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***Frischianus* gen. nov., a new genus of the Scopaeina Mulsant & Rey, 1878 from the Oriental Region (Coleoptera: Staphylinidae: Paederinae: Lathrobiini)**

JOHANNES FRISCH¹ & LEE HERMAN²

¹Center for Integrative Biodiversity Discovery, Museum für Naturkunde Berlin, Leibniz-Institute for Evolution and Biodiversity Science, Invalidenstraße 43, 10115 Berlin, Germany

✉ johannes.frisch@mfn.berlin; <https://orcid.org/0000-0002-7895-7529>

²American Museum of Natural History, Division of Invertebrate Zoology, Central Park West at 79th Street, New York 10024-5192, United States of America

✉ herman@amnh.org

Abstract

A new genus of the paederine subtribe Scopaeina Mulsant & Rey, 1878 (Staphylinidae: Paederinae: Lathrobiini), *Frischianus* Herman, **gen. nov.**, is described from the Oriental Zoogeographical Region with *F. rufulus* (Kraatz, 1859) as the type species. *Frischianus* is distinguished from the other genera of the Scopaeina according to an epigenal ridge and dorsally contiguous groove connecting the trichobothrium to the antennal hump, bump-like metakatepisternal processes, and a unipartite gonocoxal plate of females.

The following names are transferred from *Scopaeus* as new combinations: *Frischianus coriaceus* (Cameron, 1932), *F. laticollis* (Cameron, 1925), *F. miscellus* (Cameron, 1932), and *F. rufulus* (Kraatz, 1859). Lectotypes are designated for *Lithocharis rufulus* Kraatz, 1859, *Medon coriaceus* Cameron, 1932, *M. miscellus* Cameron, 1932, and *Scopaeus laticollis* Cameron, 1925.

Thirty new species of *Frischianus* are described: *F. barclayi* Frisch, **sp. nov.** (Malay Peninsula), *F. brenneri* Frisch, **sp. nov.** (Borneo), *F. burckhardti* Frisch, **sp. nov.** (Borneo), *F. communis* Frisch, **sp. nov.** (Bali, Borneo, Java, Malay Peninsula), *F. crassiphallatus* Frisch, **sp. nov.** (Thailand), *F. curtippennis* Frisch, **sp. nov.** (Sumatra), *F. echinatospinatus* Frisch, **sp. nov.** (Borneo), *F. hamatus* Frisch, **sp. nov.** (Sumatra), *F. huijbregtsi* Frisch, **sp. nov.** (Sulawesi), *F. karneri* Frisch, **sp. nov.** (Malay Peninsula), *F. keralensis* Frisch, **sp. nov.** (India), *F. latilobatoides* Frisch, **sp. nov.** (Malay Peninsula), *F. latilobatus* Frisch, **sp. nov.** (Borneo), *F. lineatocollis* Frisch, **sp. nov.** (India), *F. lineolatus* Frisch, **sp. nov.** (India), *F. loebli* Frisch, **sp. nov.** (Sumatra), *F. mariae* Frisch, **sp. nov.** (Malay Peninsula), *F. parentium* Frisch, **sp. nov.** (India), *F. pedator* Frisch, **sp. nov.** (Sumatra), *F. puthzi* Frisch, **sp. nov.** (Borneo), *F. rubiginicollis* Frisch, **sp. nov.** (Malay Peninsula), *F. schuriani* Frisch, **sp. nov.** (Malay Peninsula), *F. serratispinatus* Frisch, **sp. nov.** (Borneo), *F. setifer* Frisch, **sp. nov.** (Java), *F. similis* Frisch, **sp. nov.** (Java), *F. strigaticollis* Frisch, **sp. nov.** (India), *F. subalpinus* Frisch, **sp. nov.** (Sumatra), *F. telnovi* Frisch, **sp. nov.** (Borneo), *F. tridens* Frisch, **sp. nov.** (Malay Peninsula), *F. uhligi* Frisch, **sp. nov.** (Borneo).

Frischianus is considered a monophyletic group mainly according to the unipartite female gonocoxal plate. The phylogenetic relationships of *Frischianus* within the Scopaeina and its infrageneric phylogeny are discussed. According to putative apomorphic characters, *Frischianus* is subdivided into the *F. strigaticollis* species group from South India and the speciose, Southeast Asian *F. laticollis* species group. Within the *F. laticollis* subgroup, subordinate phylogenetic lineages are distinguished.

Key words: Taxonomy, new combinations, lectotype designations, new species, India, Southeast Asia

Introduction

The subtribe Scopaeina of the Paederinae (Coleoptera: Staphylinidae) was recently revised on the generic level (Herman 2023). Five valid genus group taxa were recognized: *Hyperscopaeus* Coiffait, 1984, *Micranops* Cameron, 1913, *Orus* Casey, 1885, *Scopaeus* Erichson, 1839, and *Trisunius* Assing, 2011. A spectacular discovery (Herman 2023: 67–69) was a stridulum in *Scopaeus*, a stridulatory organ that the other scopaeine genera lack and supports the monophyly of *Scopaeus*. The stridulum consists of up to 12 plectral ridges of the posterior surface of the mesofemur and a corresponding, lateral or submarginal stridular file of the metaventrite (Herman 2023: e.g. Figs 85, 102, 114). Herman (2023: 110–118) moreover raised *Hyperscopaeus*, formerly a subgenus of *Scopaeus*, to genus rank based on the lack of the stridulum and additional morphological differences with *Scopaeus*. With regard to the distribution of the scopaeine genera, Herman's generic revision revealed that *Micranops* and *Scopaeus* are distributed worldwide, while *Orus* is confined to the Americas, *Hyperscopaeus* native to the tropical and subtropical Old World, and *Trisunius* an Oriental faunal element. The present study adds a new, apparently speciose genus from South and Southeast Asia to the Scopaeina.

Publication of a new genus, based in part on four species previously included in *Scopaeus*, that appears on the heels of a newly proposed definition of *Scopaeus* (Herman 2023: 61–73), requires explanation. In 2009, when Herman examined types of three of these species transferred herein from *Scopaeus*, *S. miscellus* was unavailable for study, he was still under the sway of the historical definition of *Scopaeus*, i.e. the constricted neck, along with the more recently discovered supraocular trichobothrium. Using only those characters, both visible without dissection or removal from the card mount, the three names were unquestionably assigned to *Scopaeus*. At that time, the stridulum was still seven years from discovery. Furthermore, since the stridular file is on the metaventrite and the types are glued to cards, ventral-side down, a repeat trip to London and Berlin to remove them from their cards was beyond practical possibility.

However, Herman was mindful of the possibility that some species, for which presence of a stridulum was unconfirmed, might be removed from *Scopaeus* in future studies. Indeed, following discovery of the stridulum, Herman set aside as a new genus six unidentified, point-mounted Malaysian and Philippine specimens he had initially recognized years earlier as species of *Scopaeus* because they had the characters that had defined the genus for nearly two centuries. Since there were four species, each represented by one specimen, and two indeterminate females, there were too few specimens for detailed study and the description of a new genus. About a year before discovery of the stridulum and the other characters that now define *Scopaeus*, Frisch sent Herman specimens requesting an opinion on their generic assignment because he thought the specimens fell out of the normal range of variation in *Scopaeus*. Herman replied they look to be *Scopaeus*. The impetus to describe this genus came from Frisch who, after reading the *Scopaeina* revision, asked Herman's thoughts about his illustrations of some *Scopaeus*-like species he was studying. Confirming his suspicion that he was studying a new genus, we then concluded our two separate groups of species represented the same new genus. Thereby began our collaboration to describe this new genus, that we both recognized independently, at different times, using different characters. Frisch based his view on pronotal, aedeagal, and gonocoxal characters that departed from *Scopaeus* before Herman's detection of the variation of the metakatepisternum and absence of a stridulum.

The present paper establishes the new genus *Frischianus* of the *Scopaeina* along with descriptions of 30 new species. Four species are transferred to the new genus from *Scopaeus*. The phylogeny of the *Scopaeina* and the infrageneric relationships of *Frischianus* are discussed.

Authorship and author's contributions: Herman wrote the description of *Frischianus* as an addition to the *Generic Revisions of the Scopaeina and Sphaeronina* (Herman 2023) and is the author of the new genus. Frisch provided descriptions and redescriptions of the species included, created the key to the species, discussed the infrageneric relationships, the new combinations, and the

lectotype designations, and wrote the chapters *Material and Methods*, *Discussion*, and *Acknowledgements*. The introduction was coauthored.

Material and Methods

Material: The specimens this study is based on are stored in the following collections and were made available to us by the mentioned curators, collection managers, and private collectors: FMNH—Field Museum of Natural History, Chicago (Alfred Newton, Margaret Thayer); HECO—Hope Entomological Collections, Oxford (Darron Mann); MFNB—Museum für Naturkunde Berlin (Bernd Jaeger, Joachim Willers); MHNG—Muséum d'histoire naturelle, Geneva (Giulio Cuccodoro, Ivan Löbl); NBCL—Naturalis Biodiversity Center, Leiden (Hans Huijbregts); NHML—Natural History Museum, London (Max Barclay, Roger Booth, Martin Brendell, Dmitry Telnov); NHMW—Naturhistorisches Museum, Wien (Harald Schillhammer); PWCM—Paul Wunderle Private Collection, Mönchengladbach; SDEI—Senckenberg Deutsches Entomologisches Institut, Müncheberg (Vinicius Ferreira, Mandy Schröter, Lothar Zerche); SMNK—Staatliches Museum für Naturkunde, Karlsruhe (Alexander Riedel); SMNS—Staatliches Museum für Naturkunde, Stuttgart (Arnaud Faille, Wolfgang Schawaller); ZMB—Museum Zoologicum Bogoriense, Cibinong (Raden Pramesa Narakusumo).

Equipment: The habitus photographs are based on image stacks taken with the camera Sony 7R and the Canon macro lens MP-E 65mm f/2.8 5x (Figs 43–46, 48–54, 56–60) and the Mitutoyo macro lens 10x (Figs 1–4, 47, 55). The image stacks of the genal ridge and the contiguous groove (Figs 5–9) were made with the camera Sony 7R and the Mitutoyo macro lens 20x. The transmitted light microscopic images of the primary and secondary sexual characteristics are based on image stacks taken with a Leica imaging system consisting of the DM6 B transmitted light microscope with the K3C camera and operated with the LasX software. The microscopic images were made with the following magnifications: 100 x [abdominal sclerite VII and VIII (Figs 199–236)]; 200 x [bodyparts for genus description (Figs 10–29), gonocoxal plates of ♀ (Figs 248–269), sperm pump (Figs 239, 240), aedeagus (Figs 36–42, 61–198)]; 400 x [outer metatibial comb (Figs 30–35), sperm pump (Figs 237, 238, 241–247)]. The image stacks were processed into multifocus images with Helicon Focus.

Measurements: The species were measured magnified at 70 x using a stereoscopic microscope with an eye-piece linear micrometer based on at least 10 specimens per species if available. Total length of specimen—interval from apical denticles of labrum to posterior end of abdomen, depending on degree of contraction of abdomen; forebody length—interval from apical denticles of labrum to posterior margin of elytra at suture; eye length—maximum distance from anterior most to posterior most point of ocular suture measured in lateral view; temporal length—distance from posterior

most point of ocular suture to posterior margin of head measured in lateral view; pronotal length—interval from anterior to posterior pronotal margin along midline; pronotal width—maximum distance between sinistral and dextral pronotal margin; elytral sutural length—interval from posterior end of scutellum to posterior elytral margin along suture.

Forebody microsculpture: Instead of detailed, individual descriptions of the microsculpture of the forebody surface for every single species, the four main types of the setose punctation of the forebody of *Frischianus* are described below. They are used for the species descriptions and specified when deviating from the illustrated examples.

Type 1 (Figs 1a–c): Forebody matt with fine microsculpture; head with umbilicate, notably compacted, slightly coalescent punctation (Fig. 1a); pronotum with irregularly compressed, coalescent punctation not finer than cephalic punctation (Fig. 1b); elytra polished with punctation notably granular, umbilicate, and dense, but more widely spaced than cephalic and pronotal punctation (Fig. 1c).

Type 2 (Figs 2a–c): Head matt with relatively coarse, umbilicate, strongly compacted, coalescent punctation (Fig. 2a); pronotum polished with non-umbilicate, non-granular punctation finer and more widely spaced than cephalic punctation (Fig. 2b); elytra polished with non-umbilicate, feebly granular punctation finer and more widely spaced than cephalic punctation, but coarser than pronotal punctation (Fig. 2c).

Type 3 (3a–c): Head polished with fine, dense, non-umbilicate punctation with puncture interspaces smaller than puncture diameters (Fig. 3a); pronotum matt with very fine, coalescent, umbilicate punctation with elongated dots aligned longitudinally (Fig. 3b); elytra polished with sharply granular punctation with granule interspaces about as wide as granule diameters (Fig. 3c).

Type 4 (4a–c): Head and pronotum relatively matt; head with coarse, densely set, non-umbilicate punctation with puncture interstices reduced to narrow ridges (Fig. 4a); pronotal punctures confluent to form relatively coarse and regular, longitudinal grooves separated by alternating ridges formed by longitudinally fused puncture interstices (Fig. 4b); elytra polished with granular punctation somewhat finer than cephalic punctation and with puncture interspaces about as wide as puncture diameters (Fig. 4c).

Labral denticulation: The denticulation of the labrum in *Frischianus* can be divided into four main types, which are defined below and used to streamline the species descriptions. The labral denticulation is, however, subject to intraspecific variation.

Type 1 (Fig. 10): Submedial labral denticles pointed, longer than narrow, pointed, sublateral labral denticles.

Type 2 (Figs 11, 12): Submedial labral denticles pointed, longer than narrow, short, about right-angled, sublateral labral denticles.

Type 3 (Figs 13, 14): Submedial labral denticles pointed; sublateral labral denticles widely obtuse, in even, convex curve merging into convex lateral margin of labrum.

Type 4 (Fig. 15): Labrum short with reduced denticulation, but variable to some extent; submedial denticles pointed, not longer than sublateral denticles, or reduced to obtuse angle not protruding beyond anterior labral margin; sublateral denticles narrow, pointed or obtuse; labrum sometimes with additional, lateral denticle.

Terminology of primary sexual characters: Besides common terms for widespread aedeagal structures, the following specific terms are used in this contribution to describe the specific morphological structures of the aedeagus of *Frischianus*.

The apical, usually ventrad curved process, which arises from the ventroapical margin of the ostium, is termed the *apical lobe* (e.g. Figs 61, 67, 115, 166, 169). The long process that extends from the ventral margin of the aedeagus is termed the *ventral process* (Figs 157–197). The dorsoapical, postostial process of the Indian species is named the *dorsal lobe* (Figs 181–198). The same purely descriptive terms are also used for morphological structures of the aedeagus of *Scopaeus* (Frisch *et al.* 2002: 31–34), although it should be noted that these identically named structures are not necessarily homologous in *Frischianus* and *Scopaeus* and in some cases probably are not (see *Discussion*). The sclerotized endophallic structures of *Frischianus* are made up of a ventral portion of various shape, termed the *endophallic sclerite* (e.g. Figs 67, 121, 163), and a dorsal spine termed the *dorsal endophallic spine* (e.g. Figs 67, 115, 130). The endophallic sclerite is present in all *Frischianus* species and houses the gonopore, which in the genus often does not look like a pore but a dilated opening and is therefore termed the *endophallic foramen* (e.g. Figs 141, 157–180). The dorsal endophallic spine is, however, present in some species and species groups only (Figs 61–135, 157–159). The terms *postforamen* for the incassation delimiting the median foramen distally (e.g. Figs 64, 65, 67, 68) and *circoforamen* for the two lamellae, which are coming from the postforamen, delimit the median foramen laterally, and to which the vestigial parameres are attached (e.g. Figs 64, 65), were first used in the *Scopaeina* by Herman (1965: 113) and are adopted here. The longitudinal, membranous fissure of the dorsal surface of the aedeagus of most scopaeine genera was referred to as the *midlongitudinal split* (Figs 36–42) by Herman (2023: 27), a term adopted herein. The following modifications are distinguished: the midlongitudinal split is narrow and continuous from the base of the aedeagus to the ostium (type A; Figs 36–38), oval and separated from the ostium by a narrow sclerotization (type B, Fig. 39), oval and separated from the ostium by a broad sclerotization (type C, Figs 40, 41), or continuous from the base to the ostium with dorsomedially overlapping margins that open widely into the ostium (type D, Fig. 42).

Frisch in his previous works and also herein illustrates the aedeagi with the apical (distal) end pointing to the top of the page and the basal (proximal) end pointing downwards (Figs 36–42, 61–198), which is in opposite to the alignment of the aedeagus in the abdomen, if the specimen is looked at with the head up. Even if some

authors depict the aedeagus morphologically correct with the apical structures facing downwards, this traditional “upside down” presentation is widespread, because authors who use it believe it to make it easier for the reader to recognise the taxonomically relevant features, which are predominantly located at the apical end of the aedeagus. For this reason, the terms *dextral* and *sinistral* which are used here to describe the position of the aedeagal structures do not necessarily correspond to the morphologically correct, eudextral and eusinistral position of the aedeagal structures in the abdomen with the apex of the aedeagus pointing posteriorly. The terms *dextral* and *sinistral*, as they are used herein, refer to the dorsal view of the aedeagus in the figure plates.

The terminology for the female primary sexual characters of *Scopaeus* in Frisch *et al.* (2002: 30, 35) and Frisch & Narakusumo (2023: 25, 63) is transferred to *Frischianus* (Figs 237–247).

Material compilations: In the compilations of type material and additional specimens examined, the label data are not cited verbatim, but standardized to make it easier for the reader to identify the localities. Old, nowadays uncommon locality names are replaced by the current names, but added in rectangular brackets. In the case of old type specimens, the labels are also cited verbatim in quotation marks. To shorten the material paragraphs, names of superior administrative units such as provinces are only mentioned once per paragraph and the locality data compiled afterwards.

Taxonomy

1. *Frischianus* Herman, new genus

Type species: *Frischianus rufulus* (Kraatz, 1859), fixed here by original designation.

Diagnosis: Until now, four previously described species herein assigned to *Frischianus* had been included in *Scopaeus*. The two genera are distinguished as follows. *Frischianus* lacks the stridular file of the metaventrite and plectral ridges of the mesofemur that, together, comprise the stridulum, a defining feature of *Scopaeus* (Herman 2023: Figs 189–191, and many other illustrations). The metakatepisternal processes of *Frischianus* are small, apically rounded, narrowly separated lobes on the posterior margin of the metaventrite between the metacoxae (Fig. 26); for *Scopaeus* they are large, long, and tapered to acute apices (Herman 2023: Figs 89, 97, among many examples). The dorsal surface of the aedeagal median lobe of *Frischianus* is divided from the base to the ostium by a midlongitudinal membrane (Figs 36–38, 42) or there is an elongate, oval membrane separated from the ostium by sclerotization (Figs 39–41); the dorsal aedeagal surface is fused in *Scopaeus* (Herman 2023: Fig. 158).

