Zootaxa 5442 (1): 001–066
https://www.mapress.com/zt/

Monograph

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

https://doi.org/10.11646/zootaxa.5442.1.1
http://zoobank.org/urn:lsid:zoobank.org:pub:4D0061B3-D252-47F6-B2DA-F811E9131FB5

ZOOTAXA

5442

Revision of the genus *Trichophallus* Ingrisch, 1998 with notes on the genera *Secsiva* Walker, 1869 and *Subrioides* C.Willemse, 1966 (Orthoptera: Tettigoniidae: Conocephalinae: Agraeciini)

SIGFRID INGRISCH
Leibniz Institute for the Analysis of Biodiversity Change, Museum Koenig, Adenauerallee 160, D-53113 Bonn, Germany
s.ingrisch@macbay.de; https://orcid.org/0000-0002-8624-0472

Magnolia Press
Auckland, New Zealand

Accepted by D. Rentz: 22 Feb. 2024; published: 18 Apr. 2024

SIGFRID INGRISCH

Revision of the genus *Trichophallus* Ingrisch, 1998 with notes on the genera *Secsiva* Walker, 1869 and *Subrioides* C.Willemse, 1966 (Orthoptera: Tettigoniidae: Conocephalinae: Agraeciini)

(*Zootaxa* 5442)

66 pp.; 30 cm.

18 April 2024

ISBN 978-1-77973-042-8 (paperback)

ISBN 978-1-77973-043-5 (Online edition)

FIRST PUBLISHED IN 2024 BY

Magnolia Press

P.O. Box 41-383

Auckland 1041

New Zealand

e-mail: magnolia@mapress.com

https://www.mapress.com/zt

ISSN 1175-5326 (Print edition)

ISSN 1175-5334 (Online edition)

Table of Contents

Abstract

The Papuan genus *Trichophallus* Ingrisch, 1998, mainly found in New Guinea and some neighbouring Islands is revised. The study is based on historical but formerly unworked specimens found in museum collections of North America, Europe, and Indonesia. The differentiation between the genus *Trichophallus* and the superficially similar genera *Subria* Stål, 1874, *Secsiva* Walker, 1869, and *Subrioides* C. Willemse, 1966 are outlined and discussed. Important characters to differentiate *Trichophallus* from other similar genera are found in a combination of the shape of the fore wings, the absence of prosternal spines, and the male titillators being provided with tufts of hairs apart from sclerites. The female ovipositor carries a pair of sub-basal, lateral lobes, so far unknown from other genera of Tettigoniidae, and the female subgenital plate is provided with a pair of basal, dorsal-lateral extensions often larger than the ventral area of the subgenital plate. 19 species and one subspecies are described as new, all from New Guinea or nearby islands. *T. tricuspis* Naskrecki & Rentz, 2010 is removed from *Trichophallus* and newly combined with the genus *Subrioides*. Keys to the species of *Trichophallus* are provided.

Introduction

The genus *Trichophallus* comprises smaller to medium sized Tettigoniidae species of the tribe Agraeciini, and is so far known mainly from New Guinea and some nearby islands. It somewhat resembles species of the genera *Subrioides* C. Willemse, 1966 and *Secsiva* Walker, 1869, differs, however, in details of the stridulatory apparatus and in external and internal genitalia. These and several other morphological characters are assumed of being important for the delineation of species. The taxonomically oldest species in *Trichophallus* had been originally described under the genus name *Subria* Stål, 1874, a South American genus that comprises much more stout and robust species compared to the narrow elegant species found in *Trichophallus*. *Subrioides* was described by C. Willemse (1966) who already recognised the difference between the single species included and what he recognised as „*Subria"* despite of the great overall similarity in general habitus between both genera, *Trichophallus* and *Subrioides.*

Trichophallus (type species: *Subria concolor* Redtenbacher, 1891 from Amboina) had been introduced by Ingrisch (1998) as new name for the, at that time few, known Papuan species of the otherwise South American genus *Subria* Stål, 1874 (type species: *Subria nitida* Stål, 1874 from Colombia, Antioquia, Remedios). Until mid of the twentieth century, taxonomy and differentiation of species was still largely based on overall similarity. Advanced study, including that of the sclerotised genitalia and sound production and the structures involved with producing sound, it became clear that the diversity of that insect group is obviously higher than formerly thought. Using these characters for identification revealed a wealth of superficially similar species in *Trichophallus,* that is, the uniform light brown color and the long narrow fore wings reaching up to twice the length of the body. Species of that genus apparently seem to be quite restricted geographically and show a great variability with regard to characters essential for reproduction. Although the number of new species is already high for the restricted area covered in this investigation, additional species of *Trichophallus* can probably be discovered in the future.

Methods

All specimens studied come from historical insect collections of North America, Europe and South Asia; most of them formerly unidentified specimens in museum cabinets. No field work relative to this study has been done by the author. The specimens were at first sorted for locality, then according to size, shape and length of tegmen and by the shape of cerci in males or subgenital plate in females. All or a selected number of specimens, depending on the number of specimens in the probes were then relaxed, the titillators extracted and the wings spread to study the stridulatory file on the underside of the left fore wing.

Few of the specimens were photographed in earlier years, partly more than 20 years ago with older equipment during visits of the museums. The majority of specimens have, however, been studied on loan and documented recently. For study and documentation of diagnostic characters, individual male specimens of all species were relaxed, the titillators extracted from the body and cleared in KOH solution and then stored in 70% alcohol. At the end of the study, the preparations were glued with water-soluble glue to cardboard and pinned below the specimens.

The general habitus of most specimens studied was photographed using a Canon 6D mounted to a copy-stand; Microscopic images documenting details of wings, cerci and titillators were done with a Canon 6D mounted to the photo adapter of a Motic M5 microscope. The microscopic images were processed with CaptureOne and stacked with Zerene Stacker software. Habitus images were photographed together with a piece of scale paper. Microscopic images were done at one of four fixed magnifications. For each magnification also a micrometer was photographed that allowed to add scales to the finished images. Measurements of the stridulatory apparatus were done with Adobe Photoshop CS6. The length of the stridulatory file has been taken as a straight line from the first to the last tooth without considering that the file is curved at both ends.

The specimens studied had been labelled with locality names that were in use at the time of collection, none with exact coordinates. Geographical coordinates given in this publication are approximate values that have been investigated by search in Google Maps (2023) or in Gazetteer of The Papua Insects Foundation (2019). They are given in degrees and decimal degrees. The biogeographic work done by researchers of the BPBM is documented in Gressitt (1982).

The abbreviation KAE followed by a numeral is the collection number of the "Kaiserin-Augustafluß-Expedition" [Sepik River Expedition] 1912.

Abbreviations for depositories:

BPBM	Bernice B. Bishop Museum, Honolulu, Hawaii, USA
MCSN	Museo Civico di Storia Naturale "Giacomo Doria", Genoa, Italy
MZBJ	Museum Zoologicum Bogoriense, Java, Indonesia
NBC	Naturalis Biodiversity Center, Leiden, the Netherlands
NHM	The Natural History Museum, British Museum of Natural History London, UK
SMTD	Staatliches Museum für Tierkunde Dresden, Germany
ZMB	Museum für Naturkunde (the former Zoologisches Museum), Berlin, Germany

Results

History of the genus *Trichophallus*

The genus *Trichophallus* (type species: *Subria concolor* Redtenbacher, 1891) comprises small and medium sized species of Tettigoniidae in the subfamily Conocephalinae in the tribe Agraeciini distributed so far known mainly in New Guinea and some, mostly nearby Islands. The oldest known species of the genus had been originally described undere the genus name *Subria* Stål, 1874, which is, however, a South American genus that is only superficially similar in general habitus (type genus: *Subria nitida* Stål, 1874 from South America: Colombia, Antioquia, Remedios).

Historically the first generic name introduced for long-winged Agraeciini from the Papuan region and considered for this publication was *Secsiva.* It was introduced by Walker (1869) for a single species *Secsiva univitta* Walker, 1869 from Northern Australia found near the Victoria River. This species remained for a long time the unique named species in the genus, until Rentz (2009) moved *Agraecia differens* Redtenbacher, 1891 to Walker's genus *Secsiva*. A superficially somewhat similar species had been described as *Subria gracilis* by Karny (1907) from Papua New Guinea. This species is regarded here as belonging to *Trichophallus*. The genus *Subria* (type genus: *Subria nitida* Stål, 1874 from South America: Colombia, Antioquia, Remedios) is a South American genus and, apart from the fact that it has a stouter appearance with shorter wings and quite different male and female abdominal appendages (compare e.g. Naskrecki & Morris, 2000 in Naskrecki 2000), it is unlikely to occur in New Guinea. Differentiation of species at that time was still largely based on overall similarity. C. Willemse (1966) added two more species to what is now *Trichophallus* as *Subria solomona* and *Subria uniformis* and introduced the genus *Subrioides* C. Willemse (1966) for a single male from New Guinea: *Subrioides insulana* C.Willemse (1966). That proves that the author already recognised the difference at genus level between this single specimen known at his time (a male) despite of the great overall similarity between *Subrioides* and the genera *Trichophallus* and *Secsiva*. Although the original description for *Subrioides insulana* is rather poor, it is enough to separate it from other, superficially similar species. Finally, *Trichophallus* had been introduced by Ingrisch (1998) as new name for the, at that time few, known

Papuan species of the otherwise South American genus *Subria* Stål, 1874. *Trichophallus* differs from the other genera mentioned by the peculiar shape of the male titillators consisting of one or two pairs of sclerites connected with membranous structures provided with hairs and by the peculiar shape of the female subgenital plate that has long dorsal, basal extensions and by the ovipositor being provided with subbasal lateral lobes that have not been reported from any other genus of Agraeciini.

The male described by C. Willemse (1966) as *Subrioides* differs from *Trichophallus* by coloration of face, pronotum and tegmen being provided with dark markings while in *Trichophallus* face and pronotum are unicoloured. Also the shape of the tegmen differs between both genera. It has the anterior margin more or less suddenly restricted in about apical third in *Subrioides*, but only faintly and gradually narrowed in *Trichophallus*. Unfortunately, the author did not give a description of the cerci and the phallus of *Subrioides*. But if he was not certain about the identity of a new genus he would not have described it in the same paper with Papuan „*Subria*".

More recently, Naskrecki & Rentz (2010) reported two new species of *Trichophallus* from the Papuan area. One, a single male from New Guinea, they left unnamed while a male and a female from East New Britain they described as *Trichophallus tricuspis* Naskrecki & Rentz (2010). That latter species, however, does not agree with *Trichophallus* with regard to the shape of the fore wings, coloration of face, the male titillators, and the female ovipositor. Instead, it agrees as far as these characters had been described or figured by Willemse (1966), with *Subrioides*. Moreover, the titillators of *T. tricuspis* do not agree with the filigran sclerites of the titillators in *Trichophallus* connected with membranous areas and provided with tufts or rows of fine and long hairs. Also, the female ovipositor in *T. tricuspis* is conspicuously longer, only faintly curved and missing the basal projections of the ventral ovipositor valves that are typical for *Trichophallus*. Instead, these characters agree well with the situation in the genus *Subrioides*. This species is thus newly combined as *Subrioides tricuspis* (Naskrecki & Rentz, 2010) comb. nov.

The species „*Trichophallus tricuspis* Naskrecki & Rentz, 2010" is removed from *Trichophallus* and combined with *Subrioides* Willemse, 1966 because, despite of overall similarity in general shape with *Trichophallus*, *S. tricuspis* has prosternal spines that occur in *Secsiva* but not in *Trichophallus* and *Subrioides*, the male phallus is not provided with hairs but has large and complex sclerites, the female ovipositor is not dorso-ventrally widened around mid-length and the ventral ovipositor valves do not have a projecting lobe at base; moreover, the female subgenital plate does not have the large basal, dorsal expansion that occurs in *Trichophallus*.

Subrioides tricuspis differs from *Trichophallus* also by the fore wings that are wider in basal and central areas while the anterior margin narrows rather suddenly from the wider basal to the narrow apical area. This character is common in many genera of Agraeciini but not in *Trichophallus* and fully winged *Secsiva*. in which the tegmina may become slightly, gradually narrowing in a more basal area already. Moreover, the titillators of *T. tricuspis* do not agree with the filigran sclerites of the titillators connected with membranous areas and provided with tufts or rows of fine and long hairs. Also the female ovipositor in *T. tricuspis* is markedly longer than in *Trichophallus,* only faintly curved and missing the widening of the dorsal margin and the basal projection of the ventral ovipositor valves that are typical for *Trichophallus*. These characters agree well with those of the genus *Subrioides*. This species is thus newly combined as *Subrioides tricuspis* (Naskrecki & Rentz, 2010) comb. nov. The length of the female ovipositor would also agree with the situation in *Pseudonicsara*. Species of the latter genus are, however, of stouter appearance and have wider and shorter wings that reach more or slightly less to the end of abdomen and do not markedly surpass it as in *Subrioides* and *Trichophallus*.

The stridulatory file on the underside of the male left tegmen is provided with more than one hundred (rarely less) broad and large teeth that are positioned closely together in *Trichophallus* while in *Secsiva* the file carries rather small teeth that number only 50 to 70 distinctly spaced teeth. *Trichophallus* comprises so far only long winged species in which the wings distinctly surpass the tip of the abdomen in both sexes. Females of that genus have the ovipositor more strongly curved than in species of *Secsiva.* The most characteristic feature for females of *Trichophallus* is the possession of membranous lateral lobes from the dorsal margin of the external ventral ovipositor valves that arise close to the base of the valves, thus, in an area that is laterally reached or covered by the subgenital plate. This lobe is about semi-circular and covered around rim with fine hairs. In few species they are short and less striking than in the majority of the females of the genus.

TABLE 1. Differences between *Trichophallus, Secsiva* and *Subrioides.*

Species of *Trichophallus* can be distinguished from the most similar genera as follows:

Trichophallus Ingrisch, 1998
—Shape of body narrow, slender
—Face of uniform light color (without any marks)
—Wing condition: macropterous, wings largely surpassing abdomen, often distinctly longer than body
—Tegmen: rather narrow from base, only slightly and regularly narrowing backwards in anterior area of tegmen; of equal width or inconspicuously narrowed in area projecting body
—Stridulatory file with numerous (often more than 100) densely arranged teeth over the whole length
—Prosternal spines absent
—Male titillators consisting of a mixture of sclerites with bundles of hairs
—Female subgenital plate with basal area greatly extended dorsad
—Ovipositor curved and short (nearly but not fully sickle-shaped) often with dorsal margin extended around mid-length
—Ventral ovipositor valves from basal area with a distinct, about semi-oval projection; in few species only little projecting

Subrioides C. Willemse, 1966
—Shape of body narrow, slender
—Face of light color with black marks
—Wing condition: macropterous, wings surpassing hind knees
—Tegmen: wider in basal area, narrowed at or behind mid-length
—Prosternal spines absent according to Willemse (1966)
—Male titillators with hardened sclerites, without hairs according to Naskrecki & Rentz (2010).
—Female subgenital plate so far undescribed
—Females not described in Willemse (1966)
—Ovipositor curved and elongate; without lateral projection after Naskrecki & Rentz (2010)

Secsiva Walker, 1869
—Shape of body moderately wide or narrow
—Wing condition: macropterous or brachypterous
—Tegmen: rather wide, of sub-equal width throughout or brachypterous; conspicuously narrowed in about apical third
—Stridulatory file in basal area usually without teeth; afterwards with less numerous, small, and distinctly spaced teeth (often between 40 and 60 or 80 teeth, but only a restricted number of species so far studied)
—Prosternal spines present
—Male titillators so far undescribed
—Female subgenital plate-shaped, without large dorsal extensions at base
—basal area of ovipositor without projection

Description of species

Trichophallus Ingrisch, 1998

Type species: *Subria concolor* Redtenbacher 1891, by original designation.

Diagnosis: The genus contains medium sized and small, always long-winged species with narrow, elongate tegmina surpassing the abdomen in both sexes. The male phallic complex consists of a pair of sclerites, in few species divided into two pairs of sclerites, and of membranous structures covered with areas of long hairs surrounding or extending these sclerites. The stridulatory file on the underside of the left male tegmen carries densely arranged and usually more than one hundred teeth. The number of teeth and their arrangement differs between species. Females differ from those of other, superficially similar genera by the possession of long, dorsal extensions from both sides of the base of the subgenital plate while the ventral surface of that plate is divided into two plates or narrow lobes varying between species or it is extremely shortened. Very characteristic for the genus is the possession of semi-oval projections from near base of the dorsal margin of the ventral external ovipositor valves provided with hairs along rim.

Discussion: *Trichophallus* differs from *Secsiva* by the absence of prosternal spines; by the pronotum which has the humeral sinus little expressed instead of distinct and the auditory swelling is smaller and ovoid instead of very large and rounded, and by more differentiated cerci and the presence of bundles of fine hairs on the titillators or the surrounding membranes.—Females differ from those of *Secsiva* by the large dorsal expansions from base of the subgenital plate and by the presence of semi-oval lobes arising from the dorsal margin near base of the ventral ovipositor valves, which is obviously a unique character of the genus. Species of *Trichophallus* are also similar to those of the genus *Subrioides* C. Willemse, 1966 with which they share the narrow, slender appearance and long narrow tegmina. They differ from that genus by the tegmina that are of similar width over the whole length that is only slightly and gradually narrowing backwards in basal area while in *Subrioides* they are wider in basal and central area and narrowing in about apical quarter to third. Moreover, both genera differ strikingly by the shape of the male cerci and titillators and by the shape of the female ovipositor that is longer and less strongly curved in *Subrioides* and missing basal, lateral projections of the ventral ovipositor valves typical for *Trichophallus.*

Description: Medium sized to small, slender species. Fastigium verticis compressed laterally, conical, shorter than scapus, apex subobtuse or subacute; ventral margin separated by a shallow sinuosity from fastigium frontis. Frons shining, sub-smooth with very few, shallowly impressed dots, slightly depressed at clypeo-frontal suture. Pronotum sub-smooth or with some impressed dots, rather regularly curved from one side to the other, apical area of disc faintly raised, subflat and shouldered; transverse sulcus weak, interrupted in middle, a second transverse sulcus on paranota and angles; anterior margin broadly rounded but slightly concave in middle; posterior margin rounded or almost subtruncate; paranota longer than high, ventral margin very faintly concave or almost straight and little descending posteriorly, ventro-posterior angle rounded; auditory swellings ovoid, well marked; humeral sinus faintly indicated. Fully winged, tegmen long and narrow, surpassing hind knees and often middle of hind tibia. Prosternum unarmed or with two minute tubercles. Meso- and metasternal lobes rounded or rarely mesosternal lobes angular; medial plate with a tubercle or spine at both posterior angles. Mesocoxa with or without a spinule at dorsal-anterior margin, ventral internal projection rather long. All femora with spines on both ventral margins, internal spines of mid femur near base. Knee lobes of fore and of mid femur obtuse or rarely triangular on external side, and obtuse, triangular or spinose on internal side; lobes of hind femur usually bi-spinose, but in small species sometimes uni-spinose and variable within species. Anterior tibia in cross-section quadrangular with dorsal angles rounded.

Male: Stridulatory file on underside of left tegmen simple, with dense, narrow teeth. Tenth abdominal tergite to a variable degree prolonged behind. Epiproct variable, often with a pit on dorsal surface. Cerci conical, elongate or short, usually with one internal projection, varying between species. Subgenital plate with converging lateral margins, rounded lateral carinae and lateral areas ascending dorsad; apex excised. Titillators separate or rarely fused; apical part often reduced and thus apex of titillators truncate or obliquely truncate and fused with large membranous bags; internal surface of those apical bags often with a row of long bristles that are distinctly surpassing the end of the bags, external surface with tufts of pale hairs of medium length, but sometimes not conspicuous, ventral-apical angle of apical bags usually granular and weakly sclerotised, often a little projecting; external surface or phallus membranes lateral of apical bags often provided with a weakly sclerotised, granular structure like a cap or a plate. With one pair of narrow, elongate lateral sclerites on dorsal-proximal side of phallus near base of titillators.

Female: Tenth abdominal tergite divided or furrowed and apex excised in middle. Epiproct triangularly rounded, surface depressed. Cerci long-conical, faintly curved, apex acute. Subgenital plate either plate-shaped but deeply divided along mid-length or broadly excised to almost base resulting in two lobes of variable shape and varying length between species; basal-lateral areas greatly projecting dorsad into the intersegmental area between

the eight and ninth tergite. In most species, the lateral hind angle of the eighth tergite is excised to provide room for the dorsal, lateral projection of the subgenital plate; in the extreme, all of the lateral areas of the eighth tergite are reduced. Ovipositor falcate, compressed, highest slightly before or behind middle; dorsal margin substraight behind basal curvature; ventral margin regularly curved; apex acute. The dorsal margin of the ventral ovipositor valves is in subbasal area widened to a semi-oval projection bent ventrad and provided with numerous long hairs mainly along rim; in few species only, that area is little expressed. In most species of the genus, this projection is very conspicuous; only in few species it looks like being reduced to a narrow tumescence of the dorsal margin of the ovipositor valve.

Coloration: Uniform between species. Uniformly yellowish-brown, including face; face without black marks. Most individuals with some or all of the following, not very striking patterns that can be variable within species: (0) without marks; (1) antennae with spaced dark rings and scapus and pedicellus with dark spots; (2) tegmina with brown spots, (3) fastigium verticis with a dark spot between lateral ocelli, interrupted in middle; (4) pronotum with a very narrow dark brown medial band split by a light line; (5) anterior tibia with a dark spot below tympana.

Key to known species (females)

1. Main area of subgenital plate in ventral view forming a pair of wide plates . . . . . .2.
- Main area of subgenital plate either consisting of a pair of narrow, elongate lobes, is strongly shortened, or otherwise modified . . . . . .4.
2. Subgenital plate in ventral view rhombic with basal area widening laterally; apical lobes wide, plate shaped with angular apical margin; lobes of both sides meeting or faintly overlapping in midline; in lateral view with basal extensions with parallel margins and angular dorsal end . . . . . ***T. solomona*** (Willemse, 1966)
- Subgenital plate in ventral view with apical lobes not meeting or overlapping in midline; their apical margins obtuse, rounded . . . . . .3.
3. Basal area of subgenital plate with a deep but narrow furrow in midline; apical lobes clearly separated at base, then approaching each other and dividing again. . . . . ***T. murua*** **ssp. nov.**
- Basal area of subgenital plate wide and deeply grooved; apical lobes separated in basal area by a narrow furrow, partly faintly overlapping. . . . . ***T. willemsei*** **sp. nov.**
4. Subgenital plate in ventral view consisting of a narrow transverse bridge at base that is often furrowed and little prolonged in midline (in museum specimens sometimes collapsed and partly hidden under the preceding sternite); furrowed central area membranous or provided with a fold or with transverse ribs; lateral margins of that bridge prolonged posteriorly into a pair of often curved but always narrow lateral projections that reach or surpass the oval projections of the ventral ovipositor valves. . . . . .5.
- Subgenital plate of different shape, not as above . . . . . .14.
5. Subgenital plate with basal area of ventral lobes rather long, divided by a membranous band along midline; apical projections vertically widened, compressed and rather wide . . . . . ***T. robustus*** **sp. nov.**
- Subgenital plate with apical lobes narrow, laterally widened . . . . . .6.
6. Ovipositor prolonged, not dorso-ventrally widened around mid-length but of equal width in that area. Subgenital plate with a medial furrow; lateral lobes elongate, narrow, reaching to about end of lobes of ovipositor valves. . . . . ***T. elongatus*** **sp. nov.**
- Ovipositor not prolonged, with distinct dorsal-ventral widening around mid-length . . . . . .7.
7. Ventral surface of subgenital plate elongate, entire, with a medial furrow, at end divided into a pair of moderately long lobes with obtuse end. Basal-lateral lobes of ventral ovipositor valves rather long, ovoid. Ovipositor around mid-length of about the same dorsal-ventral width as near base . . . . . ***T. forcipatus*** **sp. nov.**
- Ventral surface of subgenital plate only in basal area entire, afterwards divided into a pair of elongate lateral lobes. Ovipositor in most other species of the genus with a dorsal-ventral widening. Basal-lateral extension of the ventral ovipositor valves semi-oval, not prolonged. . . . . .8.
8. Subgenital plate in basal area with surface concave and provided with two parallel, stiffened, transverse ribs in anterior area . . . . . ***T. augustus*** **sp. nov.**
- Subgenital plate in basal area with surface not markedly concave nor with a pair of transverse ribs but in basal-central area provided with a furrow and on both margins prolonged into elongate narrow projections . . . . . .9.
9. Subgenital plate with basal lateral extensions moderately wide, projecting dorsal-laterally; with bilobate hind margin; the apical lobes narrow, curved, not very long, reaching about middle of lateral lobes of ventral ovipositor valves . . . . . ***T. gracilis*** (Karny, 1907).
- Subgenital plate of different shape, not as above . . . . . .10.
10. Subgenital plate with narrow and elongate lateral lobes reaching or surpassing end of the basal-dorsal extensions of the ventral ovipositor valves; basal-lateral extensions elongate and vaulted in preserved specimens. . . . . ***T. capillatus*** **sp. nov.**
- Subgenital plate of different shape, not as above . . . . . .11.
11. Subgenital plate from dorsal, apical margin with a short projecting lobe; apical lobes rather wide, sinusoidally curved when at rest; basal extensions curved in mid-length and provided in apical half with a furrow. . . . . ***T. punctatus*** **sp. nov.**

- Subgenital plate of different shape, not as above . . . . . 12.
12. Subgenital plate with basal area stout, box-shaped, with distinct but rounded angles laterally and with a transverse fold in subbasal area that is ending shortly after into a wavy apical margin while the compressed, narrow, lateral prolongations reach to about end of the projections of the ventral ovipositor valves. . . . . ***T. uniformis*** Willemse, 1966
- Subgenital plate of different shape, not as above . . . . . 13.
13. Subgenital plate in ventral view angular with rather broad rims, subdivided in midline of basal margin by a narrow membranous line . . . . . ***T. concolor*** Redtenbacher, 1891
- Subgenital plate with prolonged, dorso-ventrally compressed and little widened apical area that has the internal margin convex and with sharp rim, the external margin concave, and the end pointed . . . . . ***T. umboi*** **sp. nov.**
14. Subgenital plate in ventral view with transverse basal area shortened but apical lobes prolonged and with alternating wider and narrower areas, widest around mid-length; internal margin wavy . . . . . 15.
- Subgenital plate of different shape, not as above . . . . . 16.
15. Subgenital plate in ventral view with transverse basal margin sinuate, depressed in middle and there provided with a rod shaped process; apical lobes narrow at base, internal surface widening toward about mid-length then narrowing again toward little incurved, narrow conical tip . . . . . ***T. hamatus*** **sp. nov.**
- Subgenital plate in ventral view with transverse basal area shortened and straight, on both sides with a short compressed process with parallel margins that ends into a step after which the internal margin of the apical projection is widened and convex but becomes afterward concave while the external margin of the process is convex throughout; the lobes end into little incurved, subacute tips . . . . . ***T. furcatus*** **sp. nov.**
16. Subgenital plate with central lobes shortened but little widened thus touching each other in midline but hardly surpassing or as long as basal extensions of subgenital plate, and with end just reaching but not surpassing dorsal lobes of ventral ovipositor valves . . . . . 17.
- Subgenital plate more strongly modified . . . . . 18.
17. Subgenital plate with central lobes shortened but little widened thus touching each other in midline, about as long as or little surpassing the basal extensions of the subgenital plate, and with its end just reaching but not surpassing dorsal lobes of ventral ovipositor valves. . . . . ***T. lobatus*** **sp. nov.**
- Subgenital plate with main, ventral area very short and lobes subfused in mid-length, its convex apical margin not reaching end of basal, lateral extensions. Ovipositor only faintly widened around mid-length . . . . . ***T. reductus*** **sp. nov.**
18. Subgenital plate in ventral view short with straight and parallel lateral margins that are prolonged into a pair of long and narrow apical projections with apical margin of plate angularly excised in between; apical lateral projections in ventral view narrow, in lateral view elongate triangular, tip rounded . . . . . ***T. aru*** **sp. nov.**
- Subgenital plate with both halves separated from each other by a membranous zone along midline . . . . . 18.
19. Apical area of subgenital plate and basal extensions auricular, with rounded margins and for a great part attached to each other; apical area vaulted-triangular with obtuse end. . . . . ***T. borneensis*** Ingrisch, 1998
- Apical area of subgenital plate and basal extensions angularly arranged to each other with substraight margins . . . . . ***T. armatus*** **sp. nov.**

Key to species (males)

1. Tenth abdominal tergite with a pair of long apical extensions forming a deep incision in between . . . . . 2.
- Tenth abdominal tergite without long extensions, only moderately emarginated from apical margin . . . . . 6.
2. Cercus with a process from inner surface arising between mid-length and apical third of cercus . . . . . 3.
- Cercus with internal process arising near end of cercus. . . . . 4.
3. Cercus moderately curved near base; internal process arises little behind mid-length of cercus and curved ventrad. Stridulatory file with teeth less densely arranged; with about 110 teeth. Titillators with a fold at about beginning of apical third . . . . . ***T. willemsei*** **sp. nov.**
- Cercus rather straight near base; internal process arises before beginning of apical third of cercus, less curved ventrad. Stridulatory file with teeth narrow and very densely arranged; with about 150 teeth. Titillators regularly curved from base to tip . . . . . ***T. murua*** **sp. nov.**
4. Internal process of cercus narrow conical, arising shortly before end of cercus. Smaller species. Stridulatory file with about 103 teeth distinctly spaced throughout . . . . . ***T. apicatus*** **sp. nov.**
- Internal process of cercus triangular with converging margins . . . . . 5.
5. Internal process of cercus dorso-ventrally compressed; apical area of cercus thin. Stridulatory file with teeth on underside of left tegmen less densely arranged, with about 108–110 teeth). . . . . ***T. salomona pilorota*** **ssp. nov.**
- Large species. Internal process of cercus swollen; apical area of cercus rounded (not very thin). Stridulatory file on underside of left tegmen with about 120–130 teeth that stand in apical area very dense. . . . . ***T. salomona salomona*** (Willemse, 1966)
6. Cerci with two internal projections . . . . . 7.
- Cerci with only one internal projection . . . . . 10.
7. Cercus with a bell-shaped internal projection carrying a spine at tip and with a stylus shaped projection from end of ventral margin. . . . . ***T. augustus*** **sp. nov.**
- Cercus of different shape . . . . . 8.
8. Cercus with two projections from end of cercus: the dorsal projection stylus shaped, elongate and the ventral projection curved

with converging margins; both with a spinule at tip . . . . . ***T. armatus* sp. nov.**

- Cercus of different shape, not as above . . . . . 9.

9. Cercus with two short conical projections with a spinule at tip, from behind mid-lengh and at end of cercus . . . . . ***T. borneensis* sp. nov.**

- Cercus curved at end and provided with a thin lamella from last curvature to nearly base; also provided with a short spine at beginning of wide area of lamella and a second conical spine at end of curvature . . . . . ***T. forcipatus* sp. nov.**

10. Cerci long and substraight, rounded, near end of basal third with a rounded internal projection with a short spine at tip and base lamelarily widened along cercus stem; apical area of cercus obviously membranous and little curved in specimen at hand. Titillators with sclerotised area in about basal half long, thin and curved, around mid-length with a short triangular widening, followed by a long membranous, band-shaped area that only at end carries a short, narrow sclerotisation . . . . . ***T. mollipes* sp. nov.**

- Cerci and titillators of different shape . . . . . 11.

11. Cercus with an internal projection at base, in shape triangular with a spine at tip . . . . . ***T. gracilis*** (Karny, 1907)

- Cercus with internal projection inserted around mid-length or closer to end of cercus . . . . . 12.

12. Cercus with basal half rounded, in apical half compressed, narrowing toward end that carries a minute spine at tip; internal projection slightly curved, with spine-like end . . . . . ***T. uniformis* (Willemse, 1966)**

- Cercus of different shape, not as above . . . . . 13.

13. Cercus short, stout and curved, at end terminating into a compressed, about semi-oval projection with a spinule at tip. Titillators rectangular with the apical branch carrying a bunch of hairs and is at end folded into a parallel branch of the same size that is moveable against the main branch . . . . . ***T. lobatus* sp. nov.**

- Cerci of different shape, longer and not so strongly curved; titillators of different shape, not angular . . . . . 14.

14. Last abdominal tergite terminating into a pair of roughly triangular projections with obtuse tips. Male cerci with apical area swollen spatulate-triangular, slightly curved with obtuse tip; known from Amboina and Buru . . . . . ***T. concolor*** Redtenbacher, 1891

- Last abdominal tergite and cerci of different shape . . . . . 15.

15. Titillators with two pairs of main sclerites plus a pair of less conspicuous lateral sclerites . . . . . 16.

- Titillators with one pair of main sclerites plus a pair of less conspicuous lateral sclerites . . . . . 20.

16. Cerci elongate, narrow, regularly curved from base to obtuse tip and carrying in subapical area from internal margin a short, acute spine. Titillators with apical sclerites connected to basal sclerites by membrane and moveable against basal sclerites; the apical sclerites each carry a lateral membranous bursa with setose margin and divide at end into a larger sickle-shaped and a shorter obtuse lobe. Cerci curved, narrow, in subapical area with a tiny, acute process . . . . . 17.

- Different combination of characters. Sclerites of titillators fully separated from each other . . . . . 18.

17. Cerci narrow, regularly curved to narrow, subobtuse tip, in subapical area from internal margin with a tiny, acute spine. Epiproct with a medium long apical process . . . . . ***T. hamatus* sp. nov.**

- Epiproct strongly prolonged into a narrow apical projection. Cerci in subapical area with a larger, compressed, triangular, internal process with acute tip. Apical area of titillators separated from basal area by a narrow membranous zone . . . . . ***T. tabubil* sp. nov.**

18. Cerci with substraight trunk, incurved apical area with approaching margins and obtuse tip, and a narrow, styliform projection arising from the curvature. Titillators simple but covered by complex sheaths in form of two pairs of membranous bursae . . . . . ***T. furcatus* sp. nov.**

- Different combination of characters, not as above . . . . . 19.

19. Male cerci elongate, straight in basal half, then slightly curved and little narrowing toward obtuse tip; from proximal surface of end of cercus provided with a long, narrow, and straight projection with little curved, acute tip. Titillators fused in about basal halve, then separated and slightly sinuate and with re-curved, acute end; from subbasal area of apical halve and connected by a narrow membranous area provided with compressed and strongly curved projections that afterward become narrow and rounded and at tip spinose . . . . . ***T. spinosus* sp. nov.**

20. Male cerci rather narrow with converging margins and a short triangular, sub-apical internal projection. Titillators at base wide, narrowing to narrow tip; from backside with another pair of sclerites with wide base, long and narrow central area, and curved and widened apical area . . . . . ***T. aru* sp. nov.**

- Male cerci of different shape, not as above . . . . . 21.

