finer), sometimes punctures of head partly confluent, punctures of scutellum and posterior half of corium between R and Cu much smaller.

Labium reaching mesocoxae, sometimes only middle of mesosternum, segment I not reaching base of head. Pronotum subquadrate with anterolateral trichobothria; surface with a weak but well visible transverse impression, anterior part of pronotum slightly convex; lateral margin moderately explanate (stronger on anterior half) and distinctly sinuate; posterior margin of pronotum rather concave. Scutellum flat but posterior half impressed, anterior corners with short fine keels orientated centrally. Clavus with four regular rows of punctures, median rows placed closer to one another than to lateral rows, their posterior part mostly irregular; row at claval furrow consisting of 20–25 punctures. Corium with very fine rugosity, almost smooth, shiny. Cu at level of scutellar apex slightly arched, therefore in posterior part situated farther from clavus, two rows of punctures running between Cu and clavus, Cu on costal side with regular row as well. R+M followed

with more or less regular rows of punctures, more or less separated from punctures of corium. Membrane shortened, reaching tergite VI but leaving tergite VII free, four veins well visible, not anastomosing. Sternites shiny, relatively densely punctate with rather big punctures and with hardly visible wrinkles; laterally with fine rugosity. Profemora more strongly, meso- and metafemora slightly incrassate. Abdomen finely rugose, with some hardly visible tiny shallow punctures. Male genitalia: pygophore posteriad of posterior aperture transversely impressed, posterior margin of aperture sharp, dorsal sinus with tiny blunt tooth (Fig. 4B). Paramere triangular, inner projection broad, outer margin slightly concave near acute apex (Fig. 4D).

Measurements (all in mm, 5 males, 3 females, holotype in parentheses). Total body length: 3.16–4.55 (3.92); head: length 0.49–0.72 (0.54); width 0.72–0.86 (0.79); interocular space 0.45–0.58 (0.51); length of antennal segments: I 0.28–0.45, (0.36), II 0.45–0.69, (0.56), III 0.36–0.42 (0.39), IV 0.44–0.49 (0.45); length of labial segments: I 0.38–0.56 (0.48), II 0.38–0.49 (0.45), III 0.31–0.41 (0.36), IV 0.30–0.37 (0.34); pronotum: length 0.65–0.92 (0.76); width 1.10–1.69 (1.36); scutellum: length 0.70–1.04 (0.88); width 0.72–1.08 (0.88).

Diagnosis. *Noteolethaeus banari* sp. n. is most similar to *N. vasarhelyii* sp. n. The most important differences are that *N. vasarhelyii* is brachypterous, its surface is more rugose (most conspicuously on corium visible) and it is more densely punctate. The pygophore and parameres of the two species are clearly different. The other similar species, *N. leui* has a very short head with much finer punctation (~20 punctures between ocelli), a more uneven pronotum with stronger transverse impression and V-like anterior furrow; furthermore, the area between the vein Cu and claval furrow has 2 full rows of punctures, posteriorly with adjacent rows as well.

Etymology. The new species dedicated to Petr Baňář, excellent Czech heteropterist and good friend, curator of the Moravian Museum, avid collector, and organizer of the Madagascar collecting project.

Habitat and distribution. All known specimens were sifted from leaf litter of evergreen mountain forest and rotting residues of *Pandanus* sp. leaves of Ambohitantely Special Reserve in Central Madagascar (Fig. 5).

Noteolethaeus (*Sweetolethaeus*) Slater, 1972, **stat. n.**

Discussion. This subgenus is very similar to the nominotypical subgenus of *Noteolethaeus*. SLATER (1972) provided the following main differences between the two taxa:

1) “the smooth dorsal surface of *Sweetolethaeus* well separated from one another”: confirmed during the present study, more accurately: the punctures on the posterior half of the pronotum are smaller than the distance between them, on the anterior half except medial part the punctures almost absent;

2) "the four distinct rows of claval punctures in *Sweetolethaeus*": of little value, because species and individuals with additional punctures are found in both group;

3) "lack of a transverse pronotal impressions in *Sweetolethaeus*": generally true but not distinct in some species;

4) "less strongly elevated corial veins": no difference could be observed between the two groups in this respect;

5) "more strongly lobate bucculae": it is true for *Sweetolethaeus macchiaensis* only;

6) "very feebly sinuate lateral corial margin": no difference could be observed between the two groups in this respect.

Additional differences between the two taxa, recognized during the present study, are the followings:

1. The outline of the mandibular plates is convex in dorsal view in *Noteolethaeus* (*Sweetolethaeus*), straight in *Noteolethaeus* (*Noteolethaeus*).