Three characters set *Frischianus* apart from all other genera of the Scopaeina: the nearly equal length and width of the squarish prothorax (Figs 1–4, 43–60); the reduction of the metakatepisternal processes to small, apically rounded lobes (Fig. 26); and the single gonocoxal plate

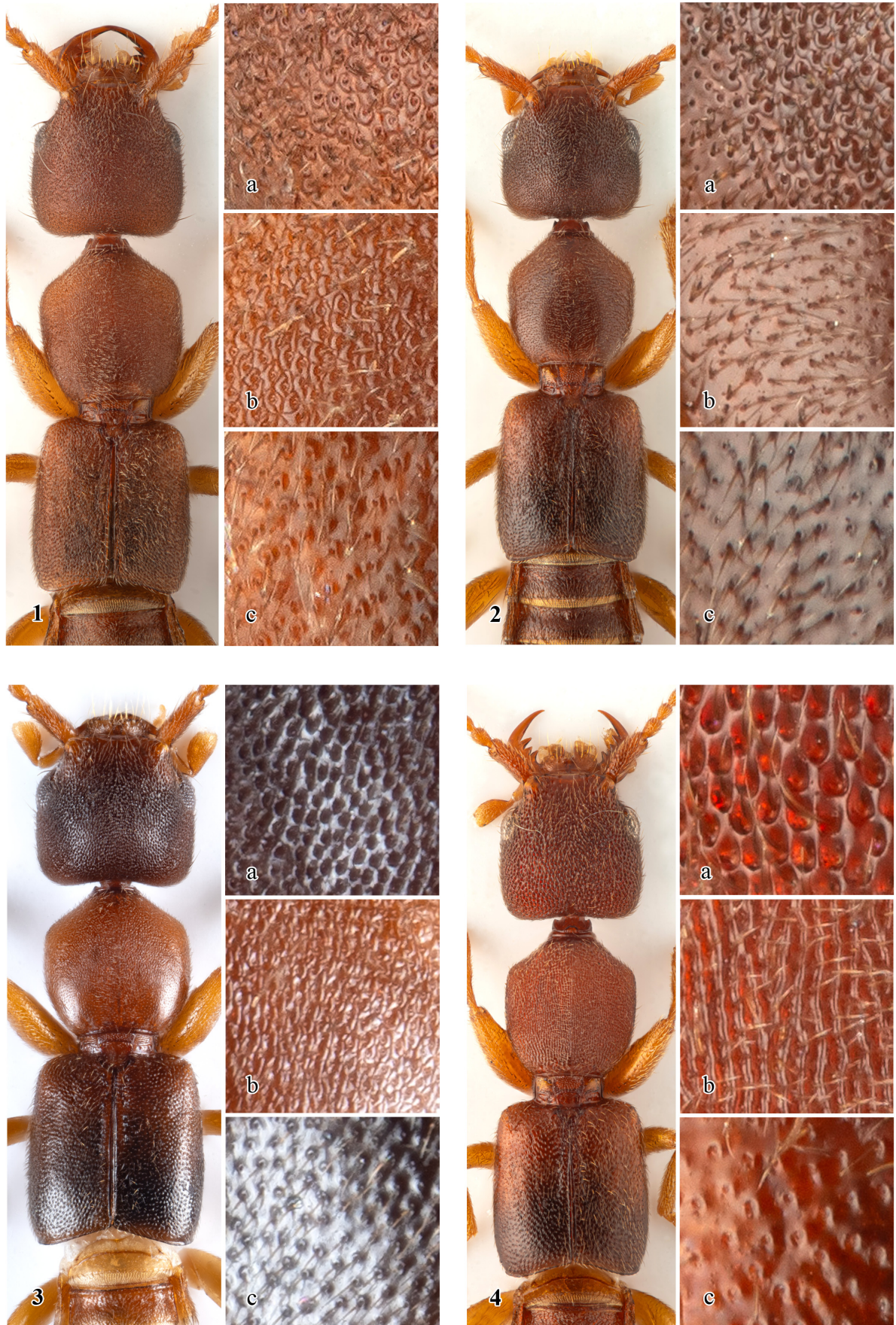
of the females (Figs 29, 248–269). Among the other five scopaeine genera, the prothorax is distinctly longer than wide, the metakatepisternal processes are moderately large to large and apically rounded or pointed (Herman 2023: Figs 251, 270, 300, 335), and females have a pair of gonocoxal plates (Herman 2023: Figs 78, 80, 264, 290, 332). If the ventral side of segment IX is exposed and the genital sclerites visible, the females are easily recognized as *Frischianus* without dissection.

The following are additional characters that separate *Frischianus* from other scopaeine genera. The neck of *Frischianus* is about a sixth to a fifth as wide as the head (Figs 1–4, 18, 43–60); the neck of *Trisunius*, most species of *Orus*, and most of the New World species of *Micranops* is wider, about a third of the width of the head. A few species of *Orus* and most of the Old World species of *Micranops* (Herman 2023: 131, 132, Table 3; Frisch, pers. comm.) have a narrow neck, about a fifth to a quarter of the width of the head, but are separated from *Frischianus*, not only by the larger, metakatepisternal processes, but also by the position of the trichobothrium. The trichobothrium of *Frischianus* is near the middorsal margin of the eye (Figs 5–9), for *Orus* the trichobothrium is adjacent to the posterodorsal margin of the eye (Herman 2023: Figs 297, 309), and for *Micranops* in a cavity behind the eye (Herman 2023: Figs 266, 267, 282). *Frischianus* and *Hyperscopaeus*, both with narrow necks, are separated, not only by the differential size of their metakatepisternal processes, but also by the widely separated gular sutures of the former (Fig. 18) and narrowly separated to contiguous gular sutures of the latter (Herman 2023: Fig. 244).

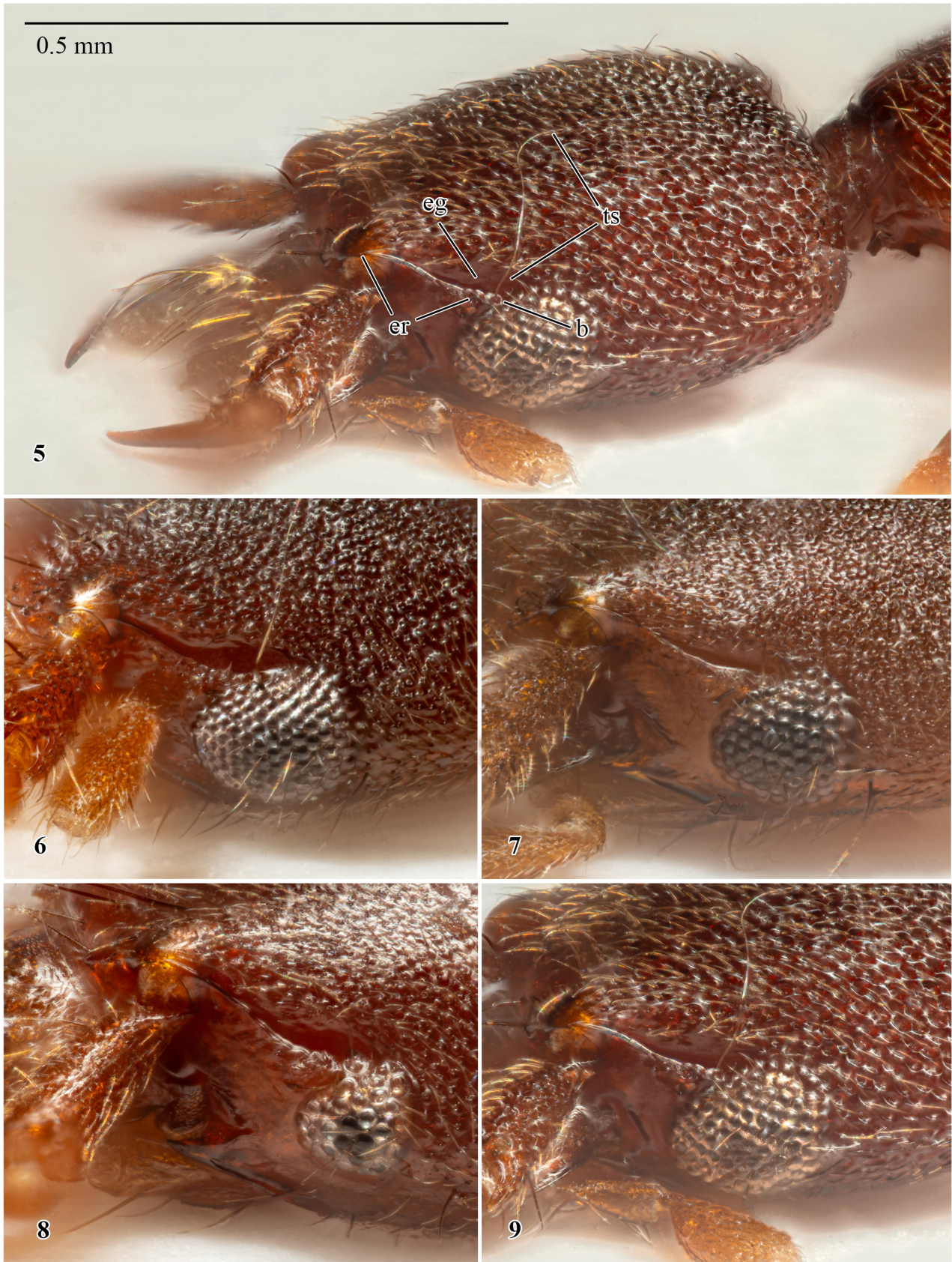
Ancillary characters that help define *Frischianus* include a well-developed, almost straight, knife-edged epigenal ridge extending from the trichobothrium to the anterior margin of the antennal hump (Figs 5–9); the dorsoposterior side of the ridge has a contiguous groove with a polished surface (Figs 5–9). Some species of *Hyperscopaeus* have a poorly developed epigenal ridge that lacks the contiguous groove, is steeply curved ventrad, and usually does not reach the trichobothrium. Some species of *Trisunius* have a short epigenal ridge that is confined to the antennal hump, lacks a contiguous groove, and does not reach the eye. The metatibia of *Frischianus* has a small, apical comb on the outer surface (Figs 30–33). Only a few species of *Hyperscopaeus* have an outer, apical, metatibial comb (Fig. 35). An outer metatibial comb is also known in *Trisunius* (Fig. 34).

Description: Length from apex of labral denticles to posterior margin of abdomen 2.4–4.9 mm; forebody length from apex of labral denticles to posterior end of elytral suture 1.5–2.3 mm.

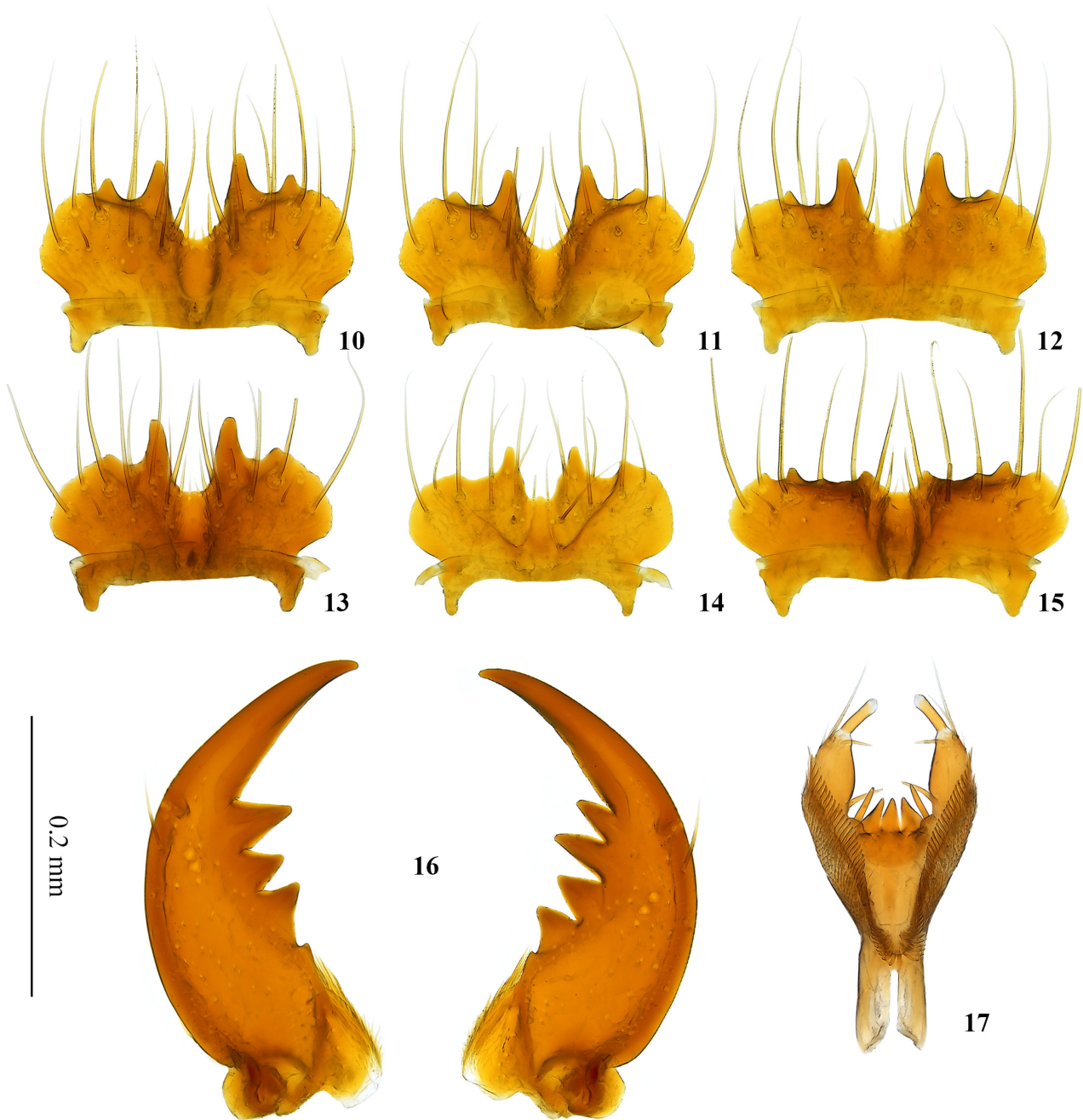
Head with postocular lateral margin straight (e.g. Figs 3, 43, 52) to shallowly and broadly rounded (e.g. Figs 46, 48); basal angles distinct, strongly rounded, and well developed (e.g. Figs 43–45); basal margin truncate (e.g. Fig. 43, 45, 48) to broadly and shallowly (e.g. Figs 1, 44, 54) to moderately deeply emarginate (e.g. Figs 3, 46, 49, 53, 56); basal margin with median, shallow (rarely almost imperceptible) to moderately deep, narrow to



FIGURES 1–4. Forebody of *Frischianus* and microsculpture of head (a), pronotum (b), and elytra (c) with the examples of *F. coriaceus*, Malaysia, Pahang, Bukit Fraser (1); *F. laticollis*, Indonesia, Jawa Barat, Sukabumi, Cikaniki (2); *F. rubiginicollis*, paratype, Malaysia, Perak, Cameron Highlands (3); *F. lineatocollis*, paratype, India, Kerala, Cardamom Hills (4).



FIGURES 5–9. Epigenal ridge and dorsally adjacent epigenal groove of *Frischianus lineatocollis*, paratype, India, Kerala, Cardamom Hills (5, 9); *F. laticollis*, Indonesia, Jawa Barat, Sukabumi, Cikaniki (6); *F. coriaceus*, Malaysia, Pahang, Bukit Fraser (7); *F. pedator*, paratype, Indonesia, Sumatera Barat, Bukittinggi, Mt Singgalang (8). Abbreviations: b—bothrium; er—epigenal ridge; eg—epigenal groove; ts—trichobothrial sensillum.



FIGURES 10–17. Labrum (10–15), mandibles (16), and labium (17) of *Frischianus laticollis*, Indonesia, Jawa Barat, Sukabumi, Cikaniki (10, 16, 17); *F. communis*, paratype, Indonesia, Jawa Barat, Sukabumi, Cikaniki (11); *F. spec.* (♀), Malaysia, Sabah, Telupid (12); *F. strigaticollis*, paratype, India, Kerala, Cardamom Hills (13); *F. miscellus*, paralectotype, Malaysia, Penang (14); *F. spec.* (♀), Brunei, Kuala Belalong (15).

wide, vertical groove (e.g. Figs 4, 49, 53); posteroventral surface with or without small tubercle laterad of neck.

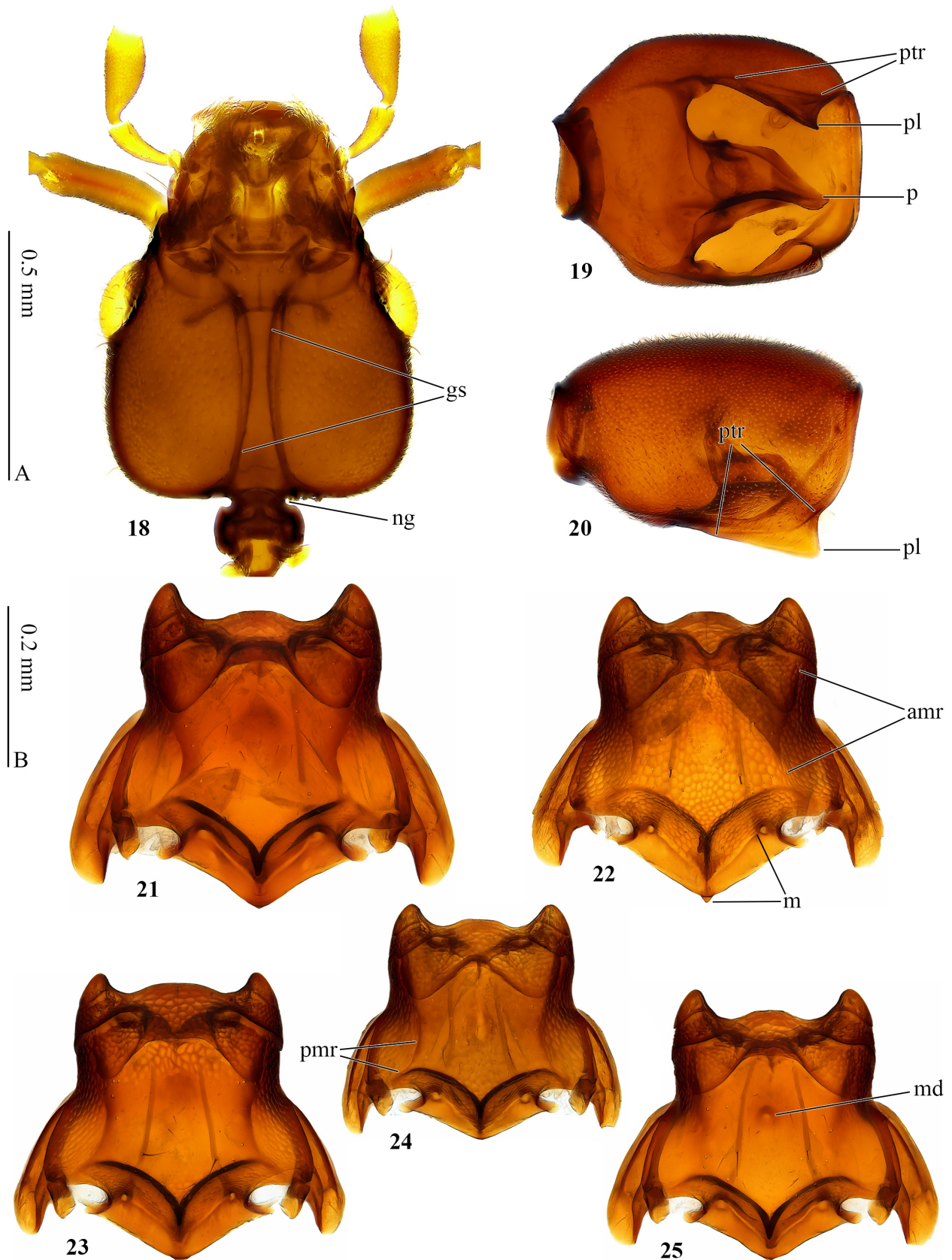
Dorsal cephalic surface with dense, setate punctation; punctures small and fine to moderately large to large and coarse; punctures discrete and separated from each other (e.g. Figs 3a, 4a, 57, 58) or some punctures partially confluent and arranged in short linear clusters (e.g. Figs 2a, 44); macrosetae few, mostly confined to or near margins, dorsum with one on each side of midlongitudinal line about halfway between clypeal and posterior margins.

