

New species of the genera *Limentinus* Distant, 1917
and *Calodia* Nielson, 1982 (Hemiptera, Auchenorrhyncha,
Cicadellidae, Coelidiinae) from the Makay Massif
of Madagascar, with a key to Malagasy species

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Calodia makayensis n. sp., holotype, ZIN, frontal view.

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ABSTRACT

KEY WORDS
Coelidiini,
key,
morphology,
Toliara Province,
new combination,
new record,
new species.

Three new species of the genus *Limentinus* Distant, 1917 and one new species of the genus *Calodia* Nielson, 1982 are described from the former Toliara Province of southwestern Madagascar: *Limentinus oryx* n. sp., *L. nielsoni* n. sp., *L. nigrifacies* n. sp., *Calodia makayensis* n. sp. The genus *Calodia* Nielson, 1982 is recorded for the first time from Madagascar. *Coelidia perineti* Evans, 1953 is redescribed and transferred to the genus *Limentinus* with a new combination formed, *Limentinus perineti* (Evans, 1953) n. comb. Key to species of the tribe Coelidiini Dohrn, 1859 known currently from Madagascar is given.

RÉSUMÉ

MOTS CLÉS
Coelidiini,
clé d'identification,
morphologie,
province de Tuléar,
combinaison nouvelle,
signalisation nouvelle,
espèces nouvelles.

Nouvelles espèces malgaches du genre Limentinus Distant, 1917 et Calodia Nielson, 1982 (Hemiptera, Auchenorrhyncha, Cicadellidae, Coelidiinae) du massif du Makay, avec une clé d'identification pour les espèces malgaches.

Trois nouvelles espèces du genre *Limentinus* Distant, 1917 et une nouvelle espèce du genre *Calodia* Nielson, 1982 sont décrites de l'ancienne province de Tuléar dans le sud-ouest de Madagascar : *Limentinus oryx* n. sp., *L. nielsoni* n. sp., *L. nigrifacies* n. sp., *Calodia makayensis* n. sp. Le genre *Calodia* Nielson, 1982 est signalé pour la première fois de Madagascar. *Coelidia perineti* Evans, 1953 est redécrite et transférée dans le genre *Limentinus*, formant une nouvelle combinaison *Limentinus perineti* (Evans, 1953) n. comb. Une clé des espèces malgaches actuellement connues de la tribu des Coelidiini Dohrn, 1859 est fournie.

INTRODUCTION

The cicadellid tribe Coelidiini Dohrn, 1859 of the subfamily Coelidiinae Dohrn, 1859 was known so far from Madagascar only after the genus *Limentinus* Distant, 1917 (Nielson 1982, 1991). This genus was erected for a single species, *Limentinus aldabranus* Distant, 1917, from Aldabra atoll in Outer Seychelles (Distant 1917) and recorded later also from Cosmoledo and As-tove atolls (Webb 1980). Two years later this species was recorded from Antsiranana (or Diego-Suarez) in northern Madagascar, with male genitalia illustrated for the first time (Nielson 1982). Subsequently, the synonymy of *L. aldabranus* with *Coelidia perineti* Evans, 1953, the latter described from Analamazaotra (or Périnet) in Eastern Madagascar, was suggested by Nielson (1982) and confirmed by Nielson & Zahniser (2012). However, this synonymy cannot be accepted according to the differences in male genitalia structure illustrated below. Thus, I treat *Coelidia perineti* as valid name and transfer it to the genus *Limentinus*.

In the same paper by Nielson (1982) *Coelidia cambouei* Signoret, 1886, originally described after a female from the environs of Tamatave (Atsinana Region in eastern Madagascar), was transferred to *Limentinus* with new material listed from Mailaka and Antatabe. Nine years later Nielson (1991) added three more new species from Madagascar: *L. sagittus* Nielson, 1991 – from Toamasina Province (Fampanambo); *L. brachius* Nielson, 1991 – from Nosy Boraha Island (or Sainte Marie); *L. varius* Nielson, 1991 – from Comanarita (the locality name was not deciphered exactly after handwritten label). Finally, *L. declinatus* Wang, Dietrich & Zhang, 2018 was described from nearby of Fianarantsoa. Thus currently, *Limentinus* is represented by seven species known mainly from the holotypes and including three species known only after the males. According to Nielson (1982), *Limentinus* Distant is closely related to African *Krosolus* Nielson, 1982 and Oriental *Calodia* Nielson, 1982, but well distinguished by its tubular aedeagus with spine-shaped processes.

Up to now the subfamily Coelidiinae was known from Madagascar from just 17 specimens of *Limentinus* mostly from northern and eastern regions of the island (Signoret 1886; Evans 1953; Nielson 1982, 1991; Wang *et al.* 2018). However material collected during a field trip to the Makay Massif of former Toliara Province of southwestern Madagascar in 2011, organised by the Association “Naturevolution”, revealed three new species of *Limentinus* and a new species of the genus *Calodia* Nielson, 1982 – the largest coelidiine genus with Oriental distribution (Nielson 1982; Viraktamath & Meshram 2019) which had not previously been recorded from the island. Thus, the total number of Coelidiini genera and species known from Madagascar increases to two and 11 respectively including new records of this tribe from the former Toliara Province. A key to all Malagasy Coelidiini is given below.

MATERIAL AND METHODS

Morphological terminology follows Anufriev & Emeljanov (1988) and Dietrich (2005). The terms “anal tube” refers to the X segment and “anal column” refers to the paraproct.

The genital segments of male specimens examined were macerated in 10% KOH and figured in glycerin jelly (Brunel Micro Ltd, UK) using Leica MZ9.5 light microscope with camera lucida attached. The photos were taken using same microscope with camera Leica DFC 290 and Canon EOS 6D camera with macrolens Canon MP-E 65 mm f/2.8 1-5X. Images are produced using the software Helicon Focus and Adobe Photoshop.

The material examined, including the type specimens of the species described below, are deposited in the Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia (ZIN) and in the Muséum national d'Histoire naturelle, Paris, France (MNHN).

SYSTEMATICS

Family CICADELLIDAE Latreille, 1802
Subfamily COELIDIINAE Dohrn, 1859
Tribe Coelidiini Dohrn, 1859

Genus *Limentinus* Distant, 1917

Limentinus Distant, 1917: 316.

TYPE SPECIES. — *Limentinus aldabranus* Distant, 1917, by original designation and monotypy.

DISTRIBUTION. — Outer Seychelles and Madagascar.

DIAGNOSIS. — Head short, together with eyes narrower than pronotum; anterior margin rounded. Face long; frontoclypeus almost twice as long as wide between the eyes, without carinae; lorae narrowly oval; anteclypeus distinctly (mushroomlike) enlarged apically, with straight basement (Fig. 6A); antennal pedicel small, cylindrical; ocelli prominent, on margin of face and crown; rostrum with short 3rd segment, reaching middle coxae. Crown with lateral margins diverging anteriorly with weak median carina. Pronotum without carinae, anterior margin convex; posterior margin concave. Mesonotum large, with scutellum well separated by transverse depression; disk of pronotum separated by carina from its lateral parts (paranotal lobes). Forewings elongate, with five apical and three anteapical cells, outer one closed; appendix well developed. Hind femora with 2 + 2 macrosetae apically. First metatarsomere as long as second and third ones combined. First metatarsomere with 2 + 1 macrosetae dorsally – two apically and one laterally. First metatarsomere with two spines laterally and two platellae between them ventroapically (Fig. 5A). Second metatarsomere with two spines laterally and one or two platellae between them ventroapically. Claws wide, each with single long lateral seta. Aedeagus tubular, asymmetrical, with long and narrow shaft bearing spiny processes. Connective short and broad, arcuated.