21. Cerci rather long and narrow, little curved and before end divided into a short, compressed dorsal lobe with truncate tip and a narrowed ventral lobe with acute tip. Titillators long and narrow and in apical area embraced and replaced by membranous structures that carry long hairs along margin . . . . . ***T. elongatus* sp. nov.**

- Cerci roundish, rather short and stout, slightly curved behind base, otherwise almost straight, apex obtuse. Titillators separate, basal area strongly sclerotised, elongate, band-shaped with internal surface little concave, curved behind mid-length, at end obliquely truncate but somewhat irregular; apical area hyaline, sub-membranous with granular surface, and obviously movable against basal area; at end little swollen with granular rim and somewhat expanded dorsad-proximad; from membranous areas covering apical areas of titillators with a pair of large, hyaline, and faintly stiffened discs that carry at convex apical rim a row of long bristles largely surpassing apices of titillators . . . . . ***T. capillatus* sp. nov.**

Description of species

Trichophallus concolor (Redtenbacher, 1891)

Fig. 1.

Subria concolor Redtenbacher, 1891 Verh. der Zoologisch-Botanischen Gesellsch. Wien 41:435 Brongniart. 1897. Bull. Soc. entomol. Fr. 83 >> *Subria concolor*

Kirby, W.F. 1906. A Synonymic Catalogue of Orthoptera (Orthoptera Saltatoria, Locustidae vel Acridiidae) 2:256 >> *Subria concolor*

Karny. 1907. Abh. Zool.-bot. Ges. Wien 4(3):57 >> *Subria concolor*

Karny. 1912. Genera Insectorum 141:10 >> *Subria concolor*

Karny. 1926[1925]. Treubia 7:209 >> *Subria concolor*

Ingrisch. 1998. Cour. Forsch.-Inst. Senckenberg 206:123 >> *Trichophallus concolor* Syntypes: 1 male, 1 female. Indonesia, Maluku, Amboina (3°37‘S 128°6‘E), 1.i.–31.xii.1859, coll. Doleschal—1 female, 1 male (Wien, NHMW).
Other specimen studied: Indonesia: Maluku, Buru (3°24‘S, 126°40‘E), Station 9, 1.i.–31.xii.1921, coll. L.J. Toxopeus—1 female (Bogor, MBBJ).

Diagnosis. The species can be recognised by the shape of the male last abdominal tergite terminating into a pair of roughly triangular projections with obtuse tips combined with male cerci that have the apical area spatulate-triangular but swollen, and slightly curved and with obtuse tip. The female subgenital plate is of the simple shape with narrow, transverse anterior area bent on both sides apicad (tip damaged in specimens studied).

Description. Fastigium verticis with dorsal surface very faintly furrowed. Pronotum with posterior margin subtruncate or faintly convex. Prosternum unarmed. Mesocoxa with a short triangular projection at dorsal-anterior margin. Femora with the following number of spines on ventral margins: fore femur 6–10 external, 5–6 internal; mid femur 6–7 external, 2–4 internal near base; hind femur 11 external, 10 internal (the latter partly very small). Knee lobes of hind femur bi-spinose on both sides.

Male. Stridulatory file with about 113 teeth. Tenth abdominal tergite with hind margin extended into a pair of moderately long, triangular extensions with rounded tips, angularly excised in between. Cerci elongate, narrow, slightly curved; apex about spatulate with swollen surface and with obtuse tip. Subgenital plate bowl-shaped; disc about triangular in general outline but apex deeply divided in middle and terminating into two rounded lobes; divided area setose. Titillators separate, basal parts simple; medial part greatly bulging laterally, ventral apical surface of bulging area with a large field of long bristles; apex curved, rounded.

Female. „Ovipositor incurvus, acuminatus, in medio dilatatus. Lamina subgenitalis valde et profunde emarginata, lobis elongatis, angustis“ Redtenbacher (1891). Subgenital plate horse-shoe-shaped and with a faint medial carinula. Ovipositor with dorsal margin in about apical half finely granulated.

Coloration. Yellowish-brown. Fastigium verticis, vertex and disc of pronotum with a narrow dark brown, medial band. Tegmen with brown dots. Legs with a few more or less distinct brown spots, most distinct at tympanum of anterior tibia. Spines partly darkened.

Measurements sensu Redtenbacher (1891): body male 25, female 25; pronotum male 7.2, female 6.5; tegmen male 36, female 35; hind femur male 20, female 19.6; ovipositor 13 mm.

Remark. The female described by Karny 1926 from Buru is markedly smaller than the specimens described by Redtenbacher (1891) from Ambon.

Measurements sensu Karny (1926), female only: body 18; pronotum 4.7; tegmen 33.5; hind femur 16.8; ovipositor 10.8 mm.

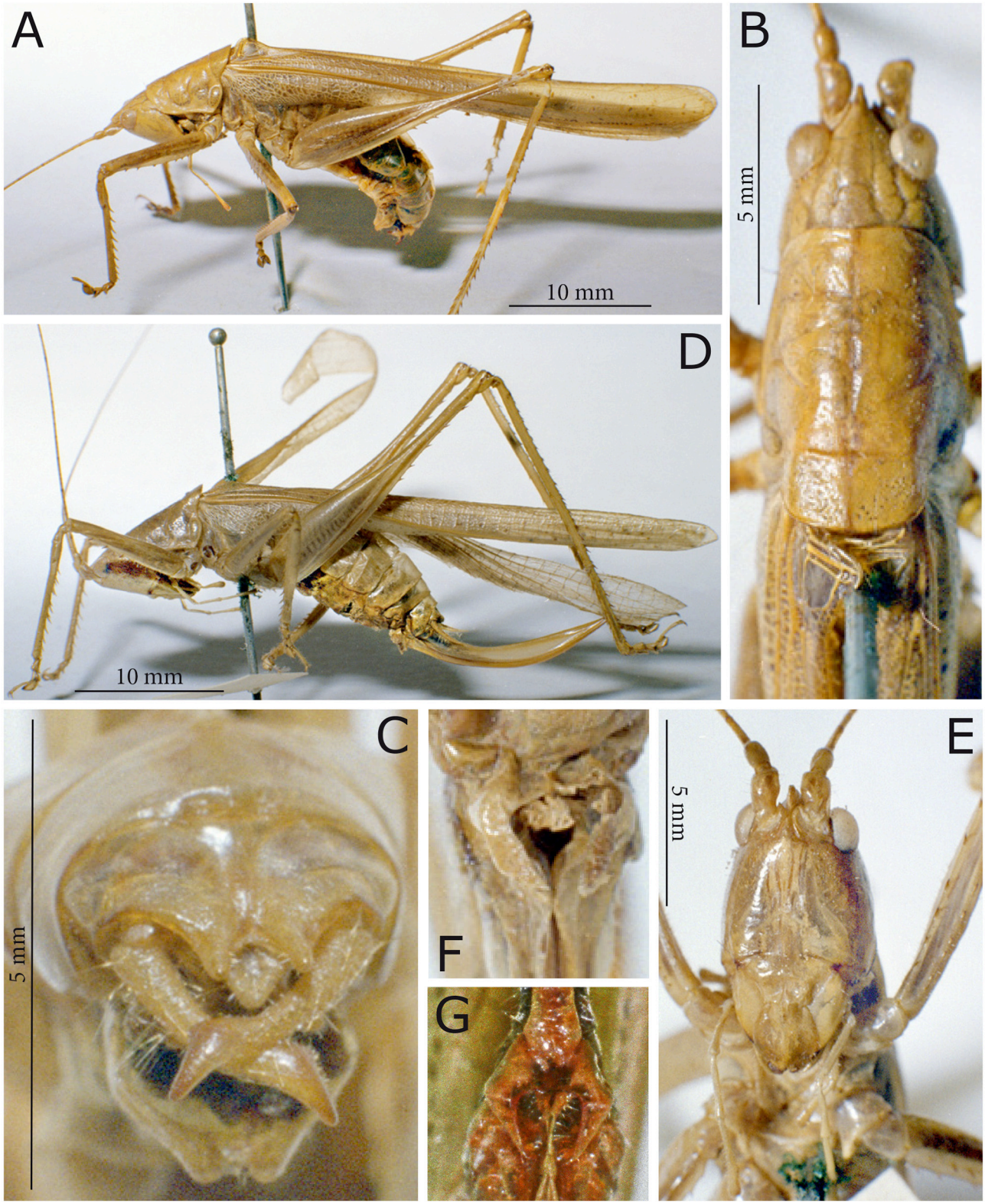

FIGURE 1. *Trichophallus concolor* (Redtenbacher, 1891): A–C, male syntype from Amboina; D–F, female syntype from Amboina; G, female from Buru (not a type).—A, D, habitus lateral view; B, head, pronotum and stridulatory area of tegmen dorsal view; C, male end of abdomen with last abdominal tergites, cerci, and subgenital plate; E, face; F–G, female subgenital plate (tip of subgenital plate apical lobes broken, should be longer than shown in photo).

Trichophallus gracilis (Karny, 1907)

Figs. 2–4

Karny. 1907. Abh. Zool.-bot. Ges. Wien 4(3):57, 58 *Subria gracilis*

Griffini. 1908. Zoologische Jahrbücher. Abt. Syst. Geogr. und Biol. der Tiere 26: 544 www.biodiversitylibrary.org >> *Subria gracilis*

Karny. 1912. Genera Insectorum 141:10 www.biodiversitylibrary.org >> *Subria gracilis*

Karny. 1926. Treubia 9(1–3):187 e-journal.biologi.lipi.go.id >> *Subria gracilis*

Willemse, C. 1966. Publ. natuurhist. Genootsch. Limburg 16:11 >> *Subria gracilis*

Ingrisch. 1998. Cour. Forsch.-Inst. Senckenberg 206:124 >> *Trichophallus gracilis*

Naskrecki & D.C.F. Rentz. 2009. RAP Bulletin of Biological Assessment 60:170 www.bioone.org >> *Trichophallus* cf. *gracilis*

Holotype (female): Papua New Guinea: „Kaiser Wilhelmsland“, coll. Schlüter“ (Wien, NHMW).

Other specimens studied. Papua New Guinea: Hinterland der Astrolabe-Bay, Erima Wald?, (5°19‘S, 145°42‘E), 22.v.1896, coll. S. Lauterbach—1 female (ZMB Berlin); Madang, Adelberg Mts. [= Adelbert Range ?], elev. 800–1000 m, 25.x.1958, coll. J.L. Gressitt—2 males (incl. holotype) (Honolulu, BPBM); Adelberg Mts. [= Adelbert Range], Wanuma, elev. 800–1000 m (4°35‘S, 145°10‘E), 23.x.1958, coll. J.L. Gressitt—1 male (BPBM Honolulu); same locality, 26.x.1958, coll. J.L. Gressitt—2 females (BPBM Honolulu); same locality, 27.x.1958, coll. J.L. Gressitt—1 female (BPBM Honolulu); same locality, 1–31.viii.1968, coll. N.L.H. Krauss—1 female (Honolulu, BPBM); Morobe, Huon Golf, Sattelberg above Finschhafen, (6°28‘S, 147°44‘E) -., coll. Prof. Neuhauß—1 female (ZMB Berlin); New Guinea (NE), Upper Jimi Valley, Tsenga, elev. 1200 m (5°25‘27.48“S, 144°43‘27.1“E), 14.vii.1955, coll. J.L. Gressitt—1 male (BPBM Honolulu); Toma, 12–15.v.1909, coll. Südsee-Expedition Wolf, 202.—2 females (SMF Frankfurt).

Remark on other specimens studied: *T. gracilis* was originally described from a single female with imprecise locality data. Within the large amount of material studied there were only few females that would roughly morphologically agree with the holotype female of *T. gracilis* (Karny, 1907). There was no male amongst specimens studied, but for only one of these females there was also one male from the same locality. That male was selected for describing the male characters of this species.

Diagnosis. (**female**): Apical projections of the female subgenital plate narrow, not widening posteriorly, just reaching but not surpassing the subbasal, ventral projections of the dorsal ovipositor valves; basal-lateral extensions of subgenital plate wider than length of central basal area of subgenital plate.

Description of female holotype according to Karny (1907) translated from Latin: Fastigium verticis conical, straight, not surpassing the first antennal segment, dorsal margin not sulcate. Pronotum with a fine doublet dorsal band in mid-line, otherwise unicoloured. Lateral lobes unicoloured. Tegmina long, fuscous punctate. Anterior femur with 3–5 very small spines at posterior margin and 4 spines at anterior margin; mid femur with 5 anterior and 2 very tiny posterior spines; hind femur with many spines at anterior and 3–4 spines at posterior margin. Hind knee lobes bi-spinose. Ovipositor short, narrow, curved with acute end, in mid-length widened. It differs from *T. concolor* by its gracile figure, the pale color, the less numerous spines on the femora, and the shorter ovipositor. Measurements of holotype: body 22, pronotum 5, tegmen 31, hind femur 17, ovipositor 8.5 mm.

Description of female characters based on this study. The female subgenital plate has a short but broad transverse basal sclerite that is in the type somewhat retracted and thus hidden below the preceding sternite, has the surface concavely vaulted and is on both sides prolonged into a down-curved, flattened plate. From hind margin of the more central area arises a pair of narrow, rounded, and curved sclerites that reach about to behind beginning or mid-length of the oval, basal projections of the ventral ovipositor valves without touching them (Fig. 2). Two other females (from Astrolabe Bay and from Wanuma) show identical structures of the subgenital plate although they are less shrunk. Also the shape of the ovipositor of these three females agrees with the type of *T. gracilis*. The corresponding male of these females is thus chosen as typical for *T. gracilis*.

Diagnosis (male). Males can be recognised by the shape of the elongate and little curved cerci that carry in subbasal area a hump with a short, acute spine at tip. Diagnostic are also the male titillators that have the sclerotised area truncate in about mid-length and continue as membranous tubes toward conical end.

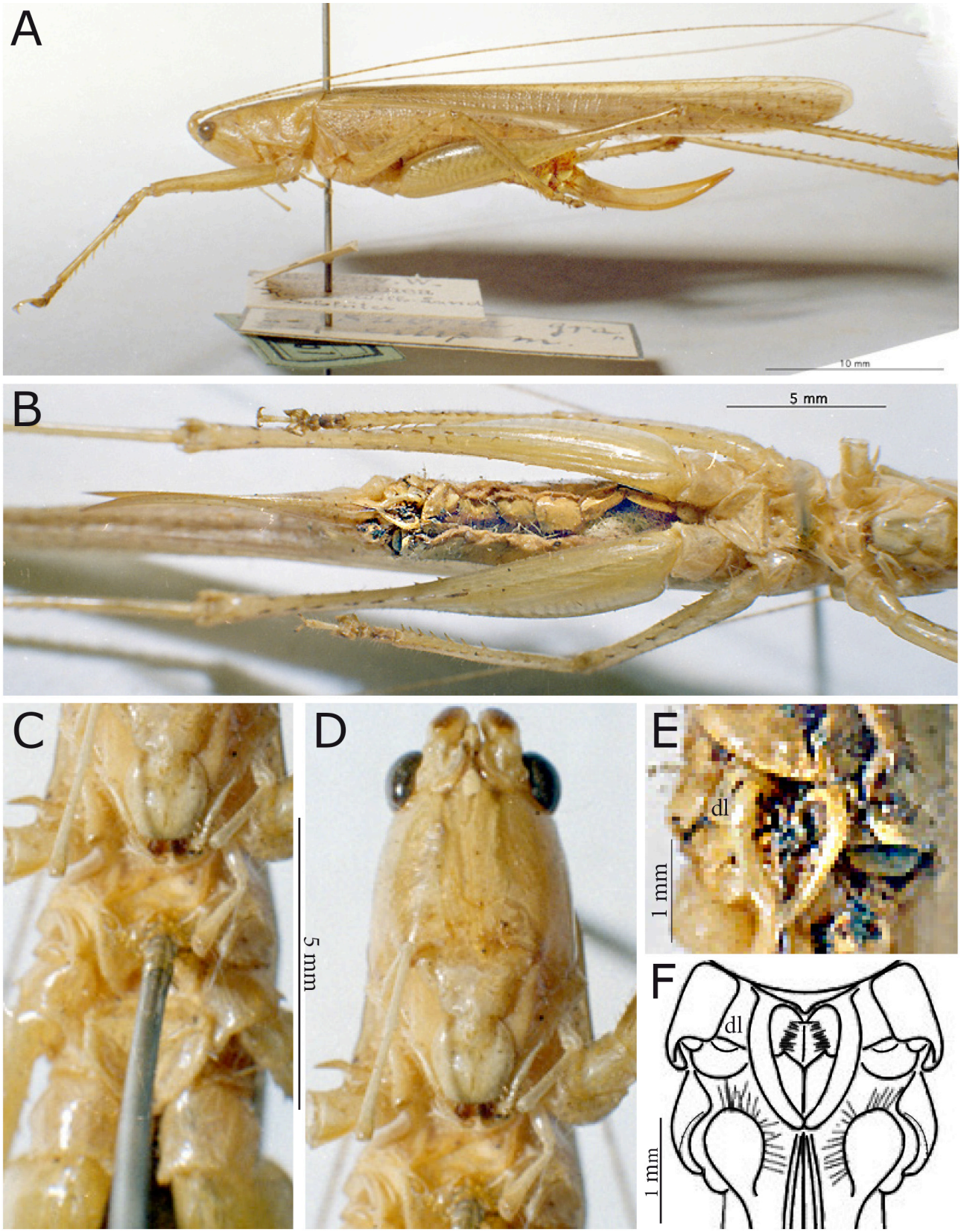

FIGURE 2. *Trichophallus gracilis* (Karny, 1907) holotype female: A, habitus lateral view; B, habitus ventral view; C, thoracic sternites; D, face; E–F, subgenital plate; dl, dorso-lateral expansion of subgenital plate.—The subgenital plate is somewhat distorted in the holotype and the very base hidden under the preceding sternite; the apical projections of the female subgenital plate just reach but do not surpass the subbasal, ventral projections of the ventral ovipositor valves; the dorso-lateral expansion (dl) is visible only at the left side of the image.

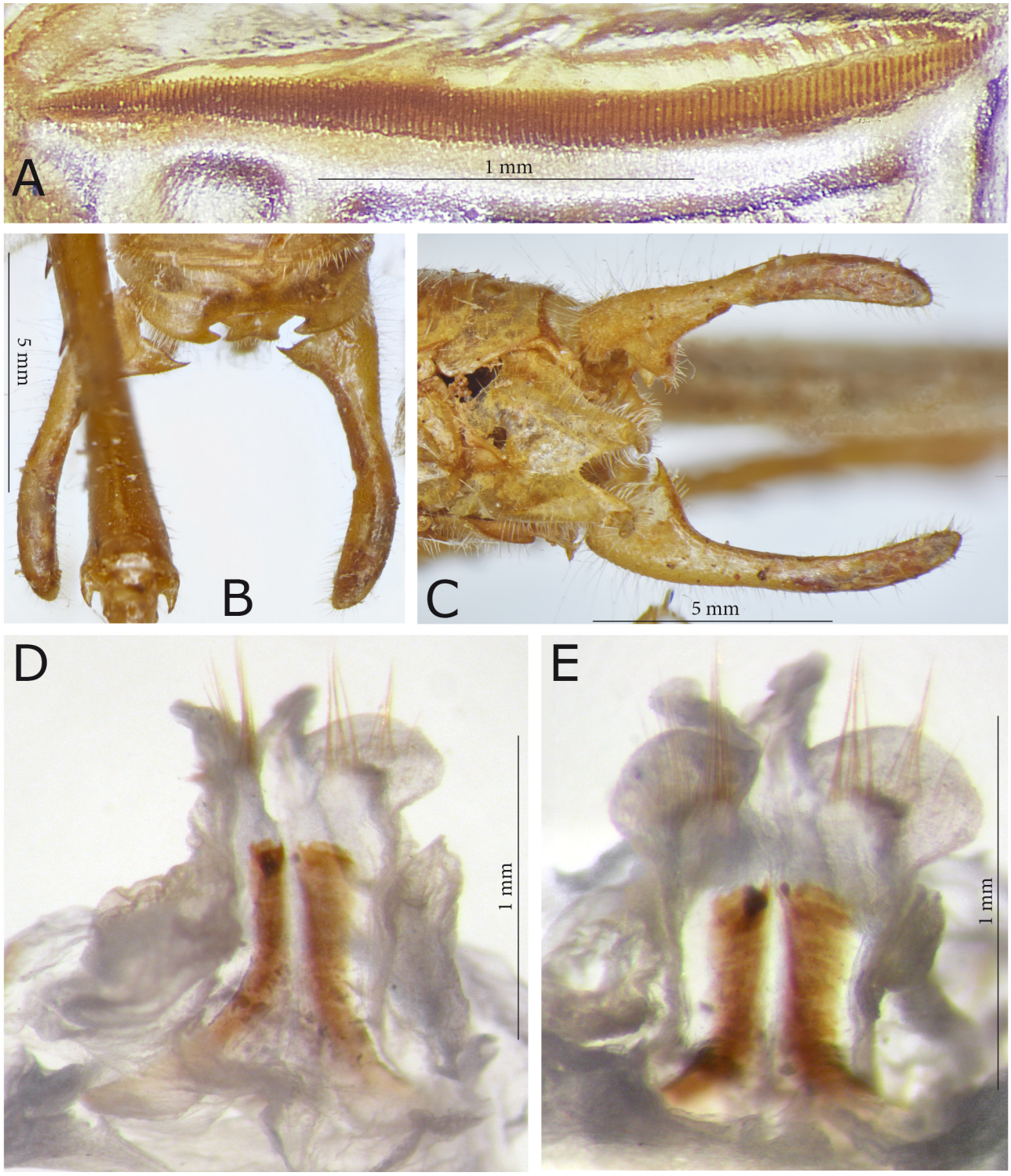

FIGURE 3. *Trichophallus gracilis* (Karny, 1907) male from Wanuma: A, stridulatory file; B, end of abdomen with last tergite and cerci; C, subgenital plate and cerci in ventral view; D–E, male phallus with titillators; note that the titillators have only the basal half sclerotised, the apical half is completely membranous, although structured.

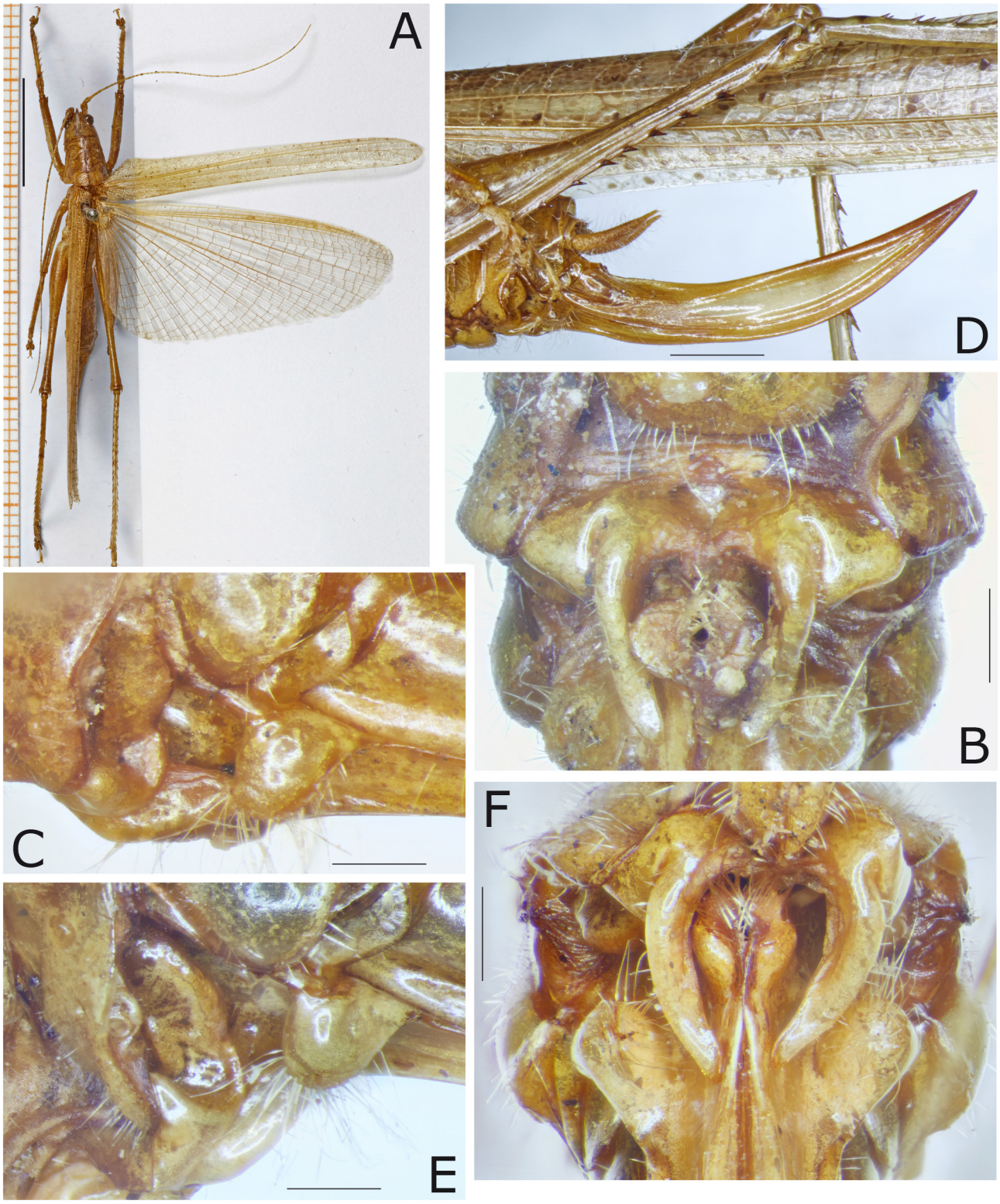

FIGURE 4. *Trichophallus gracilis* (Karny, 1907) A, female habitus (Astrolabe Bay); B, F, female subgenital plate ventral view; C, E, female subgenital plate lateral view; D, ovipositor.—B–C, Astrolabe Bay; D–F, Wanuma (2 females).—Scales 1 mm (except A 10 mm).

Male. Stridulatory file with about 133 teeth. Tenth abdominal tergite at apex with a convex excision, at both sides of excision with an obtuse lobe pointing mediad. Epiproct with lateral margins convergent in basal area only, otherwise parallel or slightly diverging posteriorly; dorsal surface with a deep pit, followed by a faint or distinct

medial furrow; apex in dorsal view bilobate, slightly excised in middle; apex in apical view with a pair of acute ventral projections. Paraprocts with a roughly triangular, obtuse swelling at internal margin. Cerci long, in dorsal view moderately curved throughout, slightly compressed in apical half, in lateral view slightly sinuate, mainly curved in basal area; internal margin with a compressed triangular internal tooth in basal quarter that has a spine at tip; apex of cercus obtuse. Subgenital plate roundly excised at apex; narrow styli of about same length with excised area or shorter. Titillators band-shaped with only the basal areas sclerotised, in about mid-length truncate, with subtruncate, obtuse end, while the basal areas are curved laterally. The subtruncate apical area continued as narrow and elongate, hyaline bursae. This membranous part of the titillators is laterally accompanied by additional hyaline bursae of which the proximal one is provided with long hairs along margin.

Measurements: body: male 19–21, female 19.5–22.5; pronotum: male 4.8–5.2, female 4.8–5.5; tegmen: male 29–33, female 30–34; hind femur: male 14.5–16, female 15–16.5; ovipositor: 10–11.5 mm.

Trichophallus forcipatus sp. nov.

Figs. 5–6

Holotype (male): North New Guinea, Mamberamo, Albatros Bivak, (2°17‘S, 138°1‘E), 1–31.v.1926, coll. W. Docters v. Leeuwen, North New Guinea Exped. (MBBJ Bogor).

Other specimens studied: Indonesia: Papua, Jayawijaya (Central) Mountains, Archbold Lake, elev. 760 m (3°41‘S, 138°53‘E), 26.xi.–3.xii.1961, coll. S. & L. Quate—1 male (BPBM Honolulu); Mamberamo Area, Pionierbivak, (2°20‘S, 138°0‘E), 1–30.vi.1926, coll. W. Docters v. Leeuwen, North New Guinea Exped.—1 female (MBBJ Bogor).

Diagnosis. Male cerci with dorsal margin convex, curved throughout, ventral margin with swollen external, flattened internal margin; from internal margin with a little curved, triangular projection, and with a second subsinuate projection from internal apical margin. Titillators with apical areas, carrying hairs, clearly separated from fused basal-central areas.

Remark. There are minor differences in the male characters between specimens from different localities. Thus it might be possible that the species could be divided into two subspecies when more specimens become available for study.

Description. Rather large for the genus. Fastigium verticis laterally compressed, dorsal surface very faintly furrowed, apex obtusely rounded. Frons shining with hardly any impressed dots. Pronotum semi-cylindrical, apical area of disc almost flat and shouldered; transverse sulcus weak, interrupted in midline; anterior margin broadly rounded but slightly concave in middle; posterior margin faintly rounded, almost subtruncate; ventral margin descending backwards, rounded below apical callus and afterwards ascending; humeral sinus faintly indicated. Tegmen long and narrow, surpassing middle of stretched hind tibia. Prosternum with 2 very faint, hardly visible tubercles. Meso- and metasternal lobes rounded; medial plate with an obtuse conus at each posterior angle. Mesocoxa with ventral internal projection rather long (less so on postcoxa), dorsal-anterior margin with a weak, obtuse-angular projection. Femora with the following number of spines on ventral margins: fore femur 7–8 external, 5–7 internal; mid femur 7–8 external, 3–4 internal near base; hind femur 12–15 external, 12–16 internal (the basal spines very tiny). Knee lobes of fore femur obtuse on external, spinose on internal side; of mid femur obtuse on external, triangular but apex obtuse on internal side; of hind femur bi-spinose on both sides. hind tibia with 1 dorsal and 2 ventral apical spurs on each side.

Male. Stridulatory file with circa 122–136 teeth. Tenth tergite prolonged behind; hind margin roundly incised in middle between two short obtuse-angular lobes; setose in central and apical areas. Epiproct angularly rounded, with a Y-shaped carina between disc and sloping lateral area. Paraprocts with apical projections rather long, finger-shaped, curved dorsad. Cerci slightly curved mediad; dorsal external area rounded, ventral internal area flattened or little concave; with a large, depressed, about triangular internal projection in circa middle of cercus length terminating into an obtuse conus, and also with an elongate-conical, S-shaped ventral apical process; very apex of main cercus trunk rounded. Subgenital plate with sloping lateral area rather low; lateral margins carinated, disc with faintly rounded carinae before bases of styli; apex broad-roundly emarginated; styli rather long and stout.

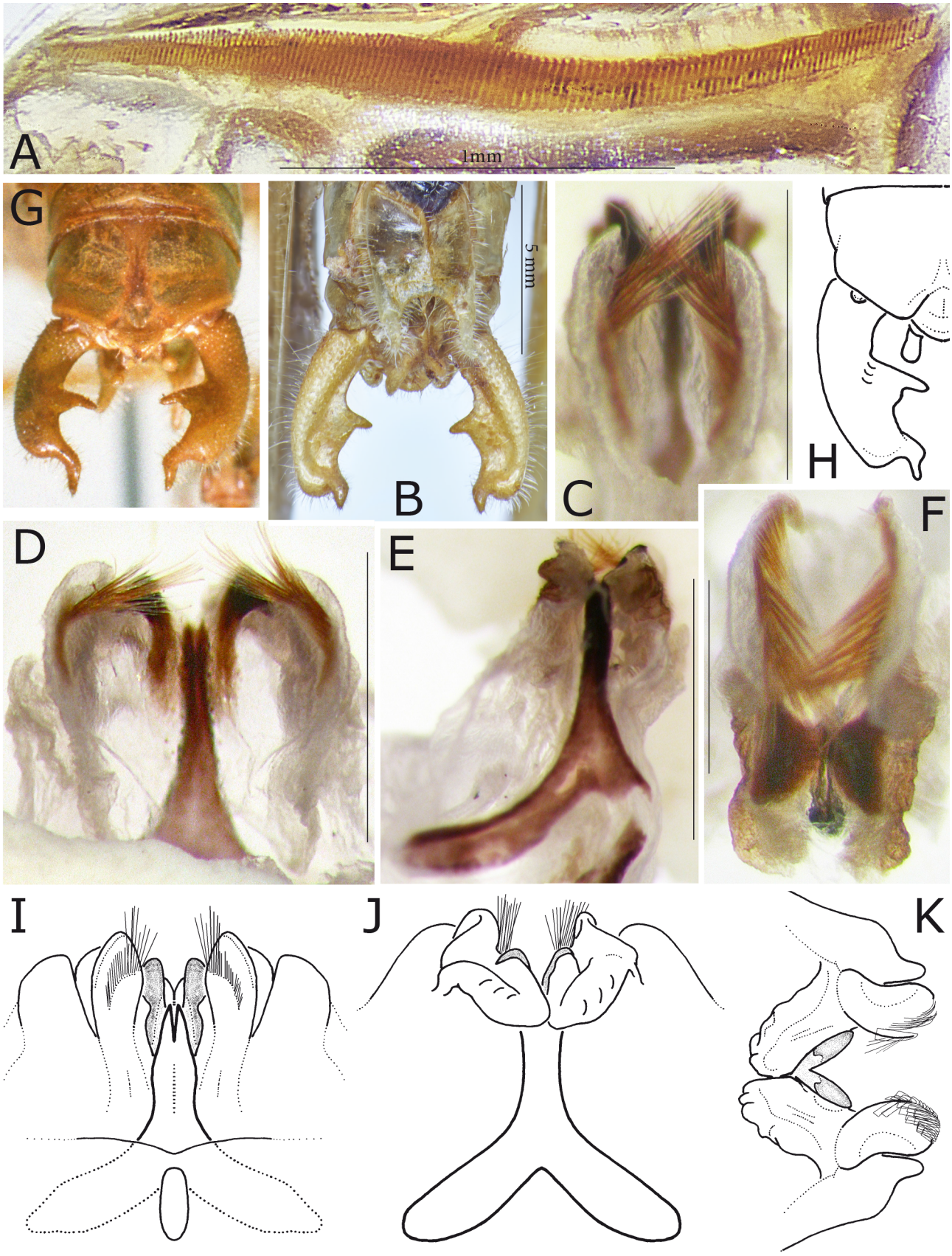

FIGURE 5. *Trichophallus forcipatus* **sp. nov.** males from Archbold Lake (A–G) and from Mamberamo (H–K).—A, stridulatory file; B, subgenital plate and Cerci ventral view; C–F, titillators in apical (C), ventro-distal (D), dorso-proximal view (E), view on tip (F); G–H, tenth tergite and cerci; I–K, titillators in ventro-distal (I), dorso-proximal (J), and apical (K) view.—Scales for titillators about 1 mm.