Neck petiolate, nuchal groove deep and strongly

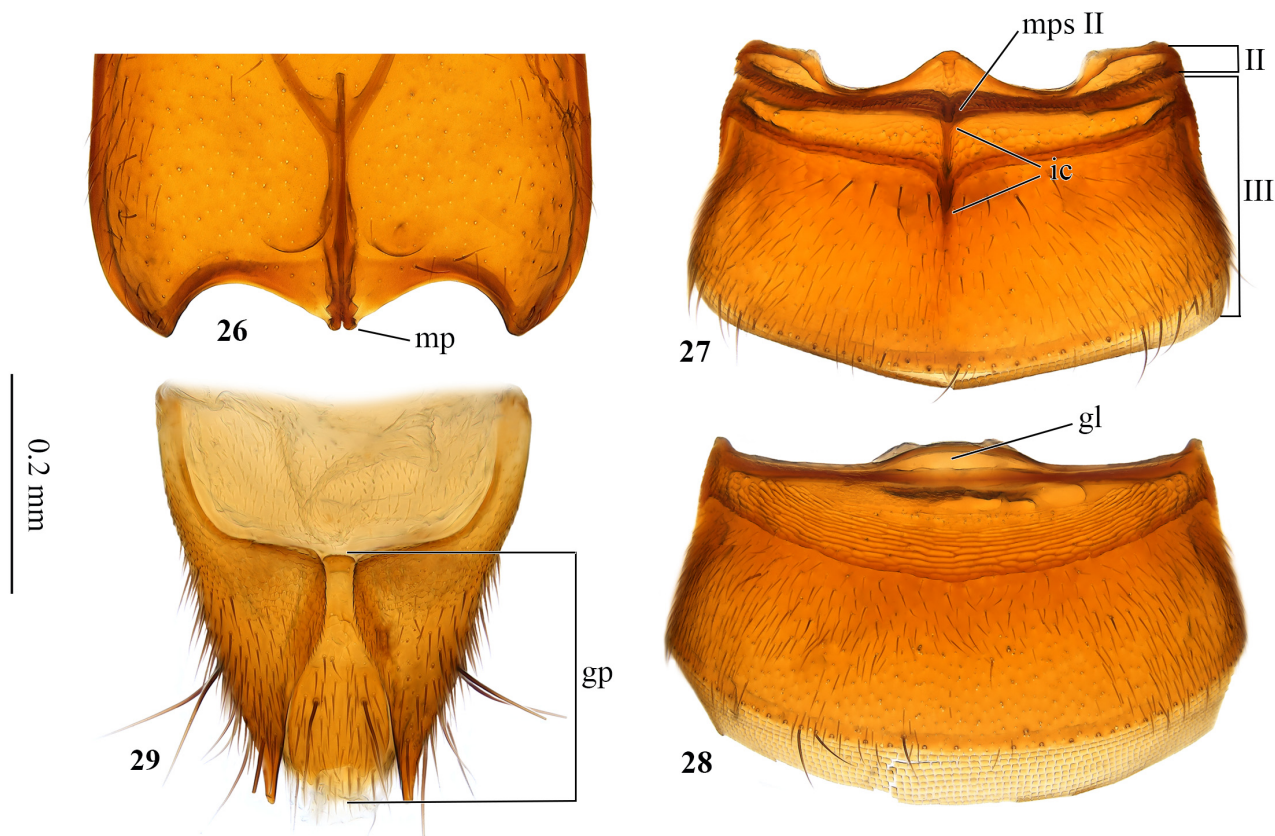
constricted (Fig. 18), and base of neck abruptly expanded; neck across nuchal constriction one fifth to one sixth as wide as greatest postocular width of head (Fig. 18); nuchal ridge strongly developed, present dorsally and laterally.

Trichobothrium contiguous with dorsal margin of eye at about or slightly forward of midpoint (Figs 5–9); bothrium (Fig. 5) in deep, rounded trichobothrial depression; trichobothrial depression without setae (Figs 5–9).

Epigental ridge extending dorsoanteriorly from trichobothrial depression to anterior margin of antennal



FIGURES 18–25. Head, ventral (18) and Pronotum, ventrolateral (19) and lateral (20), of *Frischianus laticollis*, Indonesia, Jawa Barat, Sukabumi, Sirnarasa, and mesoventrite (21–25) of *F. rubiginicollis*, paratype, Malaysia, Perak, Cameron Highlands (21); *F. telnovi*, paratype, Malaysia, Sabah (22); *F. similis*, paratype, Indonesia, Jawa Barat, Banten, Lebak (23); *F. parentium*, paratype, India, Tamil Nadu, Palni Hills (24); *F. lineatocollis*, paratype, India, Kerala, Cardamom Hills (25). Abbreviations: amr—anterior mesanapleural ridge; gs—gular suture; md—median depression; p—profurcasternum; pl—postprocoxal lobe; pmr—posterior mesanapleural ridge; ptr—prohypomeronal transverse ridge. Scale bar A: Figs 18–20; scale bar B: Figs 21–25.



FIGURES 26–29. Metaventre, posterior end (26), abdominal sternites II and III (27), abdominal sternite IV (28), and abdominal segment IX, ventral (29) of *Frischianus laticollis*, Indonesia, Jawa Barat, Sukabumi, Sirnarasa (26–28); *F. puthzi*, paratype, Malaysia, Sabah, Crocker Range (29). Abbreviations: gl—glandular lobe; gp—gonocoxal plate; ic—intercoxal carina; mp—metakatepisternal process; mps II—median point of posterior margin of abdominal sternite II.

hump; ridge knife-edged for entire length (Figs 5–9); groove present and contiguous with full length of dorsoposterior side of ridge; groove moderately wide to narrow and continuous with trichobothrial depression (Figs 5–9).

Eye with posterior margin broadly rounded (Fig. 6) to slightly flattened (Figs 7, 8); corneal sensilla absent.

Gular sutures moderately widely separated anteriorly, widely separated posteriorly (Fig. 18).

Gula depressed; surface microreticulate anteriorly and polished posteriorly; extent of microreticulation variable, restricted to small anterior region to extending to about posterior third and remainder polished; some species with matt surface behind microreticulation.

Mandibles with three large denticles on left and four on right (Fig. 16); both mandibles with minute, basal denticule or point present and distinct or hardly evident or absent (Note: Minute basal denticule or point not included for count of denticles).

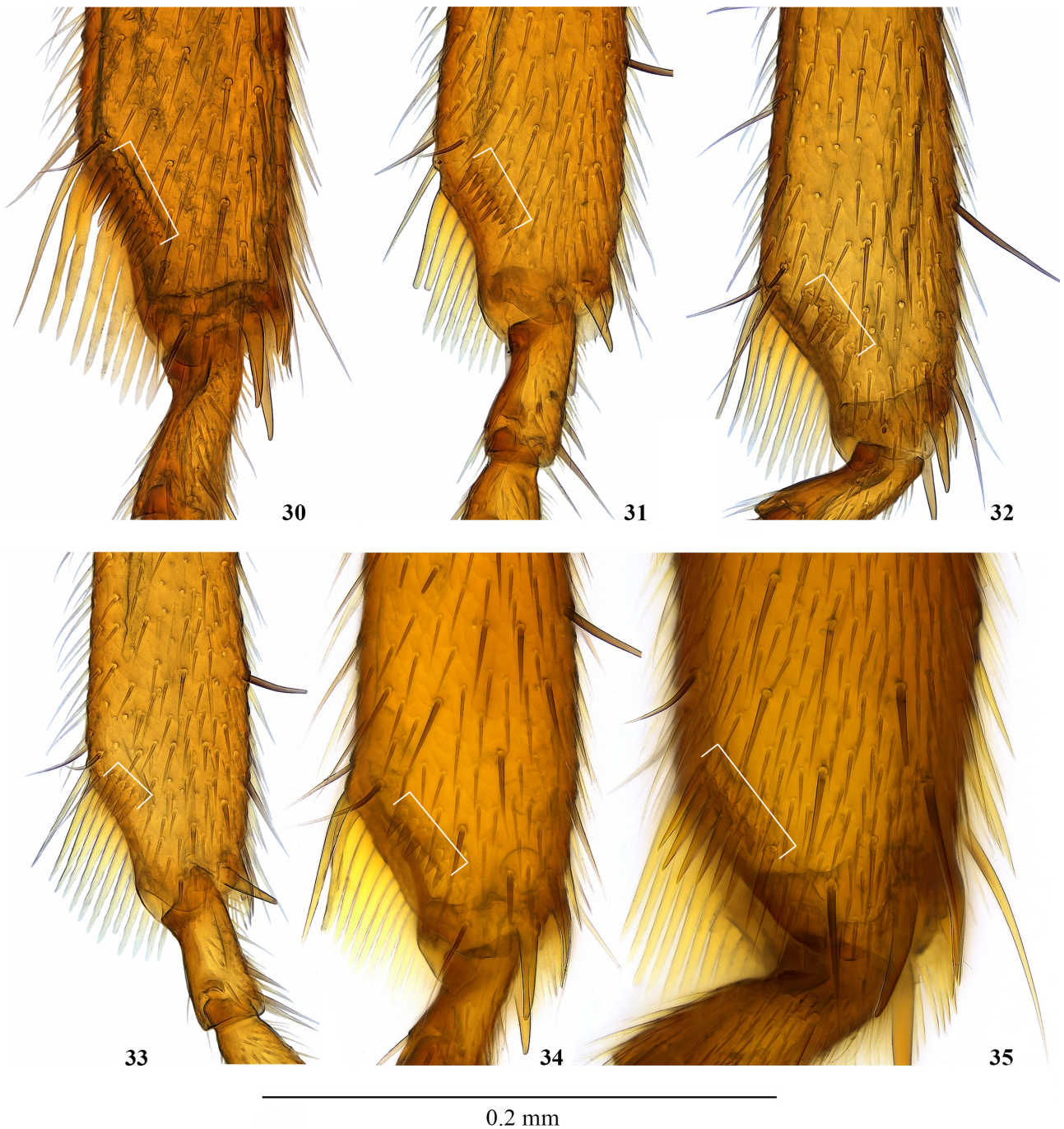
Labrum quadridentate (Figs 10–14), or rarely hexadentate with additional, small, apicolateral denticle (Fig. 15); denticles tapered to acute apex, for some species apparent sublateral denticle evident as pointed (Fig. 10) or rounded (Figs 13, 14) lobe; submedial denticle larger and longer than sublateral denticle; submedial and sublateral denticles rarely of same length (Fig. 15); sublateral denticle moderately large to tiny.

Antennal scape stout, large and parallel-sided to near base, then slightly narrowed in some species (Figs 1–4, 18).

Prothorax strongly hexagonal in dorsal view (Figs 1–4, 43–60); length slightly to moderately longer than wide (length/width: 1.01–1.13, $\bar{\phi}$ 1.04); dorsal surface with or without narrow, midlongitudinal, impunctate strip and without midlongitudinal groove on most of length; dorsal surface broadly and shallowly convex; surface with dense, very fine to moderately coarse, setate punctation; punctures discrete and separated (Fig. 2a), or surface with jumbled mix of short, contiguous rows of punctures and irregularly arranged punctures (Figs 1b, 3b), or with long, more regular, longitudinal rows, and surface striate and appearing wrinkled (Fig. 4b); macrosetae absent.

Prohypomerite with postprocoxal lobe separated from remainder of hypomerite by prohypomerite transverse ridge (Figs 19, 20).

Mesoventrite with deep, oval, median depression (e.g. Fig. 25); surface of ventrite with (Fig. 22) or without (Fig. 21) reticulate sculpturing; extent of surface reticulation variable (Figs 23–25); median depression and posterior median surface often without reticulation, but present in some species; surface without sculpturing polished; surface with few ridges; anterior mesanapleural ridge present (e.g. Fig. 22), often strongly reduced; posterior



FIGURES 30–35. Outer metatibial comb of *Frischiianus rubiginicollis*, paratype, Malaysia, Perak, Cameron Highlands (30); *F. strigaticollis*, paratype, India, Kerala, Cardamom Hills (31); *F. lineatocollis*, paratype, India, Kerala, Cardamom Hills (32); *F. keralensis*, paratype, India, Kerala, Nelliampathi Hills (33); *Trisunius* spec., Thailand, Malaysia, Sabah, Crocker Range (34); *Hyperscopaeus* spec., Thailand, Betong, Yala (35).

mesanapleural ridge present (e.g. Fig. 24) or absent (e.g. Fig. 25).

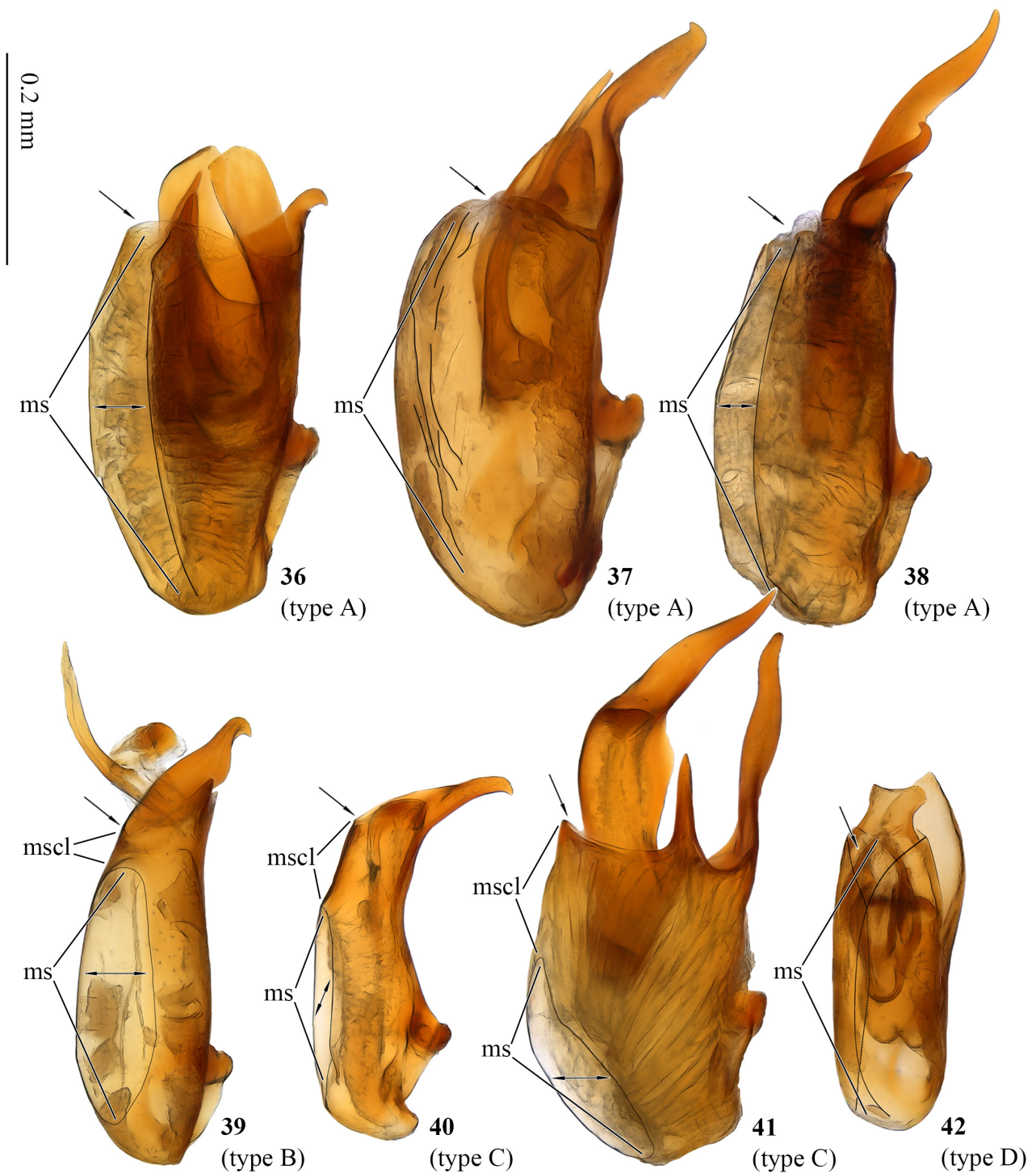
Mesofurcasternum (e.g. Fig. 22) without internal furcasternal apophysis on posteromedial margin (cf. Herman 2023: Figs 82, 241, 250).

Mesofemur without plectral ridges (Herman 2023: Figs 85, 106, 121, 185, 203).

Elytral surface with dense, moderately large to tiny, setate granules (Figs 1c–4c); seta arising from top or posterior side of granule; surface with three rows of

punctures (rows most effectively viewed using diffused light); punctures few and within each row well separated; rows extending from near anterior elytral margin to about one to two thirds of elytral length; sutural row deeply impressed, most strongly developed, and always present; median and lateral rows moderately impressed to not impressed and slightly to poorly developed to imperceptible, but row of punctures usually discernable.

Wings fully developed (and likely permitting flight) to reduced to short pads of about three-fifths to about



FIGURES 36–42. Types of dorsal, midlongitudinal split of aedeagus of *Frischianus* in dorsodextral view: Type A (narrow and membranous up to ostium) with example of *F. coriaceus*, Malaysia, Pahang, Ringlet (36); *F. pedator*, paratype, Indonesia, Sumatera Barat, Bukittinggi, Mt Singgalang (37); *F. burckhardtii*, paratype, Malaysia, Sabah, Poring Hot Springs (38). Type B (long oval and separated from ostium by short sclerotization) with example of *F. laticollis*, Indonesia, Jawa Barat, Sukabumi (39). Type C (shorter oval and separated from ostium by longer sclerotization) with example of *F. telnovi*, paratype, Malaysia, Sabah, Tawau (40); *F. rubiginicollis*, paratype, Malaysia, Pahang, Tanah Rata (41). Type D (narrow with lateral margins curved toward each other or overlapping at midlength, but widely opened into ostium) with example of *F. keralensis*, paratype, India, Kerala, Cardamom Hills (42). Abbreviations: ms—dorsal, midlongitudinal split; mscl—dorsodistal, midlongitudinal sclerotization. Arrow: Dorsal margin of ostium.

equal to elytral length (and likely flightless); some species with macropterous and micropterous individuals in same population.

Metaventrite without stridular file (cf. Herman 2023: Figs 105, 125, 154, 155, 189).

Metakatepisternal process present as small, apically rounded bump or knob on posterior, metaventral margin (Fig. 26; cf. Herman 2023: Figs 26, 89, 97, 241, 270, 335).

Metatibia with large inner and small outer apical comb (Figs 30–33); inner comb with many long tines; outer comb with significantly fewer and shorter tines than inner comb; outer comb with about four to eight tines.

Sternite II with median point of posterior margin present (Fig. 27).

Sternite III with long, intercoxal carina (Fig. 27).

Sternite IV with (apparent) glandular lobe on anterior margin (Fig. 28).

Male: Sternite VII with or without modification of median surface and posterior margin; median surface often with broad, shallow depression (Figs 206, 223) and medioposterior cluster of dark macrosetae (Figs 217, 219, 221, 223); posterior margin of most species truncate (Fig. 206) or some species with shallow (Figs 217, 225) to moderately deep (Fig. 233) median emargination.

Sternite VIII with emarginate posterior margin; emargination with variable depth, width, and form (e.g. Figs 199, 200, 227, 232, 234).

Aedeagus with dorsal surface of median lobe midlongitudinally membranous from base to ostium (Figs 36–38, 42) or with elongate membranous oval and separated from ostium by sclerotization (Figs 39–41).

Female: Sternite VII with truncate posterior margin.

Sternite VIII with rounded posterior margin, perhaps rarely with shallow emargination (Fig. 212). Abdominal segment IX with one, moderately wide to very wide gonocoxal plate (Fig 29); posterior margin emarginate; lateral margin sinuate with base slightly rounded and about as wide as apex (Figs 249–265) to greatly enlarged and significantly wider than apex (Figs 266–269).

Spermatheca hyaline, vesicular (Fig. 239), connected to sclerotized sperm pump (Figs 237–247) consisting of chamber segment (Fig. 239) and accessory terminal segment (Fig. 239); chamber segment without process of *Scopaeus* (cf. Frisch *et al.* 2002: 28); bursal duct right proximal of sperm pump straight (Figs 237–244) or curved (Figs 245–247), gradually more weakly sclerotized proximally.

Distribution: *Frischianus* is known from the Indian Subcontinent (India: Kerala, Tamil Nadu) and Southeast Asia (Thailand: Chiang Mai; Malaysia: Pahang, Penang, Perak, Sabah, Sarawak, Selangor; Indonesia: Aceh, Bali, Banten, Jambi, Jawa Barat, Jawa Tengah, Sulawesi Tengah, Sumatera Barat, Sumatera Utara; the Philippines: Mindanao). It is likely species will be found in southern China, Myanmar, Laos, Vietnam, and Brunei.

Habitat: Label data and personal collection experience of Frisch suggest a riparian habitat for *Frischianus* similar to the preference of *Scopaeus* (Frisch *et al.* 2002: 28). In Java, Frisch collected series of *F. laticollis*, *F. similis* **sp. nov.**, *F. communis* **sp. nov.**,

and the holotype of *F. setifer* **sp. nov.** in humid, slightly vegetated places along banks of creeks and rivers, below thin layers of phytodebris, under stones, and in the upper layer of sandy, gravelly soil. Frisch observed that the abundance of specimens and diversity of species decreased significantly as he moved toward shadier and dryer places away from the water. The sparse habitat information on the labels of specimens borrowed from collections is imprecise and generalized (secondary forest, logged forest, oilpalm plantation, rainforest, primary forest), but often indicates humid and riparian habitats (paddy field, riparian forest strip, near stream, Poring Hot Springs, sifted from phytodebris accumulated by flood). *Frischianus uhligi* **sp. nov.** was sifted from forest litter, although it remains unclear whether the collection site was near water. Species of *Frischianus* were collected from lowlands to 2,600 meters elevation (*F. pedator* **sp. nov.**; Mt. Singgalang, Sumatra) and 3,000 meters (*F. subalpinus* **sp. nov.**; Mt. Kerinci, Sumatra).