Limentinus perineti (Evans, 1953) n. comb.
(Figs 1; 2; 5)

Coelidia perineti Evans, 1953: 108, figs 45, 46.

TYPE MATERIAL. — Examined from photos taken by Mr Fauvre. **Holotype**. Madagascar • sex unknown as the abdomen is missed; Périnet, Sahamaloto; 13-17.I.1949; Inst. Scient. Madagascar, PC; MNHN-EH-EH2701.

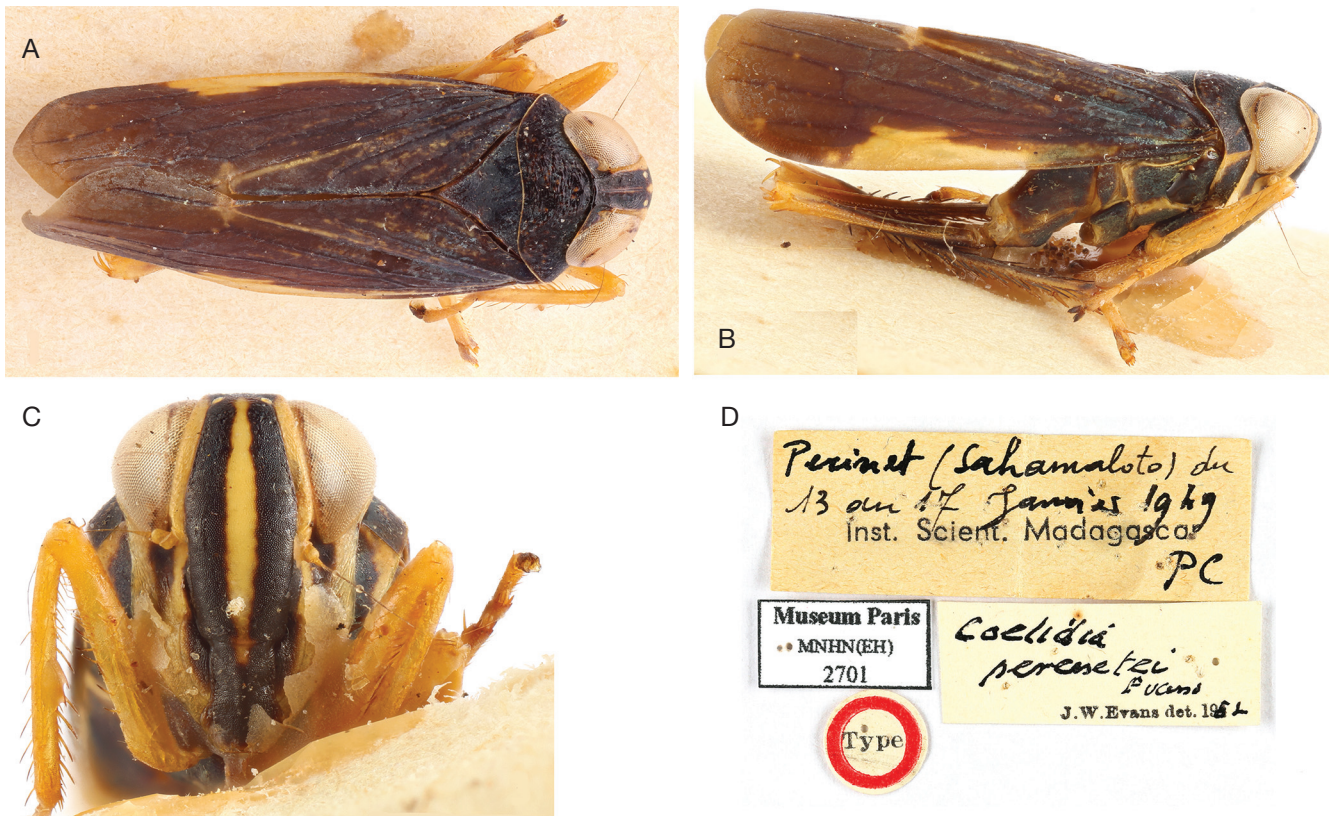


FIG. 1. — *Limentinus perineti* (Evans, 1953) n. comb., holotype, MNHN-EH-EH2701: **A**, dorsal view; **B**, lateral view; **C**, frontal view; **D**, labels. Total length of the specimen: 7.0 mm.

MATERIAL EXAMINED. — **Madagascar** • 1 ♂; Périnet; Seyrig; 12.II.1931; ZIN.

DIAGNOSIS. — Aedeagal shaft with three spine-shaped straight processes subapically on right side and one spine-shaped straight subapical process on left side and with two short and two long spine-shaped slightly curved processes below on right and left sides (Fig. 5E, F).

DESCRIPTION

Structure

As mentioned for the genus.

Coloration (Figs 1; 2)

Face yellow, with two wide black stripes running from ocelli throughout frontoclypeus and fused in one stripe on anteclypeus (Figs 1C; 2C); apical enlarged part of anteclypeus with brown yellow margins; lorae black, except brown yellow outer margins; genae with wide longitudinal black stripe under each eye running to level of lorae; antennae with scapus, pedicel, and flagellum light yellow; ocelli dark brown; rostrum brownish yellow. Crown black, except brown yellow lateral margins (Figs 1A; 2A). Pronotum and mesonotum black. Thorax below and coxae mainly black. Forewings dark brown to black, with black veins; corium with light brown yellow area along the costal margin almost from the basal cell to outer anteapical cell and with light brown yellow spot below the apex of clavus (Evans 1953: fig. 44) (Figs 1B; 2B); apical cells with appendix brown cinereous. Fore and middle

legs light yellow. Middle trochanters light yellow, with dark brown inner sides. Hind trochanters brown yellow. Hind femora dark brown to black in its basal 2/3 and light yellow in its apical third. Hind tibiae dark brown, with light setae. Hind tarsi brown yellow. Claws dark brown. Abdominal segments black, with light yellow hind margins. Genital block black, except light yellow lateral margin apically of subgenital plate.

Male genitalia (Fig. 5)

Anal tube 1.5 times as long as wide, flattened ventrally. Anal column short. Pygofer lobe triangularly elongate, with an additional small lobe on apical angle under anal tube and with ventral lobe in its middle (Fig. 5B); apical lobe with seven macrosetae subapically on its inner side (Fig. 5C). Subgenital plate long and narrow, not narrowing apically, with microsetae apically and with long setae on main surface, including several subapical macrosetae (Fig. 5D). Aedeagus asymmetrical, shaft long and narrow, slightly curved, with small hook apically bearing marginal denticles (Fig. 5E-G), with three (2 + 1) spine-shaped straight processes subapically on right side and one spine-shaped straight subapical process on left side and with two short and two long (one is damaged) spine-shaped slightly curved processes below on right and left sides respectively (Fig. 5E, F); gonopore probably subapical. Styles elongate, narrowing apically, with rounded apices (Fig. 5H). Connective arcuate (Fig. 5I).



FIG. 2. — *Limentinus perineti* (Evans, 1953) n. comb., male, ZIN: **A**, dorsal view; **B**, lateral view; **C**, frontal view. Total length of the specimen: 7.0 mm.

Measurement

Total length from the apex of head to the apices of forewings: 7.0 mm.

Limentinus oryx n. sp. (Figs 4A, B; 6)

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TYPE MATERIAL. — **Holotype**. Madagascar • ♂; Toliara Province, Massif du Makay; 21°36.144'S, 45°06.738'E; 11.I.2011; V. M. Gnezdilov leg.; ZIN.

Paratype. Madagascar • ♂; Toliara Province, Massif du Makay; 243 m; 21°36'236"S, 45°06'464"E; forêt sèche; 12.I.2011; D. Ouvrard leg.; MNHN-EH-EH24763.

