

***Afromenotes hirsuta*, a new genus and species of Eumenotini
from the Democratic Republic of the Congo
(Hemiptera: Heteroptera: Dinidoridae)**

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Abstract. *Afromenotes hirsuta* gen. & sp. nov. (Hemiptera: Heteroptera: Dinidoridae: Eumenotini) is described from the Democratic Republic of the Congo and compared with its only close relative, the Oriental genus *Eumenotes* Westwood, 1844. *Afromenotes hirsuta* thus represents the first record of Eumenotini from the Afrotropical Region. The external efferent system of the metathoracic scent glands of *E. obscura* Westwood, 1846 is described in detail, and distribution and host plants of *Eumenotes* species are reviewed. A list of known host plants for larval Dinidoridae is compiled from literature. *Eumenotes obscura* is recorded for the first time from Cambodia, Thailand, Vietnam, and several territories within India (Uttarakhand), Indonesia (Bali, Mentawai Islands) and Malaysia (Kelantan, Sabah, Tioman Island); *E. pacao* Esaki, 1922 is recorded from Vietnam.

Key words. Hemiptera, Heteroptera, Dinidoridae, Eumenotini, Megymeninae, new genus, new species, morphology, taxonomy, host plant, biogeography, Afrotropical Region

Introduction

There are very few genera of Heteroptera with such a confused and controversial history of their systematic placement like *Eumenotes* Westwood, 1846 (see Table 1). The genus was established by WESTWOOD (1846) to accommodate a single species, *E. obscura* Westwood, 1846 described based on specimens from unknown locality. WESTWOOD (1846, 1847) did not explicitly assign the genus to any family but stated that it was very close to *Amaurus* Burmeister, 1834, which is a junior synonym of *Megymenum* Guérin-Méneville, 1831. DALLAS (1851) finally included *Eumenotes* in the family Megymenidae Amyot & Serville, 1843;

this placement was followed by DOHRN (1859), WALKER (1868) and VOLLENHOVEN (1868, as subfamily of Pentatomidae). STÅL (1870) included the representatives of Megymenidae into Dinidorinae, classified as a subfamily of the Pentatomidae, which was accepted also in the world catalogue by LETHIERRY & SEVERIN (1893) and the genus level monograph of the family by SCHOUTEDEN (1913).

Despite being aware of *Eumenotes obscura* (cf. WALKER 1868), WALKER (1873) described the same taxon once more as *Aradus truncatus* Walker, 1873, placing it into the family Aradidae. BERGROTH (1889) proposed a new genus, *Odonia* Bergroth, 1889, for *A. truncatus* and placed it in the subfamily Brachyrhynchinae (now a junior synonym of Mezirinae). DISTANT (1903a,b) correctly synonymized *Odonia* with *Eumenotes*, and placed the genus into the nominotypical subfamily of Aradidae.

The systematic placement of *Eumenotes* was carefully revisited by BERGROTH (1907) who established a new tribe to accommodate the genus, Eumenotini Bergroth, 1907, which he placed in the Pentatomidae, subfamily Tessaratominae, mainly based on the exposed spiracles of the second abdominal sternite. This classification was accepted by BANKS (1909), KIRKALDY (1909), BLÖTE (1945) and MANNA (1951).

ESAKI (1922), evidently not being aware of the paper by BERGROTH (1907), still placed *Eumenotes* into Aradidae, and proposed a new subfamily for it, Eumenotinae Esaki, 1922, which thus became a junior homonym and junior objective synonym of Eumenotini Bergroth, 1907. It is interesting that this nomenclatorial act was overlooked in the catalogues by ROLSTON *et al.* (1996) and LIS (2006). Subsequently, ESAKI (1930) reconsidered the systematic placement of Eumenotinae Esaki, and transferred the subfamily from Aradidae to Pentatomidae, which was accepted by a number of authors, i.e. HOFFMANN (1935, 1948), POISSON (1951), CHINA & MILLER (1955, 1959), MILLER (1956), SOUTHWOOD (1956), STICHEL (1961, 1962), MIYAMOTO (1965), COBBEN (1968) and ABBASI (1986). LESTON (1958b) considered Eumenotinae a member of Pentatomoidea of unknown affinities but related to Dinidoridae and Pentatomidae. LESTON (1958a) and SCUDDER (1959) upgraded Eumenotidae to family rank without providing any arguments; the family status was followed also by ŠTYS & KERZHNER (1975), HENRY & FROESCHNER (1988), and HENRY (1997).

On the other hand, NUAMAH (1982, referring to an unpublished dissertation by P. Sinnadurai) classified Eumenotini in the family Dinidoridae, subfamily Megymeninae, which was followed in the monograph by DURAI (1987) and several subsequent papers (SCHAEFER 1987, 1993; LIS 1990; SCHUH & SLATER 1995; ROLSTON *et al.* 1996).

As a result of a cladistic analysis of Megymeninae based on morphological characters KOCOREK & LIS (2000) synonymized Eumenotini with Megymenini. Most subsequent authors accepted this classification (KOCOREK & DANIELCZOK-DEMKA 2002; LIS *et al.* 2002; LIS 2003, 2006; GRAZIA *et al.* 2008; KMENT & VILÍMOVÁ 2010a). However, in a recent phylogenetic analysis based on sequences of mitochondrial 12S and 16S rDNA (LIS *et al.* 2012) *E. obscura* was consistently identified as a member of the ingroup including species representing the subfamily Dinidorinae, being in sister relationship with representatives of the genus *Megymenum*. Since these results contradict all previous morphological analyses, LIS *et al.* (2012) restored the tribe Eumenotini from the synonymy with Megymenini and left it provisionally without subfamilial assignment (neither to Dinidorinae nor to Megymeninae).

Table 1. Chronological account of the systematic placement of the genus *Eumenotes* Westwood, 1846.

Megymenidae: WESTWOOD (1847): 246–247 (redescription); DALLAS (1851): 363–364 (key to genera, catalogue), DOHRN (1859): 23 (list); WALKER (1868): 504 (list).

Pentatomidae: Megymeninae: VOLLENHOVEN (1868): 49 (systematic placement).

Pentatomidae: Dinidorinae: STÅL (1870): 89 (catalogue); STÅL (1871): 645 (check-list); LETHIERRY & SEVERIN (1893): 240 (catalogue); SCHOUTEDEN (1913): 15–16 (monograph); HSIAO et al. (1977): 69 (classification).

Aradidae: WALKER (1873): 39 (description of *Aradus truncatus*); MANNA (1958): 922 (classification, chromosomes).

Pentatomidae: BREDDIN (1901): 14, 219 (check-list); PAIVA (1919): 255 (list); MIYAMOTO & HIDAKA (1960): 43 (list); TAKARA (1957): 35 (list).

Aradidae: Mezirinae (= Brachyrhynchinae): BERGROTH (1889): 733 (taxonomy, systematic placement).

Aradidae: Aradinae: DISTANT (1903b): 153 (systematic placement); DISTANT (1906): 417 (taxonomy, systematic placement).

Pentatomidae: Tessaratominae: Eumenotini: BERGROTH (1907): 498–500 (description of the tribe Eumenotaria, systematic placement); BANKS (1909): 564–565, pl. II (systematic position, list); KIRKALDY (1909): 344, 361 (catalogue); BLÖTE (1945): 308 (list); MANNA (1951): 1, 44–46 (classification, chromosomes).

Pentatomidae: Tessaratominae: BERGROTH (1908): 184 (catalogue); BERGROTH (1911): 29 (classification); ESAKI (1926): 153 (systematic position, list).

Aradidae: Eumenotinae: ESAKI (1922): 196–197 (systematic placement, description of new subfamily).

Pentatomidae: Eumenotinae: ESAKI (1930): 628–631 (systematic placement, redescription of Eumenotinae), HOFFMANN (1935): 116 (list); HOFFMANN (1948): 20 (list); POISSON (1951): 1794 (classification, diagnosis); CHINA & MILLER (1955): 258 (classification); MILLER (1956): 3, 46, 49–50 (classification, diagnosis, habitat); SOUTHWOOD (1956): 184 (egg); CHINA & MILLER (1959): 5, 39 (classification, key to families and subfamilies); STICHEL (1961): 725 (catalogue); STICHEL (1962): 205 (catalogue); MIYAMOTO (1965): 229 (list); COBBEN (1968): 116 (list); ABBASI (1986): 178 (classification).

Pentatomoidea incertae sedis: Eumenotinae: LESTON (1958b): 911, 916–917 (classification).

Eumenotidae: LESTON (1958a): 352 (classification); SCUDDER (1959): 407, 414 (classification, morphology); ŠTYS & KERZHNER (1975): 74 (list of families); NUAMAH (1982): 14, 20–21 (listed), HENRY & FROESCHNER (1988): xiv (classification); HENRY (1997): 285 (list of families).

Dinidoridae: Megymeninae: Eumenotini: NUAMAH (1982): 24–25 (classification); DURAI (1987): 167, 169–170, 261–264, 356 (history of classification, phylogeny, key to tribes and genera, diagnosis, catalogue); SCHAEFER (1987): 161 (list); LIS (1990): 143 (catalogue); SCHAEFER (1993): 109 (classification); SCHUH & SLATER (1995): 225 (review); ROLSTON et al. (1996): 76–78 (catalogue); CASSIS & GROSS (2002): 420 (catalogue).

Dinidoridae: Megymeninae: Megymenini (= Eumenotini): KOCOREK & LIS (2000): 8, 9, 14, 16–21 (phylogeny, new synonymy proposed, key to genera, figures); KOCOREK & DANIELCZOK-DEMKA (2002): 94, 96, 98 (spermatheca, figure, distribution); LIS et al. (2002): 167, 182–184 (pretarsal structures, figures, distribution); LIS (2003): 298–299 (absence of tympanal organ, distribution); LIS (2006): 230 (catalogue); GRAZIA et al. (2008): 2–4, 36 (classification); KMENT & VILÍMOVÁ (2010a): 5 (phylogenetic analysis).