Remarks: The presence in *Frischianus* of the paraocular trichobothrium (Figs 5–9), tripartite ligular lobe (Fig. 17), long and tapered profurcasternum (in ventral view, Fig. 19), trilobed anterior margin of sternite II (Fig. 27), and absence of the pronotal marginal ridge (Fig. 20) support placing the genus in the Scopaeina.

Four species are transferred herein from *Scopaeus* as new combinations in *Frischianus*. *Frischianus rufulus* (Kraatz 1859: 140), from Myanmar, was described in *Lithocharis*, transferred to *Medon* in the subgenus *Lithocharis* by Bernhauer and Schubert (1912: 243), then to *Scopaeus* by Cameron (1931: 177). *Frischianus laticollis* (Cameron 1925: 183), from Indonesia, was described in *Scopaeus*. *Frischianus miscellus* and *Frischianus coriaceus*, both from Malaysia, were described in *Medon* by Cameron (1932: 129 and 136, respectively), who (Cameron 1950: 15) later moved them to *Scopaeus*. Along with these four, Frisch describes 30 new species in the present work.

By the present study, we now know that paederines with the cephalic and cervical characters of *Scopaeus*, but for which the pronotal length is only slightly greater than the width, is a signal that card mounted specimens must be examined for the presence of the epigenal ridge and/or removed from the card to ascertain the existence of a stridulum and condition of the metakatepisternal processes.

In a key to the genera of the Scopaeina (Herman 2023: 61), *Frischianus* runs to *Hyperscopaeus* in couplet 4. Characters separating the two genera are listed above in the second paragraph of the Diagnosis for *Frischianus*.

Etymology: By choosing the name *Frischianus*, Herman honors his long-time friend and colleague, Johannes Frisch, of the Museum für Naturkunde Berlin, for his insightful work on *Scopaeus* that has resulted in numerous beautifully detailed studies and illustrations of the widespread, speciose genus *Scopaeus* and who was the first to identify both this cluster of species as differing from *Scopaeus* along with the discovery that *Hyperscopaeus* was also a genus separate from *Scopaeus*. His studies of *Scopaeus* are among the best ever published

for the genus and will be a model and guide for work on the genus far into the future. The gender of the name is masculine.

2. Infrageneric classification and species of *Frischianus*

Frischianus currently comprises 34 species, 30 of which are new to science. They are described below and grouped into species groups and subgroups based on ectomorphological and genital characters. The following identification key to the species and species groups leads via page numbers to the diagnoses of the supraspecific groups, descriptions, and redescriptions, respectively. The female gonocoxal plate is species-specific in some species only and its features do not show a dichotomous pattern that can be reconciled with the features of the males. Therefore the key allows the identification of the females to species groups only except for the females of three species from India. The male of one species and the females of twelve species are unknown.

2.1. Key to species groups and species of *Frischianus*

- 1 Aedeagus with apical lobe usually present (Figs 61–156, 163–180), dorsal lobe absent, dorsal endophallic spine present (Figs 61–135, 157–159) or absent (Figs 136–156, 160–180), and ventral process present (Figs 157–180) or absent (Figs 61–156). Gonocoxal plate of ♀ subrectangular, not remarkably enlarged anteriorly (Figs 248–265). Bursal duct near sperm pump straight or slightly curved (Figs 237–244). Distributed in Southeast Asia
..... *Frischianus laticollis* species group (p. 231) 2
- Aedeagus (Figs 181–198) with apical lobe absent, dorsal lobe present, dorsal endophallic spine absent, and ventral process present. Gonocoxal plate of ♀ strongly enlarged anteriorly with (Figs 266, 267, 269) or without (Fig. 268) sublateral rows of spinules. Bursal duct near sperm pump strongly curved (Figs 245–247). Distributed in India
..... *F. strigaticollis* species group (p. 272) 30
- 2 Aedeagus without ventral process (Figs 61–156). Abdominal sternite VIII of ♂ with medioposterior incision narrow (e.g. Figs 199–205). Gonocoxal plate of ♀ with posterior emargination usually wide, moderately deep (Figs 248–256, 258–262)..... *F. laticollis* subgroup (p. 231) 3
- Aedeagus with ventral process (Figs 157–180). Abdominal sternite VIII of ♂ with medioposterior emargination wide and with abruptly narrowed anterior end (Figs 226–230). Gonocoxal plate of ♀ with posterior incision narrow, triangular (Figs 257, 263–265).....
..... *F. rufulus* subgroup (p. 264) 24
- 3 Aedeagus with dorsal endophallic spine (Figs 61–135)... 4
- Aedeagus without dorsal endophallic spine (Figs 136–156) 18
- 4 Endophallic sclerite with deeply emarginate ventral lobe and two dorsolateral spines with crossed ends strongly protruding from ostium (Figs 61–66).....

- *coriaceus* (*F. coriaceus* lineage) (p. 231)
- Endophallic sclerite different, not divided in ventral lobe and dorsolateral spines, often not protruding from ostium.
..... *F. laticollis* lineage (p. 234) 5
- 5 Macropterous species (e.g. Figs 43–45); palisade fringe of abdominal tergite VII present. Total body length 2.9–4.0 mm; forebody length 1.6–2.1 mm; length of aedeagus 0.4–0.5 mm. Distributed across Southeast Asia 6
- Micropterous species (Figs 46–48); palisade fringe of abdominal tergite VII absent. Total body length 3.6–4.9 mm; forebody length 2.0–2.3 mm; length of aedeagus 0.66–0.69 mm. Endemic to high mountains in Sumatra 17
- 6 Endophallic sclerite shorter, invaginated not protruding from ostium (Figs 67–111); apical lobe of aedeagus shorter (Figs 67–111)..... 7
- Endophallic sclerite longer, protruding from ostium (Figs 118–135); apical lobe of aedeagus strongly lengthened (Figs 118–135)..... 13
- 7 Endophallic sclerite with two small, mediolateral, circular sclerotizations (Figs 67–105); dorsal endophallic spine undulate with dilated end and narrow base (Figs 67–105).
..... 8
- Endophallic sclerite enlarged with two elongate, lateral portions (Figs 106–111); dorsal endophallic spine straight with narrow end and widely triangular, furcate base (Figs 106–111)..... 12
- 8 Apical lobe of aedeagus straight dorsally, directed ventrodorsad (Figs 67–75)..... 9
- Apical lobe of aedeagus convex dorsally, curved ventrad (Figs 76–105)..... 10
- 9 Apical lobe of aedeagus convex ventrally with acute apical tooth (Fig. 67)..... *laticollis* (p. 231)
- Apical lobe of aedeagus angled ventrally with round, untoothed apex (Fig. 70)..... *similis* (p. 239)
- 10 Apical lobe of aedeagus subrectangular or subtriangular, angled dilated ventrally (Figs 76–99)... *communis* (p. 243)
- Apical lobe of aedeagus subparallel (Figs 100, 103) 11
- 11 Apical lobe of aedeagus elongate, with sharp ventroproximal end (Fig. 100); aedeagus with ventral margin concave (Fig. 100)..... *mariae* (p. 243)
- Apical lobe of aedeagus about as long as wide, with obtuse ventroproximal end (Fig. 103); aedeagus with ventral margin straight (Fig. 103)..... *brenneri* (p. 245)
- 12 Apical lobe of aedeagus hook-shaped (Fig. 106); endophallic sclerite elongate in lateral view (Fig. 106), in ventral view (Fig. 107) concave laterally with forcipate proximal and distal ends *hamatus* (p. 245)
- Apical lobe of aedeagus moderately curved (Fig. 109); endophallic sclerite triangular in lateral view (Fig. 109), in ventral view (Fig. 110) straight laterally without forcipate ends..... *loebli* (p. 247)
- 13 Dorsal endophallic spine smooth (Figs 118, 121) 14
- Dorsal endophallic spine echinate (spinulate) (Figs 124–126) or serrate (Figs 127, 130) 15
- 14 Apical portion of endophallic sclerite spiniform (Figs 118–120)..... *uhligi* (p. 250)
- Apical portion of endophallic sclerite triangular (Figs 122, 123)..... *burckhardti* (p. 252)
- 15 Dorsal endophallic spine echinate (Figs 124–126); endophallic sclerite spiniform without additional teeth

	(Figs 125, 126).....	<i>echinatospinatus</i> (p. 253)		adjacent, medioposterior clusters of macrosetae directed toward each other (Fig. 219)	<i>setifer</i> (p. 261)
-	Dorsal endophallic spine serrate (Figs 127, 130); endophallic sclerite lobiform with ventral or apical teeth (Figs 127–132).....	16	Endophallic sclerite with two dextralateral, ventrad pointing teeth (Fig. 127), triangular in dorsal view (Fig. 129)	23	Apical lobe of aedeagus without uncinat apex, less bent ventrad (Fig. 151), in dorsal view in sinistral position, long and slender (Fig. 153). Abdominal sternite VII of ♂ with one medioposterior cluster of macrosetae (Fig. 221)
	.....	<i>puthzi</i> (p. 253)		.....	<i>barclayi</i> (p. 261)
-	Endophallic sclerite subrectangular with three apical teeth (Figs 130–132).....	<i>serratispinatus</i> (p. 255)		-	Apical lobe of aedeagus with uncinat apex, more strongly bent ventrad (Fig. 154), in dorsal view emerging from entire apical width of aedeagus, short (Fig. 156). Abdominal sternite VII of ♂ with two separate, longitudinal bands of black macrosetae (Fig. 223)
17	Apical lobe of aedeagus broader in lateral view with strong, ventroproximal tooth (Fig. 112), in dorsal view situated dextrally at strongly asymmetrical end of aedeagus (Fig. 114); ostium in lateral view covering endophallic sclerites (Fig. 112). Abdominal sternite VII of ♂ without diagnostic characters. Posterior incision of abdominal sternite VIII of ♂ with convex lateral margins (Fig. 205).....	24	.....	<i>huijbregtsi</i> (p. 262)	Micropterous species; palisade fringe of abdominal tergite VII absent. Sumatra. Male unknown. Probably not belonging to <i>F. rufulus</i> subgroup.....
	.....	<i>subalpinus</i> (p. 247)		-	Macropterous species; palisade fringe of abdominal tergite VII present.....
-	Apical lobe of aedeagus slender in lateral view with small, ventral, subapical tooth (Fig. 115), in dorsal view arising medially from symmetrical end of aedeagus (Fig. 117); ostium strongly retracted proximad, uncovering endophallic sclerites (Fig. 115). Abdominal sternite VII of ♂ with median depression covered with macrosetae (Fig. 206). Posterior incision of abdominal sternite VIII of ♂ with subconcave lateral margins (Fig. 207).....	25	.....	25	Dorsal endophallic spine present (Figs 157–159); endophallic sclerite short, massive (Figs 157–159). Abdominal sternite VII of ♂ in posterior median third with few, short macrosetae (Fig. 225) ..
	.....	<i>pedator</i> (p. 249)		-	Dorsal endophallic spine absent (Figs 160–180); endophallic sclerite long spiniform (Figs 160–180). Abdominal sternite VII of ♂ without macrosetae
18	Apical lobe of aedeagus in lateral view straight and slender with round end (Fig. 136), in ventral view lobate with small, dextral indentation (Fig. 137); endophallic sclerite large, deeply divided in two adjacent, lateral halves, strongly protruding from ostium (Figs 136, 138).....	26	.....	26	Apical lobe of aedeagus absent (Fig. 160); endophallic sclerite evenly curved ventrad, subparallel with acute apex in lateral view (Fig. 160), heart-shaped in dorsal view (Fig. 162).....
	.....	<i>schuriani (F. schuriani lineage)</i> (p. 255)		-	Apical lobe of aedeagus present (Figs 163–180); endophallic sclerite different (Figs 163–180)
-	Apical lobe of aedeagus curved distoventrad with pointed end (Figs 139, 142, 145, 148, 151, 154), narrow in ventral view (e.g. Figs 140, 146, 155); endophallic sclerite not divided in lateral halves, elongate, in lateral view at most slightly protruding from ostium (Figs 139–156).....	27	.....	27	Aedeagus elongate, in lateral view about 2.7 times as long as wide from base to ostium (Fig. 163); ventral process protruding over endophallic sclerite distally (Fig. 163); endophallic sclerite uncinately curved ventrad (Fig. 163) .
	.....	<i>F. setifer lineage</i> (p. 257)		.....	<i>miscellus</i> (p. 266)
19	Abdominal sternite VII of ♂ without posterior cluster(s) of macrosetae	20	.....	-	Aedeagus stocky, in lateral view about 1.2–1.4 times as long as wide from base to ostium (e.g. Fig. 166); ventral process not protruding over endophallic sclerite distally (e.g. Fig. 166); endophallic sclerite not uncinat (Figs 166, 169, 172, 175, 178).....
-	Abdominal sternite VII of ♂ with posterior cluster(s) of macrosetae (Figs 217, 219, 221, 223).....	21	.....	28	Apical lobe of aedeagus longer and wider (Figs 166–168), protruding beyond ventral process dextrally (Figs 167); endophallic foramen narrow, not protruding dextrally (Fig. 168).....
20	Apical lobe of aedeagus in lateral view broader with right-angled tip and ventral margin proximad of ventral tooth convex (Fig. 139); tip of endophallic sclerite uncinat (Fig. 139).....	20	.....	.....	<i>tridens</i> (p. 268)
	.....	<i>latilobatus</i> (p. 258)		-	Apical lobe of aedeagus shorter, spiniform (Figs 169, 172, 175, 178), not protruding beyond ventral process; endophallic foramen broader, strongly protruding dextrally (e.g. Fig. 171)
-	Apical lobe of aedeagus in lateral view narrower with acute tip and ventral margin proximad of ventral tooth straight (Fig. 142); tip of endophallic sclerite not uncinat (Fig. 142).....	21	.....	29	Endophallic sclerite in dorsal view with straight base (Figs 171, 174); apical portion of endophallic sclerite (distally of endophallic foramen) with convex dorsal margin (Fig. 169, 172), in dorsal view twisted bent sinistrally at midlength (Figs 171, 174); distal margin of endophallic foramen concave (Figs 171, 174)
	.....	<i>latilobatoides</i> (p. 258)		.....	<i>rubiginicollis</i> (p. 269)
21	Apical lobe of aedeagus in lateral view gradually tapered (Figs 145, 148).....	22	.....	-	Endophallic sclerite in dorsal view angled bent at base (Figs 177, 180); apical portion (distally of endophallic foramen) of endophallic sclerite with concave dorsal margin (Figs 175, 178), in dorsal view without twist slightly, evenly curved sinistrally (Figs 177, 180); distal margin of endophallic foramen convex (Figs 177, 180).....
-	Apical lobe of aedeagus in lateral view widened at about midlength (Figs 151, 154)	23	.....	.....	<i>karneri</i> (p. 269)
22	Apical lobe of aedeagus long dentiform, considerably longer than wide (Fig. 145). Abdominal sternite VII of ♂ with one indistinct, medioposterior cluster of posteriad directed macrosetae (Fig. 217)	22	.....	
	.....	<i>telnovi</i> (p. 258)			
-	Apical lobe of aedeagus short dentiform, about as long as wide (Fig. 148). Abdominal sternite VII of ♂ with two				

- 30 Ventral process of aedeagus more or less parallel in ventral view (Figs 182, 185, 188); dorsal lobe triangular in dorsal view, movably attached to aedeagus (Figs 183, 186, 189). Gonocoxal plate of ♀ strongly enlarged anteriorly with sublateral rows of spinules (Figs 266, 267)..... 31
- Ventral process of aedeagus triangular in ventral view (Figs 191, 194, 197); dorsal lobe in dorsal view subrectangular (Fig. 192) or lobiform (Figs 195, 198), seemingly not movable. Gonocoxal plate of ♀ less enlarged anteriorly and without sublateral rows of spinules (Fig. 268), or strongly enlarged anteriorly with sublateral rows of spinules (Fig. 269)..... 32
- 31 Ventral process of aedeagus without dorsoapical tooth (Figs 181, 184), in ventral view slightly curved dextrad (Figs 182, 185); endophallic sclerite asymmetrically extended into two apicoventral teeth (Fig. 181) sometimes reduced (Fig. 184). Gonocoxal plate of ♀ with broader posterior fourth (Fig. 266)..... *parentium* (p. 272)
- Ventral process of aedeagus with dorsoapical tooth (Fig. 187), in ventral view straight (Fig. 188); endophallic sclerite symmetrical, triangular in lateral view (Fig. 187), with broad, truncate end in ventral view (Fig. 188). Gonocoxal plate of ♀ with narrower posterior fourth (Fig. 267) *strigaticollis* (p. 274)
- 32 Ventral process of aedeagus slightly protruding over dorsal lobe distally (Fig. 190), in ventral view broad with triangular end (Fig. 191); dorsal lobe slim in lateral view (Fig. 190), in dorsal view with transverse, rectangular end (Fig. 192). Gonocoxal plate of ♀ less enlarged anteriorly, without sublateral rows of spinules (Fig. 268)..... *keralensis* (p. 274)
- Ventral process of aedeagus by far not reaching dorsal lobe distally (Figs 193, 196), in ventral view narrow, triangular (Figs 194, 197); dorsal lobe extended lateroventrally (Figs 193–198), in dorsal view with emarginate end (Figs 195, 198). Gonocoxal plate of ♀ (unknown in one species) more strongly enlarged anteriorly with sublateral rows of spinules (Fig. 269)..... 33
- 33 Ventral process of aedeagus in lateral view slender with small, dorsoapical tooth (Fig. 193); endophallic sclerite in lateral view with apex deeply emarginate in apicodorsal lobe and apicoventral lobe (Fig. 193), in ventral view with narrow, emarginate apices of apicodorsal and apicoventral lobes (Fig. 194)..... *lineolatus* (p. 276)
- Ventral process of aedeagus in lateral view thick with large, dorsal tooth (Fig. 196); endophallic sclerite in lateral view convex dorsally and acute distally (Fig. 196), in dorsal view with V-shaped proximal portion and subcircular distal portion (Fig. 198)..... *lineatocollis* (p. 276)

3.2.2. *Frischianus laticollis* species group

The *Frischianus laticollis* species group currently comprises 29 species, which are described and assigned to two subgroups below.

Diagnosis: Separated from *F. strigaticollis* species group (chapter 3.2.3.) as follows: Pronotal punctation type 1–3 (Figs 1b–3b). Aedeagus (Figs 61–180) asymmetrical;

dorsal lobe absent; parameres vestigial, longitudinally contiguous with circoforamen, in ventral and dorsal view not laterally protruding from contours of phallobase (e.g. Figs 64–66); dorsal, midlongitudinal split of aedeagus ending proximally of and not opened into ostium (types A, B, C; Figs 36–41). Gonocoxal plate of ♀ (unknown in 11 of 29 species included) subrectangular without hypertrophic, anterior enlargement (Figs 248–265). Bursal duct at transition to sperm pump straight or slightly curved (Figs 237–244). Distributed in Southeast Asia [Myanmar, Thailand (Chiang Mai), southern Philippines (Mindanao), Malay Peninsula, Borneo (Sabah, Sarawak), Sumatra, Sulawesi, Java, Bali].

2.2.1. *Frischianus laticollis* subgroup of *F. laticollis* species group

Diagnosis: Separated from *F. rufulus* subgroup (chapter 3.2.2.2.) as follows: Submedial labral denticles pointed, usually longer than pointed, rarely obtuse, sublateral labral denticles (Figs 10–12, 14). Abdominal sternite VIII of ♂ with medioposterior incision narrow (e.g. Figs 199–205). Aedeagus (Figs 61–156) with apical lobe present and ventral process absent; apical lobe more or less, often strongly, shifted sinistrad and curved dextrad; endophallic sclerite variable in size and shape, small to enlarged with various modifications, with foramen indiscernible or moderately developed. Gonocoxal plate of ♀ (unknown in eight of 22 species included) with posterior margin widely, but moderately deeply emarginate (Figs 248–256, 258–262).

Classification: The *Frischianus laticollis* subgroup of the *F. laticollis* species group is widely distributed in Southeast Asia. It currently comprises 22 species, which can be assigned to four species lineages. They are diagnosed below and the species included described.

2.2.1.1. *Frischianus coriaceus* lineage of *F. laticollis* subgroup

Diagnosis: Distinguished from remaining species lineages of *F. laticollis* subgroup (chapter 3.2.2.1.) by ventral endophallic sclerite apically extended in deeply emarginate ventral lobe and two dorsolateral spines with crossed ends strongly protruding from ostium of aedeagus (Figs 61–66), and by gonocoxal plate of ♀ with sclerotization triangularly extended across membranous, basolateral dilation (Figs 248, 249). Separate from *F. schuriani* and *F. setifer* species lineages furthermore by presence of dorsal endophallic spine (Figs 61–66).