ETYMOLOGY. — The species name is referring to similarity in face coloration with *Oryx gazella* (L.) (Mammalia).

DIAGNOSIS. — Aedeagal shaft with two spine-shaped processes subapically on right side and one spine-shaped subapical process on left side and with two longer spine-shaped processes below on left side (Fig. 6D, E).

TAXONOMIC RELATIONSHIPS. — Very close to *L. declinatus* Wang, Dietrich & Zhang, 2018 in coloration, but well distinguished by lighter forewings and dense brown dots on pronotum and by fewer spiny processes of aedeagus – five processes in comparison to 12 in *L. declinatus*.

DESCRIPTION

Structure

Structure as mentioned for the genus. Crown narrow and long, 1.5 times as long at midline as wide basally. Pronotum nearly as long as crown medially. Mesonotum 1.5 times as long as pronotum medially. Second metatarsomere with two spines laterally and one platella between them ventroapically. Apodemes of second abdominal segment rather long and wide (Fig. 6C).

Coloration (Fig. 4A, B)

Face with frontoclypeus light yellow, with two longitudinal black stripes laterally; lorae black, with light yellow margins; anteclypeus light yellow, with wide lateral black stripes converging subapically; black spot under each eye; ocelli dark brown; antennae light yellow. Legs light yellow. Crown brown, with wide longitudinal black stripes on the sides of

median carina. Pronotum black, with dense light brown dots, sometimes fused in the areas; paranotal lobes of pronotum light yellow, each with black spot in its lower part. Mesonotum black, with sparse brown dots and with four black spots on brown yellowish background medially. Episternae and epimerae of thorax black, with light yellow margins. Scutellum with brown yellowish apex. Forewings with dark brown to black veins, brown to dark brown cells of corium and clavus in its basal 2/3 of length, with brown dots on veins in apical third of wing and with two separated light brown yellow areas – one narrow along the costal margin from the basal cell to apical third of inner anteapical cell and another one, wide, from costal margin throughout outer anteapical cell; appendix of forewings cinereous. Hindwings cinereous, with light spot on costal margin and dark brown veins. Hind tibiae with black apices of spines. Claws dark brown to black. Abdominal tergites dark brown to black, each with pair of large orange yellow spots laterally running from its anterior margin to its yellow posterior margin. Genital block dark brown. Abdominal sternites dark brown to black, with brown yellowish hind margins.

Male genitalia (Fig. 6)

Anal tube 1.5 times as long as wide, flattened ventrally (Fig. 6F). Anal column short. Pygofer lobe triangularly elongate, with an additional small lobe on apical angle under the anal tube and with ventral lobe in its basal half (Fig. 6B). Subgenital plate long and narrow, with around 12 microsetae apically and with long setae on the main surface. Aedeagus asymmetrical, shaft long and narrow, curved, with small hook apically (Fig. 6D), with two spine-shaped slightly curved processes subapically on right side and one spine-shaped slightly curved subapical process on left side and with two longer slightly curved spine-shaped processes below on left side (Fig. 6E), gonopore probably subapical. Styles elongate, narrowing apically, with rounded apices (Fig. 6G). Connective arcuate (Fig. 6H).

Measurement

Total length. 6.0 mm.

Limentinus nielsoni n. sp. (Figs 3A, B; 7)

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TYPE MATERIAL. — **Holotype**. Madagascar • ♂; Toliara Province, Massif du Makay; 21°36.415'S, 45°06.769'E; 12.I.2011; sweeping in dry forest; V. M. Gnezdilov leg.; ZIN.

ETYMOLOGY. — The species is named in honour of famous American specialist on coelidiine leafhoppers William Mervin Nielson (1927-2019) who described most of Malagasy *Limentinus* species.

DIAGNOSIS. — Aedeagal shaft with three straight short processes apically, two spine-shaped slightly curved processes subapically on right and left sides (right processes longer) and two spine-shaped slightly curved processes (longest ones) below on left side (Fig. 7D-F).

DESCRIPTION

Structure

In structure and coloration very similar to *L. oryx* n. sp. Second metatarsomere with two spines laterally and two platellae between them ventroapically.

Coloration (Fig. 3A, B)

Scutellum with brown yellowish margins. Abdominal tergites black, each with pair of large orange yellow spots laterally running from its anterior margin to its yellow posterior margin. Abdominal sternites black, with yellow hind margins.

Male genitalia (Fig. 7)

Anal tube 1.5 times as long as wide, flattened ventrally (Fig. 7G, H). Anal column short. Pygofer covered by long setae; pygofer lobe triangularly elongate, with an additional small lobe on its apical angle under the anal tube and with ventral lobe in its basal half (Fig. 7A, B); apical lobes of pygofer each with eight and more setae on its inner side (Fig. 7B). Subgenital plate long and narrow, with microsetae apically and with long setae on the main surface. Aedeagus asymmetrical, shaft long and narrow, slightly curved (in ventral and lateral views), with small hook apically (in lateral view) (Fig. 7D), with three straight short processes apically, two spine-shaped slightly curved processes subapically on right and left sides (right processes longer) and two spine-shaped slightly curved processes (longest ones) below on left side (Fig. 7D-F), gonopore subapical, large (Fig. 7F). Styles small, elongate, with rounded apices (Fig. 7D). Connective arcuate (Fig. 7C).

Measurement

Total length. 6.0 mm.

Limentinus nigrifacies n. sp. (Figs 3C-F; 8)

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TYPE MATERIAL. — **Holotype**. Madagascar • ♂; Toliara Province, Massif du Makay; 21°37.783'S, 45°00.286'E; 170 m; 23.I.2011; sweeping in dry forest; V. M. Gnezdilov leg.; ZIN.

Paratype. Madagascar • ♂; Toliara Province, Massif du Makay, forêt d'Ambalamanga Sud; 21°40.493'S, 44°59.603'E; 157 m; 20.I.2011; sweeping in dry forest; V. M. Gnezdilov leg.; MNHN.

ETYMOLOGY. — The species name refers to the coloration of the face.

DIAGNOSIS. — Aedeagal shaft with one short subapical process on left side, two long spine-shaped processes below it, and two long spine-shaped processes on opposite right side (Fig. 8D, E).

TAXONOMIC RELATIONSHIPS. — In general the male genitalia structure is close to *L. aldabranus* Distant *sensu* Nielson (1982), but is well differentiated by its black face and details of the aedeagus.

DESCRIPTION

Structure

General structure as mentioned for the genus. Crown wider than in other species described, as long as wide basally. Second