Dinidoridae incertae sedis: Eumenotini: LIS et al. (2012): 61, 63, 65–66 (phylogeny, tribal status restored without assignment to particular subfamily); this paper.

Until now, Eumenotini included only the nominotypical genus *Eumenotes* with two externally very similar species, *E. obscura* and *E. pacao* Esaki, 1922 (KOCOREK & LIS 2000), both of them distributed in the Oriental Region and eastwards extending beyond the Wallace line to Sulawesi and Maluku Islands (e.g. DURAI 1987, LIS 1990, ROLSTON et al. 1996, KOCOREK & LIS 2000, this paper). Therefore it was a big surprise to discover a representative of Eumenotini among old unidentified material of Afrotropical Pentatomidae in the Musée Royal de l'Afrique Centrale in Tervuren. Examination of the specimens revealed that they represent an undescribed genus and species which are described in the present paper.

Material and methods

In quoting the labels of the type specimens, a slash (/) is used to divide data on different rows of one label, double slash (//) is used to divide data on different labels, authors' comments are given in square brackets [], and the following abbreviations are used: hw = handwritten, p = printed. The specimens examined are deposited in the following collections:

| | |
|------|---|
| BMNH | Natural History Museum, London, United Kingdom; |
| BPBM | Bernice P. Bishop Museum, Honolulu, Hawaii, USA; |
| EHIA | Ernst Heiss collection, Innsbruck, Austria; |
| IRSN | Institut Royal des Sciences Naturelles, Bruxelles, Belgium; |
| MMBC | Moravian Museum, Brno, Czech Republic; |
| MRAC | Musée Royal de l'Afrique Centrale, Tervuren, Belgium; |
| NHMW | Naturhistorisches Museum in Wien, Wien, Austria; |
| NMPC | National Museum, Praha, Czech Republic; |
| OXUM | Oxford University Museum, Hope Entomological Collections, Oxford, United Kingdom; |
| WULG | Wolfgang Ullrich collection, Lübeck, Germany; |
| ZJPC | Zdeněk Jindra collection, Praha, Czech Republic. |

Measurements were taken using an MBS-10 stereomicroscope provided with an ocular micrometer. External observations and line drawings were made under a Leica MZ75 stereomicroscope with a camera lucida. Non-coated specimens were examined by Hitachi S-3700N environmental electron microscope at the Department of Paleontology, National Museum, Praha. Habitus photographs were taken using a Canon MP-E 65 mm macro lens attached to a Canon EOS 550D camera and stacked from multiple layers using the Helicon Focus 5.1 Pro software.

The general morphological terminology follows mostly TSAI *et al.* (2011); parts of the thoracic scent efferent system of the metathoracic scent glands are named in accordance with KMENT & VILÍMOVÁ (2010a,b).

Taxonomy

Afromenotes gen. nov.

Type species. *Afromenotes hirsuta* sp. nov., by present designation.

Diagnosis. The new genus is closely related to the Oriental genus *Eumenotes*, sharing a number of peculiar morphological characters (cf. also DURAI 1987, KOCOREK & LIS 2000):

- 1) Intersegmental sclerites between antennal segments almost invisible, hidden inside segments (Fig. 5).
- 2) Pronotum almost subquadrate, without collar-like structure behind head (Figs 1–3, 6–7).
- 3) Evaporatorium very small. The evaporatorium is limited to the metapleuron in *Afromenotes* gen. nov. (Figs 12–14), but it extends to the posterior margin and lateral portion of mesopleuron in *Eumenotes* (see Figs 16–18). (An evaporatorium restricted to the metapleuron was erroneously reported for *Eumenotes* by DURAI (1987) and KOCOREK & LIS (2000)).
- 4) Spiracle on sternite II (first visible abdominal segment) exposed, situated laterally (Figs 20–23) (especially when compared with position of spiracles III–VII).

- 5) Anterior and posterior margin of hypopleurites (= outer laterotergites) and epipleurites (inner laterotergites) placed in line with margins of tergites.
- 6) Two-segmented tarsi.
- 7) Absence of tibial tympanal organs (cf. also LIS 2003). This character is shared with *Dinidorinae* and is most probably plesiomorphic within *Dinidoridae*.
- 8) Unpaired trichobothria (due to the waxy crust covering the body of *Afromenotes* gen. nov. we failed to determine the presence of trichobothria with certainty, though it seems that there are small trichobothria bearing tubercles present exactly in the same position like in *Eumenotes*).

However, close comparison of both taxa revealed a number of differences substantiating erection of a new genus to accommodate the new African species, especially in the shape and structure of head, pronotum, scutellum, the external efferent system of the metathoracic scent glands, and pilosity. The distinguishing characters of both genera are presented in Table 2.

Table 2. Diagnostic characters of the genera *Eumenotes* Westwood, 1844 and *Afromenotes* gen. nov.

| Character | <i>Afromenotes</i> gen. nov. | <i>Eumenotes</i> Westwood, 1844 |
|--|---|---|
| pilosity | entire body (except membrane) densely covered with long, brown bristles (Figs 1–3, 6, 8, 20, 22, 25) | body with only sparse, short, fine, pale, erect setae (Figs 4, 7, 9, 21, 23) |
| anteocular tubercle | small, rounded, bearing 1–4 bristles (Figs 1, 8) | large, conical, pointed, without bristles (Figs 4, 9) |
| shape of the head | shorter, narrower (Fig. 8) and higher, 2.16–2.27× wider than high | longer, wider (Fig. 9), flatter, 2.4–2.6× wider than high |
| shape of pronotum | simply trapezoidal, anterolateral and humeral angles not prominent, lateral margins straight (Figs 1, 6) | anterolateral angles rectangular and prominent, lateral margins concave, humeral angles prominent (Figs 4, 7) |
| surface of pronotum | quite flat, only slightly sloping anteriorly (Fig. 3) | high between humeral angles, distinctly sloping anteriorly, sculptured with shallow longitudinal grooves and ridges (Figs 4, 7) |
| shape of scutellum | narrower, regularly narrowing and slightly curving posteriorly, apex narrower (Figs 1, 2) | wider, basally almost parallel-sided, then abruptly curved inwards, apex wider (Figs 4, 7) |
| sculpture of scutellum | basal hump very low, without median keel posteriorly (Figs 1–3) | basal hump high, with low median keel posteriorly (Figs 4, 7) |
| perioleolar depression and metathoracic spiracle | perioleolar depression oval, not extending laterally, spiracle not depressed, evaporatory channel missing (Fig. 13) | perioleolar depression extending laterally in form of depressed evaporatory channel, spiracle depressed (Figs 17, 18) |
| evaporatorium | limited to metapleuron (Figs 12, 13) | extending to lateral and posterior margin of mesopleuron (Figs 12, 13) |
| ostiole | Visible from above, not covered by a lobe-like fold of metapleuron (Figs 12, 14) | not visible from above, covered by a lobe-like fold of metapleuron (Figs 16, 18) |
| peritreme | narrow, lanceolate, with shallow median furrow and acute apex (Figs 13–15) | wider, oval, without median furrow and with narrowly rounded apex (Figs 17–19) |

Etymology. The generic name is composed of the prefix *Afro-*, referring to the African distribution of the new taxon, and the ending *-menotes*, derived from the name of the sister genus *Eumenotes*; the gender is feminine.

Species included. Monotypic.

Afromenotes hirsuta sp. nov.

(Figs 1–3, 5–6, 8, 10, 12–15, 20, 22, 24–25)

Type locality. Democratic Republic of the Congo, Katanga, Sampwe (9°21'05"S 27°26'18.02"E), Mufungwa.

Material examined. HOLOTYPE: ♀ (MRAC), 'MUSÉE DU CONGO / Mufungwa Sampwe / 1/16-XII-1911 / Dr. Bequaeret' [p, ivory label] // '♀' [p, small white label] // 'HOLOTYPE / AFROMENOTES / HIRSUTA / sp. nov. / det. Kment & Kocorek 2013' [p, red label]. Specimen pinned through scutellum by a minutien stabbed through a piece of card attached to an entomological pin; left antennal segment III and IV, left fore leg, and right antenna missing; detached antennal segments I+II, III+IV and profemur glued to the same piece of card.