***Frischianus coriaceus* (Cameron), comb. nov.**
(Figs 1, 43, 61–66, 199, 237, 248, 249)

Medon coriaceus Cameron, 1932: 127, 136.
Scopaeus coriaceus; Cameron 1950: 15.

Type specimen: Lectotype ♂, Malaysia, Selangor: The Gap, leg. Cameron (NHML); labelled “Type” (round, printed, red edged label), “The Gap, / Selangor, F.M.S. / Dr. Cameron.” (printed), “M. Cameron / Bequest / B.M.1955-147.” (printed), “Bank / of Stream” (printed), “Debris” (printed), “M. / coriaceus / TYPE Cam.” (handwritten, “TYPE” in red), “Lectotype / *Medon coriaceus* / Cameron, 1932 / des. Frisch & Herman, 2025”; here designated.

The original description of *Medon coriaceus* (Cameron 1932: 136) contains no information regarding the number of underlying specimens nor does it specify a holotype by original designation (ICZN 1999: Article 73.1.1.). However, as male characters are described, at least one male must have been available to the author. To stabilize the name *Medon coriaceus* according to ICZN 1999, Article 74.1., we designate as the lectotype the only available specimen, a male from the Cameron collection at NHML, which is labelled “Type”, originates from the type locality The Gap and bears a handwritten

identification label which agrees with the example of Cameron’s handwriting in Horn *et al.* (1990: 477).

New records: Malaysia, Pahang: Ringlet, 1250 m, 26.III.1993, leg. Calame & Löbl (MHNG); Bukit Fraser, Tiong-Layang trail, 1300 m, 18.III.1993, leg. Calame & Löbl (MHNG); Bukit Fraser, 1280 m, 17.IX.1972, leg. Jaccoud (MFNB); Tanah Rata (Cameron Highlands), 19.–23.3.2008, leg. Hammond (NHML).

Description: Habitus (Figs 1, 43). Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color unicolored medium brown or elytra with darker brown lateroposterior angles in variable expansion; tip of abdomen, antennae, palps, and legs yellow brown. Labral denticulation type 1 (Fig. 10). Forebody surface microsculpture type 1 (Fig. 1). Elytral rows of punctures present; sutural row of punctures faintly impressed anteriorly, occupying about anterior 0.7 of elytral sutural length. Total body length 3.2–3.6 mm; forebody length 1.8–2.0 mm.



FIGURES 43–45. Habitus of *Frischianus coriaceus*, lectotype, Malaysia, Selangor, The Gap (43); *F. laticollis*, Indonesia, Jawa Barat, Bogor, Mt Salak (44); *F. similis*, paratype, Banten, Lebak, Citorek Kidul (45).



FIGURES 46–48. Habitus of *Frischianus subalpinus*, paratype, Indonesia, Jambi, Mt Kerinci (46); *F. curtipennis*, holotype, Indonesia, Jambi, Mt Kerinci (47); *F. pedator*, holotype, Indonesia, Sumatera Barat, Bukittinggi, Mt Singgalang (48).

Male: Abdominal sternite VII without diagnostic characters. Abdominal sternite VIII with triangular, medioposterior incision with concave lateral margins, occupying roughly 0.3 of sternite length (Fig. 199).

Aedeagus (Figs 61–66) with short apical lobe; apical lobe in lateral view slender with apical end minutely pointed ventrally (Figs 61, 64), in ventral view widely triangular with very narrow, short apical end shifted sinistrad and strongly bent dextrad (Figs 62, 65). Endophallus in ventral and dorsal view situated medially in aedeagus (Figs 62, 63, 65, 66). Endophallic sclerite with robust, broad base,

continued distally in large ventral lobe and two dorsolateral spines (Figs 61–66); ventral lobe and dorsolateral spines of endophallic sclerite strongly protruding from ostium; ventral lobe of endophallic sclerite by deep, wide, ventral emargination divided in two ventrolateral lobes with round apical end (Figs 61–66); dorsolateral spines of endophallic sclerite slightly curved ventrad (Figs 61, 64), in dorsal view aligned toward each other with ends crossing (Figs 63, 66). Dorsal endophallic spine thin, reaching apices of dorsolateral spines of endophallic sclerite, faintly curved ventrad (Figs 61, 64), in dorsal view straight, pointing



FIGURES 49–51. Habitus of *Frischianus uhligi*, holotype, Malaysia, Sabah (49); *F. burckhardti*, paratype, Malaysia, Sabah, Ranau, Poring Hot Spring (50); *F. puthzi*, holotype, Malaysia, Sabah, road Tambunan–Mt Kinabalu (Crocker Range) (51).

longitudinally, and with apical end running ventral of crossed ends of dorsolateral endophallic spines (Figs 63, 66). Dorsal, midlongitudinal split of phallobase type A (Fig. 36). Aedeagus with ventral margin between postforamen and apical lobe straight (Figs 61, 64), in dorsal view oval with slightly curved lateral margins (Figs 63, 66). Length of aedeagus 0.43–0.46 mm.

Female: Gonocoxal plate (Figs 248, 249) with basolateral region membranous and gradually widened laterally; sclerotized, setose portion of gonocoxal plate widely emarginate posteriorly, triangularly extended across membranous enlargement anteriorly, and ending in variable tip; sclerotized, triangular extension of gonocoxal plate without basolateral ridge, not hard set off from adjacent membranes.

Distribution: *Frischianus coriaceus* is widely distributed in the Malay Peninsula and recorded from the Cameron Highlands (Ringlet) in the north as far south as The Gap and Fraser’s Hill.

2.2.1.2. *Frischianus laticollis* lineage of *F. laticollis* subgroup

Diagnosis: Separated from remaining lineages of *F. laticollis* subgroup (chapter 3.2.2.1.) by small (Figs 67–105) to moderately enlarged (Figs 106–117) or long spiniform (Figs 118–135) endophallic sclerite. Different from *F. schuriani* and *F. setifer* lineages also by presence of dorsal endophallic spine (Figs 67–135).

Remarks: With 14 species included, the *Frischianus laticollis* lineage of the *F. laticollis* subgroup is the most speciose and most widespread terminal lineage of *Frischianus* as far as known presently. It is recorded from the Malay Peninsula, Sumatra, Borneo, Java and Bali.

***Frischianus laticollis* (Cameron), comb. nov.**
(Figs 2, 44, 67–69, 200, 238, 250)

Scopaeus laticollis Cameron, 1925: 183, 184.



FIGURES 52–54. Habitus of *Frischianus telnovi*, paratype, Malaysia, Sabah, Tawau (52); *F. rufulus*, lectotype, Myanmar (53); *F. miscellus*, lectotype, Malaysia, Penang (54).

Type specimens examined: Lectotype ♀, Indonesia, Jawa Barat, Cibodas, 400 m, VIII.1921, leg. Dammerman; labelled “Tjibodas / 1400 M. / VIII. 1921” (printed except for date), “*Scopaeus / laticollis* Cam. / TYPE” (handwritten), “Type” (red, printed), “Lectotype / *Scopaeus laticollis* / Cameron, 1925 / des. Frisch & Herman, 2025” (NHML); here designated. Paralectotypes (2 specimens): 1 ♀, labelled “Tjibodas / 1400 M. / VIII. 1921” (printed except for date), “Cameron det.” (handwritten), “Syntypus” (red, printed), “*Scopaeus / laticollis* Cam” (handwritten), “coll. DEI / Eberswalde” (printed), “Paralectotype / *Scopaeus laticollis* / Cameron, 1925 / des. Frisch & Herman, 2025” (SDEI); 1 ♀, labelled “Tjibodas / 1400 M. / VIII. 1921” (printed except for date), “*Scopaeus laticollis* Cam. / Cotype”, “M. Cameron / Bequest / B.M.1955-147.” (printed), “Paralectotype / *Scopaeus laticollis* / Cameron, 1925 / des. Frisch & Herman, 2025” (NHML).

Cameron (1925: 183, 184) described *Scopaeus laticollis* based on “3 examples” from Cibodas [Tjibodas],

which we examined. Even though Cameron labeled one of them as “Type”, these specimens are syntypes, because the author did not publish a holotype by original designation (ICZN 1999: Article 73.1.1.). Thus, a lectotype designation is required to stabilize the name *S. laticollis* Cameron, 1925 according to ICZN 1999, Article 74.1. As no male syntype is available, we select as the lectotype a female from the Cameron collection at NHML, which was collected at the type locality Cibodas and labeled “TYPE” by Cameron himself as can be seen from the example of his handwriting in Horn *et al.* (1990: 477).

Frischianus laticollis is one of three closely related Javanese species that can accurately be distinguished only by the aedeagus. The other two species are described below as *F. similis* **sp. nov.** and *F. communis* **sp. nov.**. Even though no male types are available, *F. laticollis* can be interpreted quite reliably. Both the female lectotype and the two female paralectotypes differ from the females of *F. similis* and *F. communis* by the slightly longer



FIGURES 55–57. Habitus of *Frischianus rubiginicollis*, paratype, Malaysia, Pahang, Tanah Rata (55); *F. karneri*, holotype, Malaysia, Selangor, Gombak Valley (56); *F. parentium*, paratype, India, Tamil Nadu, E Kodaikanal (Palni Hills) (57).

gonocoxal plate (Fig. 250) and agree in this feature with a series that was later collected at the type locality Cibodas of *F. laticollis* and also contains males. We consider it a pragmatic solution to refer the species group name *laticollis* Cameron, 1925 to this species.

New records: Indonesia: Jawa Barat: Bogor, NO-slope of Mt Salak (06°39'55"S, 106°45'36"E), 640 m, 13.IX.2015, leg. Frisch (MFNB, ZMB); Bogor: Lake Warna, VIII.1984, leg. Robert (MHNG); Bogor, Cibodas, 1400 m, 3.–6.IX.1989, leg. Agosti, Burckhardt & Löbl (MHNG); Sukabumi, NNW Cidahu: Cirasamala River (S-slope of Mt Salak), (06°44'18"S, 106°42'52"E), 1210 m, 29.IX.2015, leg. Frisch (MFNB); Sukabumi, Cikaniki: Cikaniki River (Mt Halimun, Halimun–Salak National Park) (06°44'46"S, 106°32'25"E), 1020 m, 5.X.2015, leg. Frisch (ZMB); Sukabumi, Sirnarasa: Cimaja River (S-slope of Mt Halimun), (06°51'32"S, 106°31'06"E), 670 m, 21.IX.2015, leg. Frisch (MFNB, ZMB); Cianjur, Mt Gede, 1400–1500 m, 24.–28.V.1997, leg. Kurbatov

(MHNG). Jawa Tengah: Pekalongan, Petungkriyono (N-slope Dieng Plateau) (07°06.42'S, 109°44.51'), 1115 m, 22.VIII.2006, leg. Riedel (SMNK).

Description: Habitus (Figs 2, 44). Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color medium brown to dark brown with lighter brown humeral angles; light brown humeral color often extended across anterior third of elytra and along suture more or less reducing dark color to lateroposterior angles of elytra; tip of abdomen, antennae, palps, and legs light brown. Labral denticulation type 1 (Fig. 10). Forebody surface microsculpture type 2 (Fig. 2). Elytral rows of punctures distinct; sutural row of punctures impressed, occupying anterior half of elytral sutural length. Total body length 3.0–3.6 mm; forebody length 1.8–2.0 mm.

Male: Abdominal sternite VII without diagnostic characters. Abdominal sternite VIII with deep, narrow, medioposterior incision with feebly concave lateral margins, occupying about 0.4 of sternite length (Fig. 200).



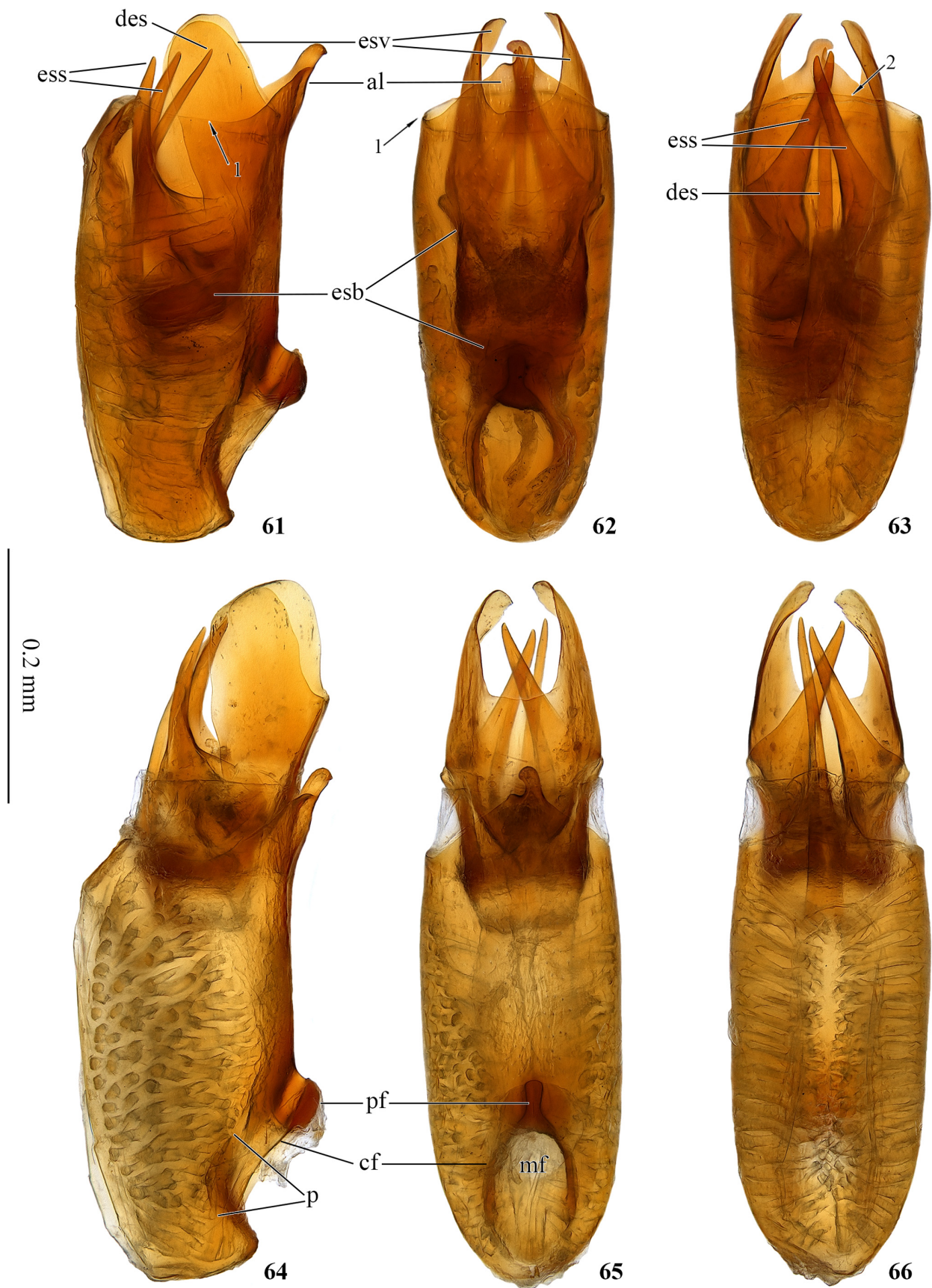
FIGURES 58–60. Habitus of *Frischianus strigaticollis*, paratype, India, Tamil Nadu, Valparai (Anaimalai Hills) (58); *F. keralensis*, paratype, India, Kerala, Nelliampathi Hills (59); *F. lineatocollis*, paratype, India, Kerala, SW Kumily, Vallakadavu (Cardamom Hills) (60).

Aedeagus (Figs 67–69) with apical lobe narrow, arising from sinistral half of truncate apical margin of aedeagus (Figs 68, 69); apical lobe with straight dorsal and convex ventral margin, gradually narrowed toward small, triangular, ventrad pointing apical tooth (Fig. 67). Position of endophallus in aedeagus unknown, because evaginated in all male type specimens. Endophallic sclerite elongate, curved dorsally, with strongly sclerotized, subcircular median portion (Fig. 67), in evaginated state broad in dorsal and ventral view (Fig. 68, 69). Dorsal endophallic spine, in lateral view, curved ventrad and narrowed toward thin, acute apical end (Fig. 67), not protruding from ostium when invaginated (cf. Figs 70, 97), in ventral and dorsal view almost straight with parallel lateral margins and acute apical end (Figs 68, 69). Dorsal, midlongitudinal split of phallobase type

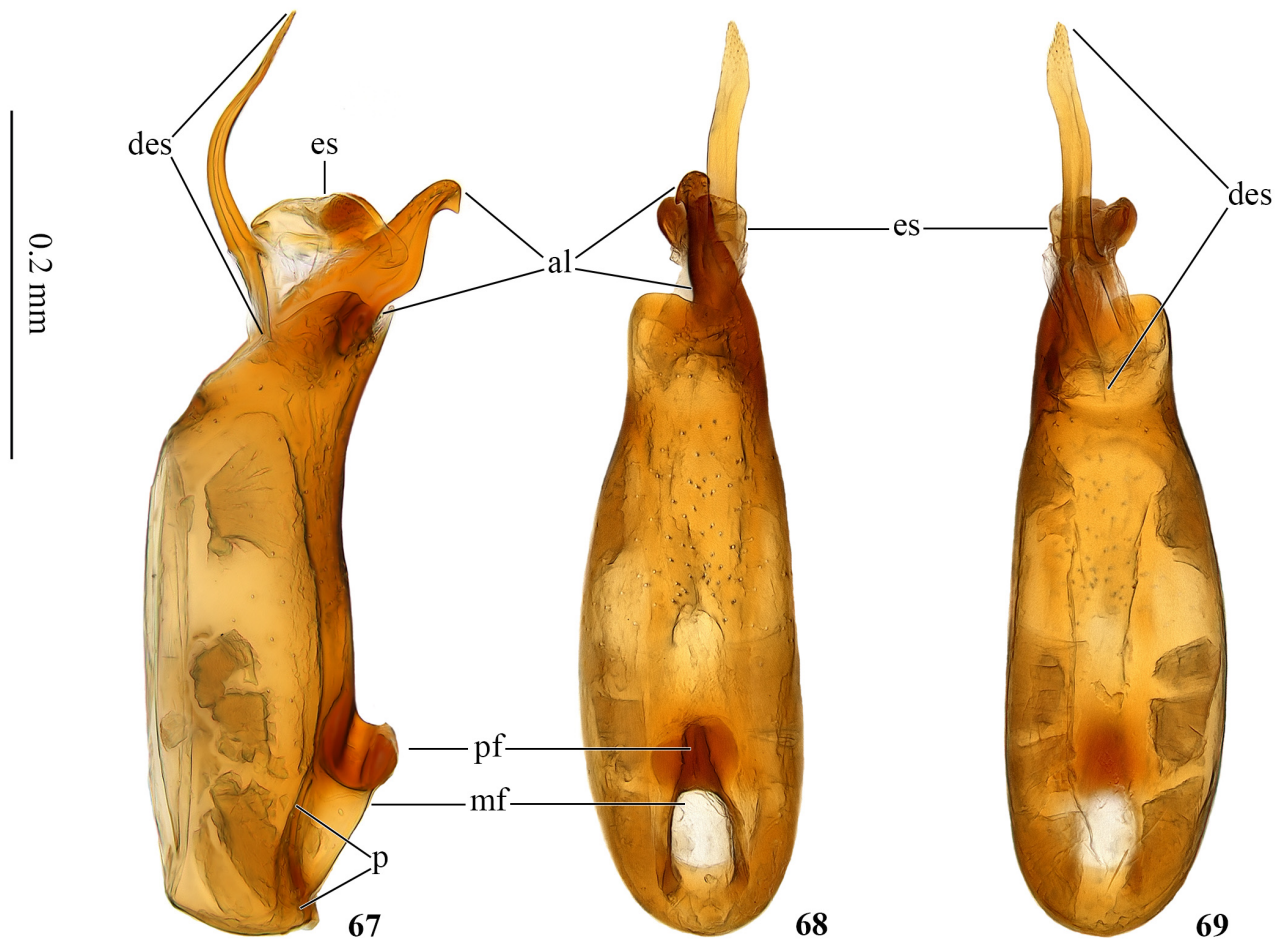
B (Fig. 39). Aedeagus with ventral margin between postforamen and apical lobe slightly concave (Fig. 67), in dorsal view long oval, slightly asymmetrical with dextral lateral margin more strongly curved than almost straight, sinistral lateral margin, and somewhat tapered apicad (Fig. 69). Length of aedeagus 0.44–0.45 mm.