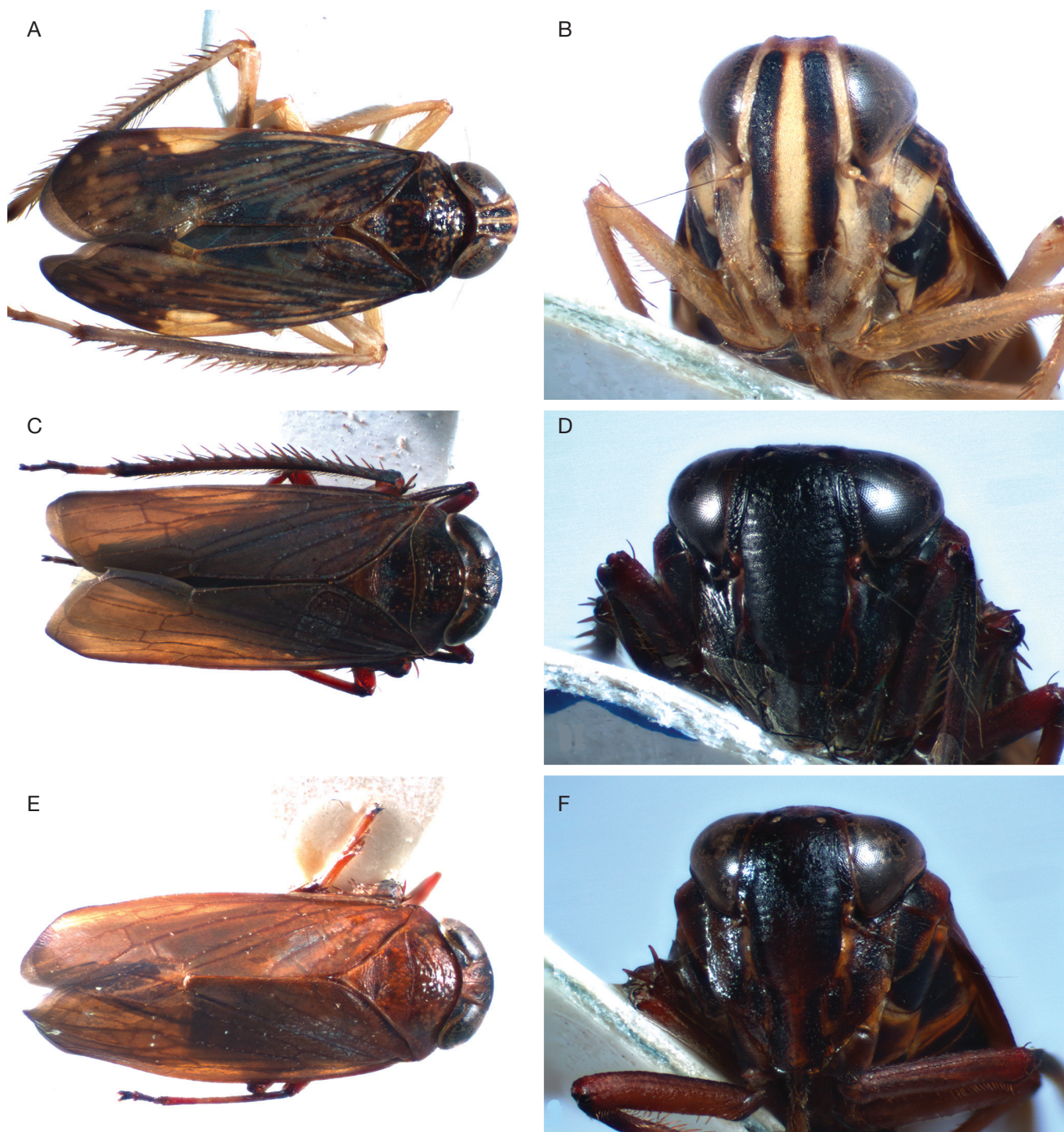


FIG. 3. — *Limentinus* spp.: **A**, *L. nielsoni* n. sp., holotype, ZIN, dorsal view; **B**, same, frontal view; **C**, *L. nigrifacies* n. sp., holotype, ZIN, dorsal view; **D**, same, frontal view; **E**, *L. nigrifacies* n. sp., paratype, ZIN, dorsal view; **F**, same, frontal view. Total length of the specimens: 6.0 mm.

metatarsomere with two spines laterally and two platella between them ventroapically.

Coloration (holotype) (Fig. 3C, D)

Head and body from below black. Legs black, with burgundy tint. Crown with brown yellowish median line. Pronotum with brown yellowish areas. Mesonotum black. Scutellum brown yellowish. Forewings cinereous to black, with black to dark brown veins. Hindwings cinereous, with brown

to dark brown veins. First metatarsomere brown yellowish in its basal half and black in its apical half. Abdominal segments including genital black black, with light yellow hind margins.

Coloration (paratype) (Fig. 3E, F)

Face black; anteclypeus with wide brown yellowish median line; lorae with brown yellowish margins; genae yellow along frontoclypeus and under antennae; rostrum with black 1st vis-

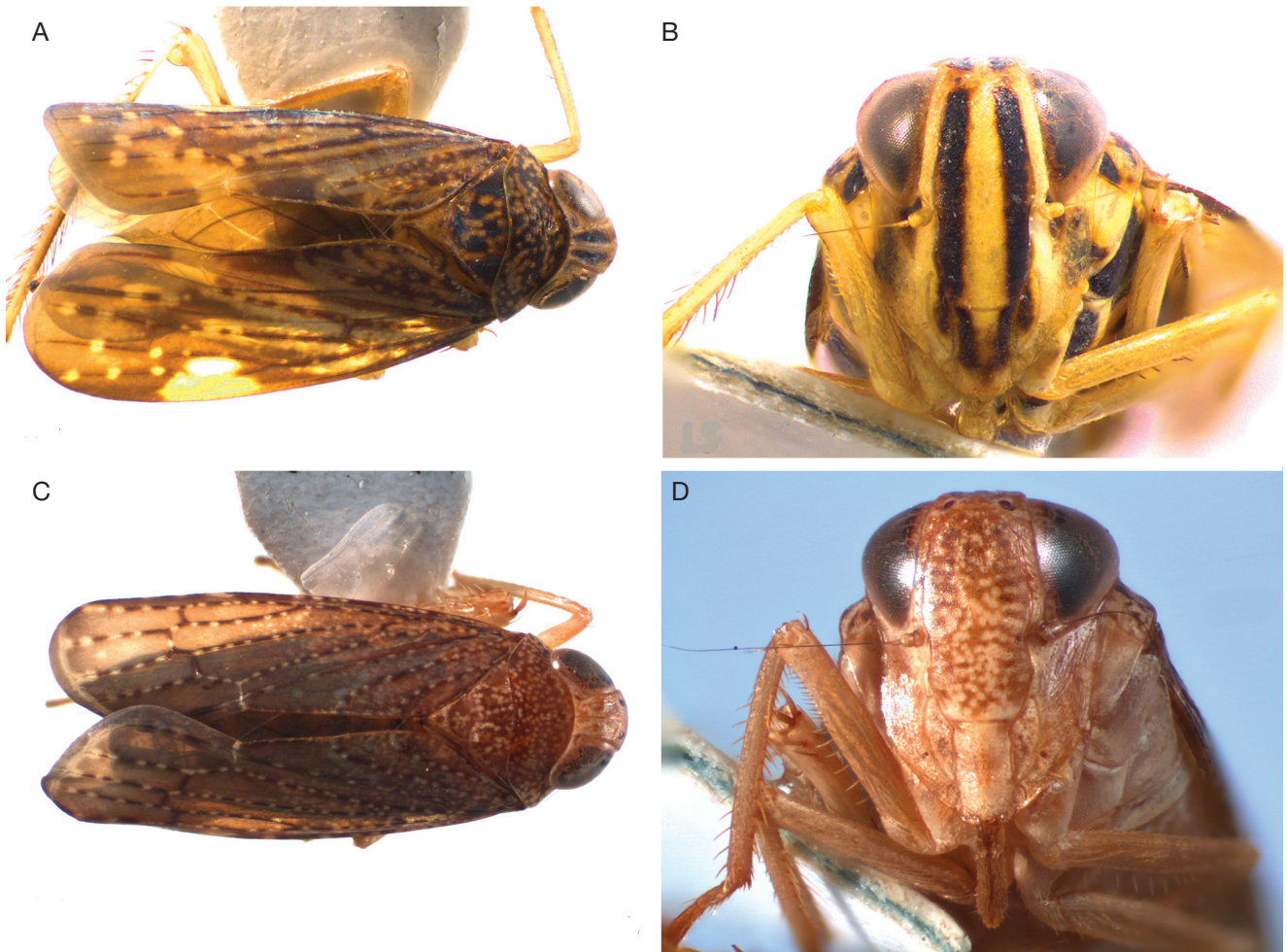


FIG. 4. — Coelidiini Dohrn, 1859, external view: **A, B**, *Limentinus oryx* n. sp., holotype, ZIN; **C, D**, *Calodia makayensis* n. sp., holotype, ZIN, dorsal view (**A, C**) and frontal view (**B, D**). Total length of the specimens: 6.0 mm.

ible segment and brown yellowish 2nd one. Crown brown yellowish, with black longitudinal areas. Pronotum brown yellowish, except black paranotal lobes. Mesonotum brown yellowish. Forewings brown yellowish, with dark brown veins. Episternae and epimerae with yellow margins. Katepisternae yellow, with dark brown to black central part. Fore and middle coxae dark brown. Hind coxae black. Fore and middle femora and tibiae dark brown, with red tint. Hind femora and tarsomeres brown yellowish.