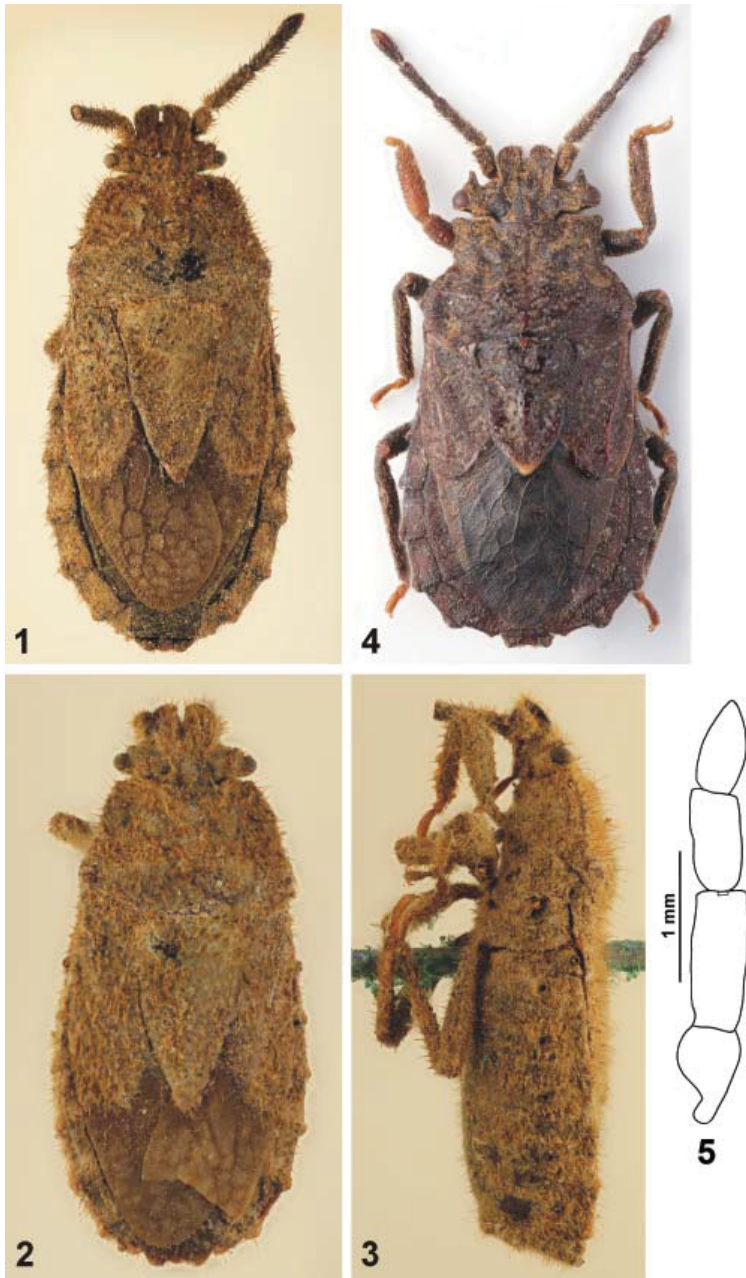
PARATYPE: ♀ (MRAC), 'COLL. MUS. TERVUREN [p] / Mufungwa Sampwe / 1/6[sic]-XII-1911 / D. Bequaeret [hw]' [white rectangular label] // '♀' [p, small white label] // 'PARATYPE / AFROMENOTES / HIRSUTA / sp. nov. / det. Kment & Kocorek 2013' [p, red label]. Specimen pinned through scutellum by a minutien stabbed through a piece of card attached to an entomological pin; left antennal segment II and IV and right antennal segments III–IV lost.

Description. Female. Coloration and vestiture. Body surface (including antennae, rostrum and legs) black, but covered with brown (waxy?) crust (Figs 1–3, 6) and long (up to 0.33 mm), erect brown bristles, straight or curved (Figs 1–3, 6, 8, 20, 22, 25). Only membrane bare, without crust and seate, brown with dark brown veins (Figs 1, 2).

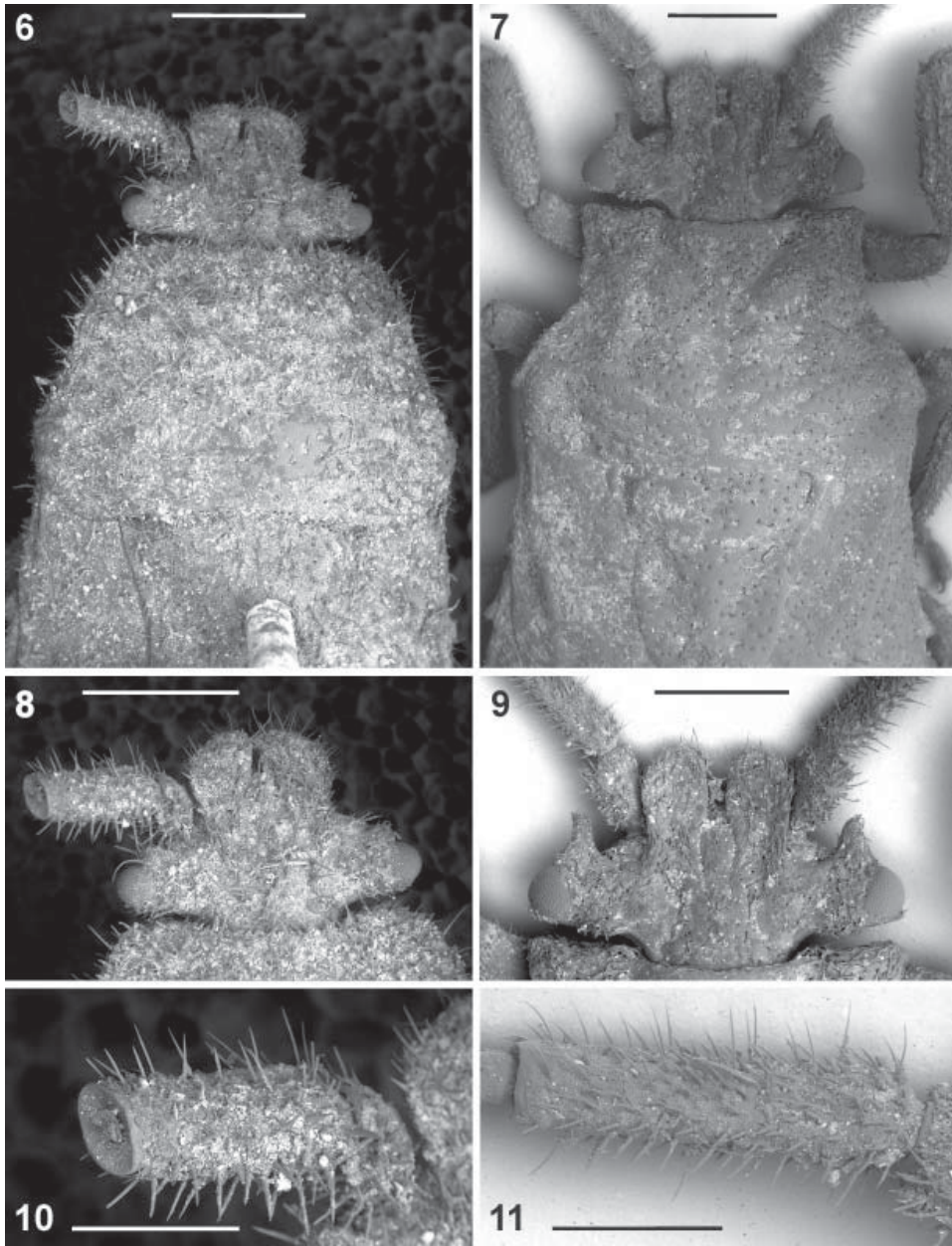
Structure. Body narrowly obovate, widest across mid of abdomen (Figs 1–2), only slightly convex dorsally, strongly convex ventrally (Fig. 3), thorax nearly trapezoid in cross-section.

Head transverse, 1.42–1.54 times wider than long (Figs 1, 2, 8), dorsally flattened; mandibular plates much longer than clypeus, their outer margin slightly divergent in basal half, then strongly curved inwards, anterolateral margin arcuately rounded; mandibular plates not adjacent in front of clypeus, their inner margins parallel, apex of clypeus free (Fig. 8). Base of head posteriad of mandibular plates and clypeus wide (widest across eyes), pedunculate; small compound eyes positioned posterolaterally; postgenae not developed (Fig. 8); anteocular tubercle small and rounded, bearing 1–4 bristles; ocelli small, positioned on posterior margin of head, hardly visible among the crust and bristles; interocellar distance slightly longer than distance between ocellus and eye (0.5 mm : 0.45 mm). **Antennae** 4-segmented (Fig. 5); antennal segment I pyriform, not surpassing apex of mandibular plates; antennal segments II and III parallel-sided, II being the longest of all (Figs 1, 5), III longer than IV; antennal segment IV lanceolate with pointed apex; all antennal segments laterally compressed, less pronounced in segment IV. Insertion of antennae clearly visible from above. Bucculae short and low, anteriorly widely rounded; a small rounded tubercle with 3 long bristles present in front of bucculae. **Rostrum** 4-segmented, reaching base of mesocoxae; segment II longest, segment III longer than IV.

Pronotum trapezoidal, anterior margin slightly concave (Fig. 6); anterolateral angles blunt, not prominent; lateral margins straight, gradually diverging posteriad; humeral angles blunt, not prominent; posterior margin along base of scutellum slightly concave. Pronotal surface rather flat, highest between humeral angles, only slightly sloping anteriorly, anteriorly shallowly depressed sublaterally. **Scutellum** 1.53–1.77 times longer than wide, reaching slightly behind middle of abdominal length (Figs 1, 2); regularly narrowing posteriad, lateral



Figs 1–5. General habitus and antennal morphology. 1–3, 5 – *Afromenotes hirsuta* gen. & sp. nov.: 1 – holotype, female (dorsal view); 2–3 – paratype, female (2 – dorsal view, 3 – lateral view); 5 – antenna of the holotype. 4 – *Eumenotes obscura* Westwood, 1846, female, Malaysia: Tanah Rata. .



Figs 6–11. External morphology: 6, 8, 10 – *Afromenotes hirsuta* gen. & sp. nov., holotype, female; 7, 9, 11 – *Eumenotes obscura* Westwood, 1846, male, Laos: Namtha. 6–7 – head and pronotum (6 – magnification 25 \times , 7 – 20 \times); 8–9 – head (8 – 42 \times , 9 – 30 \times), 10–11 – antennal segment II (10 – 90 \times , 11 – 90 \times). Scale bars: 0.5 mm (Figs 10–11), 1 mm (Figs 6–9).

margins only slightly concave; apex narrow; disc with depressions at anterolateral angles (mostly obscured with crust), with basal hump indistinct, and without a trace of median keel in posterior half. *Pro-* and *mesosternum* with shallow groove medially (mostly obscured with crust), *metasternum* seems flat in the specimens examined; coxae situated rather wide apart. External scent efferent system small, limited to metapleuron (Figs 3, 12–13); ostiole positioned ca. in mid-width of metapleuron, drop-shaped, opening posteriad in a small, deep, oval periostolar depression (Fig. 13), not covered from above; periostolar depression not extending laterad in form of evaporatory channel, metathoracic spiracle not depressed (Fig. 13); vestibular scar not visible; peritreme in form of a short and narrow spout (ca. twice as long as ostiole), directed laterad, with shallow median furrow and acute apex (Figs 13–15); evaporatorium covering the surface of periostolar depression (which also bears no bristles), presence of mycoid surface outside periostolar depression cannot be ascertained due to the crust; surface of evaporatorium inside the periostolar depression with well developed gyrfication (Figs 13–14).