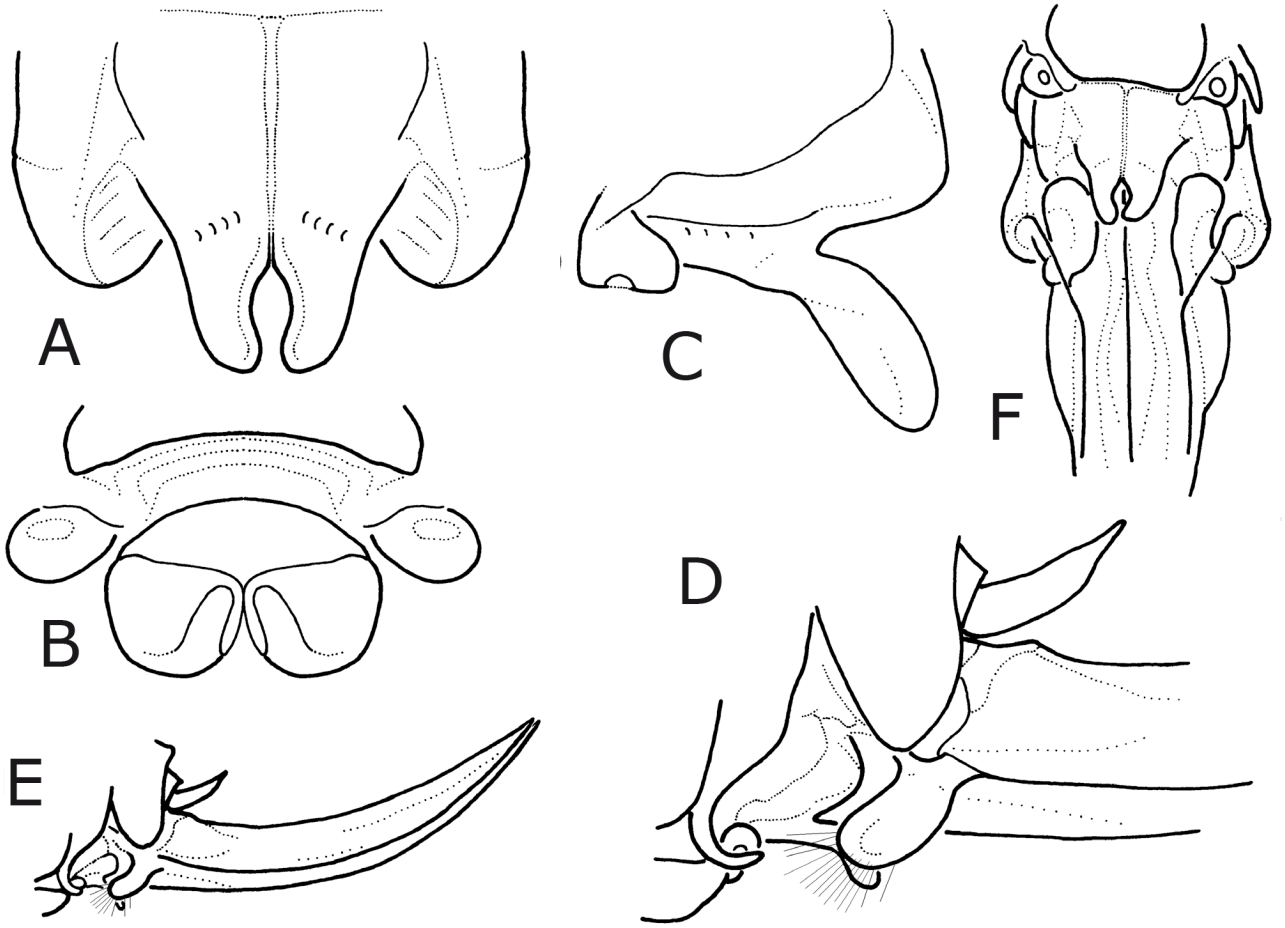

FIGURE 6. *Trichophallus forcipatus* **sp. nov.** female from Pionierbivak.—A–C, subgenital plate in ventral (A), in apical (B) and in lateral view (C); D, end of abdomen and base of ovipositor with basal lateral lobe in lateral view; E, ovipositor; F, subgenital plate and base of ovipositor in ventral view.

Titillators simple, apical parts fused, but very apices separate; connected with complex sheaths. Each apical part connected via a less sclerotised area with another apically rounded plate supporting the apical sheath on internal side. Sheaths bursa shaped, in dorsal-apical view ring-shaped embracing apices of titillators; somewhat darkened and granulose on external surface; internal surface hyaline; on ventral internal surface in apico-lateral areas with a curved row of long bristles, the longest of them surpassing the apex of the sheath. Laterally of the sheath the surrounding membranes forming another hyaline bursa. Membrane between bases of titillators with a button-shaped protuberance.

Female. Subgenital plate elongate with converging lateral margins, divided from hind margin along mid-length into two lobes that are curved ventrad at end and reach about the elongate basal lobes of the ventral ovipositor valves.

Remark. The female has been tentatively assigned to this species since it has not been collected with either of the two males, although at the same river system as the holotype.

Coloration. Uniformly yellowish-brown. Tegmen with few hardly darkened dots. Tibiae with a small, subbasal, dark spot; fore tibia with 2 spots: above and below tympanum.

Measurements (2 males): body: male 23–28; pronotum: male 5.8–6.2; tegmen: male 36–38; hind femur: male 18.5–19.7; antenna: male 95 mm. Measurements of female missing.

Etymology. The name of the new species is deviated from Latin forcipata = scissors.

***Trichophallus furcatus* sp. nov.**
Fig. 7

Holotype (male i33): Indonesia, Maluku, Kei Islands, Gunung Daab (5°35‘10‘‘S 133°4‘4‘‘E), 300m, IV.1922, H.C. Siebers (MZB, Bogor Java).

Other specimens studied: Paratypes: Indonesia, Kei Isl. 1922, Gunung Daab, H.C. Siebers (MZB, Bogor Java): 2 males, no. 94; 1 female, no. 100; 4 females, no. 100, 112, 134, and 138.

Diagnosis. The new species is characterised by the shape of the male cerci with substraight trunk, incurved apical area with approaching margins and obtuse tip, and a narrow, styliform projection arising from the curvature. The shape of the titillators with four sclerites is also characteristic. The shape of the elongate female subgenital plate that has the ventral area forming a pair of rather wide, convex and long ventral apical lobes with approaching margins is also characteristic for this species.

Description. Fastigium verticis laterally compressed; apex obtusely rounded. Frons shining with a few shallow, hardly impressed dots. Pronotum semi-cylindrical, apical area of disc nearly flat and shouldered; transverse sulcus weak, interrupted in middle; a second sulcus behind middle of pronotum is only distinct on paranota; anterior margin broadly rounded but slightly concave in middle; posterior margin very faintly rounded, almost subtruncate, sometimes faintly incised in middle; ventral margin descending posteriorly, rounded angular below apical callus, ascending afterwards; humeral sinus hardly indicated. Tegmen long and narrow, largely surpassing apex of ovipositor and hind knees. Prosternum with 2 very small tubercles, more distinct in female than in male. Meso- and metasternal lobes rounded or angularly rounded; medial plate with a strong spine at each apical angle. Mesocoxa with ventral internal projection rather long (less so on postcoxa), and with a distinct spinule on dorsal-anterior margin and sometimes with a 2nd spinule somewhat below. Femora with the following number of spines on ventral margins: fore femur 7–9 external, 5–7 internal; mid femur 7–8 external, 2–4 internal near base; hind femur 11–16 external, 12–18 internal (external spines larger than internal spines). Knee lobes of fore femur obtuse to triangular on external, spinose on internal side; of mid femur obtuse-triangular on external, triangular on internal side, of hind femur bi-spinose on both sides (the second smaller spine sometimes lacking, sometimes also present on medial femur). Hind tibia with 1 + 1 dorsal and 2 + 2 ventral, external and internal, apical spurs.

Male. Stridulatory file with about 107 teeth. Tenth tergite slightly prolonged behind; apical margin concave between 2 lateral short-conical, obtuse projections. Epiproct rounded triangular, dorsal surface shallowly depressed, lateral margins sloping in a more than 90°-angle. Cerci semi-cylindrical on external side, depressed on internal side; depressed area terminating into a large subapical internal tooth with acute apex; external area terminating in a styliform projection with obtuse apex. Subgenital plate broad, lateral margins sloping in basal area; with or without a faint medial carinula before apex and with a strong rounded carina on each side before base of styli; apical margin roundly emarginate between bases of styli.

Titillators simple but covered by complex sheaths in form of 2 pairs of membranous bursae. Apex of titillators connected via a less sclerotised area with a subflat sclerite which supports the internal area of the dorsal bursa; this sclerite with a lateral hook that is fused with the surrounding membrane except for the apex which is free. The ventral bursae paired; compressed-ovoid in general outline with the lateral margin densely covered with bristles. Dorsal bursae compressed and slightly curved; surface granulose, slightly wrinkled and apex covered densely with short hairs. The whole apex of the titillator complex is embraced by another semi-cylindrical membranous sheath, which is granulose, wrinkled, and double-fold.

Female. Tenth tergite furrowed in midline, apical margin subtruncate on both sides, angularly excised in middle. Epiproct rounded-triangular, disc depressed. Cerci long-cylindrical, gently curved, apex pointing. Subgenital plate elongate, about apical half split into two long-conical compressed lobes with obtuse apices; the entire basal area with a club-shaped groove in middle and a lateral carina at each side; with basal-lateral sclerites that have a bulging apical-lateral margin and are furrowed in middle. Ovipositor falcate; with margins hardly narrowing before apical third, of sub-equal height in basal two thirds, narrowing in apical third; margins smooth; ventral valves faintly longer than dorsal valves.

Coloration. Yellowish-brown. Fastigium verticis, vertex and disc of pronotum with a narrow, indistinctly brown, medial band, interrupted in midline by a pale line. Frons in some specimens slightly darkened around medial ocellus. Tegmina with dark brown dots. Legs with a few indistinct spots. Spines partly darkened.

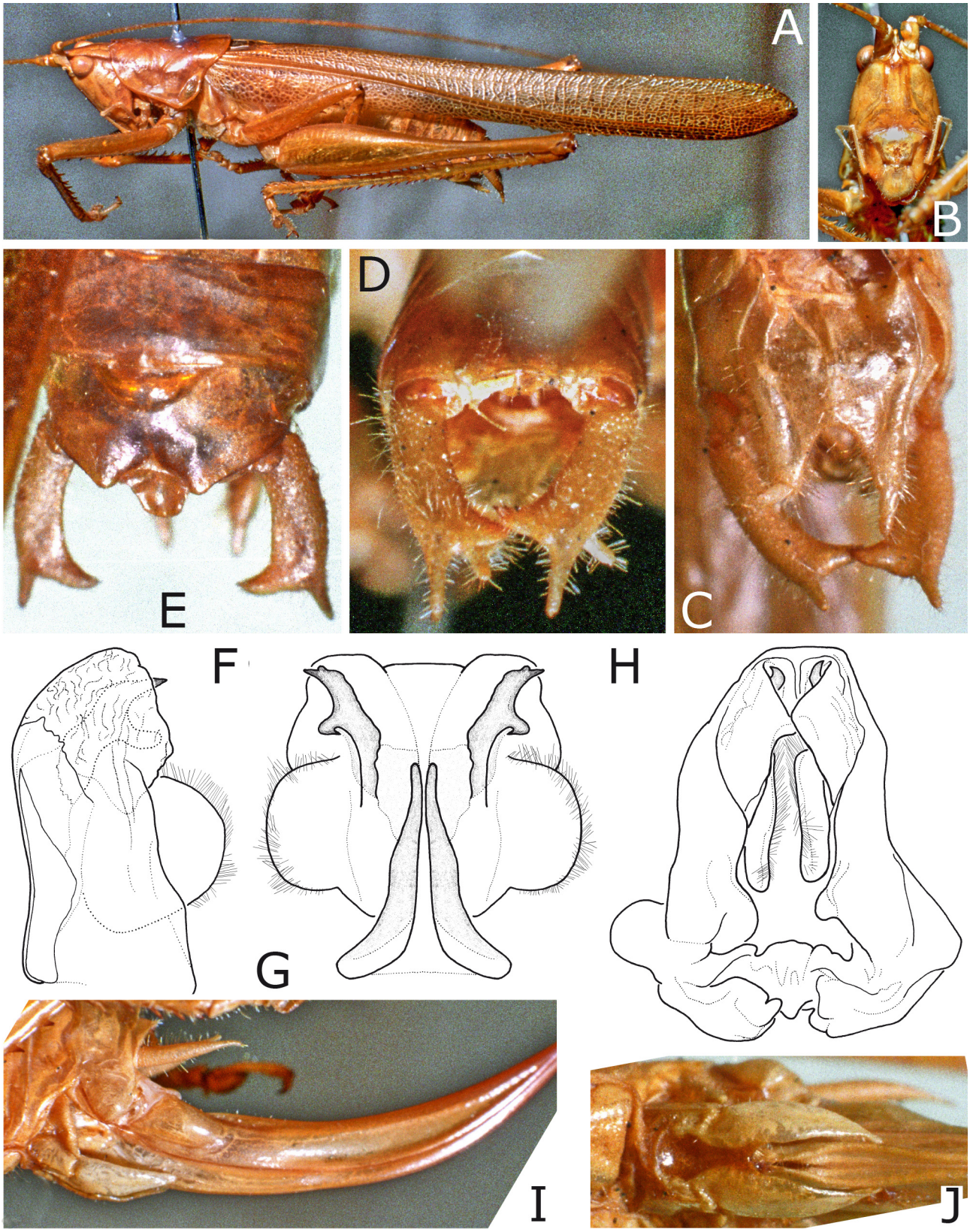

FIGURE 7. *Trichophallus furcatus* **sp. nov.** male (A–H) and female (I–J): A, habitus lateral view; B, face; C, subgenital plate and cerci ventral view; D–E, last tergite and cerci in obliqe dorsal (D) and strictly dorsal (E) view; F–H, phallus with titillators and membranous structures in lateral view (F), in ventro-apical view with membranous structures spread apart (G) and in situ with membranes embracing titillators (H); abdominal apex with ovipositor and subgenital plate in lateral view (I); subgenital plate in ventral view (J). Classical photography, not to scale.

Measurements: body male 26–28, female 26–28; pronotum male 6.5–7.2, female 6.7–7.2; tegmen male 33–36, female 37–40; hind femur male 17–19, female 19–21; ovipositor 12.0–12.5 mm.

Etymology. The name of the new species is deviated from the Latin word *furcatus* forked, refering to the shape of the male cerci.

Trichophallus lobatus sp. nov.

Figs. 8–9

Holotype (male): Papua New Guinea: Neu Guinea, Kaiserin Augustafluß Expedition 317, Standlager am Töpferfluß (4°27‘S, 144°13‘E), 22 April 1913, coll. Bürgers (ZMHB Berlin).

Other specimens studied: North New Guinea, Mamberamo, Albatros Bivak (2°17‘S, 138°1‘E), 1–31.v.1926, coll. W. Docters v. Leeuwen, North New Guinea Expedition—1 male (paratype) (Bogor, MBBJ); Indonesia: Papua, Hollandia [= Jayapura], (2°29‘S, 140°41‘E), 1–31.vii.1938, coll. L.J. Toxopeus—1 male (paratype) (MBBJ Bogor); Hollandia [= Jayapura]—Binnen, elev. 100 m (2°32‘S, 140°40‘E), 2.xi.1958, coll. J.L. Gressitt—1 female (BPBM Honolulu); 40 km W. of Hollandia [Jayapura], Genjam [Genyem, Gengen], elev. 100–200 m (2°46‘S, 140°12‘E), 1–10.iii.1960, coll. T.C. Maa—1 male (BPBM Honolulu); Cyclop Mountains, Behind Kotanika, near Lake Sentani, elev. 80 m (1°36‘S, 140°39‘E), 17.x.1957, coll. J.L. Gressitt—1 male (BPBM Honolulu); Ifar, elev. 350 m (2°34‘S, 140°31‘E), 9.vi.1962, coll. J. Sedlacek—1 male (BPBM Honolulu); Jayapura Area, Waris S. of Hollandia [= Jayapura], elev. 450–500 m (3°30‘S, 140°55‘E), 1–7.viii.1959, coll. T.C. Maa—1 female (BPBM Honolulu); same locality, 16–23.viii.1959, coll. T.C. Maa—1 female, 2 males (BPBM Honolulu); Mamberamo Area, River Tor (mouth) 4 km E. of Hol Maffen, (1°59‘S, 138°58‘E), 4.vii.1959, coll. T.C. Maa—1 male (BPBM Honolulu); Meerolakte, Motorbivak, (3°5‘S, 137°28‘E), 1–31.viii.1926, coll. W. Docters v. Leeuwen, North New Guinea Expedition—1 female (paratype) (MBBJ Bogor); Swart Valley, Karubaka, elev. 1400 m (3°35‘S, 138°30‘E), 6.xi.1958, coll. J.L. Gressitt—1 female, 1 male (BPBM Honolulu); same locality, 12.xi.1958, coll. J.L. Gressitt—2 females (BPBM Honolulu); Papua New Guinea: West Sepik, Toricelli Mountains, Samoro [Mt. Somoro], elev. 900–1100 m (3°23‘48.08“S, 142°8‘12.71“E), 1.ii.–31.v.1975, coll. J.L. Gressitt—1 male (BPBM Honolulu).

Diagnosis. *T. lobatus* is characterised by the rather short and little curved cerci that have the apical area down-curved and somewhat compressed, with rounded end that carries a small spinule or spine. The titillators are fully sclerotised with deviating bases and curved apical area; they carry in subapical area long and narrow lateral extensions that have the apical areas re-curved thus forming a loop. Females can be recognised by the short lobes of the subgenital plate that hardly surpass their proximal-dorsal expansions and leave the basal projections of the dorsal margin of the ventral ovipositor valves completely uncovered.

Description. Medium sized species. Fastigium verticis laterally compressed, dorsal surface very faintly furrowed, apex rounded, obtuse. Frons shining with hardly any impressed dots. Pronotum semi-cylindrical, apical area of disc nearly flat and shouldered; transverse sulcus weak, interrupted in midline; anterior margin broadly rounded but slightly concave in middle; posterior margin faintly rounded, almost subtruncate; ventral margin descending backwards, rounded below apical callus and afterwards ascending; humeral sinus faintly indicated. Tegmen long and narrow, surpassing middle of stretched hind tibia. Prosternum with 2 small obtuse tubercles. Meso- and metasternal lobes rounded; medial plate with an obtuse conus at each posterior angle. Mesocoxa with ventral internal projection rather long (less so on postcoxa), dorsal-anterior margin with a triangular projection. Femora with the following number of spines on ventral margins: fore femur 4–8 external, 4–6 internal; mid femur 2–9 external, 0–4 internal; hind femur 8–11 external, 4–13 internal (the internal spines smaller than the external). Knee lobes of fore femur obtuse on external, acute-triangular on internal side; of mid femur obtuse on both sides; of hind femur bi-spinose on both sides. Hind tibia with 1 dorsal and 2 ventral apical spurs on each side.

Male. Stridulatory file varying between 95 and 130 teeth in all specimens studied; toward end teeth becoming small and very dense; in holotype with 105 teeth at 1.1 mm total file length or with 91 teeth at 1 mm in the area with the largest teeth. Tenth tergite vaulted and slightly prolonged; apex widely excised between two broad, rounded-triangular lateral lobes. Epiproct rounded-triangular; disc depressed in middle. Paraprocts with internal margin carinate and setose. Cerci cylindrical but somewhat depressed; in circa apical two thirds with a strong dorsal-internal carina; internal surface below carina concave and prolonged into a broad-triangular, ventral-internal process, which is depressed, curved ventrad before apex, and terminates into an acute spine. Cerci short, slightly curved, dorsal-internal margin with a low, rounded, lamellar expansion except at base; with a stout, conical, apical-internal projection that is curved ventrad before apex and terminates into an acute tooth. Subgenital plate with lateral areas sloping and margin carinated; disc with a broad, rounded lateral carina before base of stylus on each side; apex roundly excised between bases of styli.

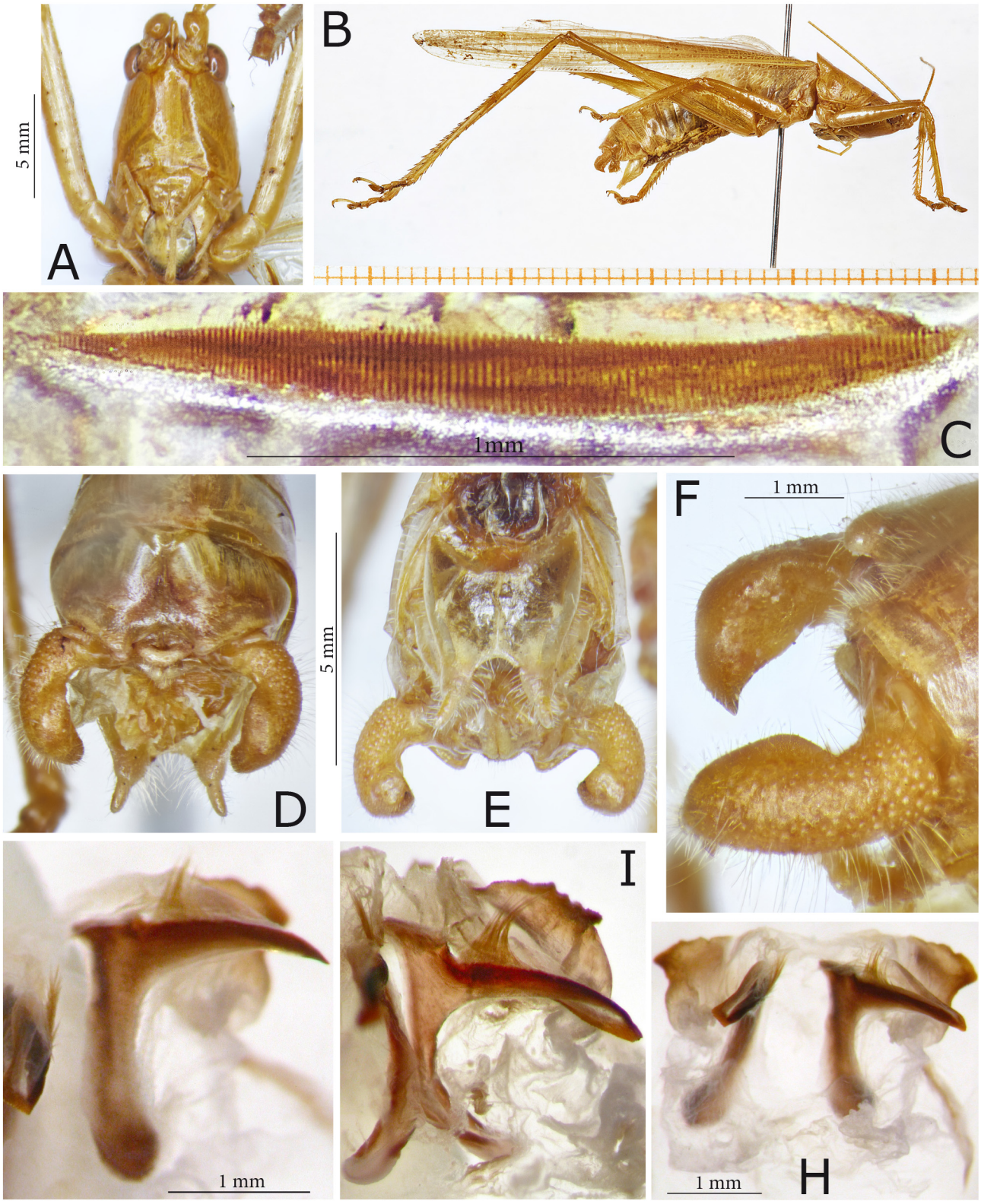

FIGURE 8. *Trichophallus lobatus* spec. nov. male: A, face; B, habitus lateral view; C, stridulatory file; D, end of abdomen in dorsal view; E, end of abdomen in ventral view; F, cerci in lateral view; G–I, titillators in different views.—A–B, D–F, from Töpferfluß; C, G–I, from Genjam.

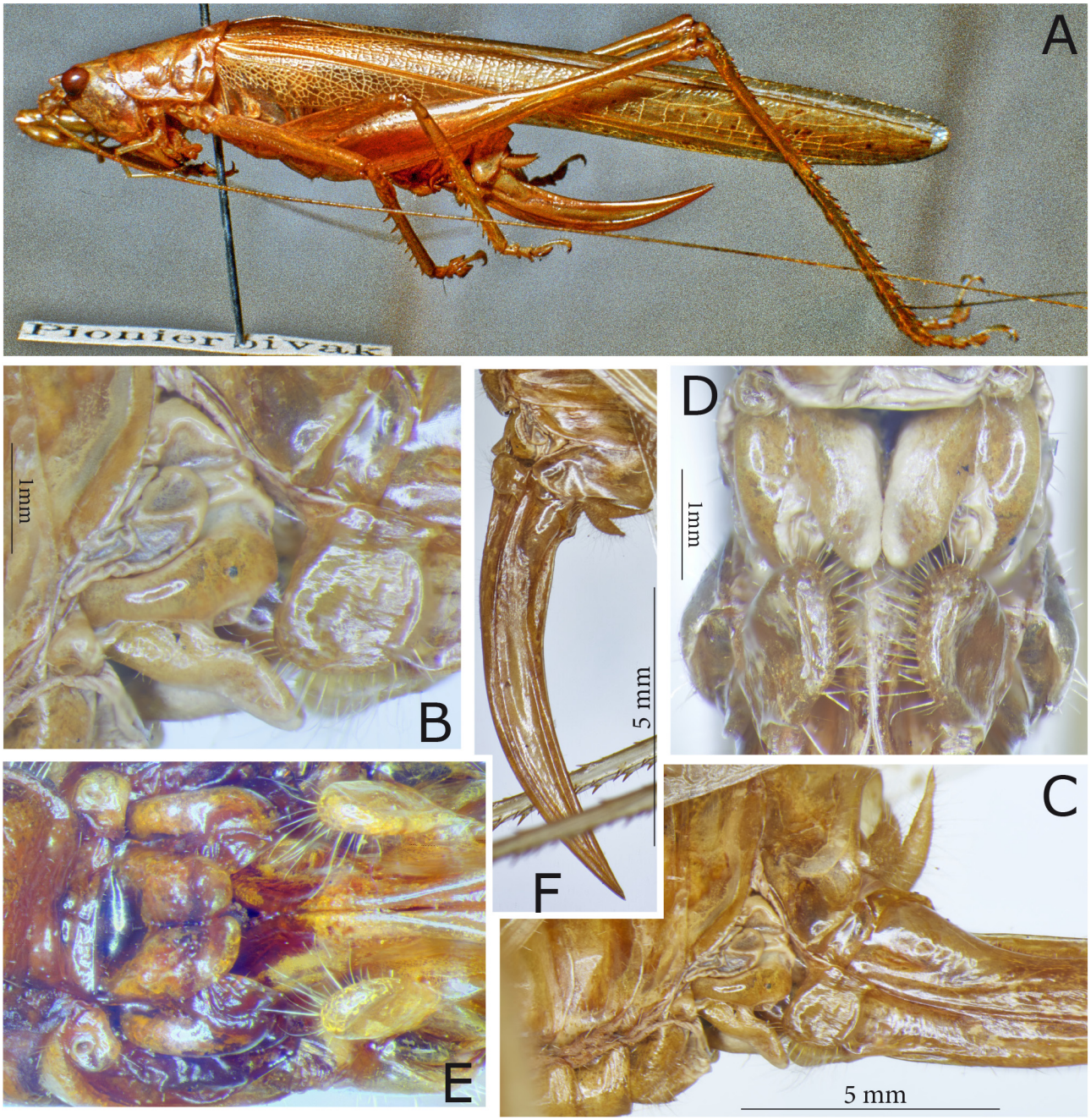

FIGURE 9. *Trichophallus lobatus* spec. nov. female: A, habitus (Pionierbivak); B–E, abdominal apex with subgenital plate and base of ovipositor with lateral appendage of ventral valve in lateral (B, C) and ventral view (D, E), ovipositor (F).—B–C, F, female from Mulic River; E, from Kurubaka.

Titillators separate, rather large and stout, roughly T-shaped with the ventral apical branch of the T however much longer than the dorsal-proximal branch; margin of the larger branch with a short row of medium long bristles; in prolongation of the apex of the large branch inserts an additional elongate sclerite that stands at first vertical to its source, but after a short distance curved and running parallel to the long branch, thus including a hyaline tube between both sclerites, bulging behind the bristles. Lateral and dorsal-proximal of titillators, phallus membranes forming large, distinctly granular, weakly sclerotised plates with irregular margins of which the apical margin is produced into a triangularly rounded cap.

Female. Eighth tergite with ventral-lateral, apical angles reduced leaving a triangular space between eight and ninth tergites. Tenth tergite furrowed in midline; apex truncate on both sides, triangularly incised in middle. Cerci

long-conical, slightly curved, apex pointing. Subgenital plate with ventral area reduced to two short lobes separated from each other and from lateral areas by deep furrows, at end down-curved with obtuse tips; lateral areas large, extended dorsad, disc-shaped with ventral and apical margins swollen, surface grooved and partly covered by a membranous lobe. Ovipositor falcate, with margins converging from behind middle of length; margins smooth; ventral margin of ventral valves just behind subgenital plate with a tuft of long hairs but otherwise unmodified; dorsal margin of ventral valves at base with a setose, semi-ovoid expansion which is pointing ventrad and surpassing the ventral margin of ovipositor; margin of process provided with long hairs. Ovipositor with ventral margin of ventral valves just behind subgenital plate with a tuft of long hairs but otherwise unmodified; dorsal margin of ventral valves at base with a setose, semi-ovoid expansion. Eight tergite with ventral-lateral, apical angles reduced leaving a triangular space between eight and ninth tergites. In the female from Motorbivak the lateral lobes of the subgenital plate are much stronger curved and the margins of the ovipositor converging only in circa apical two thirds.

Coloration. Uniformly yellowish-brown. Tegmen with a few indistinct dark spots.

Measurements (all).—body w/o wings: male 17–22, female 17–21; pronotum: male 4.8–5.7, female 4.3–5.0; tegmen: male 23.5–30.0, female 25–28; hind femur: male 13.5–15.0, female 13–15; antenna: male 55, female 50; ovipositor: female 9–10 mm.

Trichophallus hamatus **sp. nov.**

Fig. 10

Subria gracilis [nec Karny 1907] Karny 1912, Abh. Ber. Zool. Mus. Dresden 14(2): 7 (misidentification).

Holotype (male): Papua New Guinea: Toricelli mountains, 600 m (3°30‘S, 142°0‘E), I.1910, Dr. Schlaginhaufen (Dresden, SMTD).

Other specimens studied: Papua New Guinea: Toricelli mountains, 120–900 m (3°30‘S, 142°0‘E), I.1910, Dr. Schlaginhaufen—1 male, 5 females, paratypes (Dresden, SMTD); West Sepik, Feramin, elev. 1450 m (5°12‘15.16‘‘S, 141°44‘11.89‘‘E), 30–31.viii.1963, coll. R. Straatman—1 male (Honolulu, BPBM); Telefomin, elev. 1600 m (5°10‘S, 141°35‘E), 30.viii.1963, coll. R. Straatman—1 male (Honolulu, BPBM).

Remark. The specimens had been originally labeled as „*Subria gracilis* det. Karny“

Diagnosis. *T. hamatus* is characterised by the shape of the male cerci that are elongate, narrow, and regularly curved from base to obtuse tip and carry in subapical area from internal margin a short, acute spine. The titillators have the apical areas moveable against the basal area; the apical areas each carry a lateral membranous bursa with setose margin and they divide at end into a larger sickle-shaped and a shorter obtuse lobe. The female subgenital plate is more strongly modified than in other species of the genus with the central plate reduced to a tiny cone and the basal-lateral extensions are strongly prolonged into a pair of somewhat wavy and partly widened lobes.

Description. Medium sized. Fastigium verticis conical, shorter than scapus, apex obtuse; ventral margin compressed, separated by a shallow excision from fastigium frontis. Frons shining, subsmooth, with few, very shallowly impressed dots. Pronotum with lateral angles rounded, only apical area shouldered and disc flat; surface shining with few impressed dots throughout but auditory swelling and flat apical area of disc often subrugose and with a low step at begin of flat apical area; anterior margin broadly rounded but subtruncate in middle; posterior margin rounded; first transverse sulcus little distinct, second sulcus distinct only on paranota. Paranota much longer than high; ventral margin almost straight with ventro-posterior angle little produced. Fully winged; tegmen narrow, reaching about apical third of hind tibia. Prosternum with two minute tubercles, without spines. Meso- and metasternal lobes rounded; medial plate with a spine at both posterior angles. Mesocoxa with a small spinule. Femora with the following number of spines on ventral margins: fore femur 6–9 external, 5–7 internal; mid femur 7 external, 3–4 internal near base; hind femur 10–12 external, 9–15 internal over the whole length. Knee lobes of fore and of mid femur obtuse on external, obtuse or triangular on internal side; of hind femur bi-spinose on both sides. hind tibia with 1 dorsal and 2 ventral apical spurs on each side. Anterior tibia with dorsal angles rounded.