Male genitalia (Fig. 8)

Anal tube 1.4 times as long as wide, flattened ventrally (Fig. 8B). Anal column short. Pygofer covered by long setae; pygofer lobe triangularly elongate, with an additional small lobe on apical angle under anal tube and with ventral lobe in its basal half (Fig. 8A, C); apical pygofer lobe apically with macrosetae on its inner side (Fig. 8C). Subgenital plate long and narrow, with long setae on the main surface. Aedeagus asymmetrical; shaft long and narrow, weakly curved, with large hook apically bearing five small lateral denticles on each side (in ventral and lateral views) (Fig. 8D-G), with one short subapical process on

left side, two long spine-shaped slightly curved processes below it, and two long spine-shaped slightly curved processes in opposite on right side, gonopore situated below long processes of shaft, small (Fig. 8D). Styles small, rounded (Fig. 8D, E). Connective arcuate.

Measurement

Total length. 6.0 mm.

Genus *Calodia* Nielson, 1982

Calodia Nielson, 1982: 140.

TYPE SPECIES. — *Calodia multipectinata* Nielson, 1982, by original designation.

DISTRIBUTION. — Oriental Region and Madagascar.

DIAGNOSIS. — As given by Nielson (1982, 2015). In general characters close to *Limentinus* mentioned above, but well differentiated in male genitalia structure by the aedeagal shaft with fewer processes and larger styles (Fig. 9C, F-H).

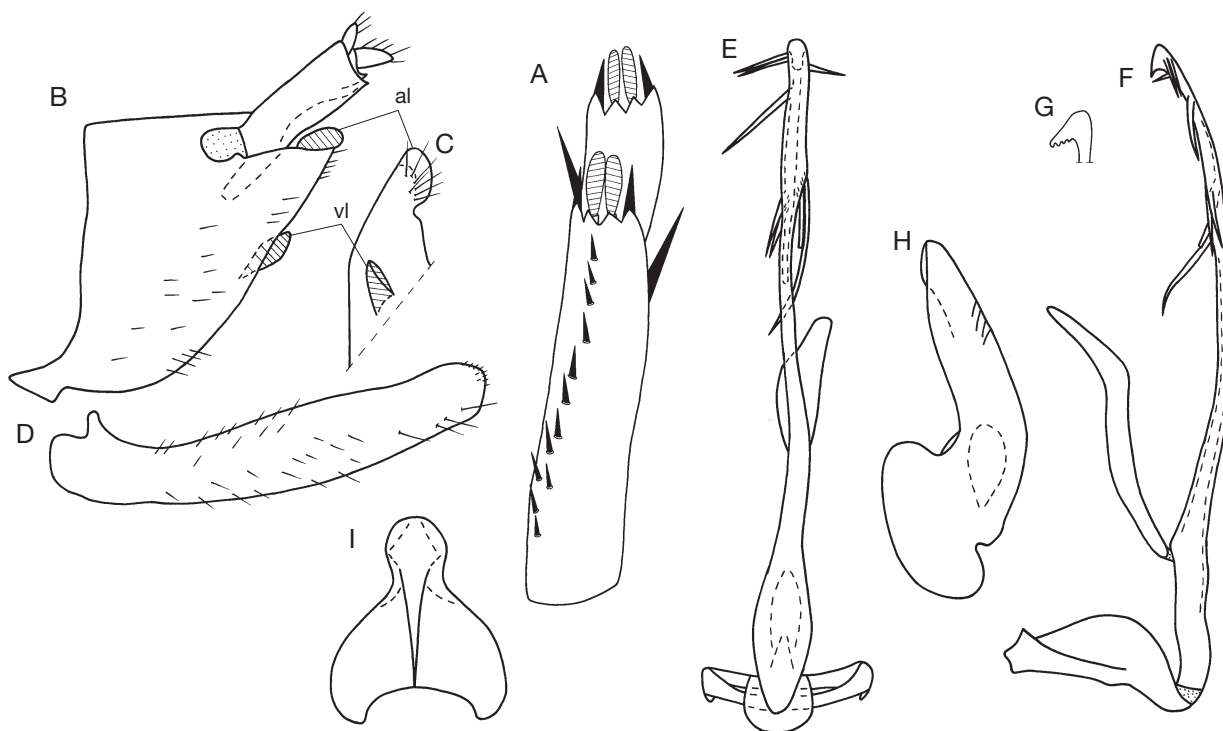


FIG. 5. — *Limentinus perineti* (Evans, 1953) n. comb., ZIN: **A**, first and second metatarsomeres, ventral view; **B**, pygofer and anal tube, lateral view; **C**, pygofer lobe, inner side; **D**, subgenital plate, lateral view; **E**, aedeagus and connective, ventral view; **F**, same, lateral view; **G**, apex of aedeagus, lateral view; **H**, style, lateral view; **I**, connective, dorsal view. Abbreviations: al, additional lobe; vl, ventral lobe. Not to scale.

Calodia makayensis n. sp.
(Figs 4C, D; 9)

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TYPE MATERIAL. — **Holotype**. Madagascar • ♂; Toliara Province, Massif du Makay; 21°33.901'S, 45°04.456'E; 312 m; 15.I.2011; sweeping in wet forest; V. M. Gnezdilov leg.; ZIN.

ETYMOLOGY. — The species is named after the Makay Massif.

DIAGNOSIS. — Aedeagal shaft with only pair of different in shape and length spine-shaped subapical processes (Fig. 9G, H).

TAXONOMIC RELATIONSHIPS. — According to the shape of aedeagus with right subapical process longer than left one and aedeagal apex with carina below gonopore (Fig. 9G, H) the species is closely related to Indian *Calodia deergha* Viraktamath et Meshram, 2019 (Viraktamath & Meshram 2019: figs 15A-H) and to *C. ostenta* (Distant, 1918) (Nielson 1982, figs 469, 470; Viraktamath & Meshram 2019, figs 20A-H), however, it is well differentiated by the pygofer lobes without ventral lobes and long styles (Fig. 9A, C). The peculiar long style, with median process (Fig. 9F), separates the new species from other *Calodia* species as well as from all other Coelidiini. Long and narrow styles, but without median processes, are known also for the African genera *Africocoelidia* Nielson, 1982 and *Amplicoelidia* Nielson, 1991 (Nielson 1991, figs 11, 17).

DESCRIPTION

Structure

Crown slightly longer than wide basally. Pronotum 1.3 times as long as coryphe medially. Mesonotum 1.5 times as long as

pronotum. Second metatarsomere with two spines laterally and two platellae between them ventroapically.

Coloration (Fig. 4C, D)

Face with frontoclypeus light yellow, with dense brown dots; genae light brownish yellow; lorae, anteclypeus, legs, and body from below light yellow; ocelli burgundy; crown light yellow. Pronotum and mesonotum dark brown, with dense light yellow dots; paranotal lobes of pronotum light yellow. Forewings ochre, with dark brown to black veins, bearing light dots. Hindwings cinereous, with dark brown veins. Claws dark brown to black. Hind tibiae with brown to dark brown apices of spines. Abdominal tergites brown to dark brown, with light yellow hind margins. Pygofer lobes with light brown yellowish basal and apical angles and dark brown medially and from above; subgenital plate light brown yellowish basally and dark brown laterally and apically; anal tube dark brown.