Hemelytra (Figs 1, 2). Clavus short, and narrow, reaching the basal third of scutellum. Corium as long as or slightly shorter than scutellum, without any apparent vein; posterolateral margin rounded. Membrane widely rounded apically, reaching or nearly reaching apex of abdomen; venation reticulate with 4 larger basal cells.

Legs. All femora clavate, widening towards apex (Fig. 3), ventrally not attenuated antepically, unarmed; tibiae slightly flattened laterally; tarsi 2-segmented.

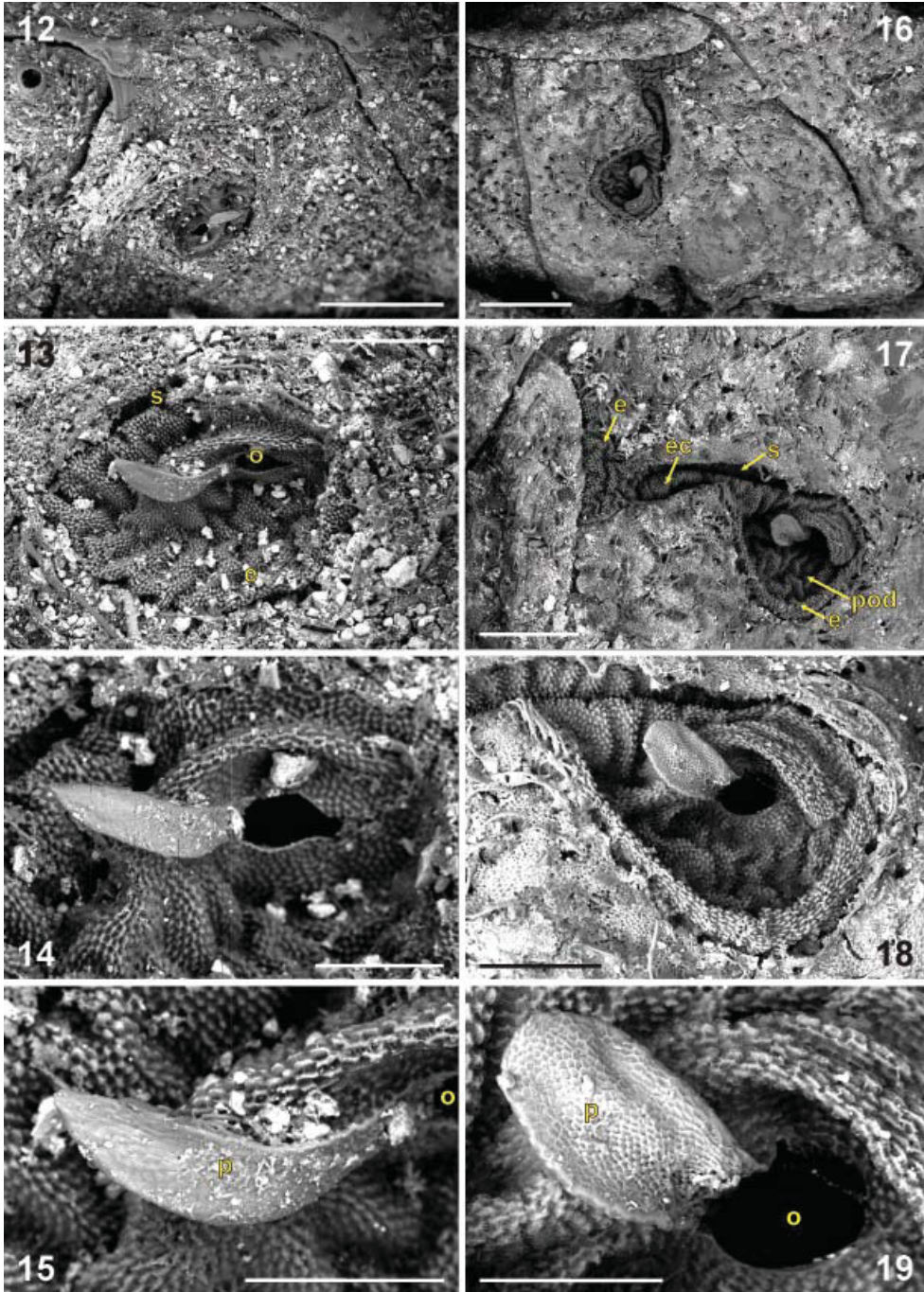
Abdomen. Connexiva not covered by hemelytrae; posterolateral angles of connexival segments with distinct small lobes which become larger and more prominent in posterior segments (Figs 1, 2); spiracle II exposed, situated laterally near margin of the ventrite (Figs 20, 22); spiracles III–VII positioned laterally on ventrites, situated on small tubercles; spiracle VIII shifted more laterally, on laterotergite VIII (Figs 24, 25). Trichobothria probably present, but heavily obscured with waxy crust. *External female genitalia*. Valvifers 8 of quarter-circle shape, not fused medially, bearing shallow depressions along inner margins (especially basally); laterotergites 9 triangular (Figs 24, 25).

Measurements (in mm; n = 2, holotype / paratype). Body length (from apex of mandibular plates to apex of abdomen) 9.0 / 6.8; head: length (from apex of mandibular plates to anterior margin of pronotum) 1.33 / 1.23, width (maximum width across eyes) 2.04 / 1.74, height (height across compound eye) 0.9 / 0.8, interocular width (between inner margins of compound eyes) 1.53 / 1.33; maximum lengths of antennal segments: I – 0.72 / 0.51, II – 1.02 / 0.77, III – 0.72 / –, IV – 0.64 / –; pronotum: length (medially in most exposed view) 2.15 / 1.53, anterior width (between anterolateral angles) 2.04 / 1.74; posterior width (maximum width between humeral angles) 3.27 / 2.66; scutellum: length (medially from base to apex) 2.96 / 2.35, width (maximum width at base) 1.94 / 1.33; abdomen width (maximum width across laterotergites IV) 4.09 / 3.27.

Male. Unknown.

Differential diagnosis. See the generic diagnosis above.

Etymology. The species name is the Latin adjective *hirsutus*, *-a*, *-um* (= hairy, hirsute, bristly or rough) referring to the long bristles of the body distinguishing the species from all remaining Dinidoridae.



Bionomics. Unknown. The only two known specimens were collected in an area originally covered by a tropical rain forest.

Distribution. Democratic Republic of the Congo, Katanga province.

Eumenotes Westwood, 1846

Eumenotes Westwood, 1846: 67 (description). Type species: *Eumenotes obscura* Westwood, 1846, by monotypy.

For correct date of publication see WHEELER (1912).

Odonia Bergroth, 1889: 733 (description). Type species: *Aradus truncatus* Walker, 1873, by monotypy. Synonymised by DISTANT (1903a: 476).

Eumenotes: WESTWOOD (1847): 246–247 (redescription); DALLAS (1851): 363–364 (key to genera, catalogue); DOHRN (1859): 23 (list); VOLLENHOVEN (1868): 49 (redescription); WALKER (1868): 504 (collection catalogue); STÅL (1870): 89 (catalogue); STÅL (1871): 645 (check-list); LETHIERRY & SEVERIN (1893): 240 (catalogue); KIRKALDY (1900): 240 (date and journal of original description, pagination of reprint); DISTANT (1903a): 476 (new synonym); DISTANT (1903b): 153, 155–156 (redescription, new synonym); DISTANT (1906): 417 (taxonomy, systematic placement); BERGROTH (1907): 498–500 (redescription, systematic placement); BERGROTH (1908): 184 (catalogue); BANKS (1909): 564–565, pl. II (morphology, teratology, habitus figure, catalogue, distribution); KIRKALDY (1909): 344, 361 (catalogue, distribution); DISTANT (1910): 419–420 (variability); SCHOUTEDEN (1913): 15–16 (redescription, catalogue); MANNA (1951): 44–46 (chromosomes); MILLER (1956): 46, 50 (listed); TAKARA (1957): 35 (list); LESTON (1958b): 911, 916–917 (classification); STICHEL (1961): 725 (catalogue); STICHEL (1962): 205 (catalogue); HSIAO et al. (1977): 69, 72, pl. 9: fig. 131 (key to genera, redescription); NUAMAH (1982): 24–25 (classification); DURAI (1987): 167, 169–170, 261–264, 356 (history of classification, phylogeny, key to genera, redescription, figures, catalogue, distribution); DURAI (1988): 123–131 (description of egg and larval instars 1–5, figures, bionomics, host plant, habitat, distribution); LIS (1990): 139, 143 (catalogue, distribution); MIYAMOTO & YASUNAGA (1991): 183 (check-list); DURAI (1993a): 41–48 (description of egg and larval instars 1–5, bionomics, host plant, habitat, distribution); ROLSTON et al. (1996): 77 (catalogue); KOCOREK & LIS (2000): 8, 9, 14, 16–21 (diagnosis, phylogeny, taxonomy, key to genera, species identification, figures, distribution); KOCOREK & DANIELCZOK-DEMSKA (2002): 94, 96, 98 (spermatheca, figure, distribution); LIS et al. (2002): 167, 182–184 (pretarsal structures, figures, distribution); LIS (2003): 298–299 (absence of tympanal organ, distribution); LIS (2006): 231 (catalogue); GRAZIA et al. (2008): 3, 11, 13–15, 17, 23–25, 29–31 (morphology, phylogenetic analysis, classification); LIS et al. (2012): 61, 63, 65–66 (phylogeny).

Eumenotus (incorrect subsequent spelling): ESAKI (1922): 196–198 (systematic placement, description of a new species); MIYAMOTO (1965): 229 (distribution).