2. Corium with only a single row of punctures between vein Cu and claval furrow in *Noteolethaeus* (*Sweetolethaeus*), in *Noteolethaeus* (*Noteolethaeus*) with at least an additional row in posterior half.

The above characters are based on *Noteolethaeus* (*Sweetolethaeus*) *macchiaensis* (Slater, 1972). *Noteolethaeus termiticolus* (Slater, 1972), which we included also to the subgenus *Sweetolethaeus*, could not have been examined in course of the present study; Dawid Jacobs kindly informed us that in his opinion this species is quite dissimilar from *N. macchiaensis* in a number of characters and it might be necessary to exclude it from *Sweetolethaeus* (possibly also from the genus *Noteolethaeus*).

Noteolethaeus (*Sweetolethaeus*) *macchiaensis* Slater, 1972

Material examined. [SOUTH AFRICA] Algoa bay / Capland / 27.10.96 / Dr. Brauns // Lethaeini / G.+SP.? / Det. J. A. Slater 1965 (1 ♀, BMNH); Ceres / Cape Province / 1,500ft. / Jan.1991 // S. Africa. / R. E. Turner. / Brit. Mus. /1921-78 (1 ♀, BMNH).

KEY TO SUBGENERA AND SPECIES

1. Outline of mandibular plates straight in dorsal view. Surface of pronotum and scutellum more or less uneven, their punctation dense, punctures closer to each other than distance between them. Transverse impression of pronotum mostly visible. At least a double row of punctures between vein Cu and claval furrow on posterior half

Noteolethaeus (*Noteolethaeus*) 2

- Outline of mandibular plates convex in dorsal view. Surface of pronotum and scutellum even, their punctation sparse, punctures on posterior half not closer to each other than distance between them, on anterior half except medial part almost missing. Transverse impression of pronotum absent. Single row of punctures between vein Cu and claval furrow
Noteolethaeus (Sweetolethaeus) 6
- 2. Body covered with short but well visible fine decumbent setae. Lateral margin of pronotum straight. Abdomen very densely punctate, not coriaceous, ventrally with dense setae. Australia
N. (N.) armstrongi Woodward et Slater
- Body except head and abdomen with almost invisible extremely short and fine setae. Lateral margin of pronotum slightly concave at transverse impression. Abdomen very finely rugose, coriaceous, ventrally with sparse short setae. Afrotropical species 3
- 3. Head very short and high (height: length 1.5). Pronotum with V-like furrow on anterior lobe; surface uneven, transverse impression relatively strong. Punctation of dorsum fine and extremely dense (between ocelli with about 20 punctures). Two rows of punctures on anterior half and 3–4 rows in posterior half inner to vein Cu. African mainland (South Africa (Transvaal) and Tanzania) *N. (N.) leui* Woodward et Slater
- Head longer (height: length 1.0). Pronotum without furrow on anterior lobe; transverse impression weak. Dorsal punctation stronger and sparser (between ocelli with 8–12 punctures). One row of punctures on anterior half and 2 rows in posterior half inner to vein Cu. Madagascar 4
- 4. Surface of pronotum flat, with relatively fine and moderately dense punctures (most of punctures on callar area of pronotum at greater distance from each other than their size). About 40 punctures present in claval row at corium. Hemelytra at least in anterior half pale; membrane translucent, sometimes with weak darker streaks between veins
N. (N.) pallens **sp. n.**
- Surface of pronotum uneven, with impressions on middle and laterad of it, with coarse punctures. 20–25 punctures present in claval row adjacent to corium. Hemelytra in anterior half also mostly dark; membrane mostly dark 5
- 5. Medial impression of pronotum weak; punctation denser (on callar area of pronotum punctures closer to each other than their size). Brachypterous species, membrane reaching tergite VI *N. (N.) vasarhelyii* **sp. n.**

- Medial impression of pronotum relatively strong; punctation of pronotum sparser (on callar area of pronotum many of punctures of greater distance from each other than their size). Submacropterous, membrane reaching last segment *N. (N.) banari* **sp. n.**
- 6 Paraclypeal lobes very large, much longer than clypeus, in lateral view almost as large as eye. Profemur with stiff subapical setae. Trichobothria present near each anterolateral pronotal angle; 3–4 stout spines present on scape; conspicuous posterior tibial spines present along entire shaft. Clavus with 4 regular row of punctures
N. (Sweetolethaeus) macchiaensis (Slater, 1972), **comb. n.**
- Paraclypeal lobes normal, not longer than clypeus, in lateral view much smaller than eye. Profemur without stiff setae. Trichobothria absent near each anterolateral angle of pronotum; scape lacking stout spines; conspicuous hind tibial spines restricted to distal 1/5 of shaft. Clavus with more than 4 irregular row of punctures
N. (Sweetolethaeus) termiticolus (Slater, 1972), **comb. n.**

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