Male genitalia (Fig. 9)

Anal tube 1.5 times as long as wide, flattened dorso-ventrally, slightly enlarged from base to apex (in dorsal view) (Fig. 9A, B). Anal column short. Pygofer covered by long setae; pygofer lobe triangularly elongate, with an additional small lobe on apical angle under anal tube, without ventral lobe (Fig. 9A); pygofer lobe apically with 4-5 macrosetae on its inner side (Fig. 9D). Subgenital plate long and narrow, rounded apically (Fig. 9C). Aedeagus asymmetrical; shaft long and narrow, straight (in ventral view), wider in its basal third, with

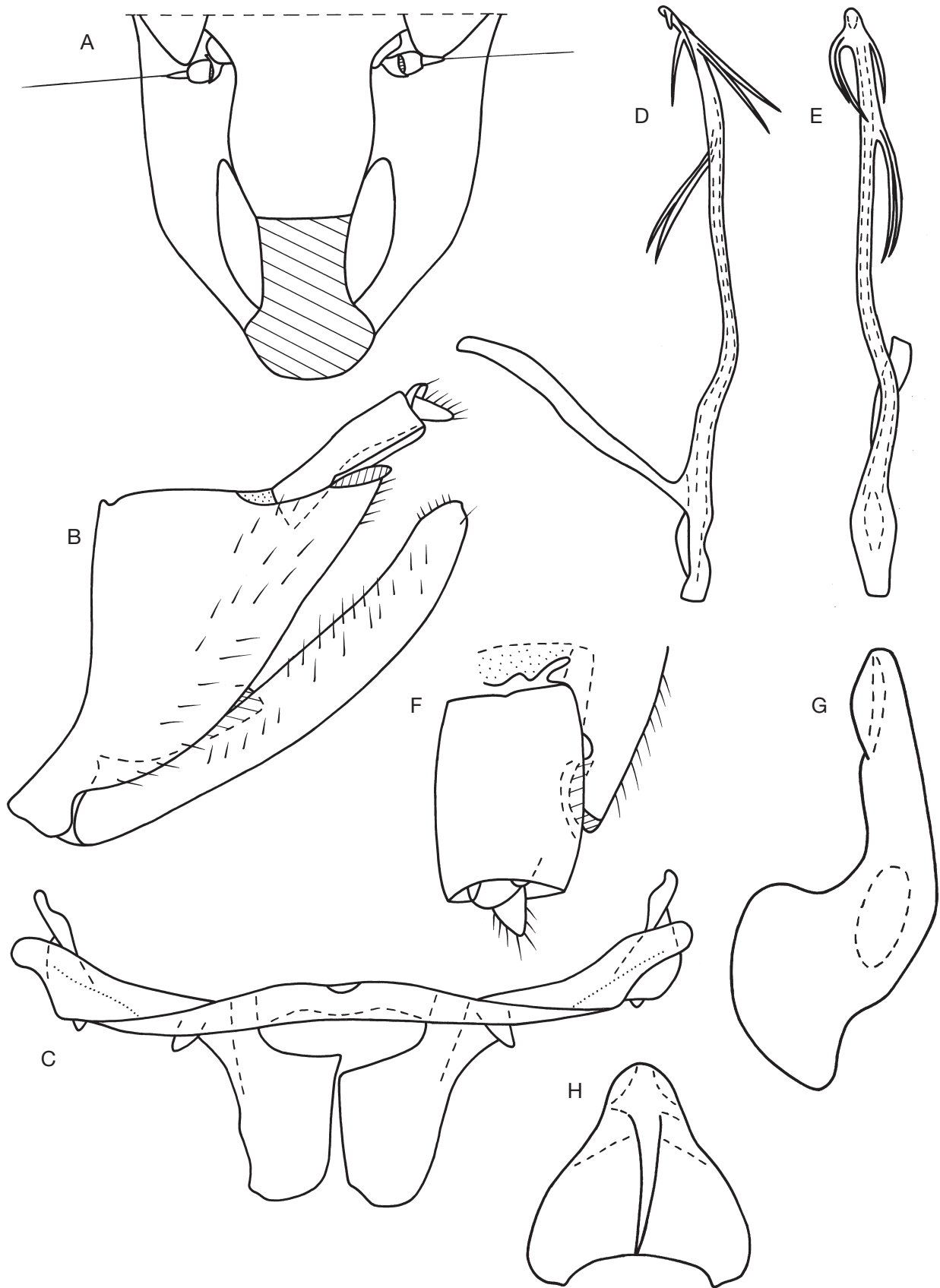


FIG. 6. — *Limentinus oryx* n. sp., holotype, ZIN, male genitalia: **A**, face; **B**, genital block (without aedeagus), lateral view; **C**, abdominal apodemes II; **D**, aedeagus, lateral view; **E**, aedeagus, ventral view; **F**, anal tube and apex of left pygofer lobe, dorsal view; **G**, style, lateral view; **H**, connective, dorsal view. Not to scale.