Eumenotes obscura Westwood, 1846

(Figs 4, 7, 9, 11, 16–19, 21, 23, 26)

Eumenotes obscura Westwood, 1846: 67 (description). LECTOTYPE: ♂, type locality unknown (OXUM) (designated by DURAI 1987: 262).

Eumenotes obscura: WESTWOOD (1847): 247 + pl. 18: fig. 4 (redescription, habitus figure); DALLAS (1851): 364 (catalogue); DOHRN (1859): 23 (list); VOLLENHOVEN (1868): 49 (redescription, distribution); WALKER (1868): 504 (distribution); STÅL (1870): 89 (catalogue, distribution); STÅL (1871): 609, 645 (morphology, check-list, distribution); LETHIERRY & SEVERIN (1893): 240 (catalogue, distribution); DISTANT (1903a): 476 (new synonym); DISTANT

Figs 12–19. External scent efferent system of the metathoracic scent glands: 12–15 – *Afromenotes hirsuta* gen. & sp. nov., holotype, female; 14–17 – *Eumenotes obscura* Westwood, 1846, 1 male, Laos: Namtha. 12, 16 – meso- and metathorax, lateral view (12 – magnification 65×, 14 – 50×); 13, 17 – external scent efferent system (13 – 170×, 17 – 90×); 14, 18 – detail of ostiole, peritreme, and evaporatorium (14 – 320×, 18 – 180×); 15, 19 – detail of peritremal surface (15 – 500×, 19 – 500×). Abbreviations: e – evaporatorium, ec – evaporatory channel, o – ostiole, p – peritreme, pod – periostiolar depression, s – metathoracic spiracle. Scale bars: 0.1 mm (Figs 14, 15, 19), 0.2 mm (Figs 13, 18), 0.3 mm (Fig. 17), 0.5 mm (Figs 12, 16).

(1903b): 153, 155–156 (redescription, new synonym, figure, distribution); BANKS (1909): 564–565, pl. II (morphology, teratology, habitus figure, catalogue, distribution); KIRKALDY (1909): 344, 361 (catalogue, distribution); DISTANT (1910): 419–420 (variability); BERGROTH (1911): 29 (morphology, variability, distribution); SCHOUTEDEN (1913): 15–16 (redescription, habitus figure, catalogue, distribution); PAIVA (1919): 255 (distribution).

Eumenotes obscurus (incorrect gender agreement): BREDDIN (1901): 14, 219 (check-list).

Eumenotus obscura (incorrect subsequent spelling): ESAKI (1922): 198 (differential diagnosis).

Eumenotes obscura (including *pacao*): ESAKI (1930): 628–631 (systematic placement, taxonomy, *E. pacao* synonymised with *E. obscura*, variability, habitus figure); HOFFMANN (1935): 116 (catalogue, distribution); BLÖTE (1945): 308 (distribution); HOFFMANN (1948): 20 (distribution); MANNA (1951): 6, 44–46, figs 23a–i (chromosomes, figures, habitat, distribution); MILLER (1956): 46 (habitat); TAKARA (1957): 35 (distribution); SCUDDER (1959): 414 (morphology of female genitalia); STICHEL (1961): 725 (catalogue); STICHEL (1962): 205 (catalogue); COBBEN (1968): 116, 118–119 (egg); HSIAO et al. (1977): 72, pl. 9: fig. 131 (redescription, habitus figure); DURAI (1986): 5–6 (photo, check-list, distribution); DURAI (1987): 167, 261–263, 265, 356 (redescription, figures, catalogue, distribution); SCHAEFER (1987): 161 (host plant); DURAI (1988): 123–131 (description of egg and larval instars 1–5, figures, bionomics, host plant, habitat, distribution); HUA (1990): 170 (check-list, distribution, host plant); LIS (1990): 139, 143 (catalogue, distribution); LIS (1992): 42 (distribution); DURAI (1993a): 41–48 (description of egg and larval instars 1–5, bionomics, host plant, habitat, distribution).

Eumenotes obscura: KOCOREK & LIS (2000): 9, 20–21 (taxonomy, distribution, figures of male genitalia); KOCOREK & DANIELCZOK-DEMSKA (2002): 94, 96, 98 (spermatheca, figure, distribution); LIS et al. (2002): 167, 182–183 (pretarsal structures, figures, distribution); LIS (2003): 298–299 (absence of tympanal organ, distribution); GRAZIA et al. (2008): 11, 13–15, 17, 23–25, 29–31 (morphology, figures of antenna and protibial apparatus, phylogenetic analysis); KMENT & VILÍMOVÁ (2010a): 5, 11, 47 (phylogenetic analysis, distribution); KOCOREK (2012): 2 (distribution); LIS et al. (2012): 61, 63, 65–66 (phylogeny).

Aradus truncatus Walker, 1873: 39 (description, distribution). LECTOTYPE: ♀, Malaysia, Penang (BMNH) (designated by DURAI 1987: 262). Junior primary homonym of *Aradus truncatus* Fieber, 1860 in Aradidae; synonymized by DISTANT (1903a: 476).

Odonia truncata: BERGROTH (1889): 733–734 (redescription, new combination, distribution); DISTANT (1910): 419–420 (variability).

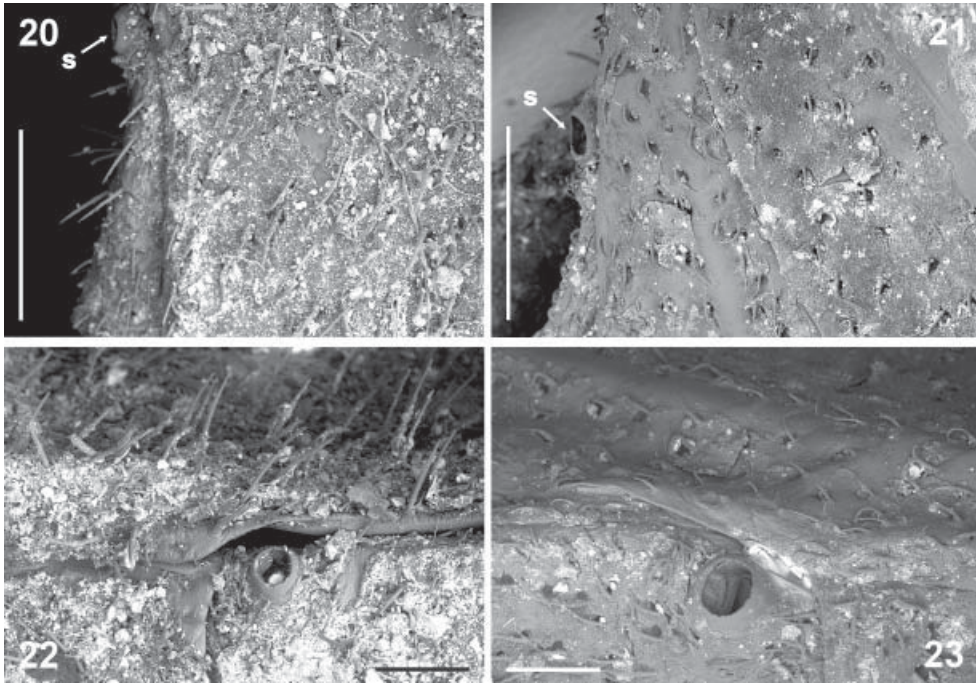
Eumenotes insularis Distant, 1906: 417 (description, distribution). LECTOTYPE: ♂, Indonesia, Sangir [= Sangihe] Island (BMNH) (designated by DURAI 1987: 262). Synonymized by ESAKI (1930: 630).

Eumenotes insularis: BERGROTH (1908): 184 (catalogue).

Material examined. **INDIA: MEGHALAYA:** 9 km NW of Jowai, 25°30'N 92°10'E, 1400 m a.s.l., 11.–15. v.1999, 1 ♂, J. Rolčík lgt., P. Kment det. (ZJPC). – **SIKKIM:** Sikkim, Atkinson Coll., 1892–6, 1 ♂, P. Kment det. (BMNH); Sikkim, 20.iv.1904, 1 ♂ 2 ♀♀, H. Frühstorfer lgt., A. Kocorek det. (BPBM); Sikkim, Regenzeit [= rain season], 1 ♂, H. Frühstorfer lgt., P. Kment det. (NHMW); Sikkim, iii.–iv.[no year], 1 ♂ 1 ♀, H. Frühstorfer lgt., P. Kment det. (NHMW); Mungphu, 1888, 1 ♀, D. Atkinson lgt., P. Kment det. (BMNH); Mungphu, Atkinson Coll., 92–6, 1 ♀, P. Kment det. (BMNH). – **UTTARAKHAND:** 25 km W of Mussoorie, Yamuna river valley near Juido, 790 m a.s.l., 5.–7.viii.2003, 1 ♂, Z. Kejval lgt., P. Kment det. (ZJPC). – **WEST BENGAL:** Darjeeling, Gopaldhara, 3.440–4.720 ft [= 1049–1439 m a.s.l.], 7.xi.1919, 1 ♂, H. Stevens lgt., P. Kment det. (BMNH); Darjeeling, Gopaldhara, Rungbong Vy [= valley], vi.1920, 1 ♀, H. Stevens lgt., P. Kment det. (BMNH); Darjeeling, Namsoo, 2.100 ft [= 640 m a.s.l.], 27.v.1918, 1 ♂, H. Stevens lgt., P. Kment det. (BMNH). — **MYANMAR:** Burma, 1928, D. J. Atkinson lgt., P. Kment det. (BMNH). – **THAILAND: CHIANG MAI PROVINCE:** ca. 3 km E Samoeng, 18°51'43.4"N 98°42'13.1"E, garden area, 16.vii.1997, 1 ♀, W. Ullrich lgt., A. Kocorek det. (WULG); Doi Pui env., 16.v.1998, 1 ♀, M. Knížek lgt., P. Kment det. (ZJPC). – **LAOS: ATTAPEU PROVINCE:** Annam Highlands Mts., Dong Amphan NBCA, Nong Fa [crater lake] env., ca. 1160 m a.s.l., 15°05.9'N 107°25.6', 1 ♀, 30.iv.–6.v.2010, 1 ♀, J. Hájek lgt., P. Kment det. (NMPC). – **KHAMMOUAN PROVINCE:** Ban Khoun Ngeun, 18°07'N 104°29'E, ca. 200 m a.s.l., 24.–29.iv.2001, 1 ♂ 2 ♀♀, V. Kubán lgt., D. Rédei & P. Kment det. (MMBC, NMPC). – **LOUANG NAMTHA PROVINCE:** Namtha → Muang Sing (21°09'N 101°19'E), 900–1200 m a.s.l., 5.–31.v.1997, 2 ♂♂ 4 ♀♀, V. Kubán lgt., P. Kment det. (MMBC; 1 ♂ in NMPC used for SEM); 15 km NW Louang Namtha, 21°07.5'N 101°21.0'E, 650–850 m a.s.l., 13.–24.v.1997, 1 ♂, E. Jendek & D. Šauša lgt., P. Kment det. (NHMW). – **LOUANG PHRABANG PROVINCE:** Ban Song Cha (20°33'N 102°14'E), 1200 m a.s.l., 24.iv.–16.v.1999, 1 ♂ 1 larva (instar 5), C. Holzschuh lgt., A. Kocorek det. (EHIA); Ban