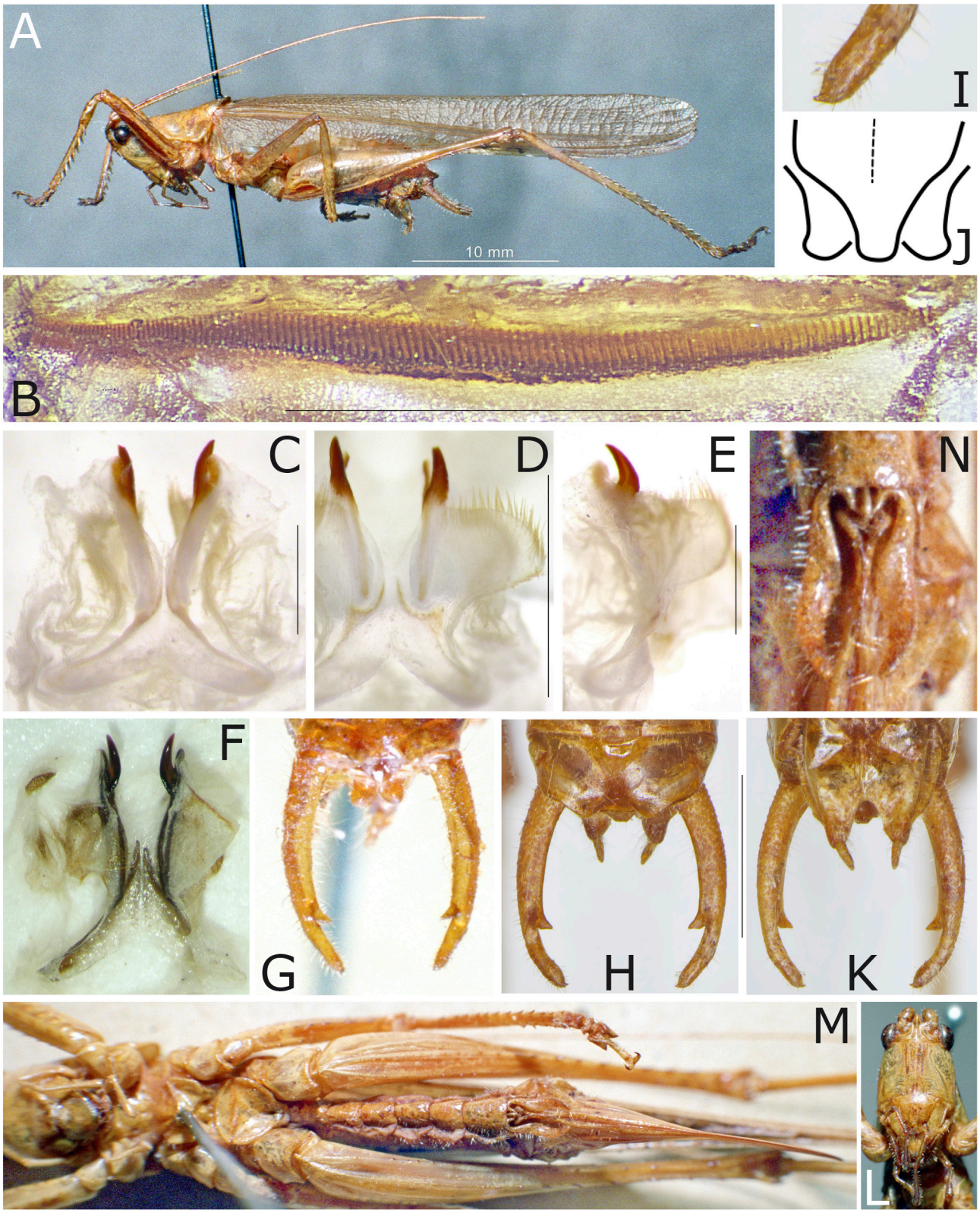

FIGURE 10. *Trichophallus hamatus* **sp. nov.**: A, male holotype; B, stridulatory file; C–F, titillators in different aspects (C–E, male from Feramin; F, male from Toricelli Mts); G–H, last abdominal tergite and cerci in dorsal view (G, of holotype); I, tip of male cercus with apical spine; J, male epiproct and paraprocts in dorso-apical view; K, male subgenital plate and cerci in ventral view; L, face; M, female habitus in ventral view; N, female subgenital plate of allotype. Scales: A 10 mm, B–E 1 mm, H and K 5 mm.

Male. Stridulatory file with about 114–135 teeth. Tenth abdominal tergite transverse, in midline slightly sunk in; apical margin on both sides of middle a little swollen and angularly extended, terminating into two very short, obtuse, projections, truncate or slightly concave in between. Epiproct rounded but apical area triangular with apex obtuse; with a pit or short furrow in middle of basal area. Paraprocts with a rather long, slightly curved, obtuse projection from internal margin. Cerci long and narrow, slightly curved, conical, with an obtuse, pre-apical, internal tooth; apex obtuse. Subgenital plate with apical margin roundly excised.

Titillators compressed, small; brown in lateral and apical, hyaline in central-basal areas; base and central area broad, in apical third suddenly constricted and apex conical; at the point where the titillators are constricted, a pair of separate, elongate sclerites is inserting which support each a hyaline fold of the phallus and divide at end into a larger sickle-shaped and a shorter obtuse process. The lateral hyaline folds are roughly disc-shaped, hollow, and carry at the apical-internal margin a row of stout bristles and at the opposite margin a field of short, fair hairs.

Female. Terminal tergite transverse, split in midline; apical margin substraight but excised in middle. Cerci long conical, slender, slightly curved, apex pointing. Subgenital plate divided into two compressed, sinusoidal curved lateral lobes with obtuse apex, only at very base connected by a small and very short central lobe which is roundly produced behind and has a medial carina; ventral surface of lateral lobes setose. Ovipositor elongate-falcate, compressed in apical half, apex acute; dorsal margin of ventral valves swollen at base and ventral surface of this swollen area setose.

Coloration. Uniformly yellowish brown. Tegmen with some scattered faint brown dots especially in anterior area before subcosta.

Measurements (4 males, 5 females).—body w/o wings: male 20–23, female 22–23; pronotum: male 5.3–6.2, female 5.8–6.2; tegmen: male 31–33, female 33.5–36; hind femur: male 15.5–16.5, female 16.5–18.5; ovipositor: female 10.5–11.5 mm.

Etymology. The name of the new species refers to the nearly hook-shaped apex of the male cerci; from Latin hamatus = hooked.

Trichophallus tabubil sp. nov.

Fig. 11

Holotype (male): Papua New Guinea: Papua New Guinea: Tabubil, 1 October–30 November 1975, coll. T. Roberts—1 male (NHM London).

Other specimens studied: The type is unique.

Diagnosis. *T. tabubil* is similar to *T. hamatus* but slightly larger, has shorter but stouter cerci with a larger internal process; the epiproct terminates into a prolonged, narrow apical process, and the titillators of the phallus have the apical spines more delicate and both with acute end instead of having the more proximal spine obtuse as in *T. hamatus*.

Description. Large species. fastigium verticis before eyes 0.7; fastigium verticis from base 0.9; dorsal eye length 1.4; greatest diameter of eye 1.4 mm; index fastigium verticis from base : eye length 0.7; index fastigium verticis from base : greatest eye diameter 0.7. Tegmen reaching apical quarter of hind tibia. Femora with the following number of spines on ventral margins: fore femur 5–6 external, 4 internal; mid femur 6–7 external, 3 internal near base; hind femur 11–12 external,11–14 internal.

Male. Stridulatory file slightly concave, near apex re-curved; 1.4 mm long; with 130 teeth or 95.3 teeth per mm, in middle of file with 94.2 teeth per mm; teeth narrow and dense, near apex indistinct; mirror hind margin rounded; 0.8 mm long 0.9 mm wide; index length:width = 0.8.

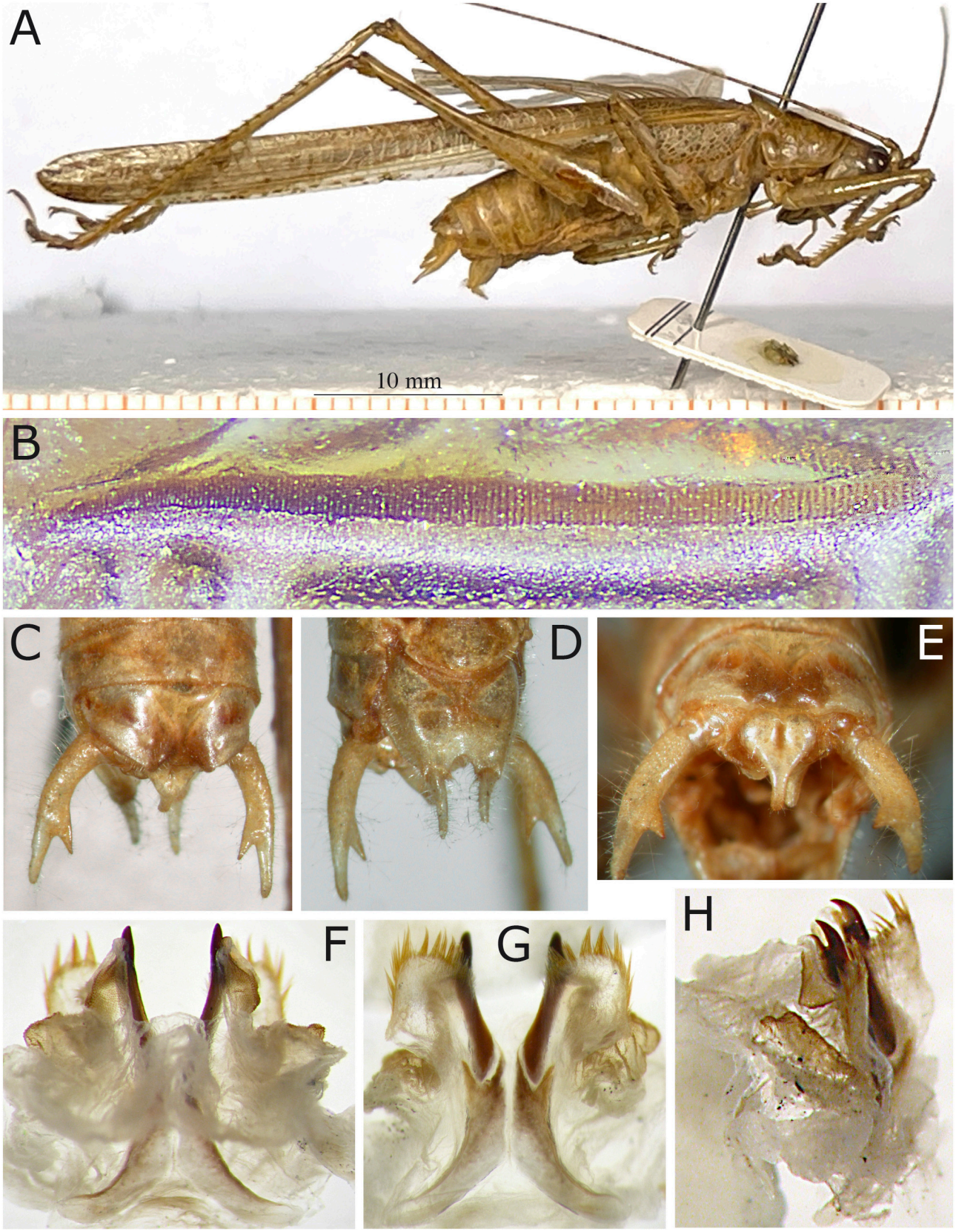

FIGURE 11. *Trichophallus tabubil* **sp. nov.** male holotype: A, male habitus; B, stridulatory file; C, end of abdomen with tenth tergite and cerci; D, end of abdomen with subgenital plate and cerci in ventral view; E, epiproct with prolonged narrow apical area; F–H, titillators in dorso-proximal (F), ventro-apical (G), and lateral view (H).

Tenth abdominal tergite with apical margin angularly projecting at both sides of midline, angularly excised in between. Epiproct Y-shaped with basal area furrowed in midline. Epiproct in *T. tabubil* strongly prolonged into a narrow apical projection while in *T. hamatus* prolonged into a relatively shorter and wider narrow apical projection. Paraprocts with long, compressed and straight projections. Cerci curved in basal half, conical and straight in apical half; with a large acute-angular internal tooth just behind middle. Subgenital plate with a short rounded excision at apex; styli much longer than excised area. Titillators with basal half simple, compressed-band-shaped, curved; apical half more strongly sclerotised, stiffened and projecting ventrad-apicad, terminating at end into a larger dorsal and a narrow ventral, curved acute tip; at dorsal-proximal side these sclerites are connected with membranous, about semi-circular bursae with hairy rim.

Female. Unknown.

Coloration. Yellowish brown with all marks (patterns 0 to 4).

Measurements of male.—body: 25; pronotum: 5.8; tegmen: 37; hind femur: 18.5 mm.

Etymology. Named after the type locality, noun in apposition.

Trichophallus augustus sp. nov.

Fig. 12

Holotype (male): Papua New Guinea: Neu Guinea, Kaiserin Augustafluß Expedition 328, Lager am Lehmfluß, 3 May 1913, coll. Bürgers (ZMHB Berlin).

Allotype (female): same data as holotype, 1 female (ZMHB Berlin)

Other specimens studied: Neu Guinea, Kaiserin Augustafluß Expedition 55, Pionierlager, 1 May–30 June 1912 (coll. Bürgers)—1 male (ZMHB Berlin); Indonesia, Papua: Neth. Ind.-Amer. New Guinea Exp. 1938–39. Bernhard Camp, elev. 50 m (3°29‘S, 139°13‘E), 1–31.vii.1938, coll. J. Olthof—1 male (MBBJ Bogor).

Diagnosis. The new species is unique within the genus for the hump-shaped internal projection of the male cerci and the apical projection of the cerci running from the underside and in prolongation of the cercus axis, thus that it appears as a prolonged cercus. The male titillators have the apical area that carries long bristles whitish transparent although somewhat stiffened. Females can be identified by the shape of the subgenital plate as described below.

Description. Medium sized species. Tegmina surpassing middle of hind tibiae. Femora with the following number of spines on ventral margins: fore femur 6–7 external, 4–6 internal; mid femur 6–7 external, 3–5 internal near base; hind femur 12–13 external, 14–16 internal.

Male. Stridulatory file with about 110–112 teeth. Tenth abdominal tergite terminating into two triangular projections, widely excised in between. Epiproct roughly quadrate or widening backwards, in middle of dorsal surface little depressed, apico-lateral angles broadly rounded, apical margin truncate in middle. Cerci narrow, with a large, hump-shaped, internal projection in about mid-length, tip of projection obtuse with a minute, acute spinule; apical area of cercus with obtuse end and from underside with an elongate, obtuse projection. Subgenital plate with a long excision at apex; styli little shorter than excised area or of about same length.

Titillators separate with sclerotised area reaching to little behind mid-length, apical area consists of membranous structures; central areas strongly approached to each other; apical margin slightly convex but somewhat irregular; in prolongation of apices forming small membranous bags that are supported by a very short stiffened area with concave apex and the dorsal-proximal angle is greatly prolonged into a long and very narrow, weak sclerite; internal surface of the small bags with a row of long bristles, external surface with tufts of medium long, pale hairs; ventral angle roundly projecting and granular; dorsal angle conically projecting with tufts of hairs on external surface.

Female. Subgenital plate in ventral view roughly shaped as a triangular bowl of which the bottom has a large ovoid hole, the apical angle is cut out, and the basal margin shifted a little posteriorly; basal-lateral areas broadly expanded dorsad, behind carinae separating them from ventral plate there is a furrow, another carina, again a furrow and the dorsal margin swollen. Eight abdominal tergite with lateral-posterior area excised for about half of tergum length. Ventral ovipositor valves with ventral margin roundly swollen and setose, as a whole embraced by the subgenital lobes; dorsal margin at base with a round setose lobe of medium length.

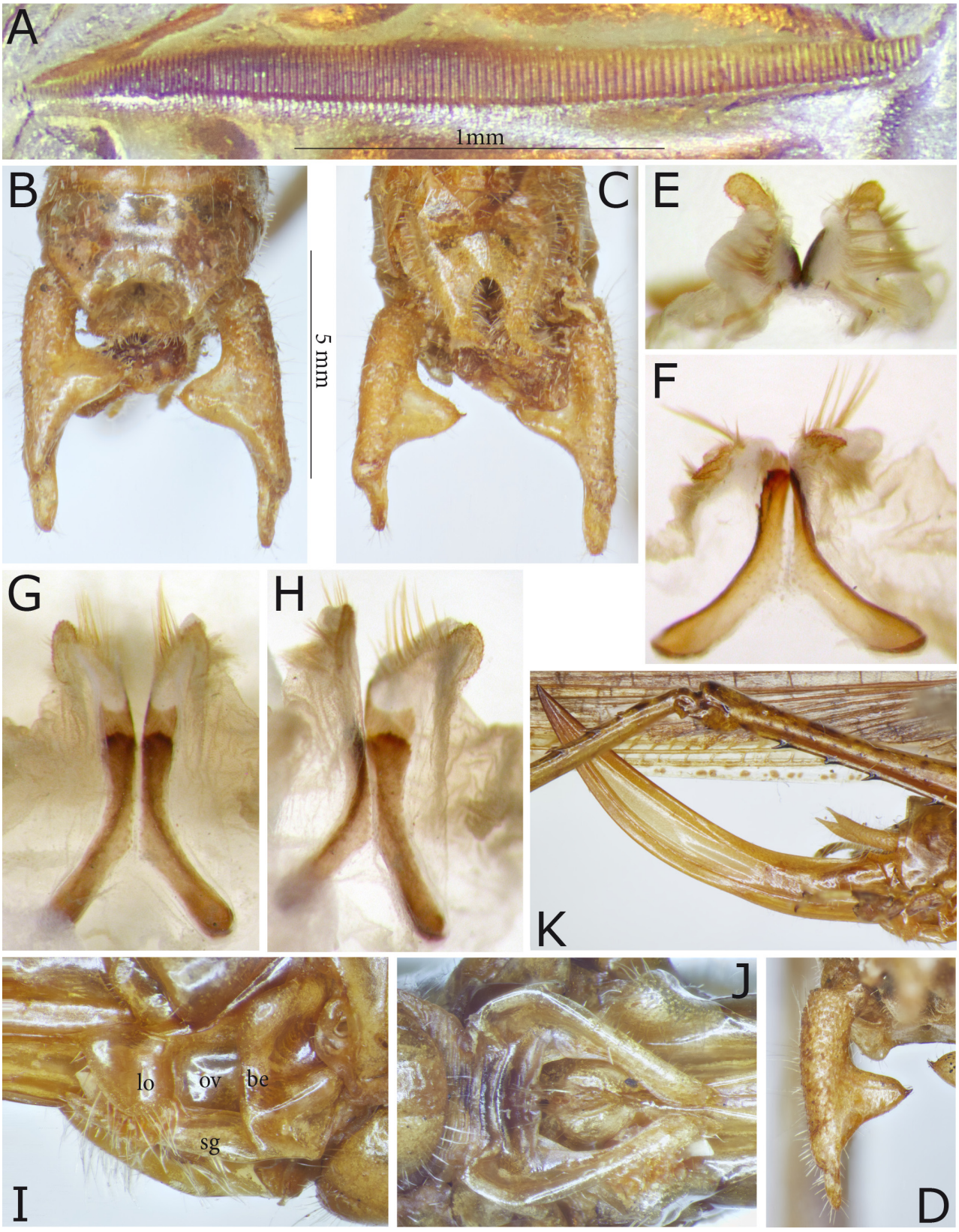

FIGURE 12. *Trichophallus augustus* **sp. nov.**: A–H, male: A, stridulatory file; B, last abdominal tergite and cerci in dorsal view; C, subgenital plate and cerci in ventral view; D, cercus of holotype in ventral view; E–H: titillators in different views (E–F of male from Pinonierlager; G–H of holotype from Lehmfluss): E, apical view; F–G, ventro-apical view (in F apical area flipped in a 90° angle); H, oblique view).—I–K, female allotype: base of ovipositor and subgenital plate in oblique lateral (I) and in ventral view (J); K, ovipositor.—Abbreviations: be basal extension of subgenital plate; lo lobe of ventral ovipositor valve; sg subgenital plate; ov base of ovipositor.

Coloration. Yellowish brown with patterns 0-1-4. Legs indistinctly maculated; hind femur indistinctly striated and dorsal and apical areas stippled.

Measurements.—body: male 21–22, female 24; pronotum: male 5.7, female 5.5; tegmen: male 32–34, female 33.5; hind femur: male 16.0–16.5, female 16.5; antenna: male 76, female 70; ovipositor: 11 mm.

Etymology. Named in memory of the Augustafluß Expedition in 1913.

Trichophallus borneensis Ingrisch, 1998

Fig. 13

Holotype: (male): East Malaysia: Sarawak, Bau distr., Bidi, elev. 90–240 m (1°25‘5.4“N 110°9‘13.45“E), 2.ix.1958, coll. T.C. Maa—1 male (holotype) (BPBM Honolulu).

Other specimens studied: Indonesia, Papua: Swart Valley, Karubaka, elev. 1550 m (3°35‘S, 138°30‘E), 8.xi.1958, coll. J.L. Gressitt—1 female (BPBM Honolulu); same locality, 12.xi.1958, coll. J.L. Gressitt—1 female (BPBM Honolulu); same locality, 20.xi.1958, coll. J.L. Gressitt—1 female (BPBM Honolulu); same locality, 20.xi.1958, coll. J.L. Gressitt—1 male (BPBM Honolulu).

Diagnosis. Males of *T. borneensis* can be recognised by the shape of the elongate and rather narrow cerci that have the end bent mediad and with acute tip and from about mid-length a narrow, conical internal projection also with acute tip. Females are unique for the shape of the subgenital plate that is completely divided in mid-length into two halves which have the dorsal extension curved into a semi-circle and the main part prolonged into narrow apical lobes.

Male. Stridulatory file with about 102–127 teeth. Tenth abdominal tergite with central area slightly prolonged behind, with two faint obtuse projections at apex and area in between depressed and truncate or little concave. Epiproct in dorsal view with almost parallel lateral margins, deeply furrowed in midline; in apical view V-shaped. Paraprocts with a curved projection from internal margin. Cerci almost straight, in dorsal view with a broader basal half and a narrower apical half; with a large, acute, internal tooth in middle of length and another, acute, internal tooth at apex. Subgenital plate almost rectangularly excised at apex; styli of about same length as excised area. Titillators separate, rather simple with transversely truncate apex with acute tip; at truncation connected to a weakly sclerotised sub-hyaline plate narrowing towards apex, and at apex terminates into a long acute thorn; titillators and projecting plate supporting part of inner surface of long, compressed, elongate, membranous bursae with globular bellied base; below margin of globular base with a row of long bristles; external surface of membranous sacks completely covered with dense dark hairs; with two pairs of granular lateral sclerites: small roughly oval sclerites near apex and elongate about canoe-shaped sclerites near middle of titillators.

Female. Tenth abdominal tergite deeply excised in midline. Epiproct triangular with a deep medial furrow, in apical view V-shaped. Subgenital plate divided in midline by a narrow membranous suture; basal area narrow; apical lobes twisted with ventral internal margin bulgy, apical area triangularly projecting sidewards with apical angle rounded and lateral angle acute; basal-lateral areas greatly extended dorsad, auricular with grooved surface. Eight abdominal tergite with lateral-posterior angle cut out for half of tergite length, remaining area roundly projecting, forming a cavity between lateral area of tergite and the setose subgenital plate. Ovipositor rather short and stout; dorsal margin of ventral valves without projecting lobe at base.

Measurements (1 male, 3 females).—body w/o wings: male 20, female 16–22 ; pronotum: male 4.5, female 4.2–4.9; tegmen: male 21, female 21–23; hind femur: male 13, female 13.0–13.5; ovipositor: female 9–10 mm.

Remark. The species was previously known from a single male. The female is described here for the first time. It is doubtful that the species really occurs in Borneo as suggested by the name and by the single specimen described before (Ingrisch, 1998), but the only locality that could be traced by the time of the first description was Bidi in Sarawak. The specimens described in the current publication come all from New Guinea.

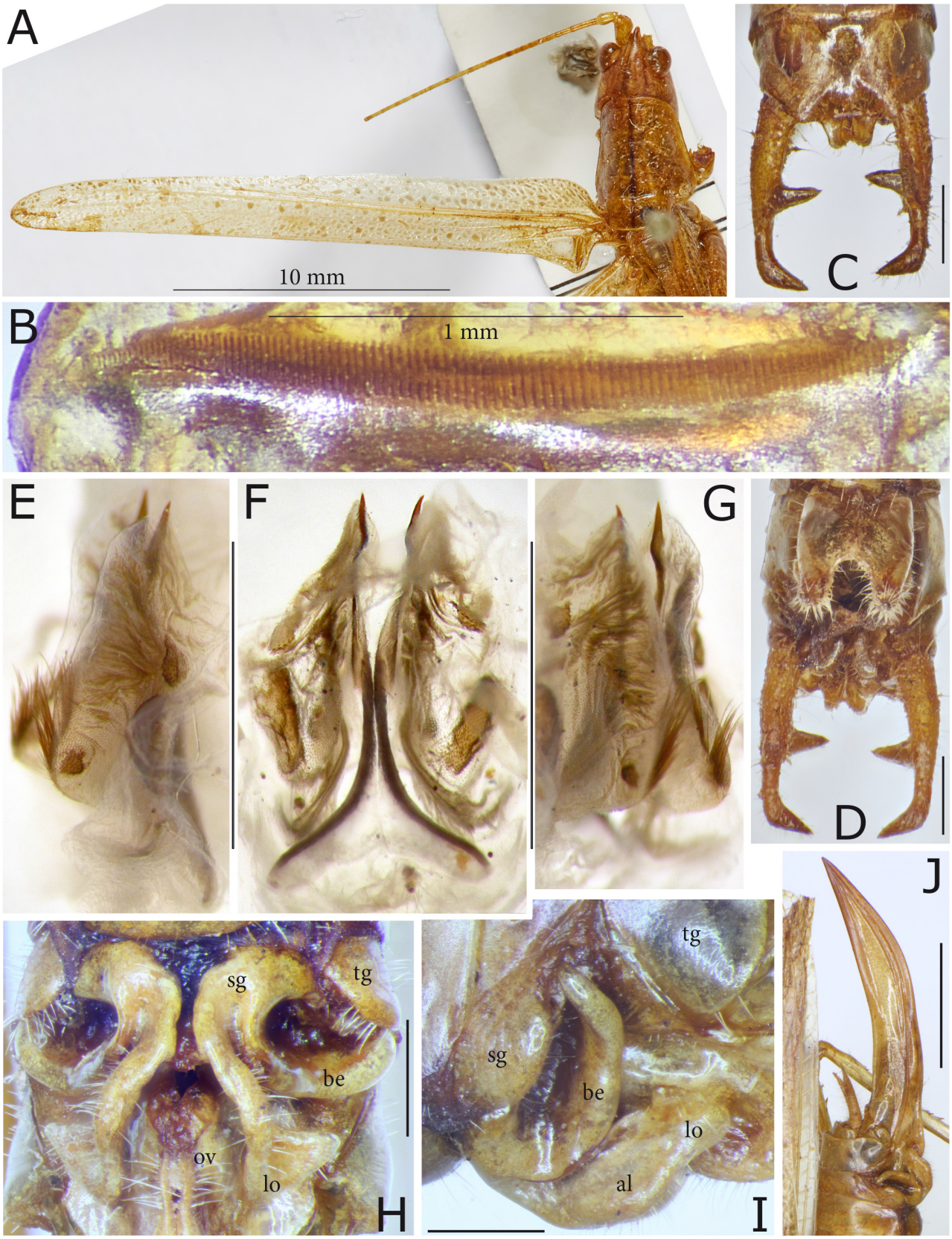

FIGURE 13. *Trichophallus borneensis* Ingrisch, 1998 (A–G male; H–J female): A, head, pronotum and tegmen in dorsal view; B, stridulatory file; C, tenth abdominal tergite and cerci in dorsal view; D, subgenital plate and cerci in ventral view; E–G, titillators in oblique lateral (E, G) and in ventral view (F); H–I, female subgenital plate in ventral (H) and in lateral view (I); ovipositor (J). Scales = 1 mm except for A and J = 10 mm. Abbreviations: al apical lobe, be basal extension, and sg main part of subgenital plate; lo basal lobe of ventral ovipositor valve; ov base of ovipositor; tg last tergite.

***Trichophallus punctatus* sp. nov.**
Fig. 14

Holotype (female): Papua New Guinea: Neu Guinea, Kaiserin Augustafluß Expedition 225, Lordberg, 9 December 1912 (coll. Bürgers), depository: (Berlin, ZMHB).

Other specimens studied: Papua New Guinea: Neu Guinea, Kaiserin Augustafluß Expedition 218, Lordberg, 29 November–2 December 1912 (coll. Bürgers)—1 female (Berlin, ZMHB); KAE 210, Etappenberg, elev. 850 m, 19 November 1912 (coll. Bürgers)—1 female (Berlin, ZMHB).

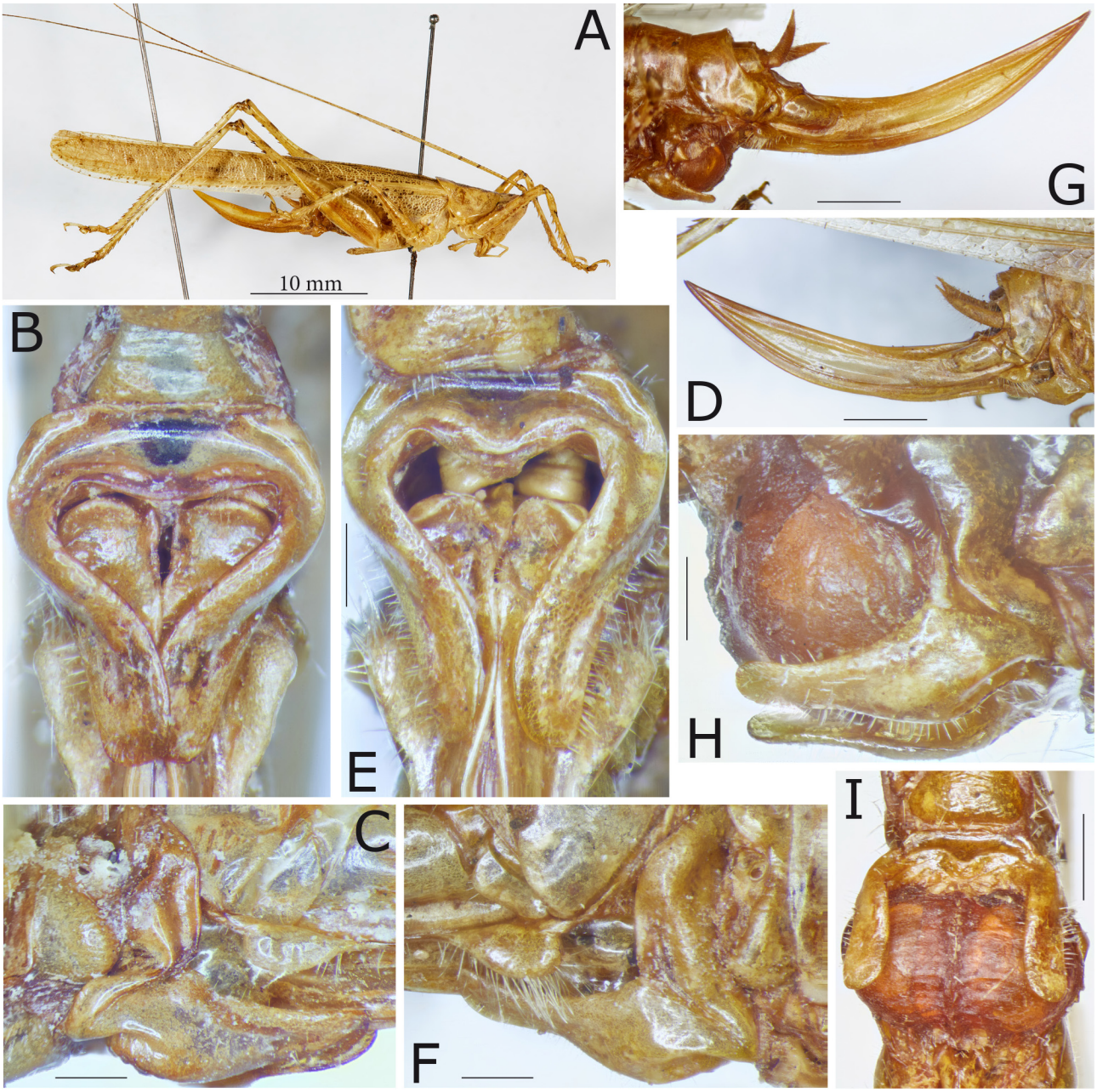

FIGURE 14. *Trichophallus punctatus* spec. nov. (only 1 female has dots on tegmina): A–C, female from Lordberg; D–F, female from Etappenberg; G–I, another female from Lordberg embracing a spermatophore between the lobes of the subgenital plate.—A, habitus lateral view; B, E, subgenital plate in ventral view; C, F, H, subgenital plate in lateral view; D, G, ovipositor. Scales 1 mm; A, 10 mm.

Diagnosis. The species can be recognised by the shape of the female subgenital plate that carry a pair of flattened and dorso-ventrally widened apical lobes that reach to about the end of the basal lobe of the ventral ovipositor valves, while the central plate terminates into a short lobe in about mid-length.

Description. Medium sized species. Tegmina surpassing middle of hind tibia. Femora with the following number of spines on ventral margins: fore femur 5–7 external, 5–6 internal; mid femur 6–8 external, 2–3 internal near base; hind femur 9–10 external, 9–16 internal.

Male. Unknown.

Female. Subgenital plate near base with a transverse furrow outlining a rim along the proximal margin; entire basal area rather short, obtuse angularly projecting behind in middle; lateral lobes compressed, curved, with rounded apex, embracing a circa heart-shaped space; this structure is used to hold the spermatophore after pairing with a male (Fig. 14); basal-lateral area greatly expanded dorsad, with a fold around mid-length and with two grooves separated by a curved carina running from basal to apical margin. Eight abdominal tergite with lateral-posterior area greatly excised. Dorsal margin of ventral ovipositor valves near base with an about semi-oval lobe that has the margin provided with long hairs.

Coloration. Yellowish brown with patterns 0, 1–4. Vertex and pronotum with a medium brown medial band with pattern 3 in midline. One female has dark dots on tegmina. Legs with dark brown spots on dorsal margins.

Measurements (female).—body: 19–25; pronotum: 5.5–5.8; tegmen: 32–34; hind femur: 15.5–16.5; antenna: 65–70; ovipositor: 10–11 mm.

Etymology. Named for the scattered dark spots on the fore wings, especially distinct in the female holotype.

Trichophallus elongatus sp. nov.

Figs. 15–16

Holotype (male): D N. Guinea 400, Mäanderberg, 10.–20.VIII.13. Kais. Augustafl. Exp. Bürgers S.G. (Berlin ZMHB, ID B72T875).

Other specimens studied: Papua New Guinea: Neu Guinea, Kaiserin Augustafluß Expedition 387, Mäanderberg, 4° 5‘ S, 141° 39‘ E, 1–10 August 1913 (coll. Bürgers)—1 male (Berlin ZMHB); Neu Guinea, Kaiserin Augustafluß Expedition 389, Mäanderberg, 1–9 August 1913 (coll. Bürgers)—1 male (Berlin ZMHB); Neu Guinea, Kaiserin Augustafluß Expedition 396, Mäanderberg, 10–20 August 1913 (coll. Bürgers)—1 male (Berlin ZMHB); Neu Guinea, Kaiserin Augustafluß Expedition 400, Mäanderberg, 10–20 August 1913 (coll. Bürgers)—5 males (Berlin ZMHB); Neu Guinea, Kaiserin Augustafluß Expedition 402, Mäanderberg, 21–30 August 1913 (coll. Bürgers)—1 male (Berlin ZMHB); Neu Guinea, Kaiserin Augustafluß Expedition 404, Mäanderberg, 21–30 August 1913 (coll. Bürgers)—1 male, 1 female (Berlin ZMHB).

Diagnosis. Males differ from those of other species by the rather long and narrow, little curved and rounded cerci that are before end divided into a short, compressed dorsal lobe with truncate tip and a narrowed ventral lobe with acute tip. The titillators are long and narrow and are in apical area embraced and replaced by membranous structures that carry long hairs along margin. The female subgenital plate, that has the apical area largely reduced to the narrow, apical projections resembles those in *T. gracilis* Karny and in *T. punctatus* **sp. nov.** It differs from both as well as from other species of the genus by the shape of the prolonged ovipositor that is only little dorso-ventrally widened around mid-length.

Description. Medium sized to smaller species. Tegmina surpassing middle of hind femur. Femora with the following number of spines on ventral margins: fore femur 4–9 external, 3–7 internal; mid femur 6–9 external, 2–5 internal near base; hind femur 9–13 external, 11–16 internal.