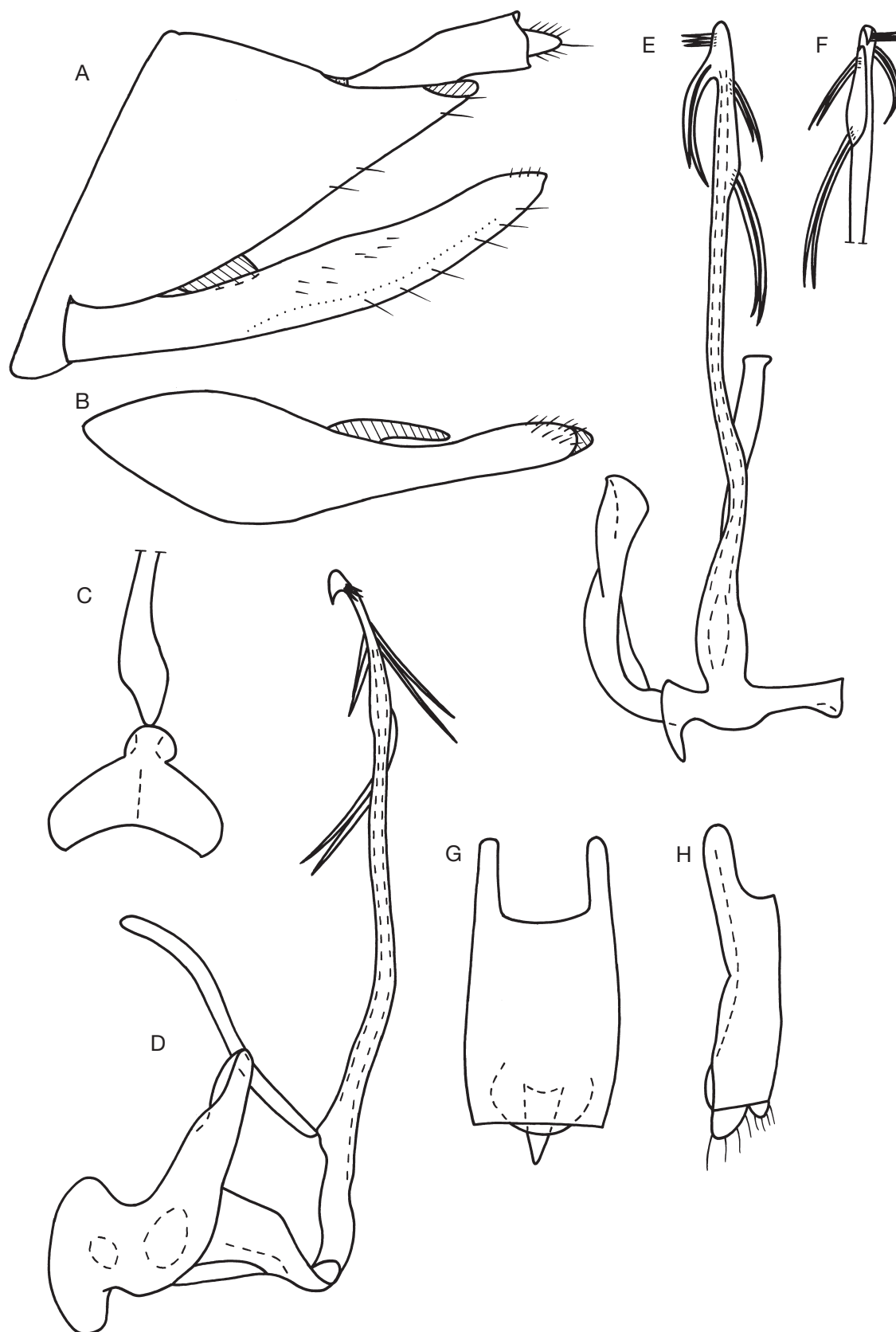


FIG. 7. — *Limentinus nielsoni* n. sp., holotype, ZIN, male genitalia: **A**, genital block (without aedeagus), lateral view; **B**, pygofer lobe, dorsal view; **C**, connective and basal part of aedeagus, ventral view; **D**, aedeagus, connective, and style, lateral view; **E**, aedeagus, connective, and style, ventral view; **F**, apical part of aedeagus, dorso-lateral view; **G**, anal tube, dorsal view; **H**, anal tube, lateral view. Not to scale.

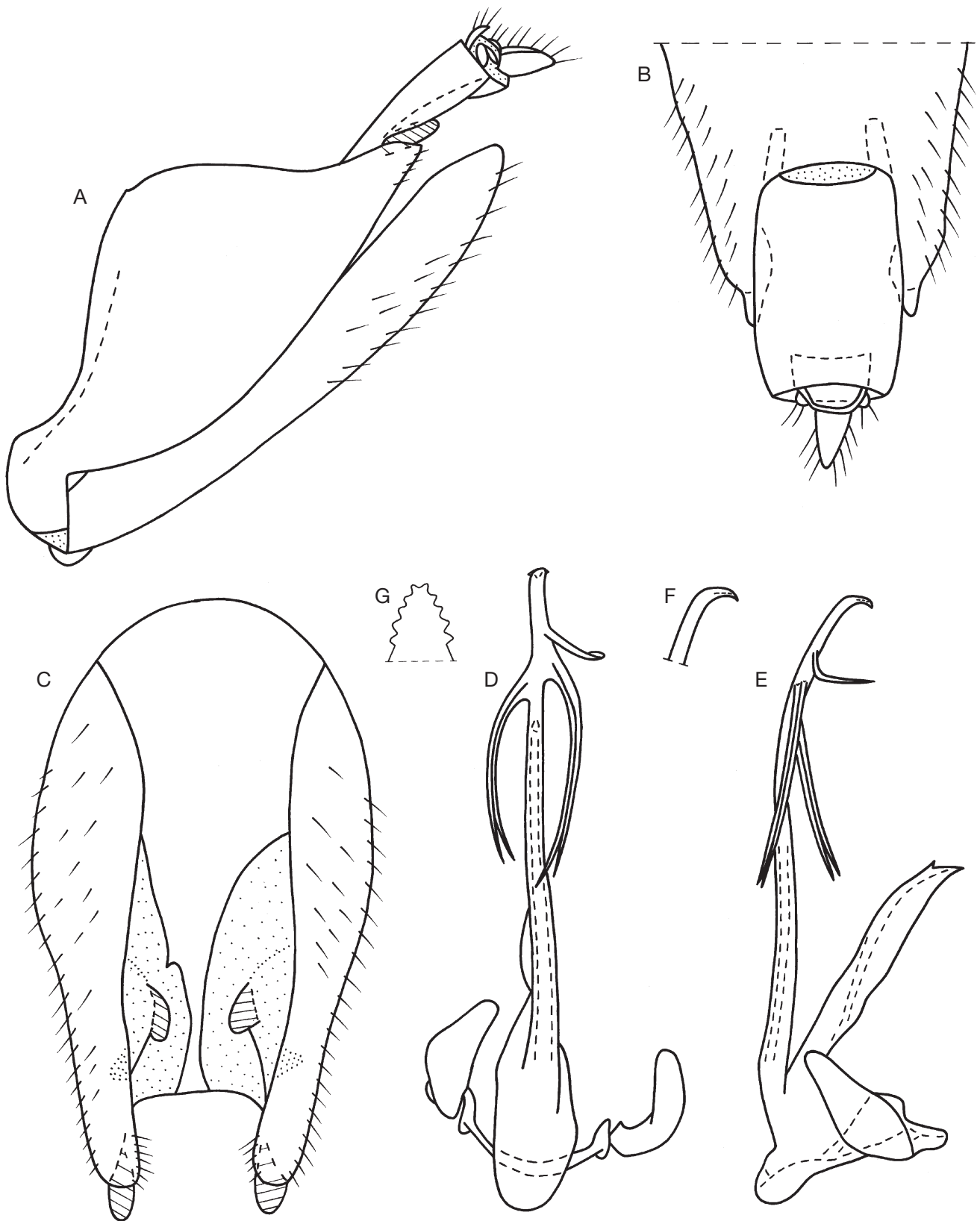


FIG. 8. — *Limentinus nigrifacies* n. sp., holotype, ZIN, male genitalia: **A**, genital block (without aedeagus), lateral view; **B**, apices of pygofer lobes and anal tube, dorsal view; **C**, pygofer, ventral view; **D**, aedeagus, connective, and styles, ventral view; **E**, aedeagus, connective, and style, lateral view; **F**, apex of aedeagus, lateral view; **G**, apex of aedeagus, dorsal view. Not to scale.