Song Cha (5 km W) (20°33'–4'N 102°14'E), ca. 1200 m a.s.l., 24.iv.–16.v.1999, 1 ♂ 3 ♀♀, V. Kubáň lgt., P. Kment det. (MMBC). Phongsaly Province: Phonsaly env., 21°41'–2'N 102°06'–8'E, ca. 1500 m a.s.l., 28.v.–20.vi.2003, 1 ♀, V. Kubáň lgt., P. Kment det. (MMBC). – **XIENG KHOUANG PROVINCE:** Xieng Khouang, 10.v.1919, 1 ♀, R. V. de Salvaza lgt., P. Kment det. (BMNH). – **CAMBODIA:** Phnom-Penh, garden, 11°30'34"N 104°53'54"E, 31.vii.–15.viii.2013, 1 ♀, M. Petrýl lgt., P. Kment det. (ZJPC). – **VIETNAM:** Hanoi, 21.v.–11.vi.1986, 1 ♀, J. Horák lgt., P. Kment & A. Kocorek det. (NMPC); Tonkin, Ngan Son, v.1906, 1 ♂, no collector, P. Kment det. (BMNH). – **MALAYSIA: FEDERAL TERRITORY:** Kuala Lumpur, Nr:L. Gardens, 19.ix.1934, 1 ♂, 21.ix.1934, 1 ♂, H. M. Pendlebury lgt., P. S. S. Durai & P. Kment det. (BMNH). – **KEDAH:** N Kedah, Changloon, iv.–vii.1938, 1 ♀, no collector, P. Kment det. (BMNH). – **KELANTAN:** Banjaran Titi Wangsa Mts., Ladang Pandrak env., 1500–1800 m a.s.l., 9.–11.iv.1997, 1 ♀ 2 larva (instar 5), P. Čechovský lgt., A. Kocorek det. (EHIA); Road between Kampong Raja and Gua Musang, 1400–1700 m a.s.l., Ladang Pandrak env., 04°63'N 101°45'E–04°88'N 101°95'E, 28.iv.2006, 1 ♂, P. Čechovský lgt., P. Kment det. (NHMW). – **PAHANG:** Cameron Highlands, 4700–5000 ft [= 1433–1524 m a.s.l.], 15.v.1939, 1 ♀, H. M. Pendlebury lgt., P. Kment det. (BMNH); Cameron Highlands, G. Jerbakan, 4981 ft [= 1518 m a.s.l.], 9.v.1939, 1 ♀, H. M. Pendlebury lgt., P. Kment det. (BMNH); Cameron Highlands, 9.–23.iv.1999, 1 ♂, V. Kabourek lgt., P. Kment det. (ZJPC); Cameron Highlands, Tanah Rata, 4600 ft [= 1402 m a.s.l.], at light, 5.vi.1940, 1 ♀, N. C. E. Miller lgt., P. Kment det. (BMNH); Cameron Highlands, Tanah Rata, 1400 m a.s.l., xi.1983, 1 ♂, E. Weiss lgt., A. Kocorek det. (EHIA); Tanah Rata, 12.–19.ii.1998, 1 ♂ 1 ♀, V. Tichý lgt., P. Kment det. (NHMW); Cameron Highlands, Tanah Rata village env., Gunung Jasar [Mt.], 1470–1705 m a.s.l., 04°28.4'–7'N 101°21.6'–22.1'E, 18.iv.–10.v.2009, 1 ♀, J. Hájek lgt., P. Kment det. (NMPC; Fig. 4); Tanah Rata vill. env., Gunung Jasar Mt., 1470–1705 m a.s.l., 04°28.4'–7'N 101°21.6'–22.1'E, 5.iii.–2.iv.2009, 2 ♂♂, R. Hergovitz lgt., P. Kment det. (MMBC); Fraser's Hill, 4000 ft [= 1219 m a.s.l.], 30.vi.1933, 1 ♀, H. M. Pendlebury lgt., P. Kment det. (BMNH); same locality, 4200 ft [= 1280 m a.s.l.], 21.v.1932, 1 larva (instar 5), 14.vii.1936, at light, 1 spec., H. M. Pendlebury lgt., P. Kment det. (BMNH); Kuala Jahang, 30.xi.1921, 1 larva (instar 5), H. M. Pendlebury lgt., P. Kment det. (BMNH). **TIOMAN ISLAND:** Kpg. Telek – K. Juara, 4.–16.iii.1998, 2 ♂♂, D. Hauck lgt., A. Kocorek det. (EHIA). – **PERAK:** Larat Hills, 3700–4500 ft [= 1128–1372 m a.s.l.], 7.–14.ii.1932, 2 ♀♀, H. M. Pendlebury lgt., P. Kment det. (BMNH). **SELANGOR:** Bukit Kutu, 3000 ft [= 914 m a.s.l.], 27.iii.1932, 1 ♀, N. C. E. Miller lgt., P. Kment det. (BMNH); Bukit Kutu, 3500 ft [= 1067 m a.s.l.], 11.ix.1929, 1 ♀, 21.iii.1931, 1 ♀, H. M. Pendlebury lgt., P. Kment det. (BMNH); Port Swettenham [= Port Klang], 4.vi.1927, 1 ♂, H. M. Pendlebury lgt., P. Kment det. (BMNH). – **SABAH:** Borneo, Nord Kina Balu, 1904, 1 ♀, Fr. Buffat lgt., ex. coll. Oberthür, P. Kment det. (IRSN); near Kinabalu, Kabayan, 600 ft [= 183 m a.s.l.], 8.v.1929, 1 ♀, H. M. Pendlebury lgt., P. Kment det. (BMNH); Mt. Kinabalu, Kiau, 3.000 ft [= 914 m a.s.l.], 30.iii.1929, 1 ♂, H. M. Pendlebury lgt., P. Kment det. (BMNH). **SARAWAK:** Sarwak, 1903, 1 ♀, C. J. Brooks lgt., P. Kment det. (BMNH); Bau-Lundu Rd., on padi [= rice], 29.xi.1966, 1 ♀, Salin Juses lgt., P. Kment det. (BMNH); Gunong Mulu Nat. Park., base camp, helipad, v.–viii.1978, P. M. Hammonds & J. E. Marshall lgt., P. Kment det. (BMNH); Kuching District, Mt. Serapi, 27.–29.iii.1994, 1 larva (instar 5), S. Bílý lgt., P. Kment det. (NMPC); Long Mujan, Baram River, 4.x.1920, 5 ♂♂ 1 ♀, J. C. Moulton lgt., P. S. S. Durai & P. Kment lgt. (BMNH); foot of Mt. Dulit, junction of rivers Tinjar and Lejok, 9.viii.1932, in reed bed, 1 ♂ 1 larva (instar 5), 28.viii.1932, flood refuse, cut reeds, 3 ♂♂ 7 ♀♀ 1 spec., Oxford University Expedition, B. M. Hobby & A. W. Moore lgt., D. Leston, R. Izzard, P. S. S. Durai & P. Kment det. (BMNH); the same locality, 6.ix.1932, 1 ♀, Oxford University Expedition, native collector, P. Kment lgt. (BMNH). – **INDONESIA: BALI:** Bedugul Reg., Tambilingan Lakes NP, 1200 m a.s.l., xi.2004, 3 ♂♂ 12 ♀♀, S. Jákl lgt., P. Kment det. (NHMW, NMPC). – **MENTAWAI ISLANDS: SIBERUT:** S Siberut, Salappa, 50–100 m a.s.l., vi.2005, 1 ♂ 1 ♀; 50 m a.s.l., ii.2006, 1 ♂ 1 ♀, all S. Jákl lgt., P. Kment det. (NHMW). – **SERAM:** Ceram, B.M. 1913–504, 1 ♀, E. Stresemann lgt., P. Kment det. (BMNH); Maluku, Seram, Sasarata, 9 km E Wahai, 16.i.1997, 1 ♀, no collector, P. Kment det. (ZJPC). – **SUMATRA:** Dolok Merangir, no date, 1 ♂, E. W. Diehl lgt., P. Kment det. (BMNH); Fort de Kock, 920 m a.s.l., 1925, 1 ♂, E. Jacobson lgt., P. S. S. Durai det. (BMNH). – **INDONESIA/MALAYSIA: KALIMANTAN:** Breiitst, Borneo, 1880, 2 ♀♀, P. Kment det. (NHMW). – **PHILIPPINES: LUZON:** Nord-Luzon, Ripang, 1500' [= 457 m a.s.l.], ii.1918, 1 ♀, G. Böttcher lgt., P. S. S. Durai det. (BMNH). – **MINDANAO:** Agusan, Esperanza, 4.–11.xii.1959, 1 ♀, C. M. Yoshimoto lgt., A. Kocorek det. (BPBM); Davao, 1 ♀, Baker lgt., P. S. S. Durai & P. Kment det. (BMNH).