Male. Stridulatory file 1.38 mm long with about 110 teeth. Tenth abdominal tergite extended behind into two triangular lobes curved ventrad and provided with a distinct raised carina, apex widely excised in between. Epiproct widening backwards with angles little projecting and with a deep pit in middle of dorsal surface, apical margin faintly excised in middle. Cerci long and narrow, slightly curved, apex divided into two branches of which the ventral branch is narrow, conical and slightly longer than the dorsal branch which is compressed and widened.

Titillators separate, simple, apex obliquely truncate and somewhat irregular; in prolongation of apices with small membranous sacs that carry on internal surface a row of long bristles, have the ventral angle little projecting, rounded, and granular, and the dorsal angle conically projecting and stiffened at internal side by a long and very narrow, weak sclerite in prolongation of dorsal-proximal angle of titillator apex. Phallus membranes laterally of titillators forming a granular cap.

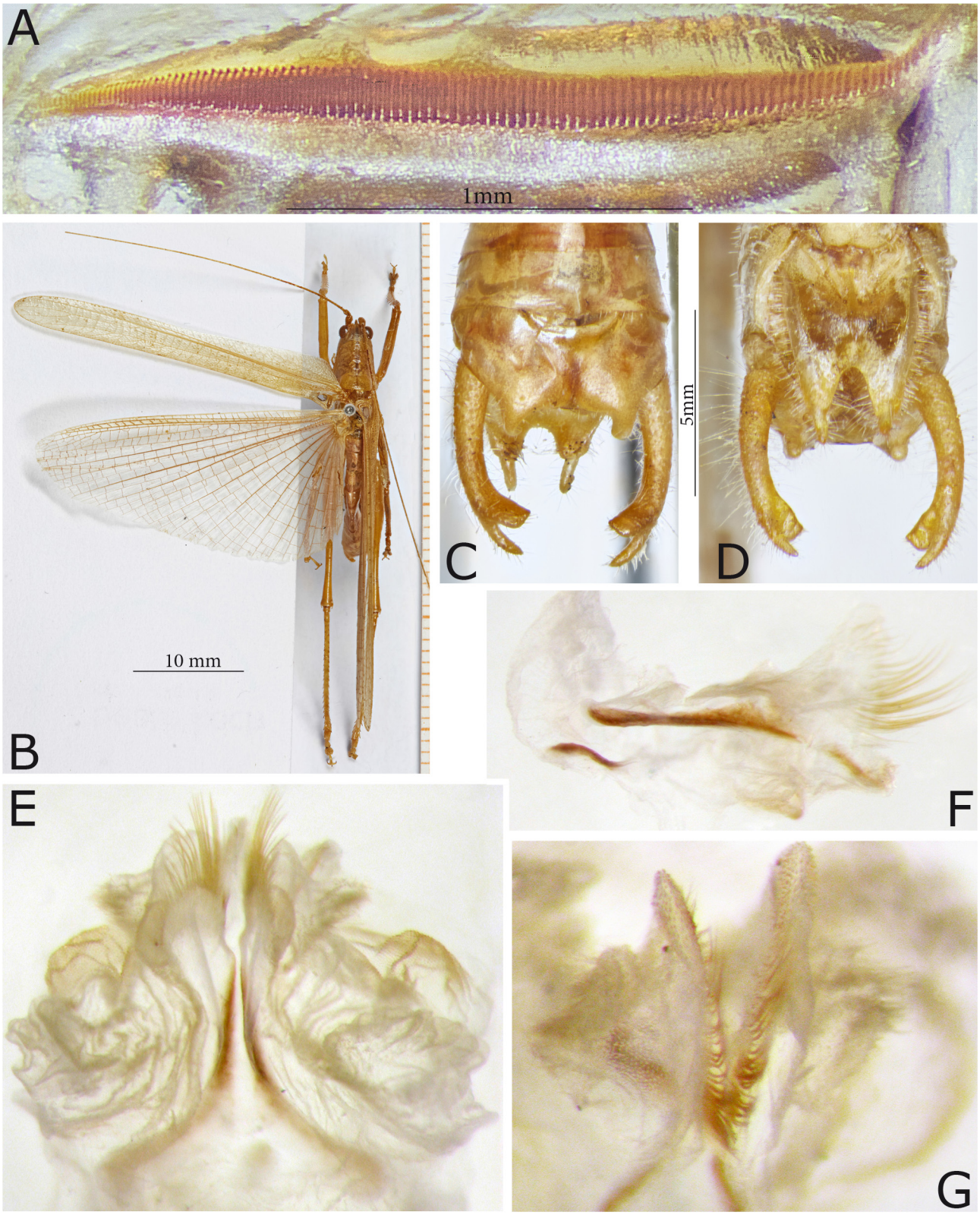

FIGURE 15. *Trichophallus elongatus* **sp. nov.** male holotype: A, stridulatory file; B, habitus dorsal view; C, end of abdomen with tenth tergite and cerci; D, subgenital plate and cerci in ventral view; E, titillators in dorsal view; F, titillator with attached membranous part carrying the long hairs and a small lateral sclerite; G, titillators in ventro-apical view.

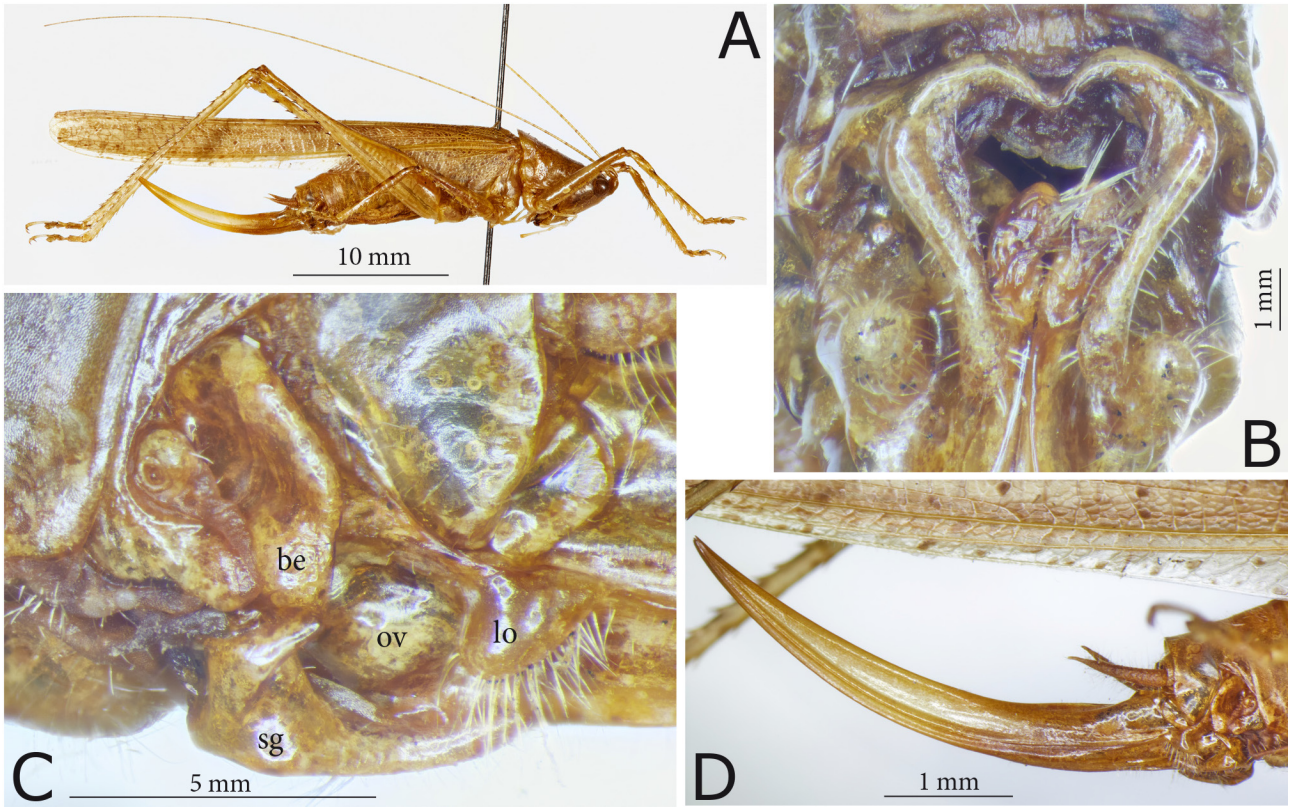

FIGURE 16. *Trichophallus elongatus* **sp. nov.** female allotype: A, Habitus lateral view; B–C, Subgenital plate in ventral (B) and in lateral view (C); D, abdominal apex with ovipositor.—Abbreviations: be basal extension of subgenital plate; lo lobe of ventral ovipositor valve; sg subgenital plate; ov base of ovipositor.

Female. Tenth abdominal tergite distinctly divided in midline. Subgenital plate with entire basal area reduced to an elevated, undulating carina, otherwise membranous; this carina at both sides prolonged into narrow, curved projections that are slightly widened at apex and embracing a circa heart-shaped space. Basal-lateral areas greatly prolonged dorsad, auriculate and separated from subgenital plate by a deep furrow. Ventral ovipositor valves with ventral margin between subgenital lobes with ovoid, setose swellings; their dorsal margins at base with medium sized, rounded projections pointing ventrad and with margin provided with long hairs. Eight abdominal tergite with lateral-posterior area largely excised to almost base but lateral margin again projecting posteriorly.

Coloration. Yellowish brown with patterns 1–4. Legs with indistinct maculation; hind femur indistinctly striated, apical area stippled.

Measurements.—body: male 18–22, female 21; pronotum: male 4.7–5.2, female 4.9; tegmen: male 28–31, female 30; hind femur: male 13.0–14.5, female 15; antenna: male 65; ovipositor: 12 mm.

Etymology. Named for the prolonged ovipositor which is only little widened around mid-length.

Trichophallus capillatus sp. nov.

Figs. 17–18

Holotype male: Papua New Guinea: Papua New Guinea, WEI, Wau, 29 August 1981 (coll. G.K. Morris)—1 male (Naturalis Leiden).

Other specimens studied: Papua New Guinea: Bismarck Archipelago, New Britain, Gazelle Peninsula, Taliligap, elev. 300 m (4°19‘23.89“S, 152°9‘38.94“E), 17–18.xii.1962, coll. J. Sedlacek—1 female, 1 male (BPBM Honolulu); Gazelle Peninsula, Vunakanau, 5.v.1956, coll. J.L. Gressit—2 males (BPBM Honolulu); same locality, 16.v.1956, coll. J.L. Gressit—1 male (BPBM Honolulu); same locality, 3.vii.1956, coll. J.L. Gressit—1 female (BPBM Honolulu); same locality, 19.vii.1956, coll. J.L. Gressit—1 male (BPBM Honolulu); Eastern Highlands, Goroka, elev. 1500 m (6°5‘S, 145°25‘E), 3.vi.1955, coll. J.L. Gressitt—1 male (BPBM Honolulu); same locality, 4.vi.1955, coll. J.L. Gressitt—1 female (BPBM Honolulu); same locality, 10.vi.1955, coll. J.L. Gressitt—1 female (BPBM Honolulu); same locality, 22.v.1961, coll. J.L. & M. Gressitt—4

females, 7 males (BPBM Honolulu); Madang, Finisterre Mts., Naho River Valley, Budemu, elev. 1220 m (5°55‘S, 146°5‘E), 15–24.x.1964, coll. M.E. Bacchus—1 female (paratype) (NHM London); Morobe, Lae, (6°45‘S, 145°0‘E), 27.v.1956, coll. E.J. Ford Jr.—1 female (BPBM Honolulu); Wau, elev. 1200 m (7°20‘S, 146°45‘E), 1.ix.1961, coll. J. Sedlacek—1 male (BPBM Honolulu); same locality, 2.ix.1961, coll. J.&. M. Sedlacek—1 male (BPBM Honolulu); same locality, 1–20.xi.1961, coll. J. Sedlacek—1 male (BPBM Honolulu); same locality, 2–10.xi.1961, coll. J. & M. Sedlacek—1 female (BPBM Honolulu); same locality, 7–16.xii.1961, coll. J. Sedlacek—1 male (BPBM Honolulu); same locality, 8.i.1962, coll. J. Sedlacek—1 male (BPBM Honolulu); same locality, 28.xi.1964, coll. J. Sedlacek—1 male (BPBM Honolulu); same locality, 21.ii.1965, coll. J. & M. Sedlacek—1 female, 1 male (BPBM Honolulu); same locality, 30.ix.1965, coll. J.L. &. M. Gressitt—1 male (BPBM Honolulu); same locality, 25.iii.1966, coll. J.L. Gressitt—1 male (BPBM Honolulu); same locality, 21.iv.1966, coll. J.L. &. M. Gressitt—1 female (BPBM Honolulu); same locality, 9.v.1966, coll. J.L. &. M. Gressitt—1 male (BPBM Honolulu); Wau, Hospital Ck., elev. 1250 m (7°20‘S, 146°45‘E), 22.v.1965, coll. J. Sedlacek—1 male (BPBM Honolulu); New Guinea (NE), Chimbu Valley, elev. 1800 m (6°2‘28.06“S, 144°57‘24.06“E), 16.v.1963, coll. J. Sedlacek—1 female (BPBM Honolulu); Garaina, elev. 800 m, 16.i.1958, coll. J.L. Gressitt—1 female (BPBM Honolulu); same locality, 11–14.vii.1969, coll. J.L. Gressitt—1 female (BPBM Honolulu); New Guinea NE, Morobe, Wau, elev. 1200 m (7°20‘S, 146°45‘E), 13–19.ix.1962, coll. J. Sedlacek—1 female (BPBM Honolulu); Western Highlands, Jimi River, elev. 1433 m (5°16‘.01“S 144°14‘.01“E), 6.vii.–21.ix.1961, coll. W.W. Brand [CSIRO]—1 male (Naturalis Leiden).

English name: Tiny Caramel

Etymology. The new species is named for the row of long hairs on the hyaline apical area of the titillators; from Latin capillatus long-haired.

Diagnosis. The new species differs from other species of the genus described so far by the distinctive shapes of the male cerci and the titillators on the male phallus. Females are unique for the shape of the subgenital plate provided with narrow and elongate lateral lobes reaching or surpassing the end of the basal-dorsal extensions of the ventral ovipositor valves, and the basal-lateral extensions are elongate and vaulted in preserved specimens.

Description. Small species. Tegmina varying from just surpassing hind knees to reaching middle of hind tibia, rarely surpassing middle of hind tibia. Femora with the following number of spines on ventral margins: fore femur 2–7 very minute external, 2–6 internal; mid femur 5–7 external, 1–4 internal near base; hind femur 7–12 external, 0–11 minute internal (1 or 2 near apex can be larger).

Male. Stridulatory file on underside of left tegmen 1.36 mm long, with about 88–93 teeth, with about the last 20–29 teeth becoming very small and narrow towards end of file. Tenth abdominal tergite terminating into two short triangular lobes, apex wide roundly excised in between. Epiproct with parallel lateral margins, apex truncate or slightly convex, ventral surface greatly swollen, dorsal surface with a deep pit at base. Paraprocts with internal margin greatly swollen. Cerci rather short and stout, slightly curved behind base otherwise almost straight, apex obtuse; with a conical, internal projection before middle which has a sharp tooth at tip. Subgenital plate roundly excised at apex; styli thin, little longer than excised area or of about equal length.

Titillators separate, basal area strongly sclerotised, darkened, with internal surface slightly concave, curved around mid-length and with apical margin obliquely truncate; apical area hyaline, inflated, sub-membranous, might be movable against basal area; that area at end divided into an area with granular surface on ventral-lateral side and a ballon like, simply hyaline area on dorsal-proximal side that gives rise to a cone on proximal side; internal surface of membranous area over whole length with a straight row of long bristles surpassing end of hyaline area.

Titillators of holotype separate, basal area strongly sclerotised, darkened, elongate, band-shaped with internal surface slightly concave, curved around mid-length and with apical margin obliquely truncate but somewhat irregular; apical area hyaline, inflated, sub-membranous, with granular surface, and obviously movable against basal area; at end on both sides with an oval sclerotised small sack with granular surface and stiffened rim with fine spinules; from the membranous subapical area on both sides with a row of long bristles.

Female. Tenth abdominal tergite divided in midline. Subgenital plate with a short entire basal area with concave surface, apical margin of entire area carinate with carina interrupted in midline and laterally curved into the ventral margin of moderately long, narrow and almost straight but converging apical lobes; apex of entire central area behind carina extended dorsad and with concave surface that is continued into the internal surface of the apical lobes, giving the lobes a spoon-shaped appearance in oblique ventral view; ascending lateral areas with concave surface that is interrupted by a longitudinal carina, with swollen apical and especially dorsal margins, and with a bulging lobe at anterior margin that is little covering the concave surface. Ovipositor with dorsal margin of ventral valves with an oblique, conical, setose projection, and ventral margin between apical lobes of subgenital plate swollen and also setose. Eight abdominal tergite with lateral-posterior area excised providing a triangular space between eight and ninth tergite in which the lateral area of the subgenital plate protrudes. Subgenital plate with lateral area deeply grooved, divided in middle by a carina which is fused with dorsal margin; dorsal margin swollen.

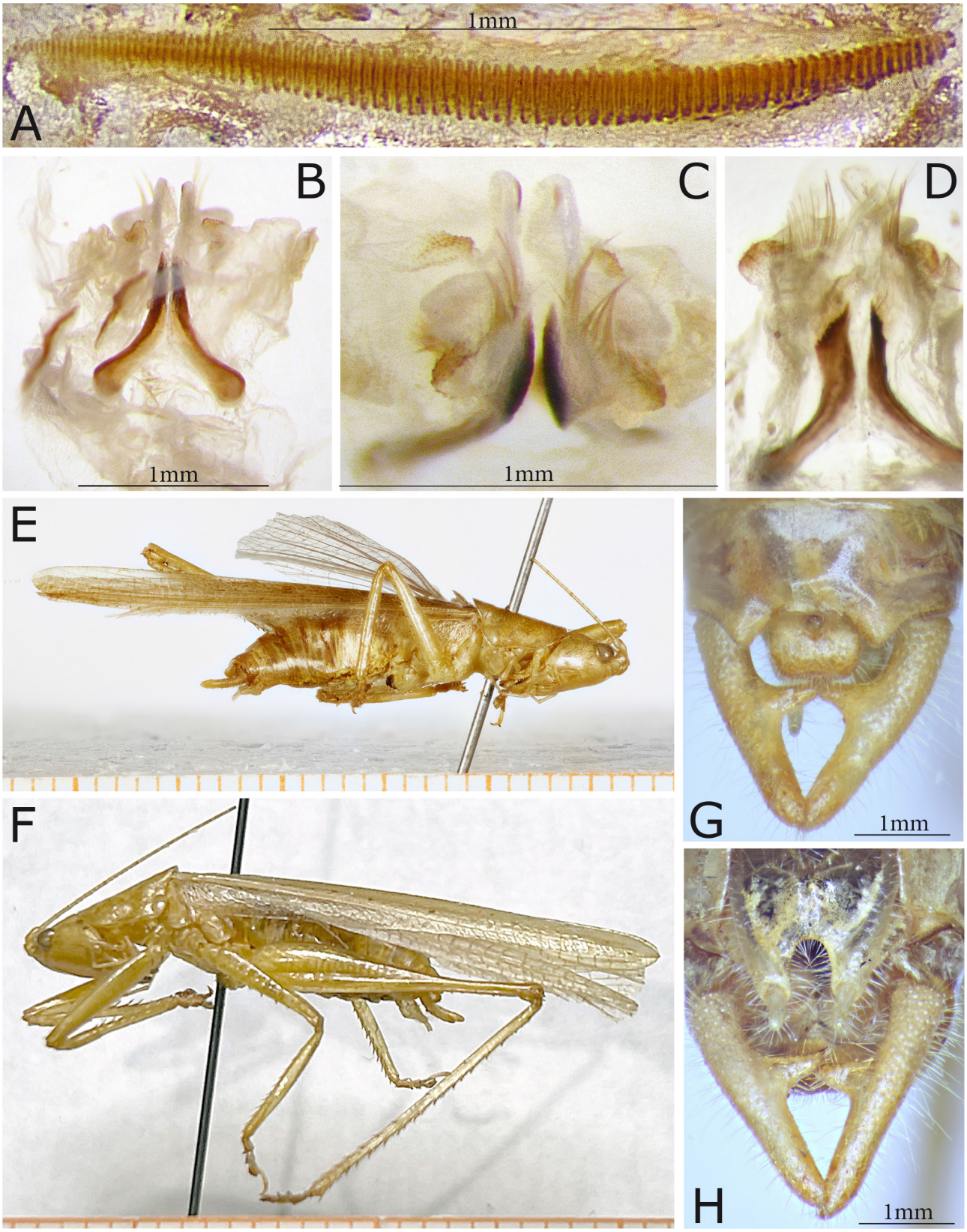

FIGURE 17. *Trichophallus capillatus* **sp. nov.** male: A, stridulatory file; B–D, titillators in ventro-apical (B), distal (C), and dorsal-proximal view; E–F, habitus lateral view of holotype (E) and a paratype from Wau (F); G, last abdominal tergite, epiproct, and cerci in dorsal view; H, subgenital plate and cerci in ventral view.—In (B) both lateral sclerites had moved to the same side which is a preparation artefact, one should be left and the other right.

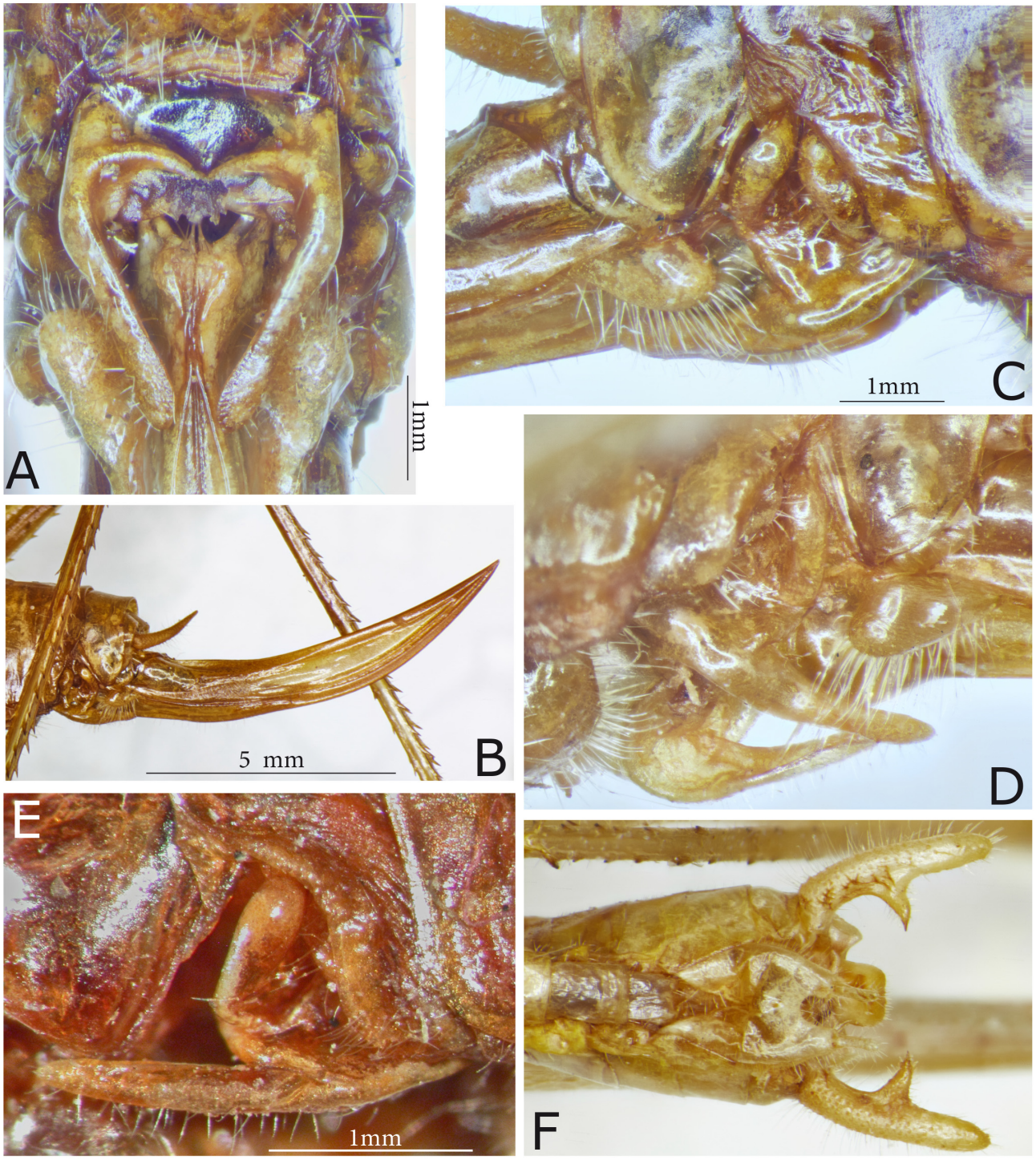

FIGURE 18. *Trichophallus capillatus* **sp. nov.** A, female: subgenital plate in ventral view; B, ovipositor; C–D, last tergites, subgenital plate and base of ovipositor with dorsal basal lobe of ventral valve in lateral (C) and oblique-lateral view (D); E, female subgenital plate in lateral view; F, end of male abdomen with subgenital plate and cerci in ventral view (F).

Coloration. Nearly uniformly yellowish brown with patterns 1–4 but very faint or with patterns 1 and 3 faintly indicated.

Measurements (26 males, 17 females).—body w/o wings: male 15–21 (17.9±1.3), female 14–23 (18.3±2); pronotum: male 4.2–5.0 (4.6±0.2), female 4.1–5.0 (4.6±0.3); tegmen: male 16.5–24 (20.1±2), female 17.5–27.0 (20.9±2.4); hind femur: male 10.5–13.5 (12±0.8), female 11.5–14.5 (12.5±0.9); antenna: male 50–60 (53.3±5.8), female 60; ovipositor: female 8.5–10.2 (9.2±0.5) mm.

Etymology.—The name of the new species refers to the group of hairs on top of the titillators.

***Trichophallus reductus* sp. nov.**
Fig. 19

Holotype (female): Papua New Guinea: West Sepik Prov., S. Toricelli Mts, Sand River, 1 July–31 August 1986 (coll. B. Oudmayer)—1 female (Naturalis Leiden).
The type is unique.

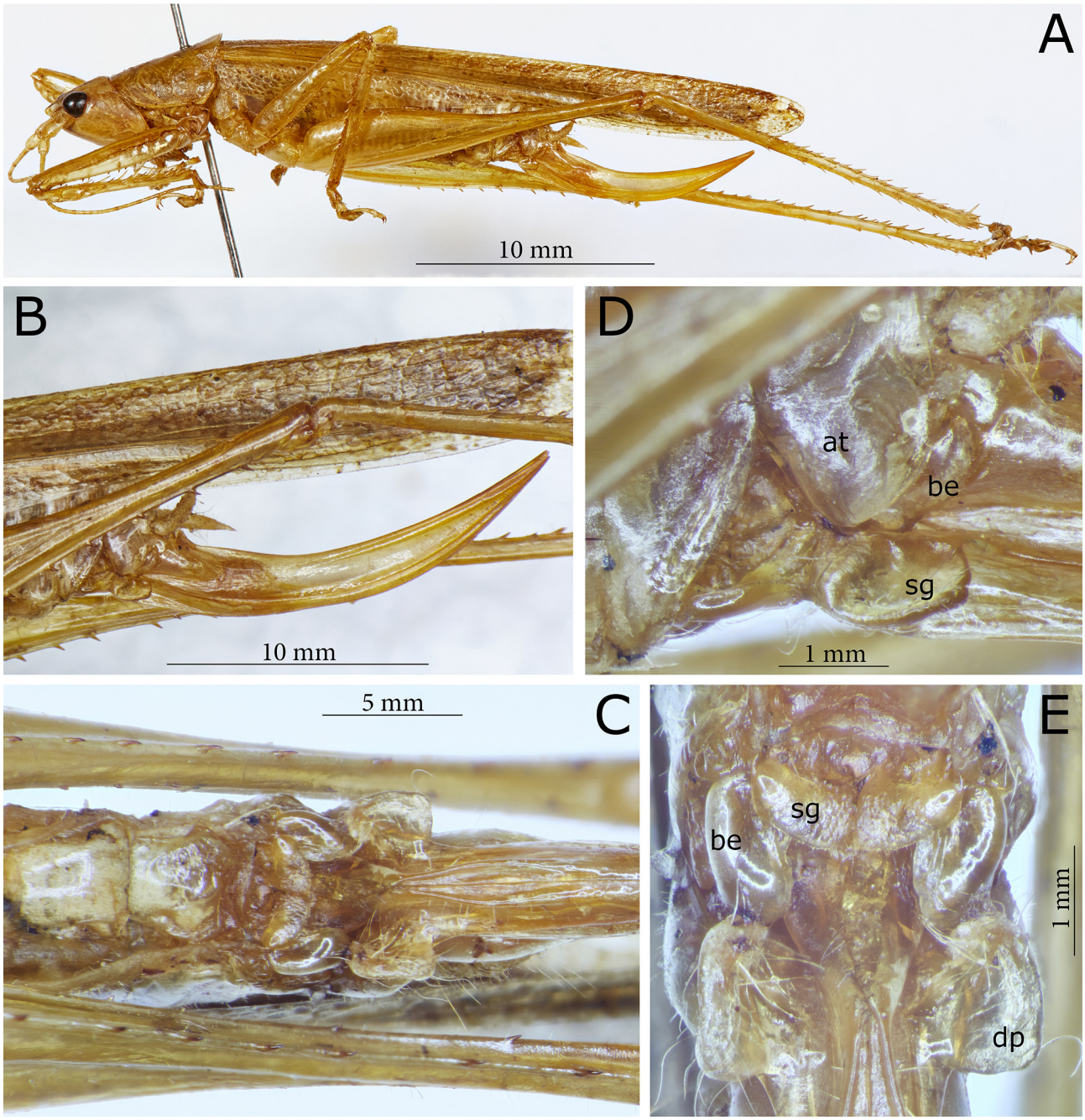

FIGURE 19. *Trichophallus reductus* **sp. nov.** holotype female: A, habitus lateral view; B, ovipositor; C–E, end of abdomen with subgenital plate in ventral view (C, E) and in oblique lateral view (D).—Abbreviations: at abdominal tergite; be basal dorsal extension of subgenital plate; dp basal projection of ventral ovipositor valve; sg main area of subgenital plate.

Diagnosis. The new species can be readily recognised by the shape of the female subgenital plate which has the central plate strongly reduced to a short lobe with convex apical margin and a faint medial furrow. The plate is about half as long as its basal-lateral extensions and thus hidden in lateral view (Fig. D). The basal-lateral extensions reach but do not overlap with the projecting ovoid lobes of the ventral ovipositor valves (Fig. E).

Description. Small and very slender species. Tegmina surpassing hind knees. Mesosternal lobes angularly rounded. Femora with the following number of spines on ventral margins: fore femur 4–6 external, 5 internal; mid femur 6 external, 3 internal near base; hind femur 9–10 external, 7–9 internal.

Male. Unknown.

Female. Subgenital plate short, entire basal area shallowly grooved over whole width; then divided into two wide and short lobes touching each other in midline and with apices obliquely truncate; basal-lateral areas separated by a narrow but distinct furrow from ventral plate, short and projecting backwards, not dorsad. Ovipositor only moderately widened around mid-length. Dorsal margin of ventral ovipositor valves at base with a large auricular projection just behind basal-lateral projection of subgenital plate, both nearly touching each other. Eight abdominal tergite with lateral-posterior angles obliquely truncate.

Coloration. Yellowish brown with patterns 1 and 3.

Measurements of female.—body: 20; pronotum: 5; tegmen: 25; hind femur: 14.5; ovipositor: 9.5 mm.

Etymology. The name of the new species refers to the strongly reduced main area of the female subgenital plate.

Trichophallus robustus sp. nov.

Fig. 20

Holotype (female): Papua New Guinea: Papua New Guinea, Kerowagi, 9 November 1965 (coll. Hans Pyka) (Naturalis Leiden).

Other specimens studied: Papua New Guinea, Tiripini, 13 November 1965 (coll. Hans Pyka)—1 female (Naturalis Leiden).

Diagnosis. The new species differs from other species of the genus by the shape of the female subgenital plate that is in basal area tunnel-shaped with a narrow membranous area along midline, and distinctly separated apical lobes oriented dorso-ventrally and terminate into truncate apical margins.

Description. Medium sized to smaller species. Tegmina surpassing middle of hind tibia. Femora with the following number of spines on ventral margins: fore femur 5–8 external, 4–6 internal; mid femur 6–7 external, 3 internal near base; hind femur 10–12 external, 11–16 internal.

Male. Unknown.

Female. Subgenital plate with basal area divided in midline by a narrow membranous zone; apical lobes compressed, inserted just behind the basal area, curved dorsad on both sides, thus lying on both sides of the ovipositor base, moderately wide with apices rounded; basal-lateral extensions separated by a narrow membranous suture from rest of subgenital plate, rather broad with a shallow oblique furrow. Eight abdominal tergite with lateral-posterior angles widely excised but very lateral area faintly projecting again. Ventral ovipositor valves between apical lobes of subgenital plate with dorsal margin only little projecting laterally, with long setae at ventral surface of projecting area.

Coloration. Yellowish brown with patterns 1, 3, and 4. Antennae annulated but scapus and pedicellus unicoloured.

Measurements (2 females).—body: 17–21; pronotum: 5.0–5.2; tegmen: female 30.5–31.0; hind femur: 15.0–15.5; antenna: 65; ovipositor: 11.0–11.5 mm.

Etymology. The name of the new species refers to its rather large and stout habitus.