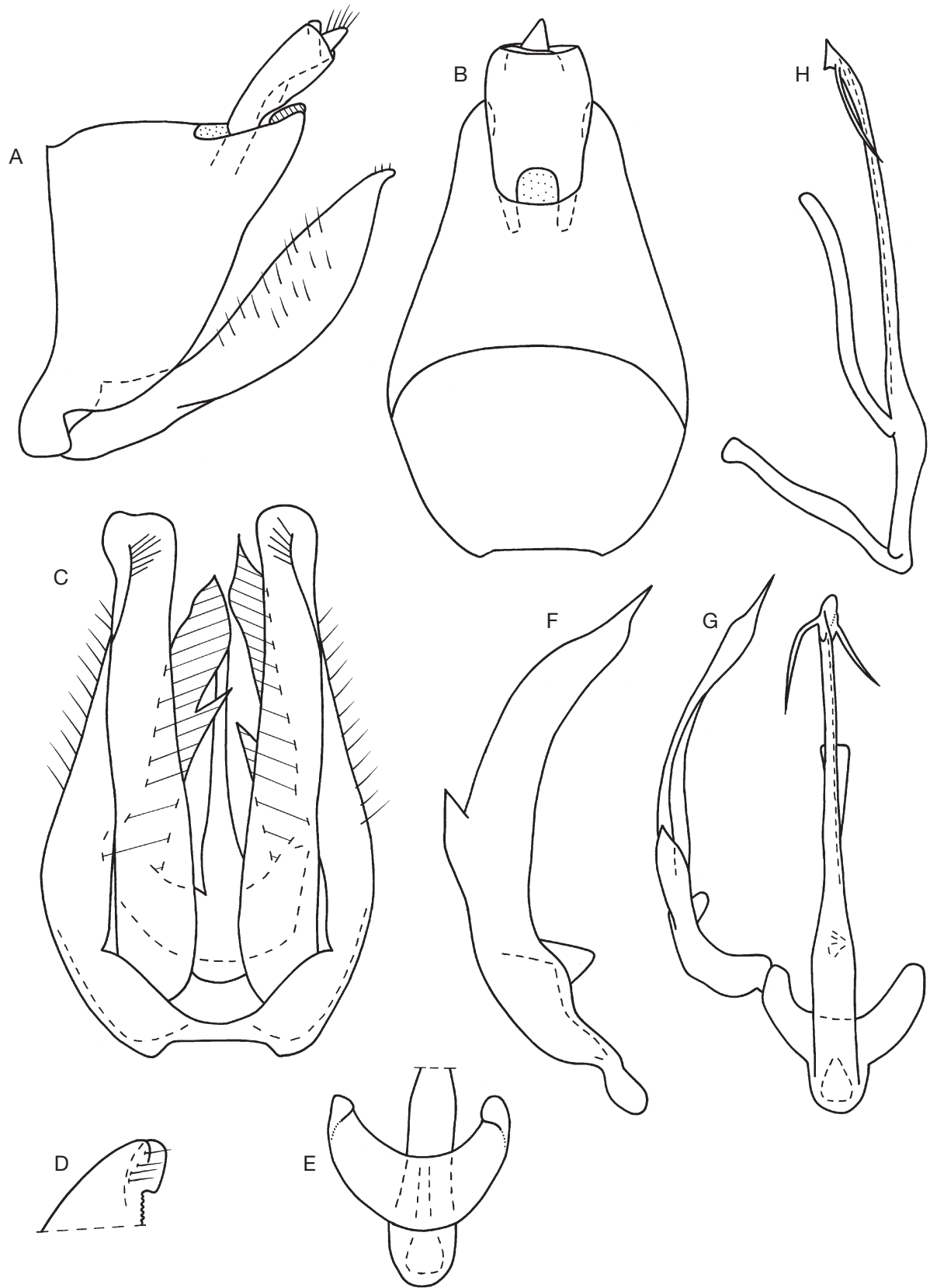


FIG. 9. — *Calodia makayensis* n. sp., holotype, ZIN, male genitalia: **A**, genital block (without aedeagus), lateral view; **B**, pygofer and anal tube, dorsal view; **C**, genital block (without anal tube, styles shaded), ventral view; **D**, apex of pygofer lobe, inner side; **E**, connective and basal part of aedeagus, dorsal view; **F**, right style, lateral view; **G**, aedeagus, connective, and style, ventral view; **H**, aedeagus and connective, lateral view (from right side). Not to scale.

KEY TO COELIDIINI DOHRN, 1859 OF MADAGASCAR

1. Style as long as subgenital plate (Fig. 9C). Aedeagal shaft with only two subapical processes (Fig. 9G, H) *Calodia makayensis* n. sp.
— Style short. Aedeagal shaft with more than two processes 2
2. Frontoclypeus black (Fig. 3D, F). Aedeagal shaft with five spiny processes (from the apex to the basement and from left to right side: 1 + 2 + 2), wherein the upper process is 0.3 times as long as four other processes which are almost equal in length (Fig. 8D, E) *Limentinus nigrifacies* n. sp.
— Frontoclypeus ochraceous with fuscous spots, dark fuscous to piceous or yellow with two black longitudinal stripes. Aedeagal shaft with number, length and or arrangement of processes different to above 3
3. Aedeagal shaft with three processes 4
— Aedeagal shaft with more than three processes 5
4. Apex of aedeagus enlarged (Nielson 1991: figs 2; 3 *L. sagittus* Nielson, 1991
— Apex of aedeagus narrow (Nielson 1982: figs 101; 102 *L. cambouei* (Signoret, 1886)
5. Aedeagal shaft with five processes 6
— Aedeagal shaft with 7–12 processes 7
6. Frontoclypeus dark fuscous to piceous. Aedeagal shaft with 4 + 1 processes (Nielson 1991: figs 5; 6) *L. brachius* Nielson, 1991
— Frontoclypeus light yellow, with two longitudinal black stripes 8
7. Aedeagal shaft with six short and one long (2 + 2 + 2 + 1) processes (Nielson 1991: figs 11; 12) *L. varius* Nielson, 1991
— Aedeagal shaft with several long processes 9
8. Aedeagal shaft with 2 + 1 + 2 processes (Fig. 6D, E) *L. oryx* n. sp.
— Aedeagal shaft with 1 + 1 + 2 + 1 processes (Nielson 1982: figs 95; 96) *L. aldabranus* (Distant, 1917)
9. Aedeagal shaft with 8–9 processes 10
— Aedeagal shaft with 12 (3 + 4 + 1 + 4) processes (Wang *et al.* 2018: figs 31–33) *L. declinatus* Wang, Dietrich & Zhang, 2018
10. Corium of forewing with elongate light brown yellow area along the costal margin almost from the basal cell to outer anteapical cell (Figs 1A, B; 2A, B). Aedeagal shaft with 8 (1 + 2 + 2 + 1 + 2) processes (Fig. 5E, F) ... *L. perineti* (Evans, 1953) n. comb.
— Corium of forewing with two separated light brown yellow areas – one narrow along the costal margin from the basal cell to apical third of inner anteapical cell and another one, wide, from costal margin throughout outer anteapical cell (Fig. 3A). Aedeagal shaft with 9 (2 + 2 + 3 + 2) processes (Fig. 7D–F) *L. nielsoni* n. sp.

pair of different in shape and length spine-shaped subapical processes (Fig. 9G, H); aedeagal apex with carina above the gonopore (in ventral view), hook-shaped and pointed (in lateral view); gonopore subapical, small. Connective arcuate (in dorsal view) (Fig. 9E, G). Style large, nearly as long as subgenital plate, with narrow, pointed apex and triangular process near midlength (Fig. 9C, F, G).

Measurement

Total length. 6.0 mm.

DISCUSSION

Within the genus *Limentinus* four species form a group of closely related species according to peculiar coloration of the face (pale with black longitudinal stripes) and forewings (dark, each with large pale spot on costal margin), but dif-

fer from each other by the details of aedeagus structure, in particular, the number and disposition of spine-shaped processes on the aedeagal shaft; these are *L. aldabranus*, *L. declinatus*, *L. nielsoni* n. sp., and *L. oryx* n. sp. In this context the synonymisation of *L. aldabranus* Distant, 1917 with *Coelidia perineti* Evans, 1953, based on a comparison of female holotypes of both species by Nielson (1982) and Nielson & Zahniser (2012) was premature as the male from Périnet illustrated and described above confirms the validity of *L. perineti* n. comb. Further study is needed to elucidate the taxonomic status of *L. aldabranus* Distant *sensu* Nielson (1982) illustrated basing on the specimen from Diego-Suarez (Nielson 1982, figs 90–96) and not compared with the male from Aldabra atoll situated in 1000 km to the north from Madagascar: this specimen may represent an endemic species different from other Malagasy species. The same is true for *L. cambouei* (Signoret, 1886) interpreted by Nielson (1982) basing on non type male.

As many species mentioned above are described after a single specimen, in particular, occasionally swept in the forests during the trip to the Makay Massif, I expect many more undiscovered taxa to be found in other regions of the island. Thus, *Olidiana indica* (Walker, 1851) recorded by Distant (1917) from Seychelles may still be found in Madagascar. Further discovering and description of these taxa will considerably increase our knowledge of Malagasy Coelidiini and may bring more genera to the list.

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