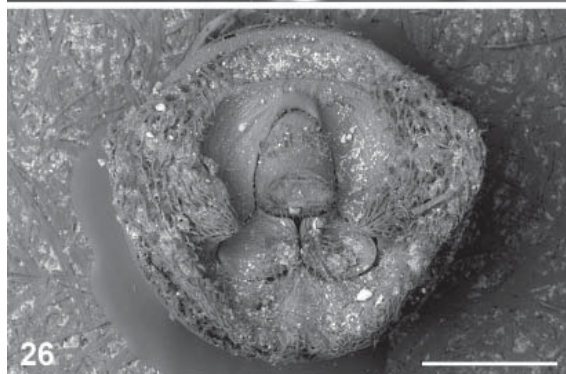
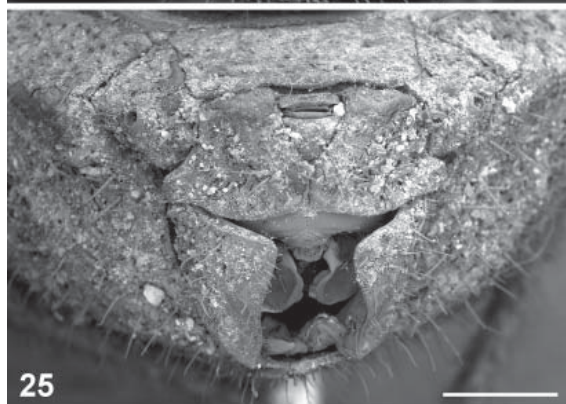
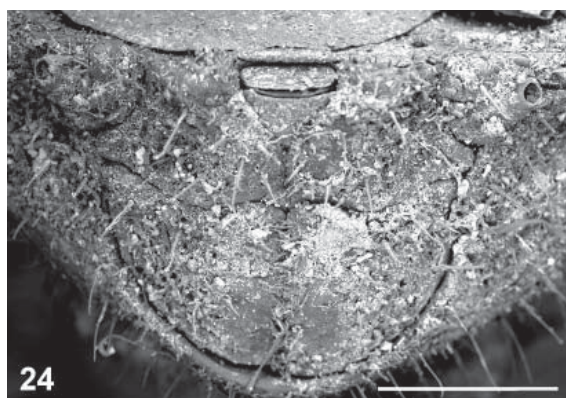
Description of the external efferent system of the metathoracic scent glands. External scent efferent system rather small, developed on both meso- and metapleuron (Figs 16–18); ostiole



Figs 20–23. External morphology: 20, 22 – *Afromenotes hirsuta* gen. & sp. nov., paratype, female; 21, 23 – *Eumenes obscura* Westwood, 1846, male, Laos: Namtha. 20–21 – base of corium and connexivum (20 – magnification 100×, 21 – 100×); 22–23 – spiracle on ventrite II (22 – 120×, 23 – 120×). Abbreviation: s – metathoracic spiracle. Scale bars: 0.2 mm (Figs 22, 23), 0.5 mm (Figs 21, 23).

positioned ca. in mid-width of metapleuron (Fig. 16), oval, opening posteriad on anterior wall of deep, oval periostolar depression (Figs 16–18), covered from above by lobe-like fold of the metapleuron (Figs 17–18); periostolar depression with sharply delimited margins (Fig. 18), extending laterad in form of evaporatory channel in place of the depressed metathoracic spiracle (Figs 17–18); vestibular scar not visible (Fig. 16); peritreme in form of short, oval spout (ca. twice as long as ostiole) (Figs 18–19), directed ventro-laterad, without apparent median furrow (Figs 18–19), apex narrowly rounded; evaporatorium covering the surface of periostolar depression (Fig. 18), continuing along the spiracle inside the evaporatory channel, extending to lateral margin of mesopleuron (Fig. 17); surface of evaporatorium within the periostolar depression with well-developed gyrfication (Fig. 18). This description also applies to *E. pacao*.

Biology. The egg, larvae and bionomics of the species were described by DURAI (1988, 1993a) based on material and observations from Peninsular Malaysia. DURAI (1988, 1993a) confirmed development of the species on *Ipomoea purpurea* (Convolvulaceae) which is a common plant on wasteland, hedges and fences throughout Malaysia; other recorded plant species probably represent only sitting records: *Camellia* sp. (Theaceae), *Zea mays* (Poaceae) (YUNUS & HUA



Figs 24–26. External genitalia: 24–25 – *Afromenotes hirsuta* gen. & sp. nov., female external genitalia, caudal view: 24 – intact genitalia, paratype (magnification 80×); 25 – genitalia with partly opened valvifers VIII, holotype (50×). 26 – *Eumenotes obscura* Westwood, 1846, male, Laos: Namtha, pygophore in dorsal view (60×). Scale bars: 0.5 mm.

1980), *Brassica oleracea* (Brassicaceae), *Imperata cylindrica* (Balsaminaceae), *Cocos nucifera* (Arecaceae) (DURAI 1988, 1993a), and *Oryza sativa* (Poaceae) (this paper). MANNA (1951) reported collecting the specimens in crevices of a mossy wall and MILLER (1956) recorded the species from vegetable debris and flood refuse, all of which are hardly the usual habitats of the species.

Distribution. **INDIA:** **Meghalaya** (PAIVA 1919, as Assam; this paper), **Sikkim** (DISTANT 1903, this paper), **Uttarakhand** (new record), **West Bengal** (Darjeeling; MANNA 1951, this paper). **MYANMAR:** **Kachin** (BERGROTH 1889, DISTANT 1903). **THAILAND** (new record). **LAOS** (KOCOREK & LIS 2000, KMENT & VILÍMOVÁ 2010a, KOCOREK 2012, this paper). **CAMBODIA** (new record). **VIETNAM** (new record). **MALAYSIA:** **Peninsula:** **Federal Territory** (= Kuala Lumpur) (DURAI 1987), **Kedah** (DURAI 1988, 1993a), **Kelantan** (this paper), **Pahang** (including Tioman Island) (DURAI 1986, 1988, 1993a; KOCOREK 2012; this paper), **Penang** (WALKER 1873, DISTANT 1903, DURAI 1986), **Selangor** (DURAI 1986), **Kalimantan:** **Sabah** (this paper), **Sarawak** (WALKER 1873, DURAI 1987, this paper). **INDONESIA:** **Amboin** (KOCOREK 2012), **Bali** (new record), **Buru** (LIS 1992), **Enggano** (KIRKALDY 1909), **Halmahera** (WALKER 1873, as Gilolo), **Java** (VOLLENHOVEN 1868, BLÖTE 1945, LIS 1992), **Kalimantan** (BLÖTE 1945), **Mentawai Islands** (Siberut; new

record), **Sangihe** (DISTANT 1906), **Seram** (this paper), **Sulawesi** (VOLLENHOVEN 1868, BREDDIN 1901), **Sumatra** (VOLLENHOVEN 1868; BLÖTE 1945; HOFFMANN 1948, erroneously as Burma; DURAI 1987; LIS 1990, 1992; KOCOREK & DANIELCZOK-DEMKA 2002), **Ternate** (WALKER 1868). **PHILIPPINES**: **Luzon** (HOFFMANN 1948, DURAI 1987), **Mindanao** (HOFFMANN 1948, DURAI 1987, this paper), **Palawan** (BANKS 1909), **Negros** (HOFFMANN 1948), **Sibuyan** (HOFFMANN 1948). **AUSTRALIA**: N Australia (no exact records) (CASSIS & GROSS 2002).

Eumenotes pacao Esaki, 1922

Eumenotus [sic!] *pacao* Esaki, 1922: 197–198 (description). HOLOTYPE: ♂, Taiwan, Kappanzan Mt., near Toyen [= Taoyuan] (KUEC).

Eumenotes pacao: ESAKI (1926): 153 (list, distribution).

Eumenotes obscura (partim, including *E. pacao*): ESAKI (1930): 628–631 (systematic placement, taxonomy, *E. pacao* synonymised with *E. obscura*, variability, habitus figure, host plant, distribution); HOFFMANN (1935): 116 (catalogue, distribution); TAKARA (1957): 35 (distribution); MIYAMOTO & HIDAKA (1960): 43 (distribution); STICHEL (1961): 725 (catalogue); STICHEL (1962): 205 (catalogue); MIYAMOTO (1965): 229 (distribution); HSIAO et al. (1977): 72, pl. 9: fig. 131 (redescription, habitus figure); DURAI (1987): 262 (*pacao* listed in synonymy); HUA (1990): 170 (check-list, distribution, host plant); LIS (1990): 143 (catalogue, distribution); MIYAMOTO & YASUNAGA (1991): 184 (check-list); ROLSTON et al. (1996): 78 (catalogue, distribution).

Eumenotes obscurus (partim, including *E. pacao*): ZHANG (1995): 24–26 (redescription, egg, larva, bionomics, host plant, distribution).

Eumenotes pacao: KOCOREK & LIS (2000): 9, 20–21 (taxonomy, species status restored, distribution, figures of male genitalia); LIS et al. (2002): 167, 182–183 (pretarsal structures, figures, distribution); LIS (2006): 231 (catalogue, distribution); KOCOREK (2012): 2 (distribution).

Material examined. **TAIWAN**: NANTOU COUNTY: Puli-Yüchin [= Puli-Yuchi], Sun Moon lake, 29.v.–13.vi.1993, 1 ♂ 3 ♀♀, 16.–24.vi.1993, 1 ♂, J. Dalihod lgt., P. Kment det. (ZJPC). – **VIETNAM**: S-Vietnam, 12 km N Dalat – Lang Bien, 1 ♂ 1 ♀, P. Pacholátko & L. Dembický lgt., A. Kocorek det. (NHMW).