Female: Gonocoxal plate 1.7 times as long as wide, without basal and subbasal ridge, with subparallel, slightly concave lateral margins, shallowly emarginate posterior margin, and biconvex basal margin (Fig. 250).

Distribution: *Frischianus laticollis* is spread in western and Central Java, Indonesia, and recorded from 06°51'32"S, 106°31'06"E at Mount Halimun, Jawa Barat, as far east as 07°06.42'S, 109°44.51', Dieng Plateau in Jawa Tengah.



FIGURES 61–66. Aedeagus of *Frischianus coriaceus* in lateral (61, 64), ventral (62, 65), dorsal view (63, 66); lectotype, Malaysia, Selangor, The Gap (61–63); Malaysia, Pahang, Bukit Fraser (endophallic structures evaginated) (64–66). Abbreviations: al—apical lobe; cf—circoforamen; des—dorsal endophallic spine; esb—base of endophallic sclerite; ess—dorsal spines of endophallic sclerite; esv—ventral lobes of endophallic sclerite; mf—median foramen; p—vestigial paramere; pf—postforamen. Arrows: 1—lateral margin of ostium (61, 62); 2—dorsal margin of ostium (63).



FIGURES 67–69. Aedeagus of *Frischianus laticollis* in lateral (67), ventral (68), dorsal view (69); Indonesia, Jawa Barat, Sukabumi, Sirnarasa (dorsal endophallic spine evaginated). Abbreviations: al—apical lobe; des—dorsal endophallic spine; es—endophallic sclerite; mf—median foramen; p—vestigial paramere; pf—postforamen.

***Frischianus similis* Frisch, sp. nov.**
(Figs 45, 70–75, 239, 251)

Type specimens: Indonesia: Holotype ♂, Banten, Lebak: Citorek Kidul (06°44'51"S, 106°19'13"E), 870 m, 23.V.2016, leg. Frisch (ZMB). Paratypes (16 specimens): 5 ♂, 9 ♀, same data as holotype (MFNB, ZMB); 2 ♂, Jawa Barat, Sukabumi: Ciptarasa (Halimun–Salak National Park) (06°49'52"S, 106°30'05"E), 19.IX.2005, leg. Riedel (SMNK).

Description: Habitus (Fig. 45). Body size, exoskeletal characters, coloring, and shape of abdominal sternite VIII as in *Frischianus laticollis* (cf. Figs 2, 44, 200), but different according to shape of aedeagus and female gonocoxal plate as follows. Total body length 3.1–3.6 mm; forebody length 1.8–1.9 mm.

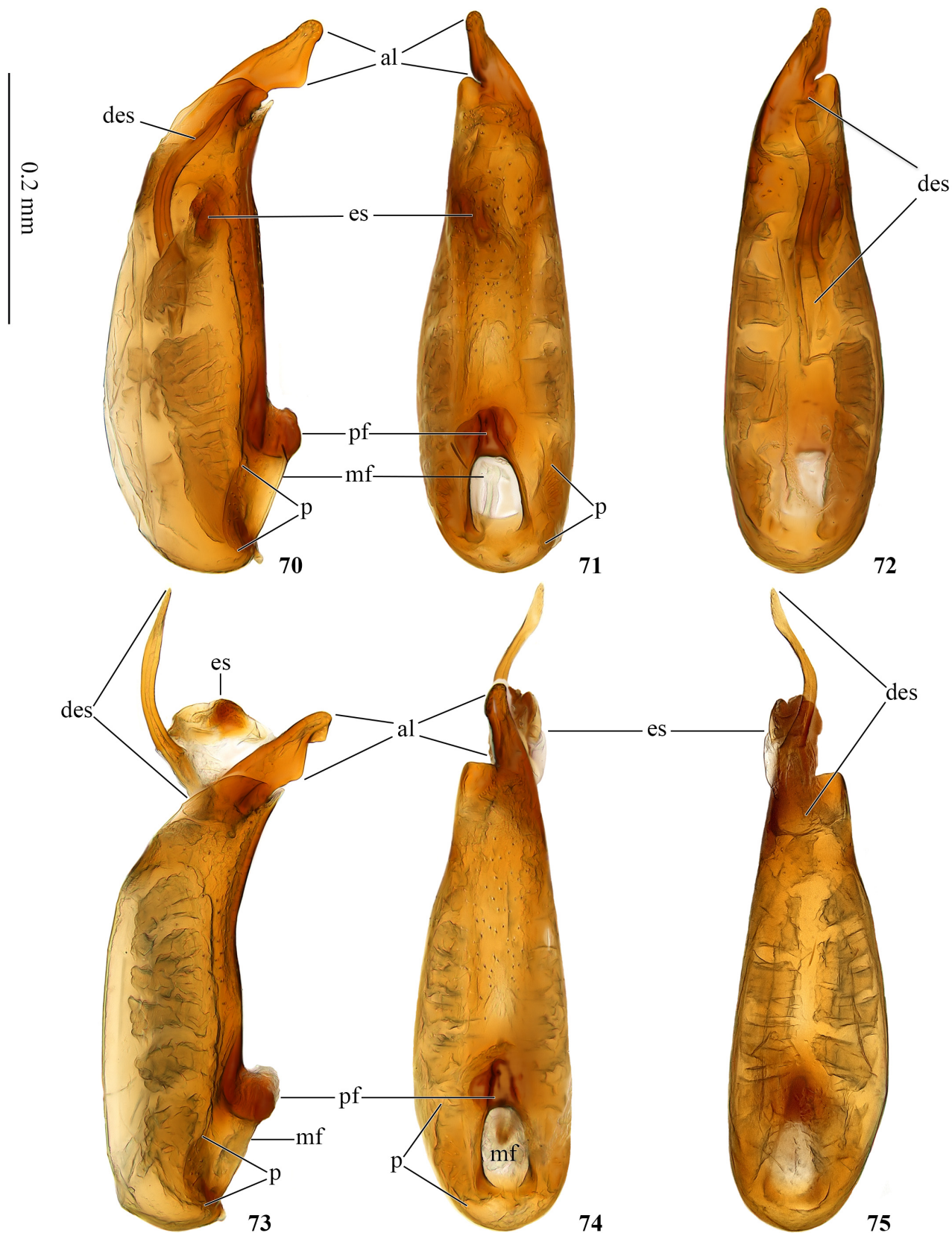
Male: Aedeagus (Figs 70–72) with apical lobe widened dextrad at base (Figs 71, 72); apical lobe with slightly concave dorsal margin, strongly triangular ventral margin, and round apical end without apicoventral tooth (Fig. 70). Length of aedeagus 0.44–0.45 mm.

Female: Gonocoxal plate shorter, only about 1.6 times as long as wide, with lateral margins somewhat more deeply concave (Fig. 251).

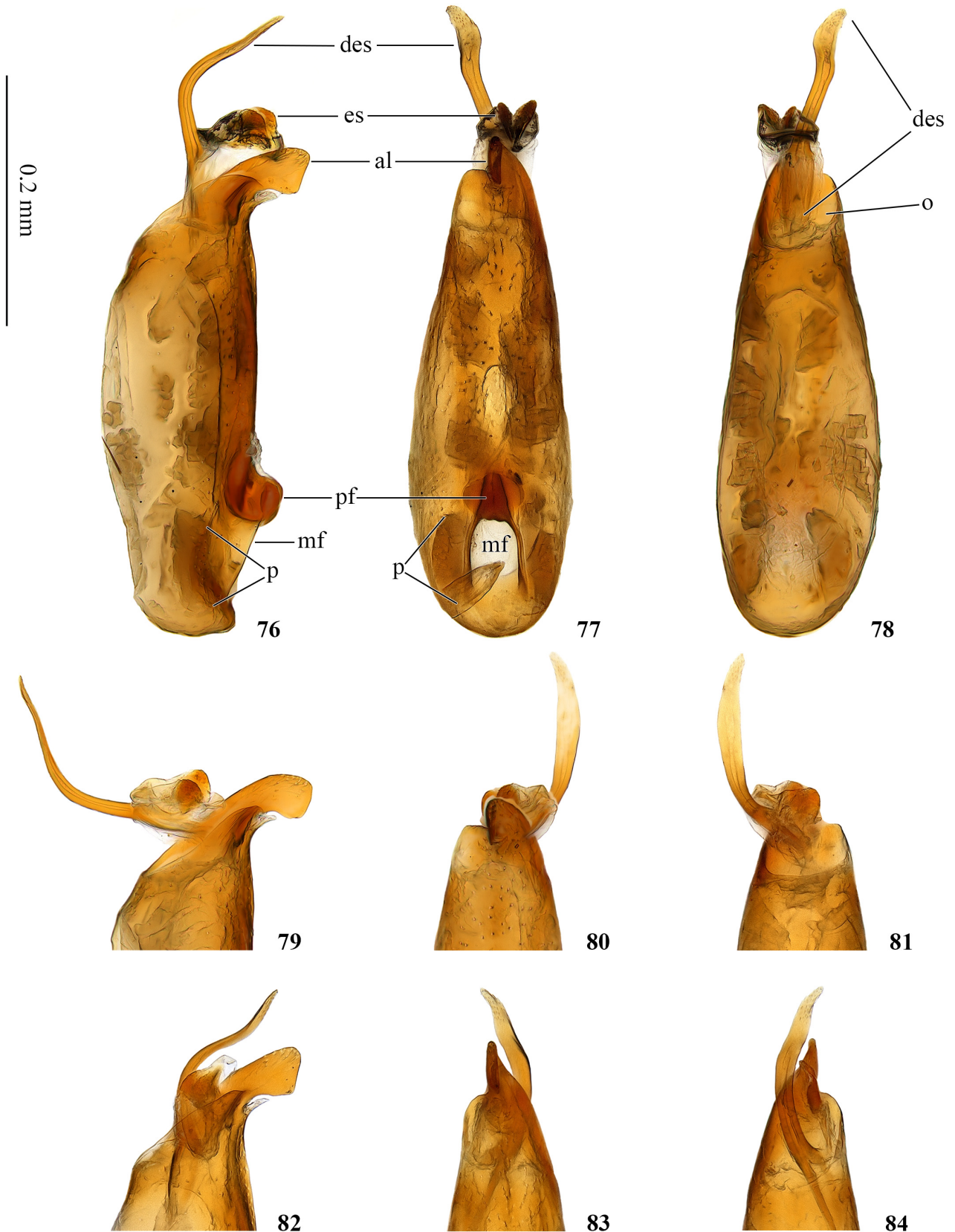
Distribution: *Frischianus similis* is known only from western Java, Indonesia, where it was found in two close localities in the east of Banten and the very west of Jawa Barat.

Etymology: The epithet *similis* (adjective, Latin: similar) emphasizes the similarity of the aedeagus of this new species to the aedeagus of *Scopaeus laticollis* and the close relationship of these species, respectively.

Comparative note: *Frischianus laticollis* and *F. similis* resemble each other in their external morphology (Figs 44, 45). Males can be distinguished according to the shape of the aedeagus. In *F. laticollis* the aedeagus exhibits a ventral apical tooth of the apical lobe (Fig. 67), while this tooth is absent in *F. similis* (Fig. 70). A single specimen with an apical tooth of the apical lobe (Figs 73–75), that was found within a *F. similis* sample, perhaps belongs to *F. similis* according to the subtriangular, angled ventral margin of the apical lobe and might reflect a possible variability of the aedeagus. Its apical tooth is furthermore broad and obtuse (Fig. 73), while in *F. laticollis* this tooth is narrower and acute (Fig. 67). This specimen is not included in the type series. Females can seemingly be distinguished according to the slightly different proportions of the gonocoxal plate, which in examined

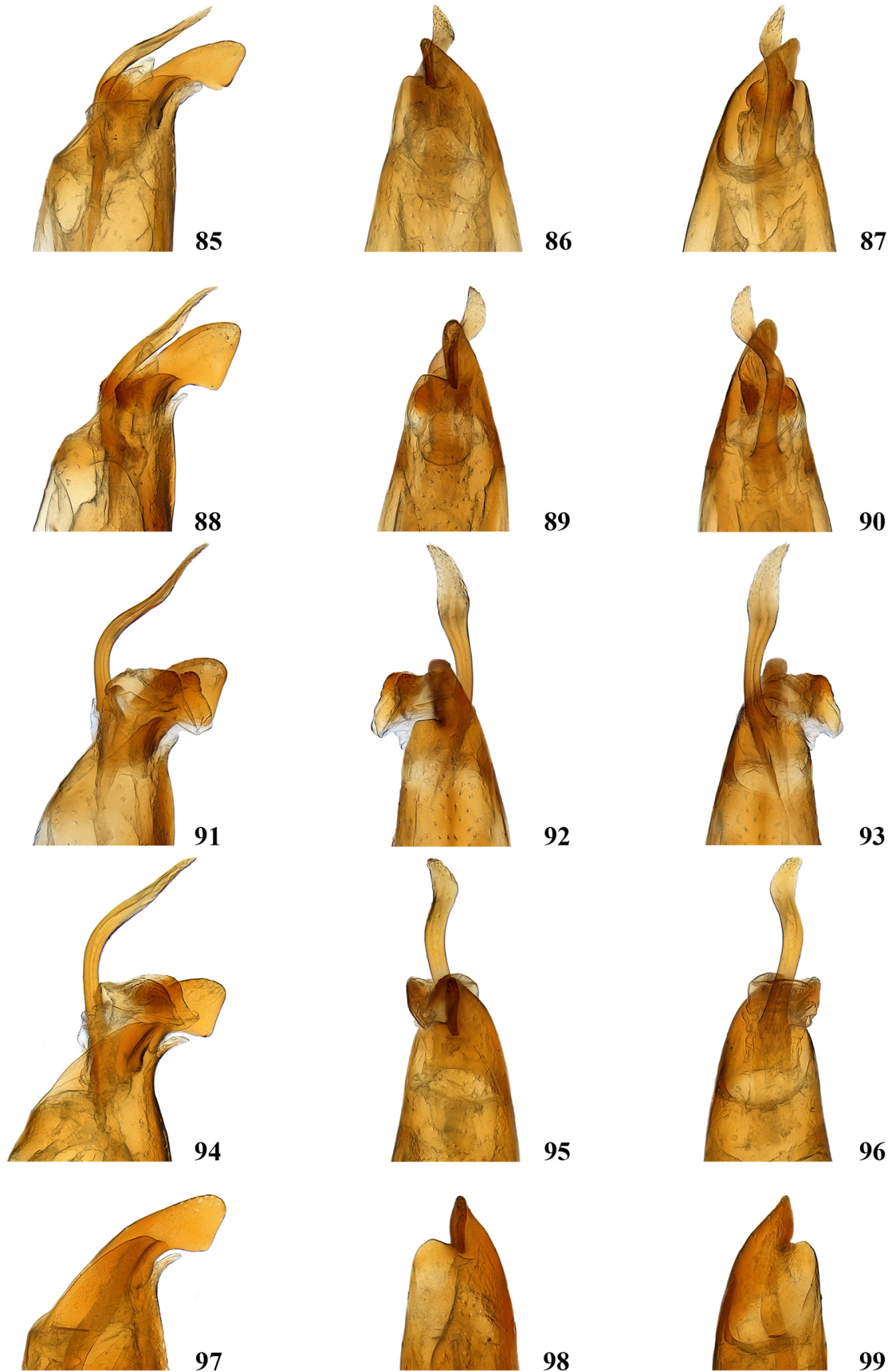


FIGURES 70–75. Aedeagus in lateral (70, 73), ventral (71, 74), dorsal view (72, 75) of *Frischianus similis*, holotype, Indonesia, Banten, Lebak, Citorek Kidul (70–72); *F.* cf. *similis*, Banten, Lebak, Citorek Kidul (dorsal endophallic spine evaginated) (73–75). Abbreviations: al—apical lobe; des—dorsal endophallic spine; es—endophallic sclerite; mf—median foramen; p—vestigial paramere; pf—postforamen.



FIGURES 76–84. Aedeagus of *Frischianus communis* in lateral (76, 79, 82), ventral (77, 80, 83), dorsal view (78, 81, 84) with dorsal endophallic spine evaginated; holotype, Indonesia, Jawa Barat, Bogor, SW Pamijahan (Cimuara Herang River) (76–78); paratype, Indonesia, Jawa Barat, Sukabumi (79–81); paratype, Malaysia, Sabah, Poring Hot Spring (82–84). Abbreviations: al—apical lobe; des—dorsal endophallic spine; es—endophallic sclerite; mf—median foramen; o—ostium; p—vestigial paramere; pf—postforamen.

0.2 mm



FIGURES 85–99. Aedeagus of *Frischianus communis* in lateral (85, 88, 91, 94, 97), ventral (86, 89, 92, 95, 98), dorsal view (87, 90, 93, 96, 99); paratype, Indonesia, Bali, Mt Batukaru (85–87); paratypes, Malaysia, Aceh, Ketambe (Mt Leuser National Park) (88–93); paratype, Malaysia, Pahang, Genting Highlands (94–96); paratype, Malaysia, Sarawak, Mt Mulu National Park (97–99). Dorsal endophallic spine evaginated in Figs 85–96.

specimens of *F. laticollis* including the lectotype is longer (Fig. 250) than in *F. similis* (Fig. 251). Examination of further females is, however, necessary to confirm the reliability of the gonocoxal plate proportions for species identification. As far as known, the distributional pattern of *F. similis* follows that of the closely related *F. laticollis* immediately to the west, which is why both taxa might be allopatric vicariants at the species or, perhaps, at the subspecies level.

***Frischianus communis* Frisch, sp. nov.**

(Figs 76–99, 240, 252)

Type specimens: Holotype ♂, Indonesia, Jawa Barat, Bogor, SW Pamijahan (Cimuaru Herang River), (06°42'41"S, 106°41'03"E), 990 m, 3.X.2015, leg. Frisch (ZMB). Paratypes (60 specimens): Indonesia: Aceh: Ketambe (Mt Leuser National Park): 1 ♂, 450 m, 26.II.–1.III.1991, leg. Bocák & Bocáková (NHMB), 4 ♂, 7 ♀, 300–500 m, 23.–30.XI.1989, leg. Agosti, Burckhardt & Löbl (MHNG). Jawa Barat: 1 ♀, same data as holotype (MFNB); 1 ♂, 1 ♀, Sukabumi, Cisalimas: Cisalimas River (E-slope of Mt Halimun) (06°45'21"S, 106°33'38"E), 870 m, 19.IX.2015, leg. Frisch (MFNB, ZMB); 1 ♂, 5 ♀, Sukabumi, Sirnarasa: Cimaja River (S-slope of Mt Halimun) (06°51'32"S, 106°31'06"E), 670 m, 21.IX.2015, leg. Frisch (MFNB, ZMB); 1 ♂, 1 ♀, Sukabumi, Simaresmi: Cisareno River (06°49'02"S, 106°30'09"E), 1000 m, 22.IX.2015, leg. Frisch (MFNB, ZMB); 1 ♂, Sukabumi, NNW Cidahu: Cirasamala River (S-slope of Mt Salak) (06°44'18"S, 106°42'52"E), 1210 m, 29.IX.2015, leg. Frisch (ZMB); 2 ♂, Sukabumi, Cikaniki: Cikaniki River (Mt Halimun, Halimun–Salak National Park) (06°44'46"S, 106°32'25"E), 1020 m, 5.X.2015, leg. Frisch (MFNB, ZMB). Jawa Tengah: 1 ♂, Pekalongan, E Petungkriyono: mountain N Tinalum (07°06.418'S, 109°44.514'E), 1120 m, 22.VIII.2006, leg. Riedel (SMNK). Bali: 1 ♂, 1 ♀, Mt Agung, 19.VII.1982, leg. Rougemont (HECO); 3 ♂, 4 ♀, Mt Batukaru [Mt Batukai, Mt Baturau], 500–700 m, 28.–29.X.1991, leg. Löbl (MHNG, MFNB); 2 ♂, Tabanan: Batukaru, 700 m, 12.VI.1994, leg. Wunderle (PWCM); 1 ♂, Tabanan: Bedugul, 1200 m, 13.VI.1994, leg. Wunderle (MFNB). Malaysia: 1 ♂, Pahang, Awana (Genting Highlands), 1150 m, 3.IV.1993, leg. Löbl & Calame (MHNG); 2 ♂, 2 ♀, Sabah, Koto Marudu, Sorinsim–Tokou [Topou] (6°127.278N, 116°42.417E), 22.–8.III.1997, leg. Floren (NHMW); Sabah, Ranau, Poring Hot Spring: 1 ♂, 9.IV.1990, leg. Rougemont (HECO), 8 ♂, 3 ♀, 7.–12.V.1987, leg. Burckhardt & Löbl (MHNG); 2 ♂, 2 ♀, Sarawak, Mt Mulu National Park, 50–100 m, V.–VIII.1978, leg. Hammond & Marshall (NHML).