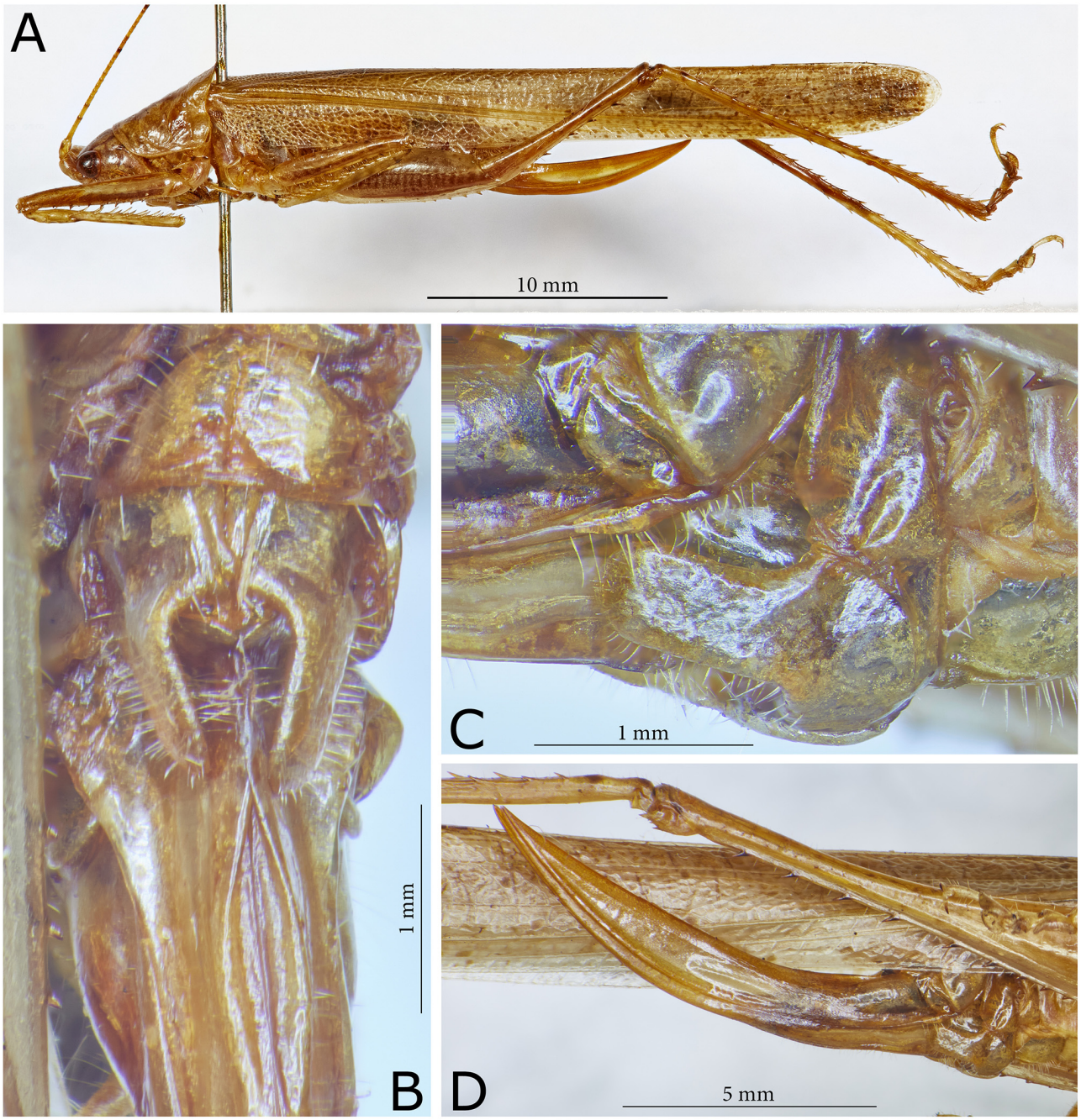

FIGURE 20. *Trichophallus robustus* **sp. nov.** female holotype (A–B) and paratype (C–D): **A**, habitus lateral view; **B**, end of abdomen with subgenital plate and base of ovipositor in ventral view; **C**, do. in lateral view; **D**, ovipositor in lateral view.

Trichophallus armatus sp. nov.

Fig. 21

Holotype (male): Indonesia: Papua, Paniai, 7.9.1939 (Naturalis Leiden).

Other specimens studied: New Guinea: New Guinea Exp. K.N.A.G. 1939, Araboebivak, 10 October 1939 (Naturalis Leiden)—1 male (Naturalis Leiden); New Guinea Exp. K.N.A.G. 1939, Dejateda at Mt. Barara, 11 September 1939 (Naturalis Leiden)—1 female (Naturalis Leiden); New Guinea Exp. K.N.A.G. 1939, Paniai, 4 September 1939 (Naturalis Leiden)—1 female (Naturalis Leiden); New Guinea Exp. K.N.A.G. 1939, Paniai, 7 September 1939 (Naturalis Leiden)—2 males (CW (Naturalis Leiden); New Guinea Exp. K.N.A.G. 1939, Paniai, 17 September 1939 (Naturalis Leiden)—1 female (Naturalis Leiden); New Guinea Exp. K.N.A.G. 1939, Paniai, 27 September 1939 (Naturalis Leiden)—1 male (Naturalis Leiden); New Guinea Exp. K.N.A.G. 1939, Paniai, 29 September 1939 (Naturalis Leiden)—3 males, 1 female (CW (Naturalis

Leiden); New Guinea Exp. K.N.A.G. 1939, Paniai, 3° 50‘ S, 136° 15‘ E, 1 October 1939 (Naturalis Leiden)—1 female (Naturalis Leiden); New Guinea Exp. K.N.A.G. 1939, Paniai, 17 October 1939 (Naturalis Leiden)—1 female (Naturalis Leiden); New Guinea Exp. K.N.A.G. 1939, Paniai, 19 October–20 November 1939 (Naturalis Leiden)—1 male (Naturalis Leiden); Irian Jaya, New Guinea (Neth.), Wisselmaren, Itouda, Kamo Valley, elev. 1500 m, 13 August 1955 (coll. J.L. Gressitt)—1 male (Bishop Museum, Honolulu (BPBM)); New Guinea (Neth.), Wisselmaren, Moenemani, Kamo Valley, elev. 1500 m, 15 August 1962 (coll. J. Sedlacek)—1 female (Bishop Museum, Honolulu (BPBM)); New Guinea (Neth.), Wisselmaren, Urapura, Kamo Valley, elev. 1530 m, 11 August 1955 (coll. J.L. Gressitt)—1 female (Bishop Museum, Honolulu (BPBM)); New Guinea (NW), Nabire, S. Geelvink Bay, elev. 0–30 m, 2–9 July 1962 (coll. J.L. Gressitt)—3 males, 2 females (Bishop Museum, Honolulu (BPBM)); New Guinea (NW), Wisselmaren, Enarotadi, elev. 1900–2000 m, 2–11 July 1962 (coll. J. Sedlacek)—2 males, 2 females (Bishop Museum, Honolulu (BPBM)); New Guinea (NW), Wisselmaren, Enarotadi, elev. 1800–1900 m, 20 July 1962 (coll. J. Sedlacek)—1 female (Bishop Museum, Honolulu (BPBM)); New Guinea (NW), Wisselmaren, Enarotadi, elev. 1850–1900 m, 28 July 1962 (coll. J. Sedlacek)—1 female (Bishop Museum, Honolulu (BPBM)); New Guinea (NW), Wisselmaren, Enarotadi, elev. 1800–1900 m, 1–9 August 1962 (coll. J. Sedlacek)—1 male (Bishop Museum, Honolulu (BPBM)); New Guinea: New Guinea Exp. K.N.A.G. 1939, Araboebivak, 10 October 1939 (Naturalis Leiden)—1 male (Naturalis Leiden); New Guinea Exp. K.N.A.G. 1939, Dejateda at Mt. Barara, 11 September 1939 (Naturalis Leiden)—1 female (Naturalis Leiden); New Guinea Exp. K.N.A.G. 1939, Paniai, 4 September 1939 (Naturalis Leiden)—1 female (Naturalis Leiden); New Guinea Exp. K.N.A.G. 1939, Paniai, 7 September 1939 (Naturalis Leiden)—2 males (CW (Naturalis Leiden); New Guinea Exp. K.N.A.G. 1939, Paniai, 17 September 1939 (Naturalis Leiden)—1 female (Naturalis Leiden); New Guinea Exp. K.N.A.G. 1939, Paniai, 27 September 1939 (Naturalis Leiden)—1 male (Naturalis Leiden); New Guinea Exp. K.N.A.G. 1939, Paniai, 29 September 1939 (Naturalis Leiden)—3 males, 1 female (Naturalis Leiden); New Guinea Exp. K.N.A.G. 1939, Paniai, 3°50‘S, 136°15‘E, 1 October 1939 (Naturalis Leiden)—1 female (Naturalis Leiden); New Guinea Exp. K.N.A.G. 1939, Paniai, 17 October 1939 (Naturalis Leiden)—1 female (Naturalis Leiden); New Guinea Exp. K.N.A.G. 1939, Paniai, 19 October–20 November 1939—1 male (Naturalis Leiden).

Diagnosis. Male cerci with a pair of narrow, parallel projections at end. Titillators with a pair of simple, at base out-curved sclerites and with a second pair of sclerites with angulate base and apex faintly sinuate before acute tip; laterally of both sclerites with a pair of membranous blades that carry long hairs or bristles along internal margin and have the apical-lateral margin recurved and darkened. Female subgenital plate with apical projections separated from basal area by a step.

Description. Small species. Tegmina surpassing hind knees (one female slightly brachypterous with tegmen not reaching hind knees). Femora with the following number of spines on ventral margins: fore femur 4–9 external, 3–7 internal; mid femur 5–7 external, 1–4 internal near base; hind femur 6–11 external, 0–8 internal (the latter very minute except for 1 or 2 near apex).

Hind knee lobes usually uni-spinose, but in several specimens single lobes (rarely all) are bi-spinose.

Male. Stridulatory file roughly 1.4 mm long with 128–133 teeth. Tenth abdominal tergite terminating into two obtuse lobes, wide and roundly excised in between. Epiproct triangularly rounded, dorsal surface grooved. Paraprocts with a small obtuse projection at ventral margin. Cerci elongate, little conical, and slightly curved; circa basal third with internal margin slightly widened and a tubercle at end of widened area; with two acute, apical-internal projections, the dorsal a little smaller than the ventral projection, both with a spinule at tip. Subgenital plate widely excised at apex, setose, especially at apical margin and dorsal (= internal) apical surface; styli small, little shorter than excised area.

Titillators separate, strongly curved in middle, apical part (behind curve) triangularly widened, apex subacute. With a pair of apical-lateral sclerites that are completely separated from titillators proper and connected with them by membranes, circa horse-shoe-shaped but with apical branch slightly hooked and acute, basal branch widened and subdivided into a truncate and in a rounded lobe; the membrane that is connecting the titillators with the apico-lateral sclerites widened toward base, forming a large lobe that is folded across thus forming two triangular lobes: the medial lobe carrying a curved row of long bristles, the lateral lobe includes a black triangular sclerite; apical angle of fold between both lobes with a short granular projection. Phallus membranes with a granular cap on both sides of apical-lateral sclerites.

Female. Tenth abdominal tergite divided in midline. Subgenital plate divided in midline by a narrow membranous suture; basal area narrow, separated by an oblique, curved step from apical lobes; connection between basal area and apical lobes sclerotised in medial, membranous in lateral areas; apical lobes rather short, broad, triangular with angle rounded and lateral-proximal angle angularly curved ventrad; basal-lateral areas greatly extended dorsad but not outlined against ventral area, narrow with obtuse-angular apical margin. Ovipositor rather short and stout.

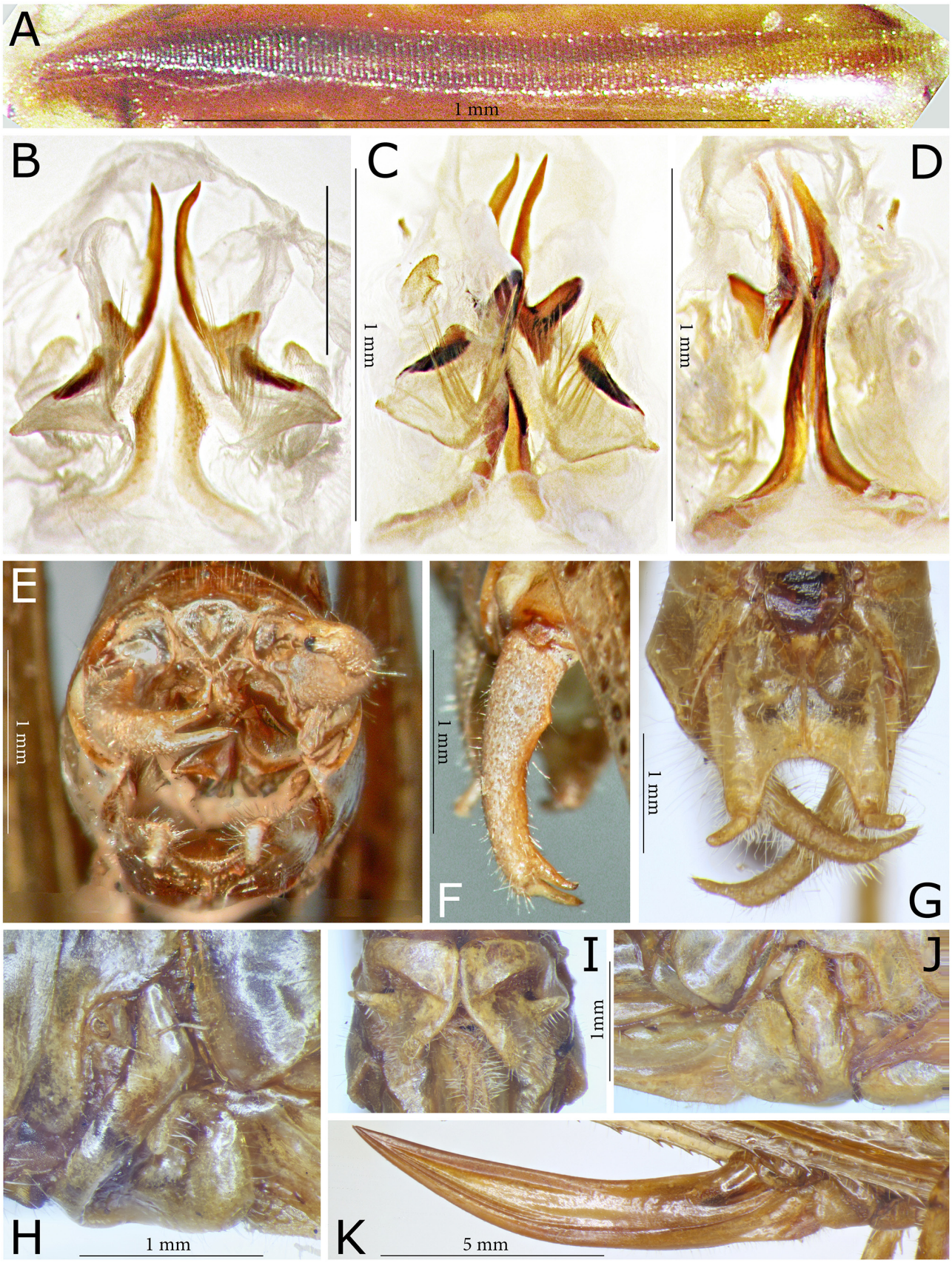

FIGURE 21. *Trichophallus armatus* **sp. nov.**: A–G, male: A, stridulatory file; B–D, titillators in ventro-apical (B), oblique ventro-apical (C), and oblique dorso-cranial view (D); E, abdominal apex in apical view; F, cercus; G, subgenital plate; H–K, female: H–J, subgenital plate in lateral (H, J) and in ventral (I) view; K**,** ovipositor.

Coloration. Yellowish brown with patterns 0-1-4. Pronotum with a medium brown medial band including pattern 3. Tegmen with light veins and dark cells. Variation: Vertex light but can be black in melanistic specimens. Patterns 2 and 4 missing in some individuals. Legs maculated in some individuals.

Measurements.—body: male 16–22, female 17–21; pronotum: male 5.0–5.3, female 4.8–5.3; tegmen: male 17.5–22.0, female 21–22; hind femur: male 12–14, female 13.5–15.0; longest antenna: female 60; ovipositor: 9–10 mm.

Etymology.—The name of the new species refers to the comparatively large and stout projections of the male titillators provided with acute tips; from Latin armatus = armed.

Trichophallus spinosus sp. nov.

Fig. 22

Holotype (male): Indonesia: Misool Island (West), elev. 0–75 m, 8 September–20 October 1948 (coll. M.A. Lieftinck), (Naturalis Leiden).

Other specimens studied: The type is unique.

Diagnosis. The new species is unique for the shape of the male cerci and the titillators. Thus it is useful to describe it despite of the rather bad preservation of the specimen. The cerci are elongate, straight in basal half, then slightly curved and little narrowing toward obtuse tip; from proximal surface of end of cercus provided with a long, narrow, and straight projection with little curved, acute tip. The titillators are fused in about basal halve, then separated and slightly sinuate and with re-curved, acute tips; from subbasal area of apical halve and connected by a narrow membranous area provided with compressed, long and strongly curved projections that afterward become narrow and rounded and at tip spinose.

Description. Medium sized to smaller species. Femora with the following number of spines on ventral margins: fore femur 5–7 external, 5 internal; meso- and hind femur missing.

Male. Stridulatory file with about 108 teeth. Tenth abdominal tergite terminating into two triangular lobes with rounded angles; apex angularly excised in between. Epiproct triangularly rounded with a pit in centre. Paraprocts with obtuse projections. Cerci conical, internal surface flattened; circa apical third curved mediad and with a long and narrow, slightly curved, apical-internal projection with acute tip. Subgenital plate with apex roundly excised; styli slightly longer than excised area.

Titillators with basal-central area fused, end of fused area truncate with a faint excision in middle, completely separated from apical parts which are forming a pair of a little twisted tubes which are strongly curved at apex and have the apical margin spinulose, their lateral margins connected with large, hyaline sacs; with an additional pair of apical sclerites that are completely separated from both the basal and the apical parts of titillators but connected by membranes at about transient area. Apical sclerites strongly curved with curve separating a wider but short basal from a very long and narrow, slightly curved apical area with pointing acute apex. Tiny hairs stand along the membranous rim along tip of phallus (Figs B + D)

Female. Unknown.

Coloration. Yellowish brown with patterns 1–4. Antennae annulated but scapus and pedicellus unicolored. Legs dotted.

Measurements of male.—body: 23; pronotum: 5; tegmen: 31.5 mm; hind femur: broken.

Etymology. *T. spinosus* **sp. nov.** is named for the long spear-shaped or spine-like projections of the titillators; from Latin spinosus = spiny.

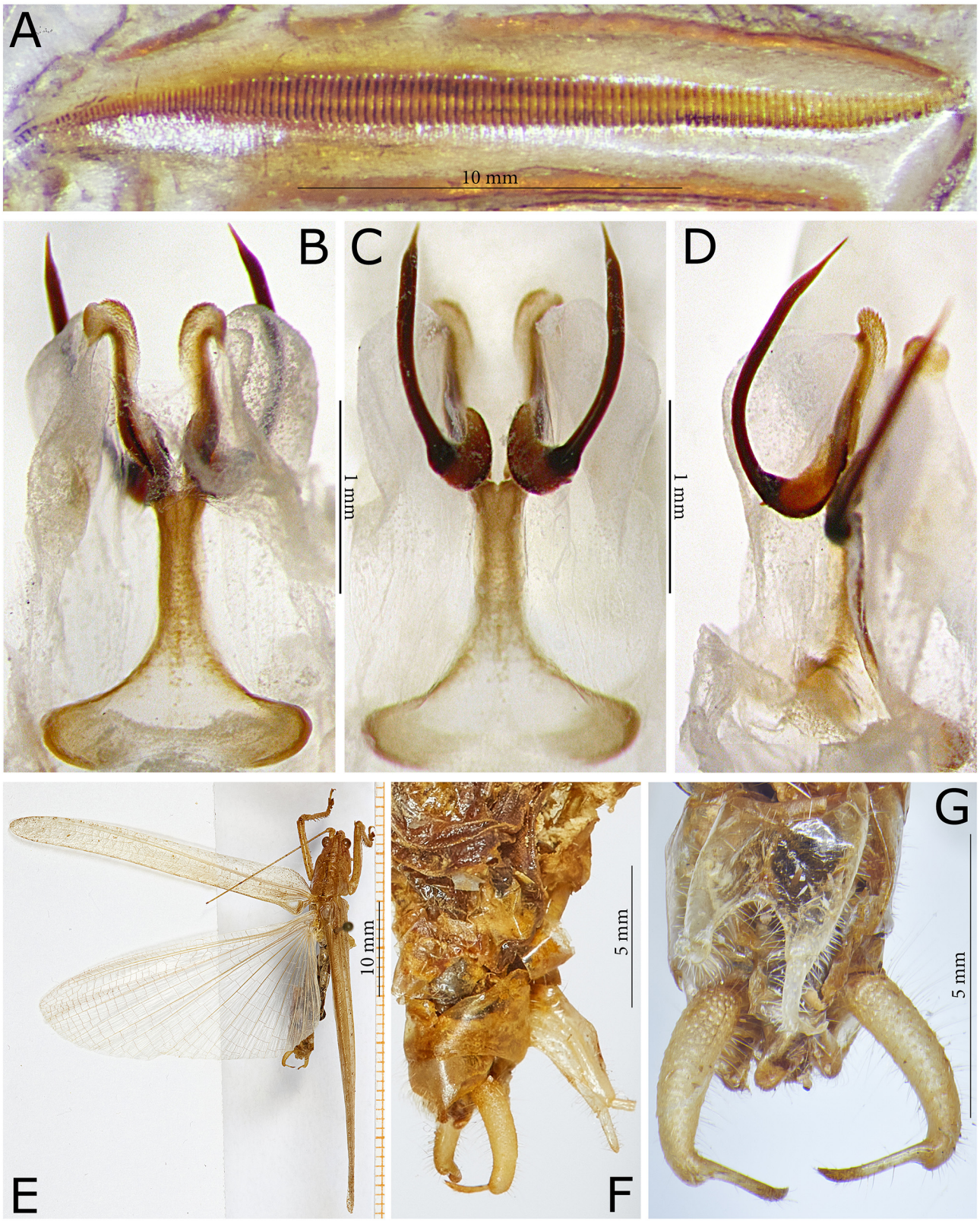

FIGURE 22. *Trichophallus spinosus* **sp. nov.** male (holotype): A, stridulatory file; B–D, titillators in dorso-cranial (B), ventro-apical (C) and oblique lateral (D) views; E, habitus; F–G, abdominal apex with subgenital plate and cerci in lateral (F) and in ventral view (G).

***Trichophallus aru* sp. nov.**
Figs. 23–24

Holotype (male): Indonesia: Aroe Eilanden, Manoembai en omgeving, 11–44, (6°2‘S, 134°18‘E), 1–31 October 1929, Snellius Expedition; depository: Naturalis Leiden.

Other specimens studied: Indonesia: Maluku, Aru Islands, Manoembai en omgeving, 11–44, (6°2‘S, 134°18‘E), 1–31.x.1929, coll. Mus. Leiden, Snellius Exp.—5 females, 4 males (Naturalis Leiden).

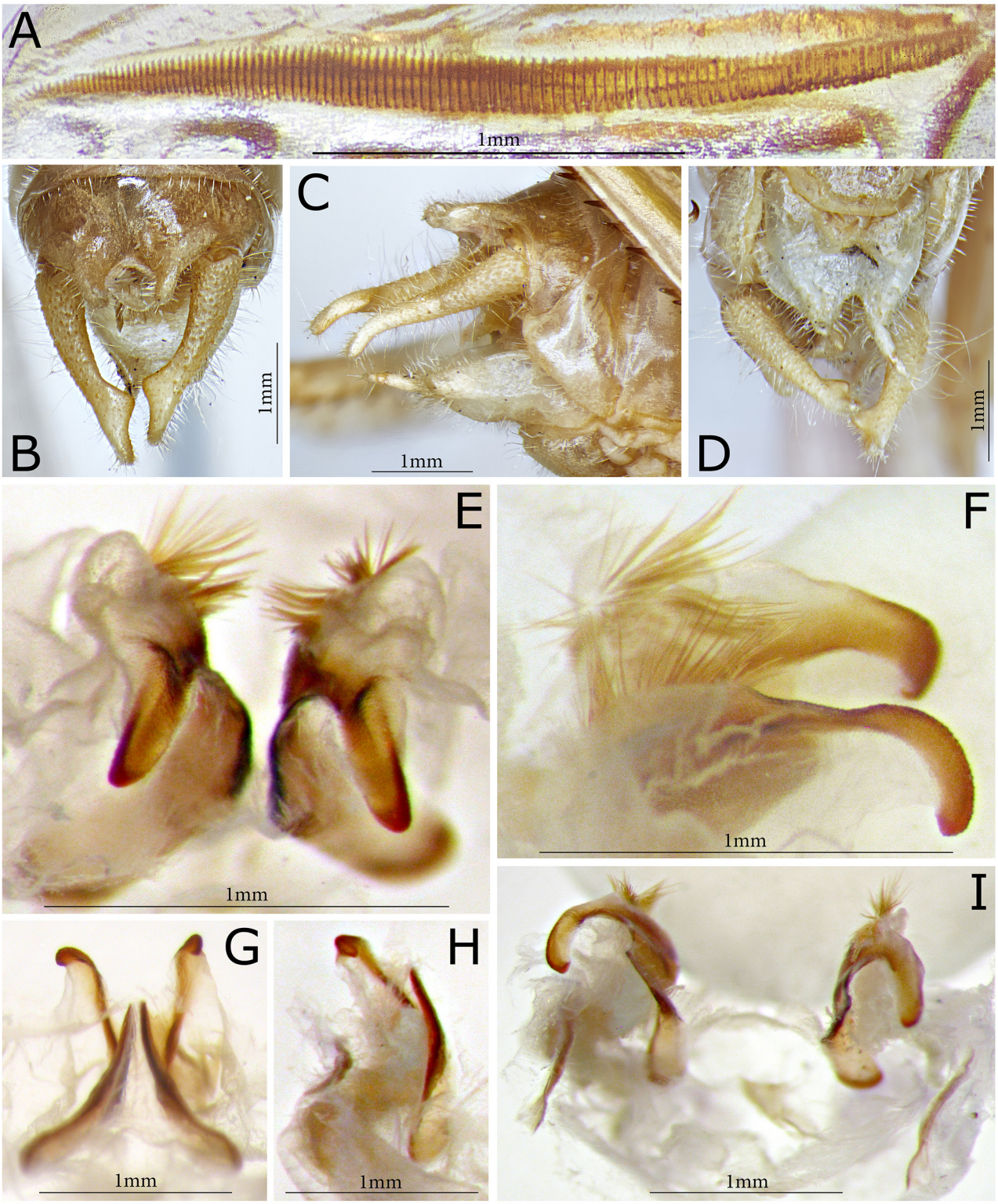

FIGURE 23. *Trichophallus aru* **sp. nov.** male: A, stridulatory file; B, supra-anal plate and cerci in dorsal view; C, abdominal apex in lateral view; D, subgenital plate and cerci in ventral view; E–I, titillators: E, I, view on tip; F, oblique lateral view; G, ventro-apical view; H, lateral view; A–D, H–I = male W52T893; E–G = male W52T894.

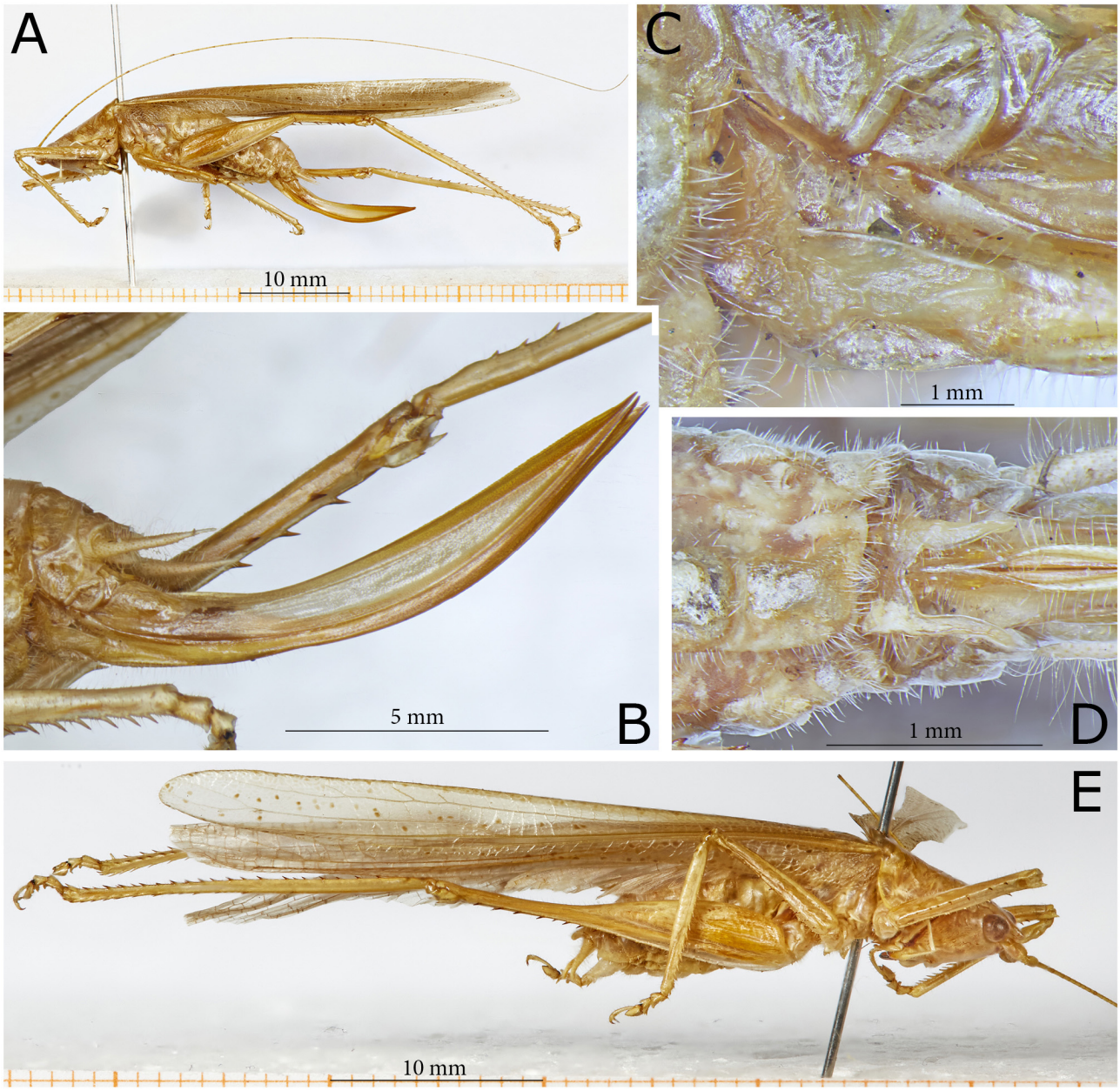

FIGURE 24. *Trichophallus aru* **sp. nov.**: A–D: female: A, habitus in lateral view; B, ovipositor; C–D, area around subgenital plate in lateral (C) and in ventral (D) view.—E, male habitus (holotype) in lateral view.

Diagnosis. The new species can be recognised by the shape of the rather narrow male cerci with converging margins and a short triangular, sub-apical internal projection. The shape of the male titillators is also characteristic. Females have the basal-lateral extensions of the subgenital plate relatively short, the central area short, and the apical projections moderately long and narrow in ventral view but rather high in lateral view.

Description. Medium sized species. Tegmina surpassing middle of hind tibia. Femora with the following number of spines on ventral margins: fore femur 6–9 external, 6–9 internal; mid femur 6–10 external, 3–5 internal near base; hind femur 11–15 external, 11–17 internal.

Male. Stridulatory file with about 107–115 teeth. Tenth abdominal tergite terminating into two compressed lobes slightly approaching each other posteriorly, roundly excised in between. Epiproct triangularly rounded, surface without pit. Cerci narrow, with little approaching margins, and toward end slightly down-curved; in sub-apical area with a short but wide, obtuse-angular, subapical-internal projection with rounded tip. Subgenital plate with apex triangularly excised; styli a little longer than excised area. Titillators consisting of three pairs of sclerites: the basal

pair simple, slightly curved and with approaching margins from rounded base to subacute tip, the central pair long, compressed, with both ends rounded, in basal area wide and in apical area sickle-shaped; the third pair is formed by the elongate and narrow lateral sclerites. The area that holds the first and second pair of sclerites together is formed by membranous structures that carry bulks of long hairs and bristles.

Female. Tenth abdominal tergite furrowed, apex with two short angular projections at both sides of midline. Subgenital plate with a weak medial carina; lateral angles of basal area swollen; apical lobes inserted at or a little dorsad of lateral angle, rather short, compressed, conical with rounded apex; basal-lateral areas only little projecting dorsad (little shrunk due to former preservation in alcohol and not well conserved). Eight abdominal tergite only little excised at lateral-posterior angles. Lateral areas of eight abdominal tergite, apical area of seventh abdominal sternite and ventral margin of ovipositor base setose; otherwise ventral ovipositor valves unmodified.

Coloration. (formerly preserved in alcohol). Yellowish brown with only pattern 1.

Measurements.—body: male 19–23, female 21–24; pronotum: male 5.8–6.2, female 5.8–6.2; tegmen: male 33.0–35.5, female 35–37; hind femur: male 17–18, female 17.5–18.5; antenna: male 80, female 75–80; ovipositor: 13 mm.

Etymology. The name of the new species refers to the type locality, the Aru Islands.

Trichophallus mollipes sp. nov.

Fig. 25

Holotype (male): Papua New Guinea: New Guinea (NE), Huon Pen. Pindiu, elev. 750–850 m (6°27‘S, 147°31‘E), 21 April 1963, coll. J. Sedlacek, depository: Bishop Museum, Honolulu (BPBM).

Other specimens studied: same data as holotype—1 male paratype (BPBM Honolulu).

Diagnosis. The new species is characterised by the long male cerci with obviously sub-membranous apical area and with an internal projection near end of basal third that carries at end two minute spines. Characteristic are also the titillators that have the sclerotised area small and only weakly expressed and embedded into a pair of rather large membranous structures with widened central areas that carry near end large hairs; apical areas narrow and approached to each other.

Description. Medium sized. Tegmina surpassing middle of hind tibia. Femora with the following number of spines on ventral margins: fore femur 2–6 external, 4–6 internal; mid femur 5–7 external, 3–4 internal near base; hind femur 10–11 external, 7–11 internal.

Male. Stridulatory file with about 95 teeth. Tenth abdominal tergite terminating into two short obtuse lobes, concave or obtuse-angularly excised in between. Epiproct with converging lateral margins except in apical area; apex truncate; dorsal surface with a deep pit. Paraprocts with compressed, roughly triangular projections from internal margin. Cerci faintly sinuate, with a little compressed internal tooth before middle of length with slightly concave anterior and convex posterior margins, at rounded tip with a pair of minute and little curved spines; apical areas of cerci collapsed in preserved specimens, might be partly membranous, apex obtuse. Subgenital plate roundly excised at apex; styli of almost equal length with excised area. Titillators mostly hyaline, simple; in middle with an obtuse projection that forms the base of a large, compressed, hyaline bursa of oval-triangular shape, surpassing titillators and with a tubular projection at inner apical angle; inner surfaces of bursae about one quarter before apical margin provided with a row of long bristles, the longest bristles reaching the tip of the tubular projection.

Female. Unknown.

Coloration. Yellowish brown with patterns 1, 2, 3, 4 or with all patterns (0 to 4) and vertex with a black medial band and legs with little distinct maculation.

Measurements of male.—body: 19; pronotum: 5.0–5.2; tegmen: 27–28; hind femur: 14.5–15.0 mm.

Etymology: The new species is named for the soft apical area of the male cerci.