Host plant. The species was reported to cause serious damage to sweet potatoes (*Ipomoea batatas*) in Amami-oshima in 1929 (ESAKI 1930). HUA (1990) further listed *Calystegia hederacea* (Convolvulaceae) as a host plant without further details. According to ZHANG (1995) it feeds on *Calystegia hederacea*, *Ipomoea purpurea*, and members of the Brassicaceae, but prefers *C. hederacea*.

Distribution. **Japan**: Ishigaki I. (KOCOREK 2012), Amami-oshima I. (ESAKI 1930), Okinawa (HOFFMANN 1935, TAKARA 1957), Okinawa-jima I. (TAKARA 1957), Tokara Islands (MIYAMOTO & HIDAKA 1960); **Taiwan** (ESAKI 1922, 1926; MIYAMOTO 1965; KOCOREK 2012); **China**: **Guangdong** (HUA 1990), **Guizhou** (HUA 1990), **Hainan** (HUA 1990), **Yunnan** (HUA 1990); and **Vietnam** (new record).

Discussion

As the status of Eumenotini has remained controversial after 150 years since its description, discovery of a new genus-group taxon undoubtedly belonging to this taxon brings new light into this matter. The so far monotypical Eumenotini was considered an endemic taxon of Oriental distribution, this zoogeographic pattern supporting its relationship with the morphologically similar Megymeninae which is widespread in the Oriental Region and the neighbouring Palearctic (China, Japan) and Austro-Papuan (New Guinea, Solomon Islands, tropical nor-

thern Australia) areas (DURAI 1987; LIS 1990; ROLSTON et al. 1996; KOCOREK 2000, 2004a,b; KOCOREK & LIS 2000, 2008; KOCOREK & DANIELCZOK 2002; KOCOREK & GHATE 2012). The discovery of *Afromenotes hirsuta* sp. nov. in the Democratic Republic of the Congo reveals a Palaeotropical distribution of Eumenotini; this distributional pattern corresponds rather to Dinidorinae known from tropical regions of Africa (including Madagascar) and Asia, with only few taxa distributed in the tropical Australian (*Folengus* Distant, 1914 – 1 species, *Thalma* Walker, 1868 – 2 species) and Neotropical Regions (*Dinidor* Latreille, 1829 – 7 species); within the Dinidorinae two widely distributed genera share a Palaeotropical distribution – *Coridius* Illiger, 1807 and *Cyclopelta* Amyot & Serville, 1843 (e.g. DURAI 1987, LIS 1990, ROLSTON et al. 1996, LIS & KOCOREK 1996).

The bionomics of Eumenotini is poorly known, all available information concerns only *Eumenotes*. Nothing could be stated about the taxon as a whole except for the assumption that it is restricted to areas with a humid tropical climate, which could be deduced from its known distribution. Several unrelated plants were cited in association with *Eumenotes* species (see DURAI 1988, 1993a) but most records are probably only sitting records of adults. The true host plants, on which development of *Eumenotes* was documented, are two species of the genus *Ipomoea* (Solanales: Convolvulaceae), *I. batatas* for *E. pacao* (ESAKI 1930) and *I. purpurea* for *E. obscura* (DURAI 1988, 1993a). ZHANG et al. (1995) and HUA (2000) listed also *Calystegia hederacea* (Convolvulaceae) as a host plant of *E. pacao* (under the name *E. obscura*) but unfortunately without further details. These scattered records may suggest tropical specialization of Eumenotini to Convolvulaceae, but more records are required to confirm such pattern before any generalization. The host plants of Dinidoridae were reviewed especially by SCHAEFER & AHMAD (1987), DURAI (1987), SCHAEFER et al. (2000), CASSIS & GROSS (2002), and RIDER (2014), listing host plants of several plant orders and families: for Dinidorinae – magnoliids: Piperales (Piperaceae); monocots: commelinids: Arecales (Arecaceae); eudicots: rosids: fabids: Malpighiales (Euphorbiaceae, Passifloraceae), Cucurbitales (Cucurbitaceae), Fabales (Fabaceae), Rosales (Moraceae, Urticaceae); malvids: Brassicales (Moringaceae), Malvales (Malvaceae, including Sterculiaceae), Sapindales (Sapindaceae); asterids: lamiids: Gentianales (Apocynaceae, incl. Asclepiadaceae; Rubiaceae), Lamiales (Pedaliaceae), Solanales (Solanaceae); for Megymeninae – monocots: commelinids (Poaceae), eudicots: Caryophyllales (Amaranthaceae, Basellaceae); rosids: fabids: Malpighiales (Passifloraceae), Cucurbitales (Cucurbitaceae); malvids: Sapindales (Rutaceae); asterids: Ericales (Balsaminaceae); campanulids: Asterales (Asteraceae) (plant system according to APG III 2009). However, most of these records concern adults, while larval host plants are properly published for only a few species (see Table 3) including the families Cucurbitaceae, Asteraceae, Fabaceae and Apocynaceae for Dinidorinae, and Cucurbitaceae, Basellaceae and Passifloraceae for Megymeninae; with apparent preference for Cucurbitaceae (e.g. DURAI 1987, 1993b; SCHAEFER & AHMAD 1987, VERMA et al. 1978, WILSON & FLANAGAN 1993, BEN YAKIR et al. 1996). Considering the laboratory tests of food choice by BEN YAKIR et al. (1996) we may expect Dinidoridae being rather oligophagous than widely polyphagous. However, there is so far no record of Dinidoridae or Megymeninae on Convolvulaceae, which may support Eumenotini as a separate lineage.

From a morphological point of view, *Afromenotes* gen. nov. exhibits all autapomorphies or other diagnostic characters of *Eumenotes* used previously for defining Eumenotini (cf.

Table 3. Known larval host plants of Dinidoridae.

| | Plant family | Host plant | Record from | Reference |
|---|---------------------------------|---|-------------|---|
| Dinidorinae | | | | |
| <i>Coridius brunneus</i> (Thunberg, 1783) | Fabaceae | <i>Millettia pinnata</i> (= <i>Pongamia pinnata</i>) | India | MESHAM et al. (1990) |
| <i>Coridius ianus</i> (Fabricius, 1775) | Apocynaceae: Asclepiadoideae | <i>Calotropis procera</i> | India | VERMA et al. (1978) |
| | Cucurbitaceae | <i>Lagenaria siceraria</i> (= <i>L. vulgaris</i>) | India | DHIMAN (1981) |
| <i>Coridius remipes</i> (Stål, 1858) | Cucurbitaceae | <i>Diplocyclos</i> sp. | Ghana | LODOS (1969) |
| <i>Coridius viduatus</i> (Fabricius, 1794) | Cucurbitaceae | <i>Citrullus lanatus</i> | Israel | BEN-YAKIR et al. (1996) |
| | Cucurbitaceae | <i>Ecbalium elaterium</i> | Israel | BEN-YAKIR et al. (1996) |
| <i>Coridius ianus</i> (Fabricius, 1775) | Cucurbitaceae | <i>Luffa aegyptica</i> (= <i>L. cylindrica</i>) | India | RASTOGI & KUMARI (1962) |
| <i>Cyclopelta siccifolia</i> (Westwood, 1837) | Fabaceae | <i>Millettia pinnata</i> | India | SHASHIKUMAR et al. (1996), HOSETTI et al. (1998), NAVEED et al. (2000), JOSHI et al. (2011) |
| | Fabaceae | <i>Erythrina variegata</i> (= <i>E. indica</i>) | India | HOSETTI et al. (1998) |
| Eumenotini | | | | |
| <i>Eumenotes obscura</i> Westwood, 1846 | Convolvulaceae | <i>Ipomoea purpurea</i> | Malaysia | DURAI (1988, 1993a) |
| Megymeninae | | | | |
| <i>Megymenum affine</i> Boisduval, 1835 | Asteraceae | <i>Xanthium occidentale</i> | Australia | WILSON & FLANAGAN (1993) |
| <i>Megymenum brevicorne</i> (Fabricius, 1787) | Basellaceae | <i>Basella alba</i> (= <i>B. rubra</i>) | Malaysia | DURAI (1993b) |
| | Cucurbitaceae | <i>Cucumis sativus</i> | Malaysia | DURAI (1993b) |
| | Cucurbitaceae | <i>Cucurbita maxima</i> | Malaysia | MILLER (1929), DURAI (1993b) |
| | Cucurbitaceae | <i>Momordica charantia</i> | Malaysia | DURAI (1993b) |
| | Cucurbitaceae | <i>Trichosanthes cucumerina</i> (= <i>T. anguina</i>) | Malaysia | MILLER (1929), DURAI (1993b) |
| | Passifloraceae | <i>Passiflora quadrangularis</i> | Malaysia | MILLER (1929) |
| <i>Megymenum distanti</i> Kocorek & Ghate, 2012 | Cucurbitaceae | <i>Diplocyclos palmatus</i> | India | KOCOREK & GHATE (2012) |
| <i>Megymenum gracilicorne</i> Dallas, 1851 | Cucurbitaceae | 'several species' | Japan | KOBAYASHI (1955) |

KOCOREK & LIS 2000), differing distinctly in the shape of head, pronotum, scutellum, the external scent efferent system, and body pilosity, but neither of these autapomorphies contradicts the monophyly of Eumenotini. Discovery of *Afromenotes* gen. nov. thus support Eumenotini as a distinct evolutionary lineage with different geographic distribution and probably also a different host plant association rather than merely an aberrant member of Megymeninae, which is in accordance with recent molecular phylogenetic studies by LIS et al. (2012). In spite of the phylogenetic relationships of Eumenotini, Dinidorinae, Megymeninae, and the various subgroups of the closely related and morphologically diverse family Tessaratomidae *sensu lato* being not resolved, we prefer to retain Eumenotini as a taxon of an uncertain position until a robust phylogenetic analysis is available for the Dinidoridae-Tessaratomidae complex.

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