Description: Body size, exoskeletal characters, coloring (cf. Figs 2, 44), and shape of medioposterior incision of abdominal sternite VIII (cf. Fig. 200) as in *Frischianus laticollis*, but different according to shape of aedeagus and female gonocoxal plate as follows. Total body length 2.9–3.6 mm; forebody length 1.7–1.9 mm.

Male: Aedeagus (Figs 76–99) with apical lobe short, strongly curved ventrad, round to right-angled widened

ventrally, variable in width (Figs 76, 79, 82, 85, 88, 91, 94, 97). Dorsal endophallic spine variable, in lateral view slender, weakly to strongly curved ventrad, and with apical end thin and acute, in dorsal view wider, usually curved sinistrad with longitudinally or slightly dextrad directed, more or less dilated apical end (Figs 78, 81, 84, 87, 90, 93, 96). Length of aedeagus 0.41–0.44 mm.

Female: Gonocoxal plate shorter, only about 1.6 times as long as wide; lateral margins somewhat more deeply concave (Fig. 252).

Distribution: *Frischianus communis* is widespread in Indonesia and Malaysia. It is recorded from the north of Sumatra (Aceh), the Malay Peninsula (Pahang), and northern Borneo (Sabah, Sarawak) as far south as Java and Bali. Though no records are known from southern parts of Sumatra and Borneo, the species is certainly present there.

Etymology: The epithet *communis* (adjective, Latin: common, frequent) refers to the widespread distribution of *Frischianus communis* in Southeast Asia compared to the presumably much smaller distribution areas of the other species of this genus.

Comparative note: *Frischianus laticollis*, *F. similis*, and *F. communis* cannot be identified based on their external appearance alone. The distinguishing characters of *F. laticollis* and *F. similis* are discussed above in the species chapter for *F. similis*. Males of *F. communis* can easily be distinguished according to the short, strongly ventrad curved apical lobe of the aedeagus (Figs 76, 79, 82, 85, 88, 91, 94, 97), while the apical lobe is straight in *F. laticollis* and *F. similis* (Figs 67, 70, 73). In *F. laticollis*, the apical lobe moreover exhibits a ventral apical tooth (Fig. 67). While females of *F. laticollis* seem to differ from females of *F. similis* and *F. communis* according to the longer gonocoxal plate (Fig. 250), females of the latter two species, which are sympatric in Java, agree in the shape of the gonocoxal plate (Figs 251, 251) and cannot be distinguished.

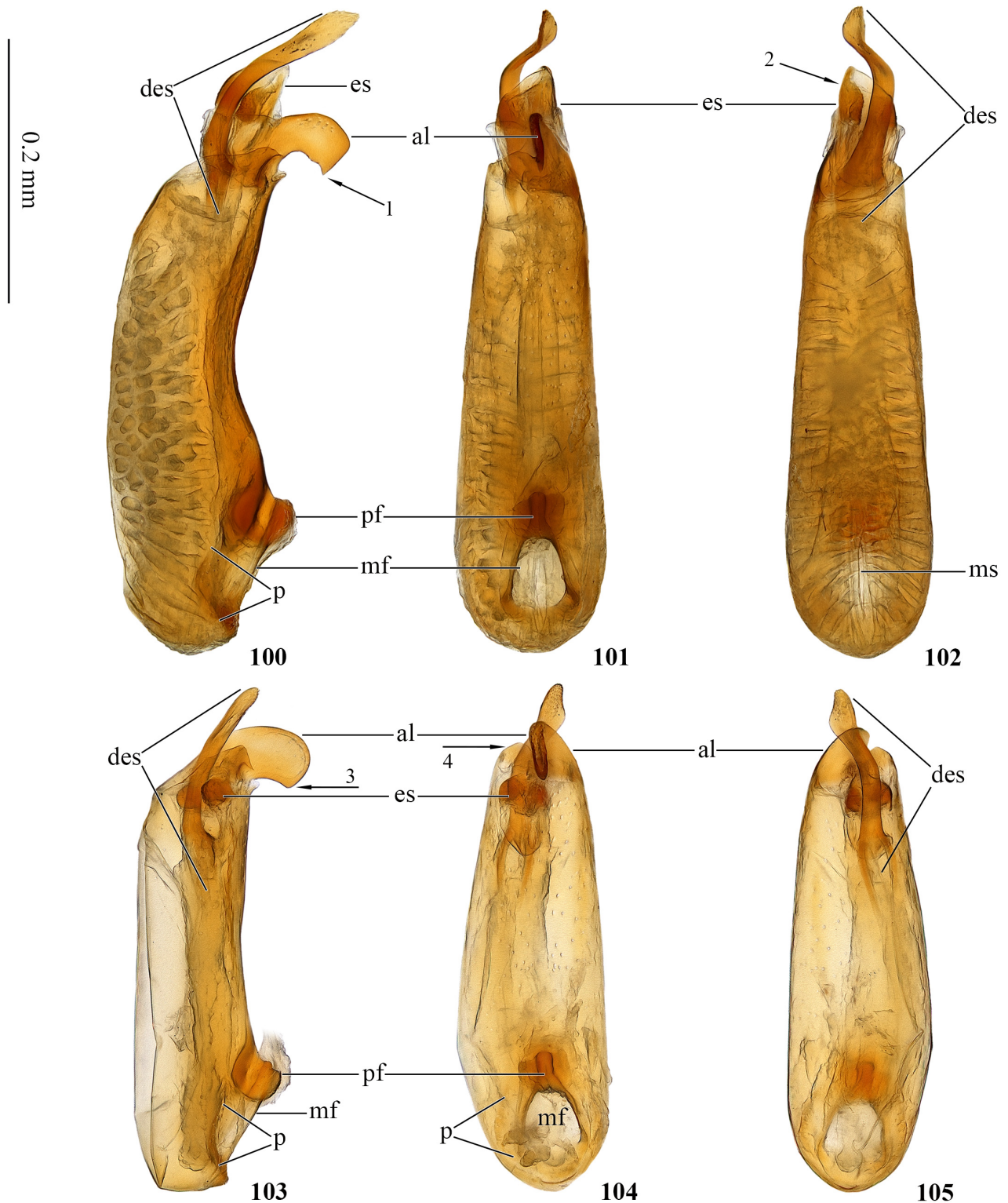
***Frischianus mariae* Frisch, sp. nov.**

(Figs 100–102, 201, 253)

Type specimens: Holotype ♂, Malaysia, Perak: Cascade Sungei Simei (Cameron Highlands), III.1977, leg. Jaccoud (MHNG). Paratypes: 2 ♀, same data as holotype (MFNB, MHNG).

Description: Habitus cf. Figs 2, 44, 45. Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color medium brown with darker brown lateroposterior angles; antennae, palps, and legs light brown. Labral denticulation type 1 (Fig. 10). Forebody surface microsculpture type 2 (Fig. 2). Elytral rows of punctures present; sutural row of punctures impressed, extending over anterior half of elytral sutural length. Total body length 3.3–3.4 mm; forebody length 1.8 mm.

Male: Abdominal sternite VII without diagnostic characters. Abdominal sternite VIII with narrow triangular, medioposterior incision with straight lateral margins,



FIGURES 100–105. Aedeagus in lateral (100, 103), ventral (101, 104), dorsal view (102, 105) of *Frischianus mariae*, holotype, Malaysia, Perak, Cascade Sungei Simei (Cameron Highlands), dorsal endophallic spine evaginated (100–102); *F. brenneri*, holotype, Malaysia, Sabah, Sandakan, S Lokan (103–105). Abbreviations: al—apical lobe; des—dorsal endophallic spine; es—endophallic sclerite; mf—median foramen; p—vestigial paramere; pf—postforamen. Arrows: 1—ventroapical tooth of apical lobe (100); 2—sinistral portion of endophallic sclerite (102); 3—ventroapical end of apical lobe (103); 4—convex ventrodextral margin of ostium (104).

occupying about 0.3 of sternite length (Fig. 201).

Aedeagus (Figs 100–102) with apical lobe arising from aedeagus sinistrally; apical lobe narrower than half of distal width of aedeagus (Fig. 101), strongly curved ventrad, and slightly widened toward round end with proximad pointing tooth (Fig. 100). Position of endophallus in aedeagus unknown, because evaginated in male type specimen. Endophallic sclerite in lateral view elongate with strongly sclerotized apical portion convex dorsally (Fig. 100), in dorsal view with strongly sclerotized, laterally straight and apically pointed, sinistral section sharply set off against less sclerotized, laterally curved, dextral portion (Fig. 102). Dorsal endophallic spine in lateral view curved ventrad, slightly widened toward apex (Fig. 100), when invaginated probably not protruding from ostium (cf. Figs 70, 97), in dorsal view strongly curved sinistrad with longitudinally directed apical end (Figs 102). Dorsal, midlongitudinal split of phallobase type B (cf. Fig. 39). Aedeagus with ventral margin strongly concave between postforamen and apical lobe (Fig. 100), in dorsal view narrow and symmetrical with almost straight lateral margins feebly, gradually narrowed apicad (Fig. 102). Length of aedeagus 0.43 mm.

Female: Gonocoxal plate about 1.7 times as long as wide, without basal and subbasal ridge, with subparallel, slightly concave lateral margins, shallowly emarginate posterior margin, and faintly biconvex anterior margin (Fig. 253).

Distribution: *Frischianus mariae* is known only from the type locality Cascade Sungei Simei in the Cameron Highlands of Perak, Malaysia.

Etymology: With choosing the epithet *mariae* (Latinized noun, derived from the first name Maria, genitive, singular) Johannes Frisch dedicates this new species to his dear wife Maria Frisch in gratitude for her love that survived all the worries that come with being in a relationship with a passionate entomologist.

***Frischianus brenneri* Frisch, sp. nov.**

(Figs 103–105, 202)

Type specimens: Malaysia: Holotype ♂, Sabah, Sandakan: S Lokan, III.1997, leg. Chung (NHML). Paratypes: 1 ♂, 2 ♀, Ranau, Poring Hot Springs (6°03.547'N, 116°42.181'E), 9.VIII.2009, leg. Floren (MFNB, NHMW).

Description: Habitus cf. Figs 2, 44, 45. Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color unicolored reddish medium brown; tip of abdomen, antennae, palps, and legs yellow brown. Labral denticulation type 1 (Fig. 10). Forebody surface microsculpture type 2, but pronotal and elytral punctation somewhat coarser than in Figs 2b, 2c and elytral punctation stronger granular than in Fig. 2c. Sutural elytral row of punctures impressed, occupying anterior half of elytral sutural length; medial row of punctures distinct, lateral row of punctures indistinct. Total body length 3.0 mm; forebody length 1.7 mm.

Male: Abdominal sternite VII without diagnostic

characters. Abdominal sternite VIII with narrow triangular, medioposterior incision with straight lateral margins, occupying about 0.3 of sternite length (Fig. 202).

Aedeagus (Figs 103–105) with apical lobe arising from sinistral half of distal width of aedeagus and being evenly curved dextrad (Figs 104, 105); apical lobe in lateral view short, wide and parallel, strongly curved ventrad, and evenly rounded apically toward proximally pointing, obtuse angle (Fig. 103). Endophallus in dorsal view inserted dextrally in aedeagus (Fig. 105). Endophallic sclerite short, in ventral view with two round, subapical, lateral sclerotizations (Fig. 104). Dorsal endophallic spine strong, quite far protruding from ostium, in lateral view evenly, weakly curved distoventrad with minutely serrate apical end (Fig. 103), in dorsal view from narrow, furcate basal end curved sinistrad toward sinistrally widened, longitudinally directed apical end (Fig. 105). Dextral half of ventral, ostial margin of aedeagus convex (Figs 104, 105). Dorsal, midlongitudinal split of phallobase type B (cf. Fig. 39). Aedeagus with ventral margin between postforamen and apical lobe slightly concave (Fig. 103), in dorsal view long oval, gradually narrowed apicad with dextral lateral margin more strongly curved than almost straight sinistral lateral margin (Fig. 105). Length of aedeagus 0.4 mm.

Female: Gonocoxal plate as in *F. communis* (Fig. 252), about 1.6 times as long as wide.

Distribution: *Frischianus brenneri* was discovered in northern Borneo, where it was collected south of Lokan, Sabah Province, Malaysia.

Etymology: With the epithet *brenneri* (Latinized noun, derived from the surname Brenner, genitive, singular) Johannes Frisch honours his friend Uli Brenner, Schlüchtern-Breitenbach, Germany, coleopterist experienced in faunistics and ecology, in memory of joint collecting trips and the good times spent together.

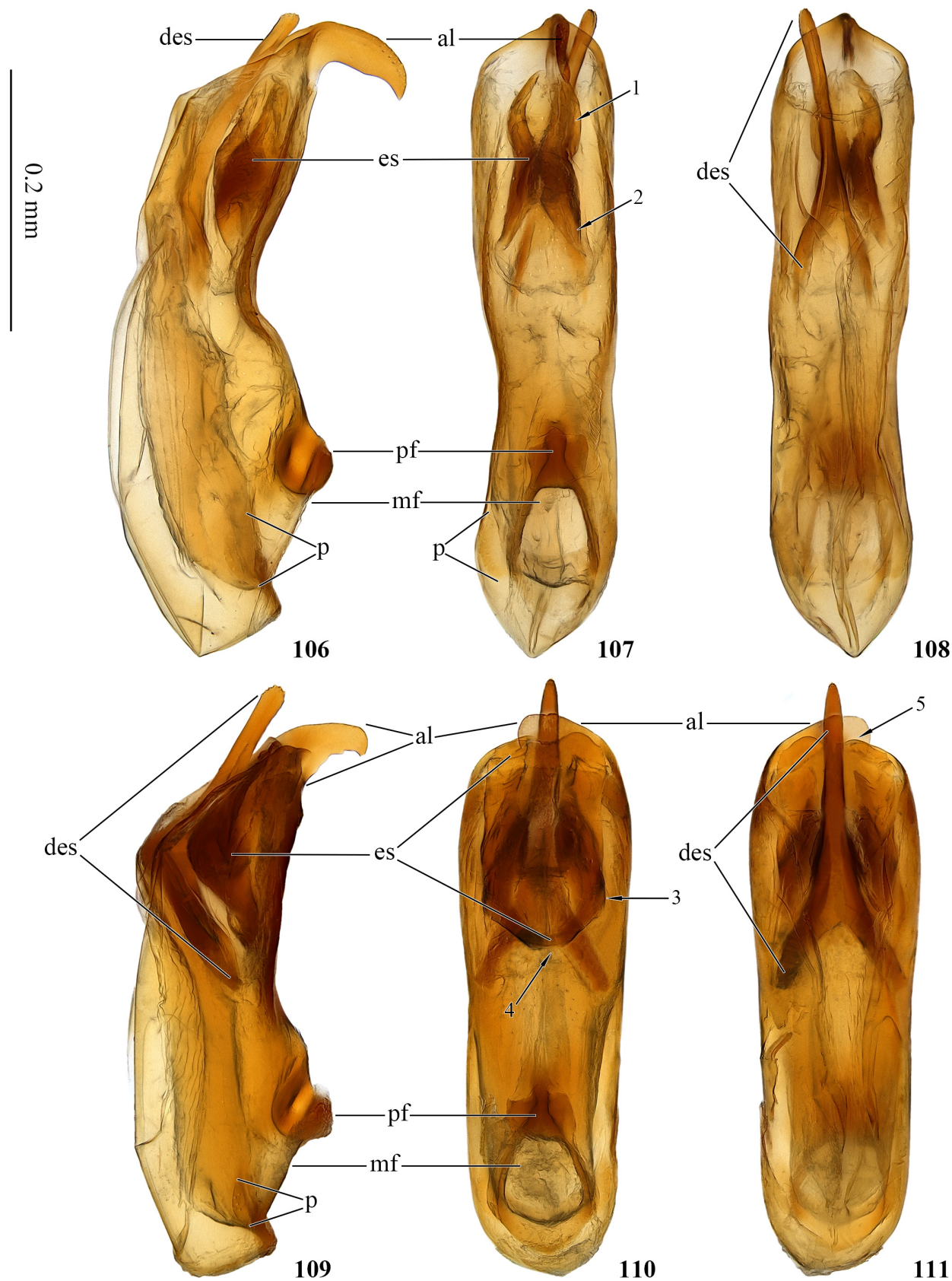
***Frischianus hamatus* Frisch, sp. nov.**

(Figs 106–108, 203, 254)

Type specimens: Holotype ♂, Indonesia, Jambi, Kerinci: W Mt Tujuh Lake, 1400 m, 14.XI.1989, leg. Agosti, Burckhardt & Löbl (MHNG). Paratypes: 3 ♀, same data as holotype (MFNB, MHNG).

Description: Habitus cf. Figs 2, 44, 45. Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color reddish medium brown with somewhat darker brown lateroposterior angles of elytra and abdomen; tip of abdomen, antennae, palps, and legs yellow brown. Labral denticulation type 1 (Fig. 10). Forebody surface punctation type 2, but pronotal punctation notably coarser than in Fig. 2b. Sutural elytral row of punctures impressed, occupying anterior half of elytral sutural length; medial and lateral elytral row of punctures indistinct. Total body length 3.6–4.0 mm; forebody length 1.9–2.1 mm.

Male: Abdominal sternite VII without diagnostic characters. Abdominal sternite VIII with narrow triangular, medioposterior incision with slightly convex lateral



FIGURES 106–111. Aedeagus in lateral (106, 109), ventral (107, 110), dorsal view (108, 111) of *Frischianus hamatus*, holotype, Indonesia, Jambi, Kerinci, Mt Tujuh Lake (106–108); *F. loebli*, holotype, Indonesia, Sumatera Utara, Karo, Brastagi (109–111). Abbreviations: al—apical lobe; des—dorsal endophallic spine; es—endophallic sclerite; mf—median foramen; p—vestigial paramere; pf—postforamen. Arrows: 1—forcipate apical ends of endophallic sclerite (107); 2—tooth-like, diverging proximal ends of endophallic sclerite (107); 3—lateral third of endophallic sclerite (110); 4—sclerotized band connecting lateral thirds of endophallic sclerite (110); 5—biconvex ventral margin of ostium (111).

margins, occupying about 0.3 of sternite length; anterior end of incision shortly narrowed and subparallel (Fig. 203).

Aedeagus (Figs 106–108) with apical lobe arising subsinistrally from asymmetrically subtriangular, ventrodiscal end of aedeagus (Figs 107, 108); apical lobe in lateral view elongate, subparallel, and hooked bent ventrad with apical end acute and somewhat curved proximad (Fig. 106). Endophallus in ventral and dorsal view situated submedially in aedeagus (Figs 107, 108). Endophallic sclerite large, in lateral view elongate with pointed proximal and round apical end (Fig. 106), in ventral view concave laterally, forcipate apically, and with tapered, diverging proximal ends (Fig. 107). Dorsal endophallic spine thin with feebly serrate apical end somewhat protruding from ostium, in lateral view straight with basal portion somewhat curved ventrad (Fig. 106), in dorsal view from notably widened, triangular, furcate basal end slightly curved sinistrad (Fig. 108). Type of dorsal, midlongitudinal split of phallobase unclear. Aedeagus with ventral margin between postforamen and apical lobe strongly concave (Fig. 106), in dorsal view with very narrow, parallel distal half and slightly narrowed, somewhat dextrad bent proximal end (Figs 108). Length of aedeagus 0.51 mm.

Female: Gonocoxal plate about 1.6 times as long as wide, without basal and subbasal ridge, with bisinuate anterior margin, subparallel, slightly concave lateral margins, and slightly emarginate posterior margin (Fig. 254).

Distribution: *Frischianus hamatus* was found only at the type locality near Mount Kerinci in the Indonesian province of Jambi, Sumatra.

Etymology: The epithet *hamatus* (adjective, Latin: hook-like, uncinat) refers to the hook-like apex of the aedeagus of this new species.

***Frischianus loebli* Frisch, sp. nov.**

(Figs 109–111, 204, 255)

Type specimens: Holotype ♂, Indonesia, Sumatera Utara, Karo, 5 km W Brastagi: Tongkoh, 1450 m, 3.XII.1989, leg. Agosti, Burckhardt & Löbl (MHNG). Paratypes: 1 ♂, 2 ♀, same data as holotype (MFNB, MHNG).