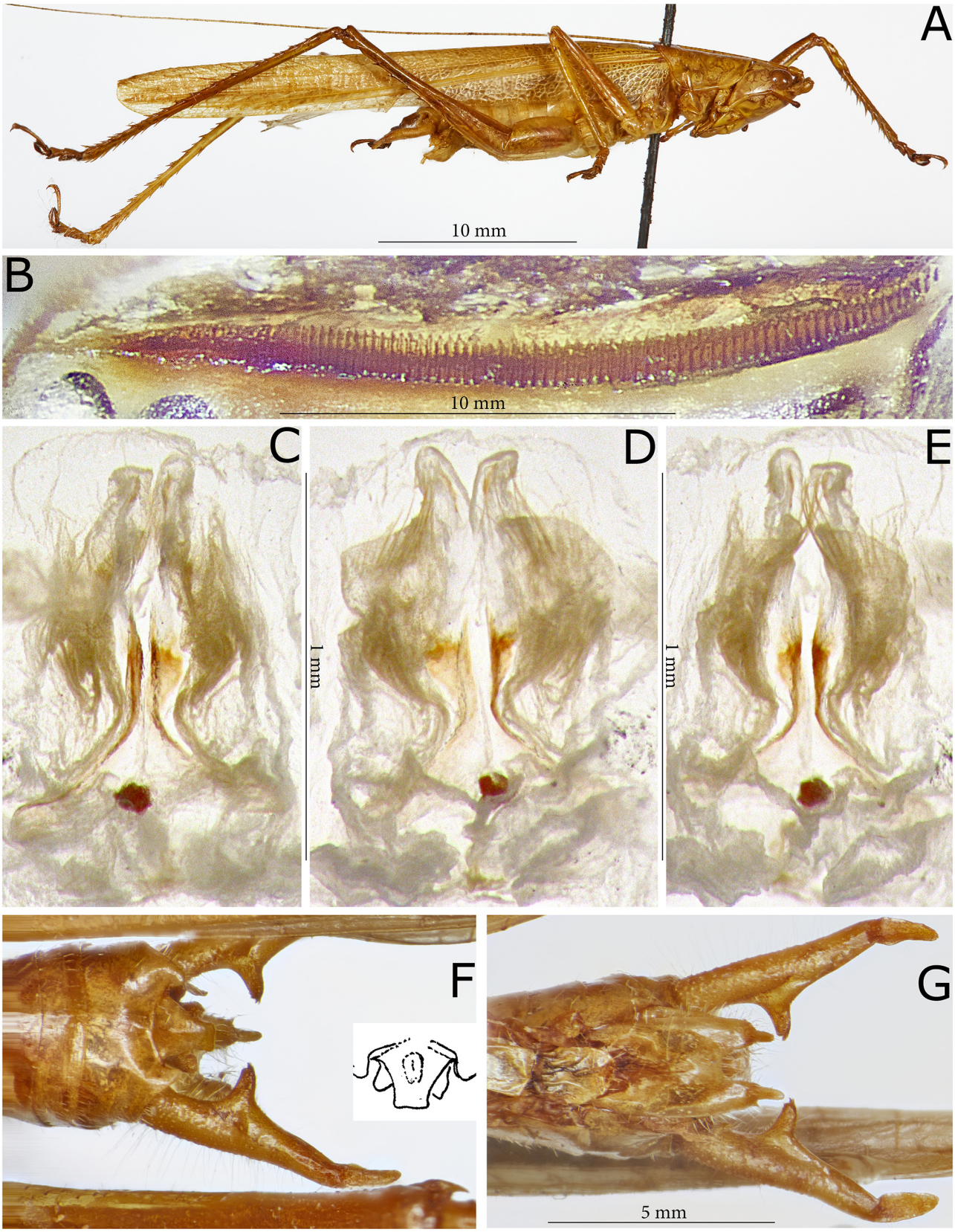

FIGURE 25. *Trichophallus mollipes* **sp. nov.** male holotype: A, habitus; B, stridulatory file; C–E, titillators in different views; F, end of abdomen with apical tergites and cerci in dorsal view (inset, epiproct); G, subgenital plate and cerci in ventral view.

***Trichophallus umboi* sp. nov.**
Fig. 26

Holotype (female): Papua New Guinea: New Guinea (NE), Umboi Island ca 8 km WNW Lab Lab, 300 m, 8–19.ii.1967, leg. G.A. Samuelson, at light.
Depository: Bishop Museum, Honolulu (BPBM).

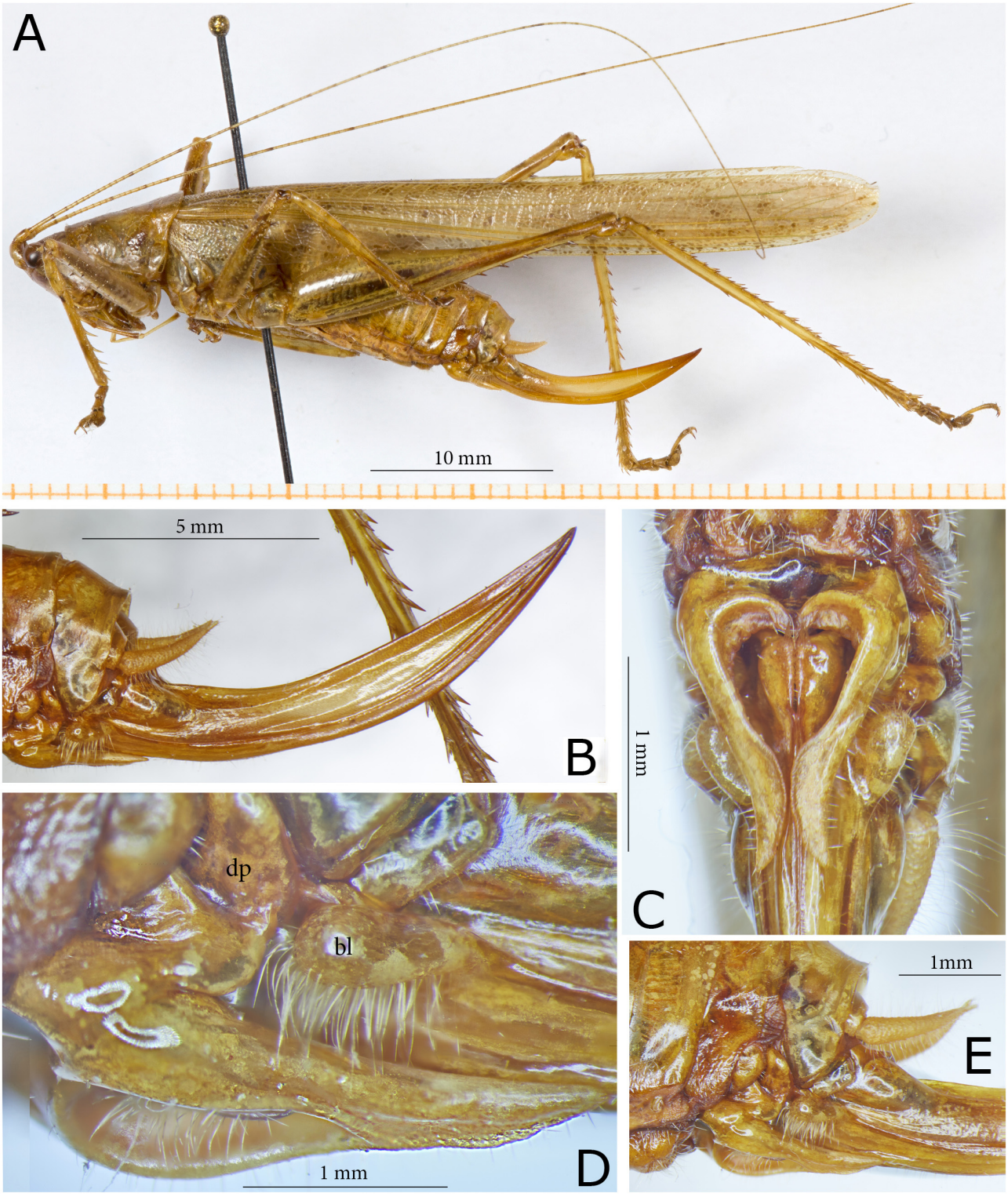

FIGURE 26. *Trichophallus umboi* **sp. nov.**, holotype female from Umboi Island: A, habitus female; B, ovipositor; C–D, subgenital plate in ventral (C) and in oblique lateral view (D); E, abdominal apex in lateral view. Abbreviations: dp, basal, dorsal extension of subgenital plate; bl, basal lobe of ventral ovipositor valve.

Diagnosis. The new species can be recognised by its large and stout appearance. It is larger than the majority of the other species of the genus. The female subgenital plate resembles in anterior area the shape in *T. gracilis* but has the marginal areas stiffened, widened, and strongly prolonged with the apical areas compressed and with the internal margins rounded, convex, the external margin little concave and the tip acute. *T. umboi* differs from other species of the genus by the strongly prolonged female subgenital plate.

Description. Larger and stouter than the majority of the other species of the genus. Apart from this the new species differs by the prolonged female subgenital plate that markedly surpasses the lateral lobes of the ventral ovipositor valves. The basal dorsal projection of the subgenital plate is furrowed in about mid-length. The ventral area of the subgenital plate has the transverse anterior area furrowed in midline, the lateral branches elevated but laterally compressed, while in the apical area it becomes dorso-ventrally compressed, little widened on convex internal margin and terminates into a subacute tip.

Male unknown.

Measurements of female.—total length with wings 48; body: 28; pronotum: 6.5; tegmen: 38.5; hind femur: 19; antenna: 85; ovipositor: 15 mm.

Etymology: The new species is named after the type locality—Umboi Island; noun in apposition.

Trichophallus Salomona Group

The following species of the Salomona Group are very similar in general appearance, as well as in the shape of the male tenth abdominal tergite that is provided with a long apical incision and the subgenital plate terminates into a pair of long apical lobes; also the titillators are very similar within this group. The species differ in the arrangement, size and shape of the pair of internal teeth of the male cerci as well as in length and curvature of the cerci and the exact position of the internal tooth. Conspicuous are differences in number and density of the teeth on the stridulatory file. Thus there might be differences in the acoustic behaviour between the species. Females of the group, so far known, have widened apical lobes of the subgenital plate that differ somewhat between species.

Trichophallus solomona solomona (Willemse, 1966)

***Subria solomona* C.Willemse 1966**

Fig. 27

Holotype (male): Solomon Isl., Malaita Auki, 22.9.1957 (BPBM Bishop Museum Honululu).

Paratype (female): Solomon Islands, Malaita, Auki, 1 female, paratype (Naturalis Leiden).

Other speciemens studied: Solomon Islands: Aruligo, R.A. Lever, 12.09.1934 (1 female); Buala, M. McQuillan, 25.2.28/1963 (1 female); Camp 2, Roy. Soc. Exp. BM 1966-1, P.J.M. Greenslade, 25.7.1965 (2 males); ex scrub covered laterid hillside (coastal) and frings of Casuarina forest, 23.9.1965 (1 female); Honiara, P.J.M. Greenslade, 02.02.1962 (1 female); Honiara Dist., Kukum, E.S. Brown, 22.1.1956 (1 female); KitipiR, P. Shanahan, 17.3.1964 (1 male); Kolombangara, D. Naturaga, 30.9.1965 (1 female); Kukum, E.S. Brown, 24.9.1964 (1 female), 04.12.56 (1 male), 14.7.1955 (1 male), 23.9.1965 (1 male); Kukum, M. McQuillan, 18.5.1963 (3 females); Kukum, P. Greenslade, 10.11.1963 (1 female); Makwalu, M. McQuillan, 25.9.1963 (1 female); Rendova, E.S. Brown, 10.09.34 (1 female); Rua Vatu, E.S. Brown, 04.07.55 (2 males, 3 females); Tatamba, Roy. Soc. Exp. BM 1966-1, P.J.M. Greenslade, 30.6.1965 (1 female); Umasani River camp, P.J.M. Greenslade, 13.7.1965 (1 female); Warahito River, Camp Site, Roy. Soc. Exp. BM 1966-1, P.J.M. Greenslade, 28.7.1965 (2 females), (specimens in NHM/BMNH).—Solomon Islands, Auki, J.L. Gressit, 18.9.1957 (1 female); Lunga River (Mth.), H.E. Milliren, 10.08.14 (1 female); Poha River, J.L. Gressitt, 07.02.56 (1 male); Pusisama, P. Shanahan, 17.11.1963 (1 female); Ulo Crater, P. Shanahan, 12.09.63 (1 female); Solomon Islands, J.A. Kusche, 18.12.1920 (1 female), (specimens in BPBM Bishop Museum Honululu); North Solomons Province, Bougainville, Buin (1 female), Brussels (ISNB).

References: *Subria solomona* C.Willemse 1966, Publ. natuurh. Gen. Limburg 16: 11, fig. 19. 1966 Willemse, Publ. Natuurhist. Genoot. Limburg 16: 11—1979 Nishida, Pacific Insects 20: 27–32 (Type data).

Diagnosis. Males of *T. solomona* can be recognised by the long apical excisions of both, the tenth abdominal tergite and the subgenital plate, combined with curved, elongate cerci that are provided in subapical area with a rather large triangular expansion. The titillator is simple with a small curved spine at tip, it comes along with membranous folds that carry hairs along margin. Females have a plate-shaped subgenital plate with both halves obviously movable against each other along mid-length and with triangular ends; the basal-lateral extensions are simple and flat.

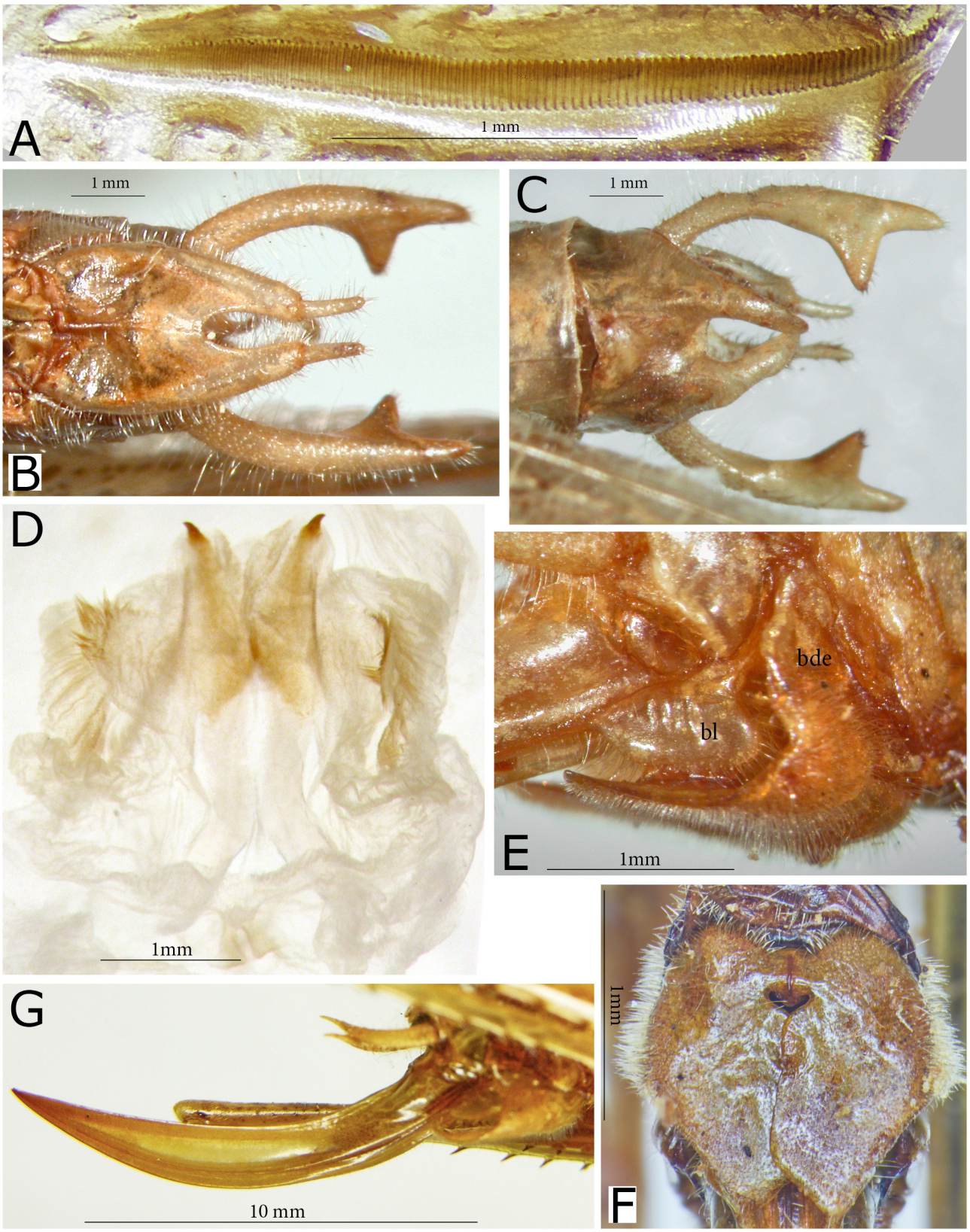

FIGURE 27. *Trichophallus solomona solomona* (Willemse, 1966): A–D, male: A, stridulatory file; B, subgenital plate and cerci in ventral view; C, last abdominal tergite and cerci in dorsal view; D, phallus with titillators in ventro-apical view.—E–G, female: E, subgenital plate with baso-dorsal extension (bde) and with baso-ventral lobe (bl) of ventral ovipositor valve in lateral view; F, subgenital plate in ventral view; G, ovipositor.

Description. Rather large for the genus. Tegmina surpassing middle of hind tibia. Femora with the following number of spines on ventral margins (paratype): fore femur 6 external, 5 internal; mid femur 6–7 external, 3 internal near base; hind femur 9–11 external, 12–15 internal. Femora with the following number of spines on ventral margins: fore femur 4–7 external, 2–6 internal; mid femur 5–7 external, 2–4 internal near base; hind femur 9–13 external, 10–18 internal.

Male. Stridulatory file with about 122–130 teeth. Tenth abdominal tergite terminating into two long projections that are slightly curved mediad and ventrad. Epiproct triangular. Paraprocts compressed with apical margin triangularly projecting and curved ventral-lateral, tip setose. Cerci long, distinctly surpassing projections of tenth abdominal tergite, curved in basal half, apical half almost straight, with a dorso-ventrally compressed, triangular, internal tooth at about beginning of apical third. Subgenital plate setose, apex with a narrow ovoid excision for more than a third the length of the subgenital plate; styli shorter than excised area. The titillators are widened around mid-length and carry at end a small curved spine. On both sides of the titillators there is a compressed membranous plate with hairs around margin. The basal-dorsal expansions are simply flat. They form, together with the margin of the plate, a wall around the basal-lateral projection of the ventral ovipositor valve.

Female. Tenth abdominal tergite furrowed and apex with a spiniform projection at both sides of midline. Subgenital plate in entire basal area furrowed and with a weak medial carina in the furrow; divided for the greatest part into two broad lobes widening in basal half, narrowing in apical half; internal margins straight except at apex and slightly overlapping in midline; apices of lobes rounded. Lateral areas roundly curved dorsad, roughly triangular, with a shallow furrow. Dorsal margin of ventral ovipositor valves at base with an elongate, setose projection pointing ventrad, roughly triangular with angle rounded, swollen in proximal, shallowly depressed in distal area. Eight abdominal tergite with lateral-posterior angles greatly excised and connected with lateral projections of subgenital plate by a wide membranous area. Subgenital plate and lateral areas of eight tergite strongly setose.

Coloration. Yellowish brown with patterns 0-1-4 or with all marks (0 to 4). hind femur with dorsal and apical areas stippled.

Measurements (7 males, 10 females).—body w/o wings: male 24–30 (26.9±2), female 25–32 (27.8±2.2); pronotum: male 6–6.5 (6.3±.2), female 6–6.8 (6.4±.3); tegmen: male 35.5–40.5 (37.9±1.7), female 37–42 (39.8±1.7); hind femur: male 18.5–20 (19.1±.7), female 18.5–21 (19.4±.9); antenna: male 65–85 (78.8±9.5), female 65–90 (71.3±12.5); ovipositor: female 11.5–14 (12.7±.8) mm.

Trichophallus solomona pilorota subspec. nov.

Fig. 28

Holotype (male): Papua New Guinea: Northern prov., Popondetta, elev. 60 m, 1–4 September 1963, coll. J. Sedlacek (Bishop Museum Honolulu, BPBM).

Other specimens studied: Papua New Guinea: Northern distr., Agricultural Station Popondetta, 8 August 1962 (coll. A. Catley)—1 male, head missing (Naturalis Leiden); Northern distr., Agricultural Station Popondetta, 8 August 1962 (coll. A. Catley)—1 male (Naturalis Leiden). New Guinea (NE), Kokoda, elev. 366 m, 17–18 November 1965 (coll. J. & M. Sedlacek)—1 male (Bishop Museum, Honolulu (BPBM)); New Guinea NE, Northern, Kokoda, elev. 366 m, 1–30 September 1933 (coll. L.E. Cheesman)—1 male (NHM London).

Diagnosis. The new subspecies, *T. s. pilorota* resembles nominate *T. solomona* in general habitus although it is in the mean of slightly smaller size. Also the male cerci are similar between both taxa having a triangular internal lobe from subapical area. But marked differences can be found in the shape of the stridulatory file which is wider and carries less numerous teeth in *T. pilorota* (108–110) but narrower and with distinctly more numerous teeth in *T. solomona* (122–130 teeth).

Description. Medium sized species. Tegmina reaching apical quarter of hind tibia. Femora with the following number of spines on ventral margins: fore femur 4–7 external, 3–5 internal; mid femur 6 external, 2–4 internal near base; hind femur 5–12 external, 10–16 internal.

Fastigium verticis before eyes 0.6 mm; fastigium verticis from base 0.9 mm; dorsal eye length 1.3 mm; greatest diameter of eye 1.3 mm; index fastigium verticis from base : eye length 0.7; index fastigium verticis from base : greatest eye diameter 0.7.

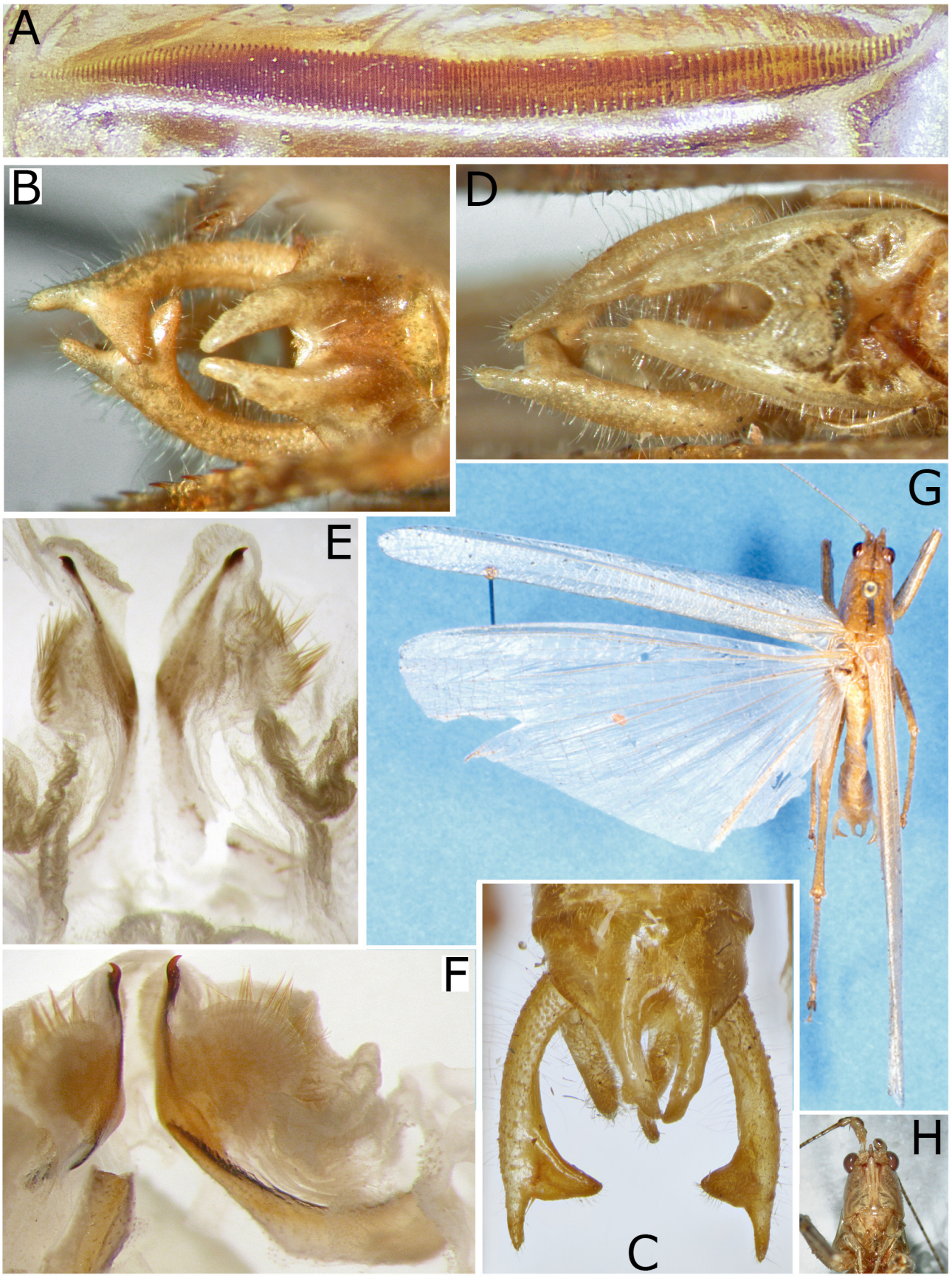

FIGURE 28. *Trichophallus solomona pilorota* subspec. nov.: A, stridulatory file; B–C, end of abdomen and cerci in dorso-apical view; D, subgenital plate and cerci in ventral view; E–F, titillators of 2 different males; G, habitus with spread wings; H, face.—Male from northern Popondetta (A, C, E, G, H, in BMH); (B, D, in NHM); (F, in Naturalis).

Male. Stridulatory file with about 108–110 teeth. Tenth abdominal tergite terminating into two long conical projections, slightly curved ventrad at apex and almost reaching internal tooth of cercus. Epiproct very small, hidden under projections of tenth tergite. Paraprocts with a long and narrow projection. Cerci elongate, slightly curved, with a large subapical internal tooth, roughly triangular with rounded apex; apical area of cercus behind internal tooth thin, styliform. Subgenital plate with a long excision at apex; styli of about half the length of excised area.

Titillators separate; apical parts triangularly widened at base, apical area conical and apex provided with a hook; apical parts supporting internal surface of membranous bursae which are forming two rounded lobes: around apical area of titillaters and around triangular expansion of apical parts; the latter provided with long bristles along margin. Membranes on each side of titillators with an irregular area of dense granulation. Phallus membranes forming a cap around apices of titillators.

Female unknown.

Coloration. Yellowish brown with patterns 1, 3 and 4.

Measurements of male.—body: 22–27; pronotum: 5.3–5.7; tegmen: 33.5–35.5; hind femur: 16–18 mm.

Etymology. The name of the new subspecies refers to the pilose rounded extension of the titillators (from Latin: pilose = hairy; rota = wheel).

Trichophallus apicatus sp. nov.

Fig. 29

Holotype (male): New Guinea: New Guinea, Wogen, Anazu Bay, 2300‘, elev. 701 m, 23 October–11 December 1962 (coll. W.W. Brand) (Naturalis Leiden).

Other specimens studied: Papua New Guinea: New Guinea (NE), Morobe Dist., Wau, elev. 1200 m, 27 October 1968–1 male paratype (Bishop Museum, Honolulu (BPBM)).

Diagnosis. The new species is similar to other species that have elongate apical projections of the tenth abdominal tergite, elongate titillators with a single hook at end and membranous lateral expansions that carry a row of hairs as e.g. in *T. solomona*. It differs by the elongate, narrow, and slightly curved cerci, that have the internal projection inserted nearly at end. Another difference is found in the cerci being slightly but regularly curved over the whole length and divided almost at tip into an incurved dorsal lobe with subacute tip and a substraight ventral lobe also with subobtuse tip; both short.

Description. Medium sized species. Tegmina reaching apex of hind tibia. Femora with the following number of spines on ventral margins: fore femur 3–6 external, 4–5 internal; mid femur 5–6 external, 3 internal near base; hind femur 8–10 external, 11–14 internal.

Male. Stridulatory file on underside of left tegmen with about 103 distinctly spaced teeth. Tenth tergite terminating into two long, conical projections, slightly curved and approaching each other at end, apex long and narrowly excised in between. Epiproct small, obtuse triangular, hidden below projections of tenth tergite. Paraprocts with internal margin extended into compressed, rounded projections. Cerci long and narrow, slightly curved, with a large, conical, subapical, internal projection. Subgenital plate roundly excised at end; styli little shorter than excised area.

Titillators separate, elongate; apical parts at first a little widened, then narrow, at end with an acute hook; apical parts supporting internal surface of small membranous sacs which are roundly projecting and have the margin provided with long bristles. On both sides of apical small sacs phallus membranes with a distinct granular area.

Female. Unknown.

Coloration. Yellowish brown with patterns 0-1-4. Legs with brown dots.

Measurements (2 males).—body w/o wings: 22–25; pronotum: 4.8–5.5; tegmen: 32.0–32.5; hind femur: 15.0–15.5; antenna: 62 mm.

Etymology. The name of the new species refers to the branching point of the tooth of the cercus.

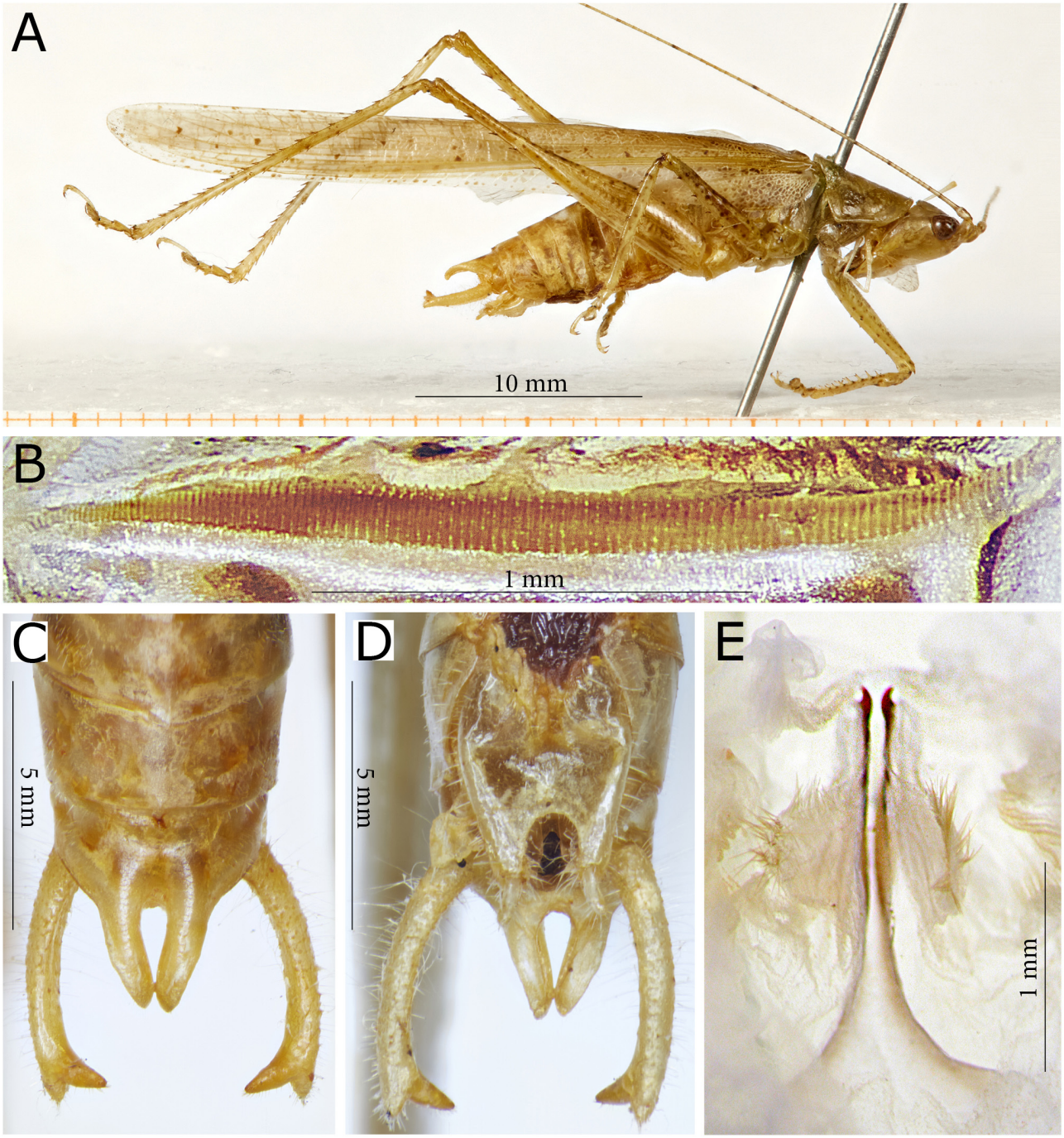

FIGURE 29. *Trichophallus apicatus* **sp. nov.** male: A, habitus lateral view; B, stridulatory file; C, end of abdomen with supra-anal plate and cerci in dorsal view; D, end of abdomen with subgenital plate and cerci in ventral view; E, titillators.

Trichophallus uniformis **(Willemse, 1966) comb. nov.**

Figs. 30–31: 110155F + 110155M

Subria uniformis C. Willemse 1966, Publ. natuurh. Gen. Limburg 16: 10, fig. 18.1966 Willemse, Publ. Natuurhist. Genoot. Limburg 16: 10—1979 Nishida, Pacific Insects 20: 27–32 >>Type data—Otte, D. 1997. Orthoptera Species File 7:70 >> Note: 1996 Ingrisch pers. comm.: probably not *Subria* >> *Subria uniformis*

Holotype (male), allotype (female), New Britain, Gazelle Penins. Bainings St. Pauls 350m, 07.09.1955, J.L. Gressitt (BPBM Honolulu Museum), both not re-exemined.

Other specimens studied: Papua New Guinea: New Britain, Gazelle Pen., Bainings: St. Paul‘s, elev. 350 m, 7 September 1955 (coll. J.L. Gressit)—1 male, 1 female (Bishop Museum, Honolulu (BPBM)); New Britain, Gazelle Pen., Bainings:

St. Paul's, elev. 350 m, 9 September 1955 (coll. J.L. Gressit)—1 female (Bishop Museum, Honolulu (BPBM)); New Britain, Gazelle Pen., Gaulim, elev. 130 m, 28 October 1962 (coll. J. Sedlacek)—1 male (Bishop Museum, Honolulu (BPBM)); New Britain, Gazelle Pen., Mt. Sinewit, elev. 1100–1200 m, 15–16 November 1962 (coll. J. Sedlacek)—1 male (Bishop Museum, Honolulu (BPBM)); New Britain, Gazelle Pen., Talliligap, elev. 300 m, 17–18 December 1962 (coll. J. Sedlacek)—1 female (Bishop Museum, Honolulu (BPBM)); New Britain, Gazelle Pen., Upper Warangol, elev. 250–700 m, 6–7 December 1962 (coll. J. Sedlacek)—1 male (Bishop Museum, Honolulu (BPBM)); New Britain, Kerawat, elev. 135 m, 20–25 November 1959 (coll. T.C. Maa)—1 male (Bishop Museum, Honolulu (BPBM)); New Guinea (NE), East New Britain, „New Guinea", Rabaul, 22 October 1932 (coll. J.L. Froggatt)—1 female (NHM London).

Records not examined: West New Britain, New Britain, Linga Linga Plain, W. of Willaumoz Pen. l m., 12 April 1956 (coll. J.L. Gressitt)—1 male **paratype** (Naturalis Leiden).

Diagnosis. Males of *T. uniformis* can be recognised by the shape of the elongate cerci that carry a hump with a spine near base, the subgenital plate is of medium length and the last abdominal tergite provided with a short apical excision; the male cerci have the reduced acute internal process in apical area; titillators are provided with one pair of main sclerites. Females have the subgenital plate projecting more laterally than in other species of the genus and the apical projections are markedly curved and reaching about mid-length of the conical projections of the ventral ovipositor valves.

Description. Medium sized to large species. Tegmina reaching apical third of hind tibia. Femora with the following number of spines on ventral margins: fore femur 4–7 external, 3–6 internal; mid femur 6–7 external, 2–4 internal near base; hind femur 9–12 external, 11–15 internal.

Male. Stridulatory file with about 130–136 teeth. Tenth abdominal tergite terminating into two short projections, with a wide and concave or truncate excision in between. Epiproct rectangular with a deep pit near base, apex convex or truncate. Paraprocts with internal margin swollen and slightly projecting. Cerci long and narrow, conical and slightly sinusoidal curved; with a large, acute, internal projection before middle of length; apex of cercus often collapsed in set specimens, with or without a spinule at tip. Subgenital plate setose, roundly excised at apex; styli long and thin, of nearly equal length with excised area.

Titillators short and stout, apex covered with a rounded sheath; with a bilobate bursa at each side laterally of titillator apex; ventral-medial lobe conical, granular, little sclerotised, margin spinulose; dorsal-proximal lobe large, semi-ovoid behind apex of titillators, and at bottom of internal surface provided with a row of large bristles surpassing apex of lobe; at dorsal-proximal side lobe conically projecting with rounded apex; external surface of bursae with a distinctly granular and slightly sclerotised area.

Female. Tenth abdominal tergite divided in midline. Subgenital plate with entire ventral area short, transverse, grooved, and with an apical carina that is slightly curved backwards on both sides towards middle, divided in midline; projections of ventral area compressed, almost straight but pointing apical-medial, with ventral-medial margin concave and apex obliquely truncate or convex; lateral areas divided by a carina in about middle of height and a furrow dorsal of carina, area dorsal of furrow bent lateral. Eight abdominal tergite with lateral-posterior angle excised; a lobe of the intersegmental membrane that is carrying the stigma is stiffened and swollen and partly covering the lateral area of the subgenital plate. Dorsal margin of ventral ovipositor valves at base with an elongate, swollen, setose, oblique triangular projection with rounded angle.

Variations: (1) Lo003F001: Subgenital plate lateral area with strong 90° fold in middle; just ventral of fold with a high lamella; ventral and ventral apical margins swollen; dorsal margin little sinusoidal.—(2) Lo003F002: Tenth abdominal tergite divided in midline. Epiproct triangular; dorsal surface grooved. Cerci narrow, slightly curved; apex pointed. Subgenital plate in short basal part with surface slightly grooved; afterwards divided into two widely spaced, compressed, narrow lobes approaching backwards; lateral areas bent from ventral surface in greater than 90° angle, strongly concave with swollen margin and weak carina in middle. Ovipositor falcate; dorsal margin of ventral valves with conical, hairy appendage at base.

Coloration. Uniformly yellowish brown. Pronotum with faint indication of brown medial band split by a white line. Tegmen nearly transparent with scattered brown dots and brown dorsal margin.

Measurements.—body: male 22–27, female 19–28; pronotum: male 5.6–6.2, female 5.5–6.5; tegmen: male 33–38, female 34.0–38.5; hind femur: male 16.5–18.0, female 13–18; antenna: male 60–75, female 65–85; ovipositor: 11.5–12 mm.

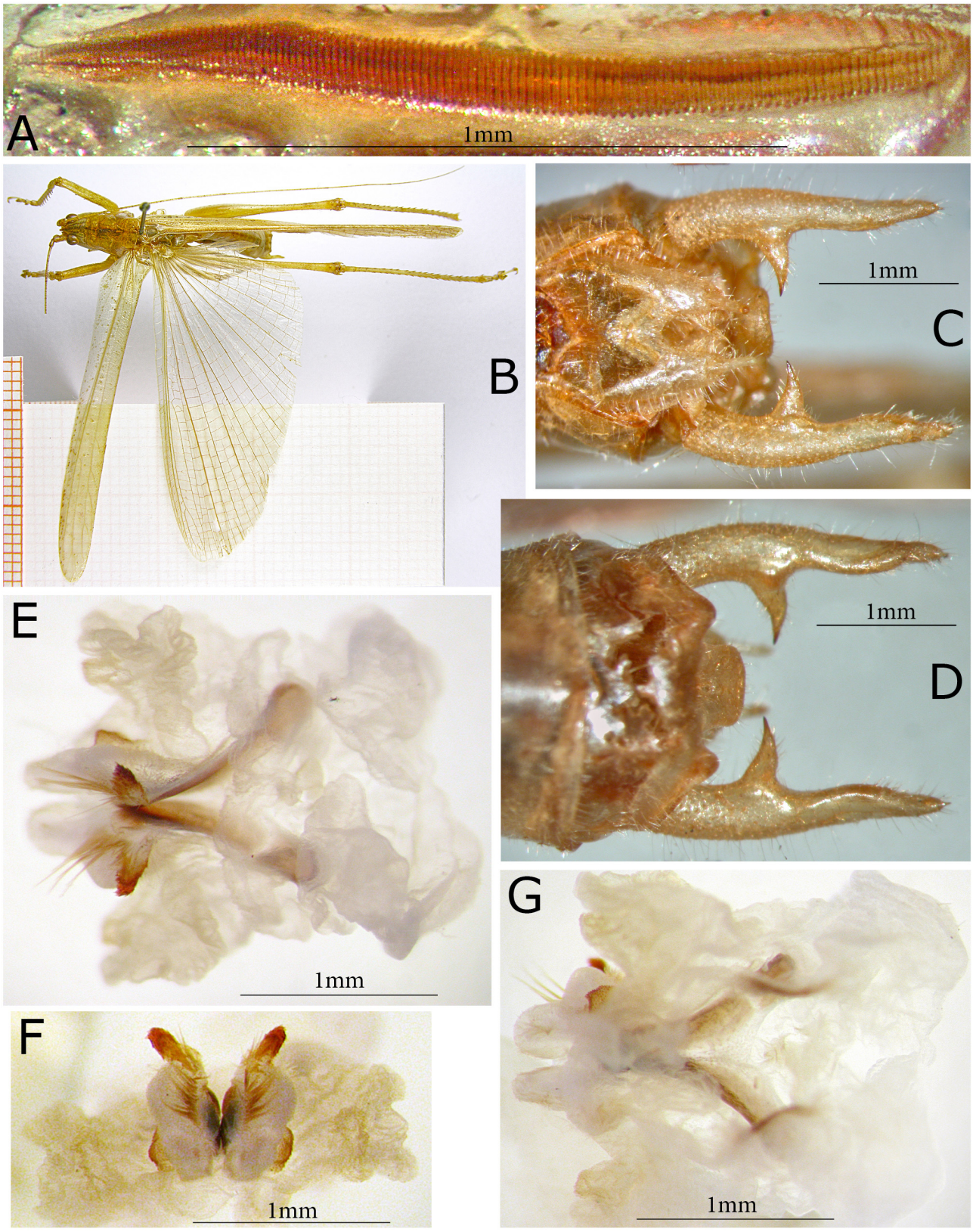

FIGURE 30. *Trichophallus uniformis* (Willemse, 1966) male: A, stridulatory file; B, habitus male with left wings spread; C, subgenital plate and cerci in ventral view; D, last abdominal tergite and cerci in dorsal view; E–G, titillators in ventro-apical (E), apical (F), and dorsal-proximal view (G). Male from Linga Linga Peninsula (New Britain).

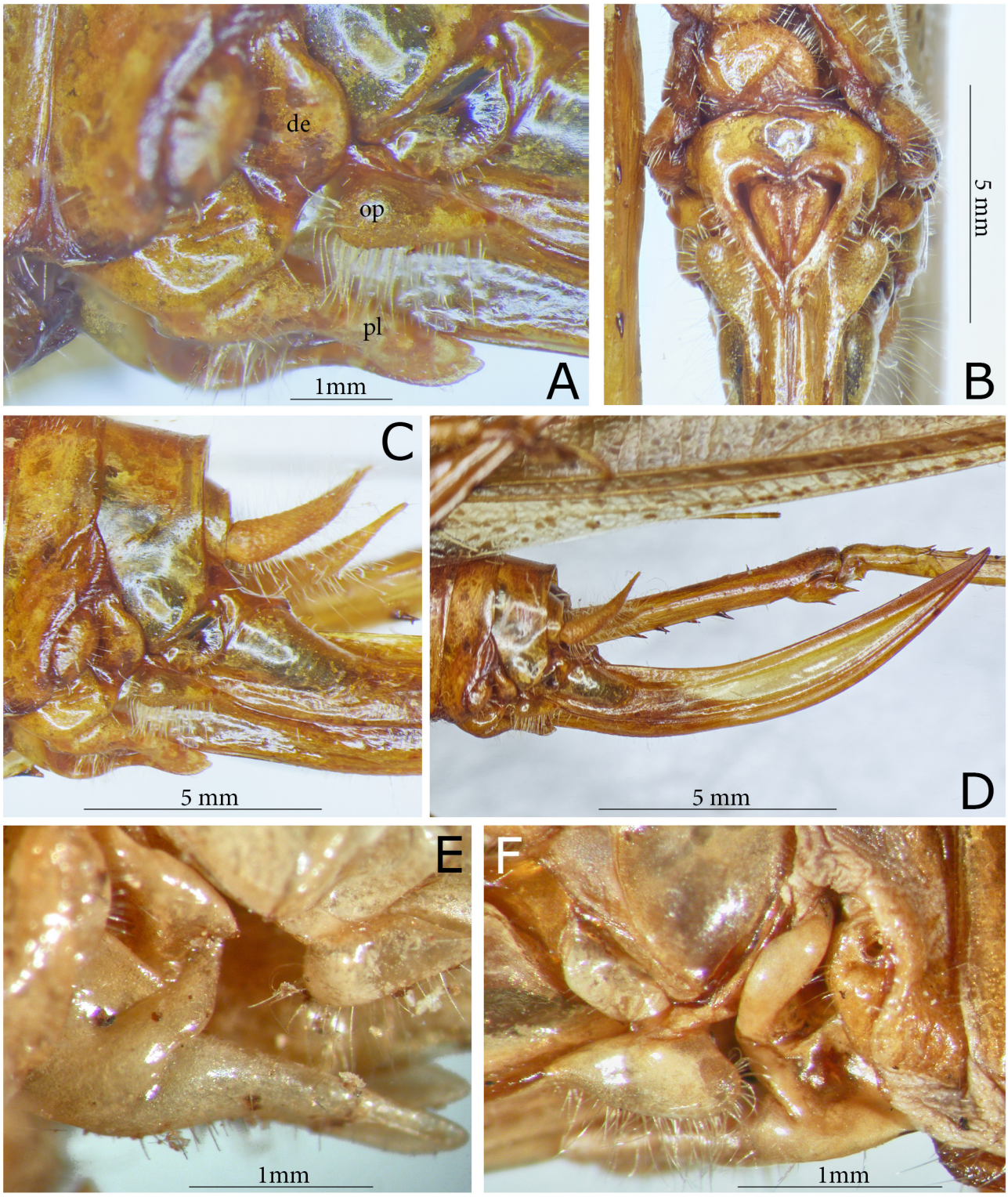

FIGURE 31. *Trichophallus uniformis* (Willemse, 1966) females: A, E–F, subgenital plate and dorsal lobes of ventral ovipositor valves in lateral view; B, subgenital plate in ventral view; C, abdominal apex in lateral view; D, ovipositor.—A–D, female from Gazelle Peninsula; E, female from Rabauel; F, female from Vagau.—Abbreviations: de, basal dorsal expansion of subgenital plate; pl, plate with apical prolongations; op, oval projection from dorsal margin of ventral ovipositor valve.

***Trichophallus willemsei* sp. nov.**
Fig. 32F–K, Fig. 33A–E

Holotype (m): HI011M008 = Papua New Guinea, Aroa Estate, W of Redscar Bay, grasses (9°1‘33.76“S 146°39‘45.3“E), 30.ix.1958, J.L. Gressit (Bishop Museum Honolulu, BPBM).

Other specimens studied:

Papua New Guinea: New Guinea S. E., Haveri, VII–XI.1893, (coll. Loria)—1 female (Genoa (MCSN)); Papua New Guinea, Aroa Estate, W of Redscar Bay, grasses, elev. 1 m, 29 October 1958 (coll. J.L. Gressit)—1 female (Naturalis Leiden); New Guinea, Middle Fly River, 250–300 miles up, 1 July–31 August 1928 (coll. Perberton)—1 female (Bishop Museum, Honolulu (BPBM)); Papua New Guinea: Daradae near Javarere, Musgrove R., elev. 100 m, 3 October 1958 (coll. J.L. Gressitt)—2 males (Bishop Museum, Honolulu (BPBM)); New Guinea, Koitaki, elev. 457.2 m, 1 October–30 November 1928 (coll. Pemberton)—2 males, 1 female (Bishop Museum, Honolulu (BPBM)); New Guinea S. E., Haveri, VII–XI.1893, (coll. Loria)—1 female (Genoa (MCSN)); Nouvelle Guinée, Kubuna,—1 female (Paris (MNHN)); Papua: Mt. Tafa, elev. 2590.8 m, 1–31 March 1934 (coll. L.E. Cheesman)—1 female (NHM London); Papua New Guinea, Aroa Estate, W of Redscar Bay, grasses, elev. 1 m, 30 September 1958 (coll. J.L. Gressit)—2 males (Bishop Museum, Honolulu (BPBM)); Papua New Guinea, Aroa Estate, W of Redscar Bay, grasses, elev. 1 m, 29 October 1958 (coll. J.L. Gressit)—1 female (Naturalis Leiden); Papua New Guinea, between Ladoki [d? - pin] River and Brown River, elev. 35 m, 16 March 1956 (coll. J.L. Gressit)—1 female (Bishop Museum, Honolulu (BPBM)); Papua New Guinea, Brown River, 23 October 1960 (coll. J.L. Gressit)—1 female (Bishop Museum, Honolulu (BPBM)); Rigo District PNG, 1–31 October 1928 (coll. Pemberton)—3 males, 1 female (Bishop Museum, Honolulu (BPBM)).

Diagnosis. The new species is closely related to *T. solomona* Will., It differs however by the shape of the male cerci that have a narrow and little curved internal process shortly behind mid-length of cercus while in *T. solomona* the internal process is compressed, triangular and arises from the subapical area. Females differ from the latter species by narrower lobes of the subgenital plate that do not overlap in apical area when at rest and have in basal area a wide and conspicuously grooved furrow instead of a small pit.

Description. Medium sized species. Tegmina reaching apical quarter of hind tibia. Femora with the following number of spines on ventral margins: fore femur 4–7 external, 4 internal; mid femur 6–7 external, 3 internal near base; hind femur 8–10 external, 8–12 internal. Femora with the following number of spines on ventral margins: fore femur 3–7 external, 3–5 internal; mid femur 5–7 external, 2–4 internal near base; hind femur 7–11 external, 7–15 internal.

Male. Stridulatory file with about 111 teeth, less densely arranged than in *T. murua* **sp. nov.** Tenth abdominal tergite with two long apical projections slightly curved mediad and ventrad. Epiproct small, obtuse-triangular or rounded with a pit in middle. Paraprocts with a styliform projection at internal margin. Cerci elongate, narrow, very faintly sinuate, with a large compressed internal tooth in middle of length which is roughly triangular with curved margins and setose apex. Subgenital plate long-roundly excised at apex; setose, especially dorsal-internal and medial areas of apical lobes densely covered with long setae; styli little shorter than excised area or of almost equal length. Titillators hyaline, simple, in about apical third with an angular fold, at apex with a small curved spine; apical parts supporting internal surface of membranous bags which are forming two rounded lobes: around apical area of titillators and around triangular expansion of apical parts; the latter provided with long bristles along margin.

Female. Tenth abdominal tergite furrowed and apex with a short spiniform projection at both sides of midline. Subgenital plate with entire basal area deeply furrowed and with an incomplete weak medial carina in the furrow; circa apical half of plate divided into two broad lobes touching each other in midline; external margin of lobes first concave, then convex, internal margin straight, then convex, apex obliquely subtruncate with angles broadly rounded; basal-lateral areas greatly extended dorsad and with apical margin convex. Eight abdominal tergite with lateral-posterior areas excised but very marginal area again a little projecting. Dorsal margin of ventral ovipositor valves at base with an elongate setose projection. Subgenital plate with short setae; its lateral areas strongly bent dorsad, flattened and faintly grooved; dorsal margin rounded.

Coloration. Yellowish brown with patterns 0-1-4. hind femur with dorsal and apical areas stippled; genicular areas of all legs indistinctly maculated and stippled.

Measurements (9 males, 9 females).—body w/o wings: male 20–24 (21.7±1.4), female 17–26 (21.3±2.9); pronotum: male 5.2–5.5 (5.4±.1), female 5–6 (5.4±.3); tegmen: male 30.5–33 (31.3±.9), female 30–33.5 (31.8±1.1); hind femur: male 15–16.5 (15.8±.6), female 15–18 (16.3±.9); antenna: male 50–55 (52.5±3.5), female 50–55 (52.5±3.5); ovipositor: female 10–11.5 (10.8±.5) mm.

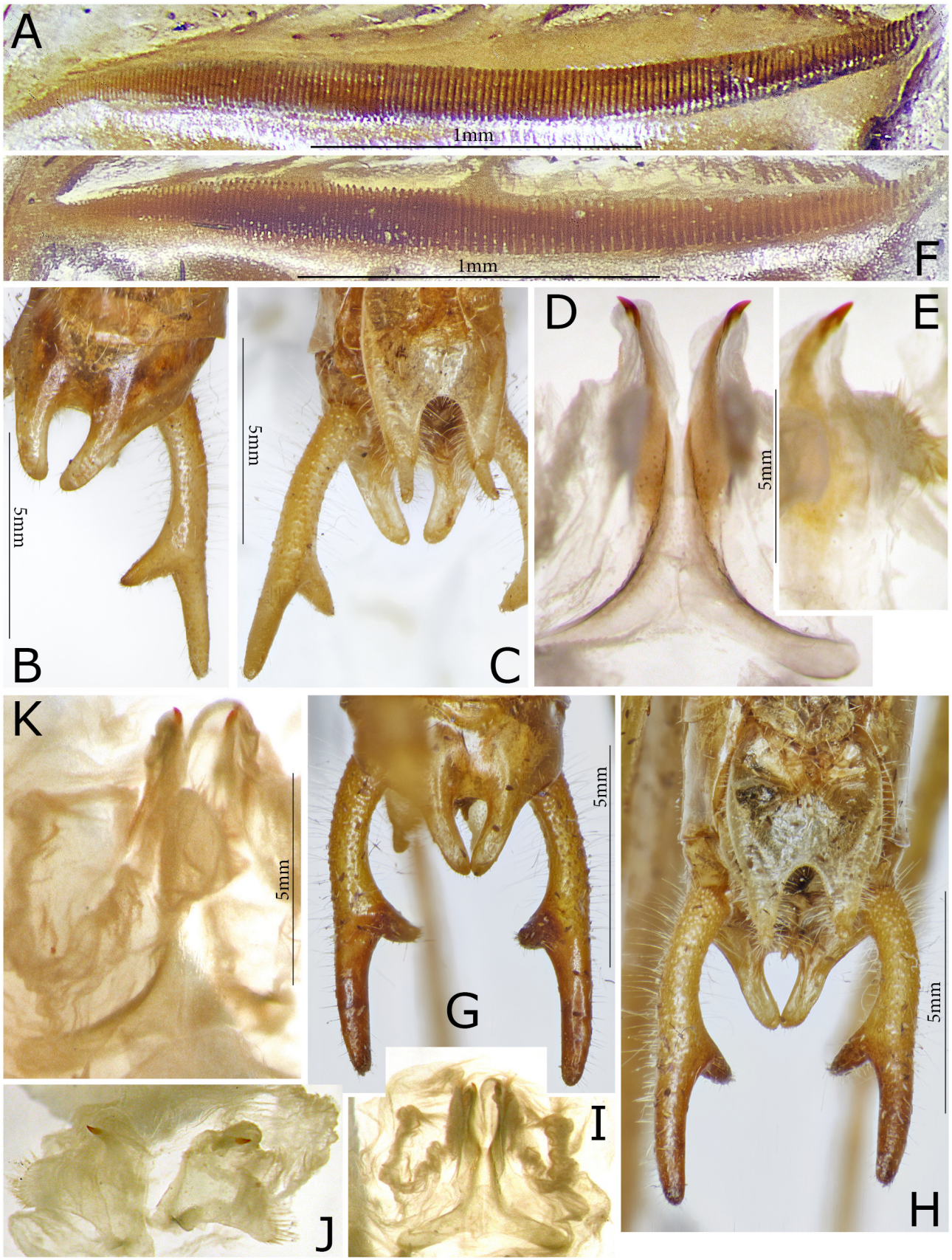

FIGURE 32. A–E: *Trichophallus murua* **sp. nov.** from Murua, holotype; F–K: *Trichophallus willemsei* **sp. nov.** from Aroa Estate, holotype.—A, F, stridulatory file; B, G, supra-anal plate and cerci; C, H, subgenital plate and cerci; D–E, I–K, titillators in ventro-apical (D, I), oblique lateral (E, K), and apical view (J). I and J not to scale.

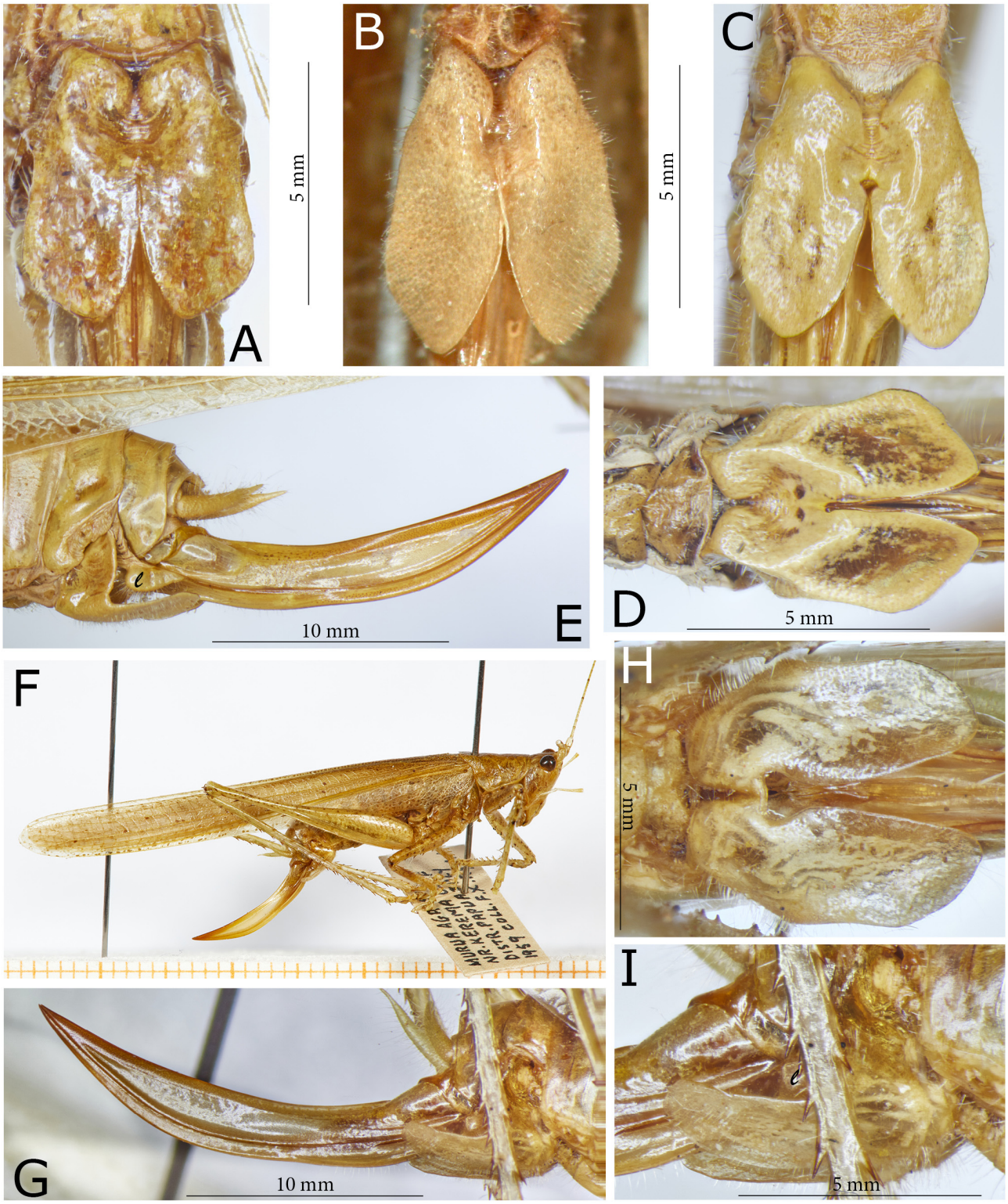

FIGURE 33. A–E, *Trichophallus willemsei* **sp. nov.** from Brown River (A), Mt. Tafa (B), Middle Fly River (C, E), Koitaki (D).—F–I, *Trichophallus murua* **sp. nov.** from Murua.—A–D, H: female subgenital plate in ventral view; E, G, Ovipositor; F, habitus female; I, subgenital plate in lateral view.—Abbreviation in I: *l*, basal lobe of ventral ovipositor valve.

Etymology. The name of the new species is given in honour of the late Dr. C. Willemse, who was the first person to study this insect.

***Trichophallus murua* sp. nov.**
Figs. 32A–E, 33F–I

Holotype (male): Papua New Guinea: Gulf district, Murua Agricultural Station (near Kerema), 1–31 July 1959 (coll. F.X. Ryan); depository: Naturalis Leiden.
Other specimens studied: Same data as holotype, 1 female, paratype (Naturalis Leiden).

Diagnosis. *T. murua* resembles *T. solomona* with regard to the shapes of male last tergite and subgenital plate; also the cerci are similar but end of cercus and internal projection show small but distinct differences: the internal tooth of cercus is less end-near than in *T. solomona*. The titillators of *T. murua* are long and only faintly curved in basal area and the narrow conical internal projection inserts at beginning of about apical third while in *T. solomona* they are strongly curved in basal half and the internal tooth is shorter and arises in subapical area of cercus. The female subgenital plate has less widened lobes that do not touch each other along mid-line while in *T. solomona* they are wider and touch or slightly overlap along mid-line.

Description. Medium sized species. Tegmina reaching apical quarter of hind tibia. Femora with the following number of spines on ventral margins: fore femur 4–6 external, 3–4 internal; mid femur 6 external, 3 internal near base; hind femur 8–12 external, 10–13 internal.

Male. Stridulatory file with about 152 teeth. Tenth abdominal tergite with two long apical projections slightly curved mediad and ventrad. Epiproct triangular with a pit in middle. Paraprocts with a rather short styliform projection at internal margin. Cerci elongate, narrow, very faintly sinuate, with a large compressed internal tooth in middle of length which is conical and with setose apex. Subgenital plate long-roundly excised at apex; setose, especially dorsal (= internal) and medial areas of apical lobes densely covered with long setae; styli little shorter than excised area. Titillators sub-fused in basal-central area; elongate, narrow, regularly curved throughout; apical parts a little widened at base, then narrow, apex with an acute hook; apical parts supporting internal surface of hyaline bursae; bursae roundly projecting and margin provided with long bristles.

Female. Tenth abdominal tergite divided and apex with a short conical projection at both sides of midline. Subgenital plate setose; a little more than basal quarter entire and deeply furrowed, otherwise divided into two broad lobes, internal margins converging at base, then diverging; apex of lobes obliquely convex with angles broadly rounded; basal-lateral areas broad and long, projecting dorsad with surface concave and apical margin truncate. Eighth tergite with lateral areas completely shortened for the length of the projections of the subgenital plate. Dorsal margin of ventral ovipositor valves at base with a setose projection pointing ventrad and has the proximal half swollen.

Coloration. Yellowish brown with patterns 0-1-4. Frons with four small black spots lateral and dorsal of medial ocellus. Legs with brown dots. hind femur indistinctly striated. Variation: in male vertex and pronotum with a light brown medial band that includes pattern 3.

Measurements (length in mm):—body: male 24, female 22; pronotum: male 6.1, female 5.2; tegmen: male 36, female 34; hind femur: male 17, female 16; ovipositor: 12 mm.

Etymology.—Named after the type locality, noun in apposition.

Acknowledgements

For extended loan of specimens and the patience shown for it or for guidance during visits of the museums I am grateful to the former or current curators of the following collections: Bishop Museum, Honolulu HI, USA (N.L. Evenhuis, Jim Boone); Museum für Naturkunde, Berlin (K.K. Günther and J. Deckert); Naturalis Biodiversity Center, Leiden (Luc Willemse); Bogor Museum at the Indonesian Institute of Sciences, LIPI (Yayuk R. Suhardjono); Natural History Museum, London (J. Marshall, G. Becalloni); Museum für Tierkunde, Dresden (R. Emmrich, K.-D. Klass); Museo di storia naturale Giacomo Doria, Genova (G. Poggi).

My sincere thanks go also to David Rentz for comments on an earlier version of the manuscript.

References

Brongniart, C. (1897) Revision des Salomonitae, Locustidae de la tribu des Conocephalinae. *Bulletin de la Société Entomologique de France*, 83, 79–87.

Gressitt, J.L. (1982) Biogeography and Ecology of New Guinea. *In*: *Monographiae Biologicae*. *Vol. 42*. Springer, Dordrecht, pp. I–VI + 1–983.
https://doi.org/10.1007/978-94-009-8632-9

Griffini, A. (1908) Sulle Agraecinae malesi ed austro-malesi del Museo Civico di Storia Naturale di Genova. *Zoologische Jahrbücher. Abteilung Systematik Geographie und Biologie der Tiere*, 26, 541–566.

Ingrisch, S. (1998) Monograph of the Oriental Agraeciini (Insecta, Ensifera, Tettigoniidae): Taxonomic revision, phylogeny, stridulation, and development. *Courier Forschungsinstitut Senckenberg*, 206, 1–387.

Karny, H.H. (1907) Revisio Conocephalidarum. *Abhandlungen der zoologisch-botanischen Gesellschaft Wien*, 4, 1–114.

Karny, H.H. (1912) Orthoptera Fam. Locustidae Subfam. Conocephalinae. *In*: *Genera Insectorum. Vol. 135*. V. Verteneuil & L. Desmet, Bruxelles, pp. 1–17, pls. 1–2.

Karny, H.H. (1926) Fauna Buruana. Orthoptera, Fam. Tettigoniidae. *Treubia*, 7, 145–215, pl. 4. [1925]

Kirby, W.F. (1906) *A synonymic catalogue of Orthoptera. Vol. II. Orthoptera Saltatoria. Part I. (Achetidae et Phasgonuridae)*. Printed by order of the Trustees [by Taylor and Francis], London, 562 pp.

Naskrecki, P. & Morris, G. (2000) n.k. *In*: Naskrecki, P., *Katydids of Costa Rica. Vol. 1. Systematics and bioacoustics of the cone-head katydids (Orthoptera: Tettigoniidae: Conocephalinae sensu lato)*. The Orthopterists Society at the Academy of Natural Sciences of Philadelphia, Philadelphia, Pennsylvania, pp. 1–164.
http://doi.org/10.5281/zenodo.270035

Naskrecki, P. & Rentz, D.C.F. (2009) A rapid assessment survey of katydids and relatives of the Muller Range (Insecta: Orthoptera: Ensifera). *RAP Bulletin of Biological Assessment*, 60, 167–174.
https://doi.org/10.1896/054.060.0116

Naskrecki, P. & Rentz, D.C.F. (2010) Studies in the orthopteran fauna of Melanesia: New katydids of the tribe Agraeciini from Papua New Guinea (Orthoptera: Tettigoniidae: Conocephalinae). *Zootaxa*, 2664 (1), 1–35.
https://doi.org/10.11646/zootaxa.2664.1.1

Nishida, G.M. (1979) Catalog of entomological types in the Bishop Museum: Orthoptera: Tettigoniidae. *Pacific Insects*, 20, 27–32.

Otte, D. (1997) Orthoptera Species File 7. Pemberley Books and online version, 70 pp. Available from: http://orthoptera.archive.speciesfile.org (accessed 12 March 2024)

Redtenbacher, J. (1891) Monographie der Conocephaliden. *Verhandlungen der Zoologisch-Botanischen Gesellschaft in Wien*, 41, 315–562, pls. 3–4.

Rentz, D.C.F. (2009) Nomenclatural Changes in Australian Tettigoniidae. *Zootaxa*, 2221 (1), 67–68.
https://doi.org/10.11646/zootaxa.2221.1.5

Stål, C. (1874) Recensio orthopterorum. Revue critique des Orthoptères décrits par Linné, De Geer et Thunberg. 2. *Öfversigt Kongliga Vetenskaps-akademiens Förhandlingar*, 31, 1–121.

The Papua Insects Foundation (2019) Gazetteer of The Papua Insects Foundation. Available from: https://www.papua-insects.nl/gazetteer/gazetteer.htm (accessed 12 March 2024)

Walker, F. (1869) n.k. *In*: *Catalogue of the specimens of Dermaptera Saltatoria in the collection of the British Museum. Part II. Catalogue of Locustidae.* British Museum of Natural History, London, pp. 225–423.

Willemse, C. (1958) On some Tettigonioidea injurious to coconut palms. *Natuurhistorisch Maandblad*, 47, 122–125.

Willemse, C. (1966) Descriptions of new and redescriptions of lesser known Orthoptera. Part II. *Publicaties van het Natuurhistorisch Genootschap in Limburg, Maastricht*, 16, 1–16.