Description: Habitus cf. Figs 2, 44, 45. Microphthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color unicolored reddish medium brown, or darker reddish brown with abdomen and lateroposterior angles of elytra somewhat darkened; tip of abdomen, antennae, palps, and legs light brown. Labral denticulation type 1 (Fig. 10). Forebody surface microsculpture type 2, but pronotal punctation compared to Fig. 2b notably coarser and mediolongitudinally almost compacted. Sutural, elytral row of punctures impressed, occupying anterior half of elytral sutural length; medial and lateral row of punctures indistinct. Total body length 3.4–3.6 mm; forebody length 1.8–2.0 mm.

Male: Abdominal sternite VII without diagnostic characters. Abdominal sternite VIII with narrow triangular, medioposterior incision with lateral margins

slightly convex, occupying about 0.3 of sternite length; anterior end of incision narrow, subparallel (Fig. 204).

Aedeagus (Figs 109–111) with apical lobe arising from sinistral lateral margin of aedeagus; apical lobe in dorsal view strongly curved dextrad (Fig. 111), in lateral view elongate, evenly curved ventrad, and tapered toward acute, proximad curved apical end [Fig. 109 (outermost tip of apical lobe broken off)]. Endophallus in ventral and dorsal view situated medially in aedeagus (Figs 110, 111). Endophallic sclerite large, in lateral view triangular with right-angled tip pointing dorsad and seemingly inserted into right-angled curved, dorsal endophallic spine ventrally (Fig. 109), in ventral view subrectangular with strongly sclerotized, lateral thirds proximally connected by basally extended, biangulate, sclerotized band (Fig. 110). Dorsal endophallic spine strong, in lateral view at about midlength right-angled bent with ventroproximal pointing proximal portion and longer, narrow, straight distal portion with round, feebly serrate apical end far protruding from ostium (Fig. 109); dorsal endophallic spine in dorsal view sagittate, aligned midlongitudinally, from broadly furcate base evenly tapered toward acute apical end (Fig. 111). Ventral margin of ostium in dorsal view widely biconvex (Fig. 111). Type of dorsal, midlongitudinal split of phallobase unclear. Aedeagus with ventral margin distal of postforamen shortly concave, afterwards running straight toward apical lobe (Fig. 109), in dorsal view slightly, gradually widened apicad (Fig. 111). Length of aedeagus 0.46 mm.

Female: Gonocoxal plate 1.6 times as long as wide, without basal and subbasal ridge, with bisinuate anterior margin, subparallel, slightly concave lateral margins, and emarginate posterior margin (Fig. 255).

Distribution: *Frischianus loebli* is currently known only from the type locality Tongkoh in the Indonesian province of Sumatera Utara.

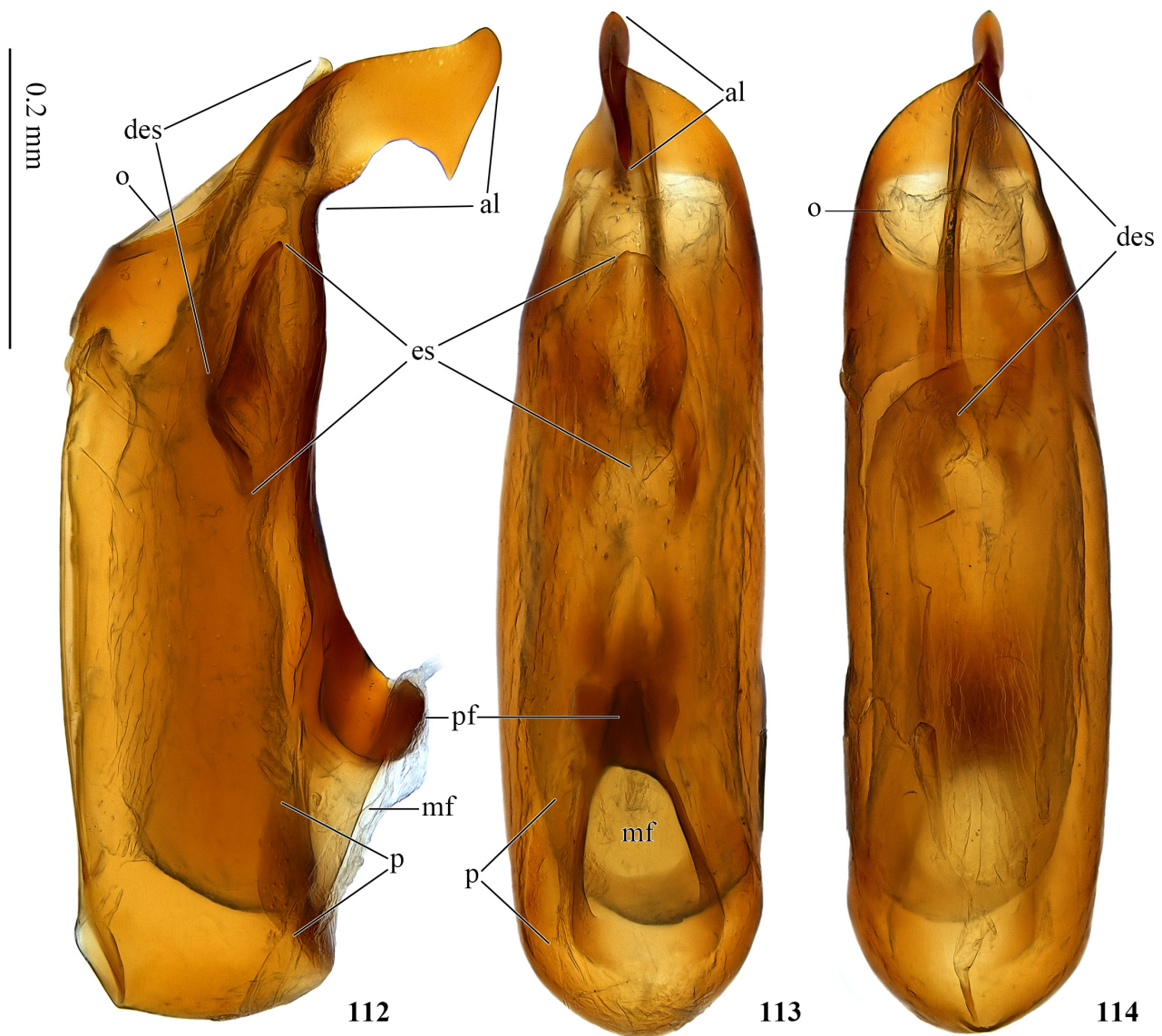
Etymology: With choosing the epithet *loebli* (Latinized noun, derived from the surname Löbl, genitive, singular) Johannes Frisch dedicates this new species to his dear friend Ivan Löbl, specialist of Scaphidiinae at Muséum d'histoire naturelle, Geneva, Switzerland, in gratitude for his friendly support over the years and in appreciation of his important life's work.

***Frischianus subalpinus* Frisch, sp. nov.**

(Figs 46, 112–114, 205, 256)

Type specimens: Holotype ♂, Indonesia, Jambi, Kerinci: Mt Kerinci, 3000 m, 12.XI.1989, leg. Agosti, Burckhardt & Löbl (MHNG). Paratypes: 2 ♀, same data as holotype (MFNB, MHNG).

Description: Habitus (Fig. 46). Microphthalmous, micropterous without palisade fringe of abdominal tergite VII. Body color unicolored light, reddish medium brown; tip of abdomen, antennae, palps, and legs yellow brown. Labral denticulation type 2 (cf. Figs 11, 12). Forebody surface microsculpture type 2; compared to Figs 2a, 2b cephalic and pronotal punctation finer and more widely spaced, and elytra notably more coarsely punctate with



FIGURES 112–114. Aedeagus in lateral (112), ventral (113), dorsal view (114) of *Frischianus subalpinus*, holotype, Indonesia, Jambi, Kerinci, Mt Kerinci. Abbreviations: al—apical lobe; des—dorsal endophallic spine; es—endophallic sclerite; mf—median foramen; o—ostium; p—vestigial paramere; pf—postforamen.

somewhat uneven, almost rugulose surface. Eyes strongly reduced, 0.2 times as long as temples, in longitudinal diameter comprising 4–5 ommatidia. Temples notably widened posterior of eyes. Elytral sutural length 0.7 times as long as pronotal length. Elytra strongly narrowed across rounded humeri and with shallow, transverse depression in anterior half. Metathoracic wings strongly reduced in length and width to very narrow, elongate strip 0.6 times as long as elytral sutural length and 4.7 times longer than wide. Elytral sutural row of punctures not impressed, comprising only about three large punctures in anterior third of elytral sutural length; medial and lateral elytral row of punctures imperceptible in coarse elytral sculpturing. Total body length 4.3–4.9 mm; forebody length 2.1–2.3 mm.

Male: Abdominal sternite VII without diagnostic characters. Abdominal sternite VIII with very narrow, deep, medioposterior incision with lateral margins convex, occupying about 0.4 of sternite length (Fig. 205).

Aedeagus (Figs 112–114) with apical lobe situated dextrally at strongly asymmetrical, subtriangular distal end of aedeagus (Figs 113, 114); apical lobe in lateral view elongate, strongly curved ventrad, ventrally extended in strong, proximad pointing tooth, and with short, blunt, somewhat distad curved tip (Fig. 112). Endophallus in ventral and dorsal view situated submedially in aedeagus (Figs 113, 114). Endophallic sclerite relatively small, elongate, in lateral view dentiform with sharp apical end (Fig. 112), in ventral view about half as wide as aedeagus, oval, with convex lateral margins evenly narrowed toward round apical end (Fig. 113). Dorsal endophallic spine slender with narrow base, feebly curved dextrad, slightly narrowed medially and with acute end (Figs 112–114), in dorsal view strongly protruding from ostium (Fig. 114), but only slightly projecting dorsally in lateral view (Fig. 112). Dorsal, midlongitudinal split of phallobase type B (cf. Fig. 39). Aedeagus with ventral margin between

postforamen and apical lobe feebly inverted S-shaped (Fig. 112), in dorsal view long oval with subparallel lateral margins and slightly curved dextrad at midlength (Fig. 114). Length of aedeagus 0.69 mm.

Female: Gonocoxal plate about 1.4 times as long as wide (measured at greatest width across feebly concave, transverse basal ridge excluding acute, lateroanterior ends), without subbasal ridge, with subparallel, concave lateral margins, and almost semicircularly emarginate posterior margin (Fig. 256).

Distribution: *Frischianus subalpinus* is known only from the type locality in the subalpine zone of Mt Kerinci, Indonesia's highest mountain on Sumatra, and in view of its flightlessness probably endemic there.

Etymology: The epithet *subalpinus* (adjective, Latin: subalpine) refers to the subalpine altitude where *Frischianus subalpinus* was found on Mount Kerinci.

***Frischianus curtipennis* Frisch, sp. nov.** (Figs 47, 257)

Type specimens: Holotype ♀, Indonesia, Jambi, Kerinci: Mt Kerinci, 1900 m, 13.XI.1989, leg. Agosti, Burckhardt & Löbl (MHNG).

Description: Habitus (Fig. 47). Similar to *Frischianus subalpinus* from which it differs as follows: Body color dark medium brown with posterior half of elytra blackish brown; tip of abdomen, antennae, palps, and legs light brown. Head and pronotum with denser, coarser punctation; elytral surface not rugulose with finer punctation notably coarser than punctation of head and pronotum. Eyes somewhat larger, 0.4 times as long as temples; longitudinal diameter comprising 6–7 ommatidia. Temples parallel, not widened posterior of eyes. Elytra slightly longer, sutural length 0.7 times as long as pronotal length, less narrowed across rounded humeri, and without clear depression in anterior half. Somewhat smaller; total body length 4.0 mm, forebody length 2.0 mm.

Male unknown.

Female: Gonocoxal plate slender, about 2.1 times as long as wide, with roundly subtriangularly extended basal margin without basal and subbasal ridge, subparallel, slightly concave lateral margins, and deeply, narrowly emarginate posterior margin (Fig. 257).

Distribution: *Frischianus curtipennis* is native to the montane zone of Mt Kerinci, Indonesia's highest mountain on Sumatra, where it is probably endemic due to its flightlessness.

Etymology: The epithet *curtipennis* [adjective, Latin, composed of the adjective *curtus* (short) and the noun *penna* (wing)] refers to the reduced elytra and metathoracic wings of this new species.

Remarks: The metathoracic wings were not examined to avoid damage of the single type specimen. They are expected to be reduced judging by the absence of the palisade fringe of abdominal tergite VII.

Frischianus curtipennis is treated in the chapter of the *F. laticollis* lineage of the *F. laticollis* species group for purely practical reasons due to its similarity with *F.*

subalpinus, to which it is compared. The long gonocoxal plate with a deep, narrow posterior emargination (Fig. 257) is more suggestive of the *F. rufulus* subgroup of the *F. laticollis* species group (cf. Figs 263–265). *Frischianus curtipennis* is not assigned to the *F. laticollis* lineage, but a species incertae sedis as long as male characters are unknown.

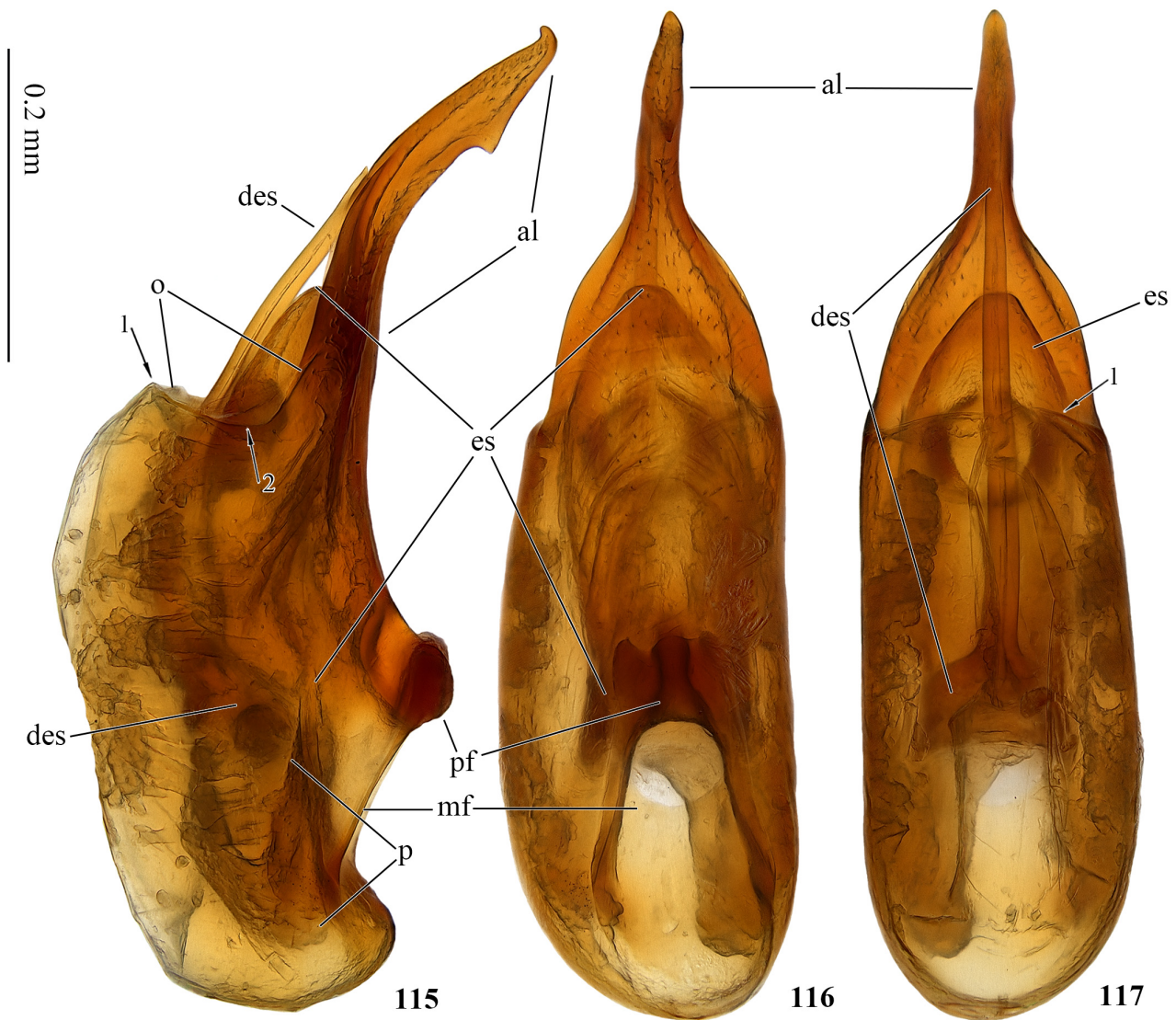
***Frischianus pedator* Frisch, sp. nov.** (Figs 48, 115–117, 206, 207, 258)

Type specimens: Holotype ♂, Indonesia, Sumatera Barat, Bukittinggi: Mt Singgalang, 2100–2600 m, 16.X.1990, leg. Riedel (SMNS). Paratypes: 2 ♂, 1 ♀, same data as holotype (MFNB, NHMW, SMNS).

Description: Habitus (Fig. 48). Microphthalmous, micropterous without palisade fringe of abdominal tergite VII. Body color unicolor dark brown except for medium brown tip of abdomen; antennae, palps, and legs light brown to medium brown. Labral denticulation type 2 (Figs 11, 12). Forebody surface microsculpture type 2 (Fig. 2), but cephalic punctation finer and elytral punctation coarser. Eyes strongly reduced, 0.2 times as long as temples, in longitudinal diameter comprising 4–5 ommatidia. Temples notably widened posterior of eyes. Elytral sutural length 0.6 times as long as pronotal length. Elytra strongly narrowed across rounded humeri and with shallow, transverse depression in anterior half. Metathoracic wings strongly reduced in length, about as long as humeral length of elytra. Sutural elytral row of punctures short, impressed, occupying anterior third of elytral sutural length; medial and lateral elytral row of punctures imperceptible in coarse elytral sculpturing. Total body length 3.6–4.0 mm; forebody length 2.0–2.1 mm.

Male: Abdominal sternite VII with longitudinal depression in posterior two-thirds of median third of sternite width covered with widely spaced, laterally more densely arranged, black macrosetae (Fig. 206). Abdominal sternite VIII with narrow, triangular, medioposterior incision with concave lateral margins occupying about 0.3 of sternite length (Fig. 207).

Aedeagus (Figs 115–117) with long, slender apical lobe situated medially at slightly asymmetrical, subtriangular, distal end of aedeagus (Figs 116, 117); apical lobe evenly curved ventrad, with subapical, ventral tooth and minute, sharp, dorsad bent, apical tip (Fig. 115). Ostium considerably retracted laterally, uncovering distal half of dorsal endophallic spine and distal fourth of endophallic sclerite (Figs 115, 117). Endophallus in ventral and dorsal view situated medially in aedeagus (Figs 116, 117). Endophallic sclerite large, in lateral view elongate (Fig. 115), in ventral view widely oval, almost occupying aedeagal width, and with convex lateral margins evenly tapered toward round apical end (Fig. 116). Dorsal endophallic spine long, thin and straight, with short, broad, basal dilation (Figs 115, 117). Dorsal, midlongitudinal split of phallobase type A (cf. Figs 36–38). Aedeagus with ventral margin between postforamen



FIGURES 115–117. Aedeagus in lateral (115), ventral (116), dorsal view (117) of *Frischianus pedator*, holotype, Indonesia, Sumatera Barat, Bukittinggi, Mt Singgalang. Abbreviations: al—apical lobe; des—dorsal endophallic spine; es—endophallic sclerite; mf—median foramen; o—ostium; p—vestigial paramere; pf—postforamen. Arrows: 1—dorsal margin of ostium (115, 117); 2—lateral margin of ostium (115).

and apical lobe weakly concave (Fig. 115), in dorsal view long oval with dextral lateral margin slightly curved and sinistral lateral margin straight, and distally of dorsal margin of ostium gradually, convexly tapered toward apical lobe (Fig. 117). Length of aedeagus 0.66 mm.

Female: Gonocoxal plate about 1.4 times as long as wide, widest across medially divided basal ridge with posteriorly curved median ends, without subbasal ridge, somewhat concave laterally and somewhat narrowed toward emarginate posterior margin (Fig. 258).

Distribution: *Frischianus pedator* was discovered at high altitude on Mount Singgalang, Sumatera Barat, and is expected to be endemic to this volcano judging from its flightlessness.

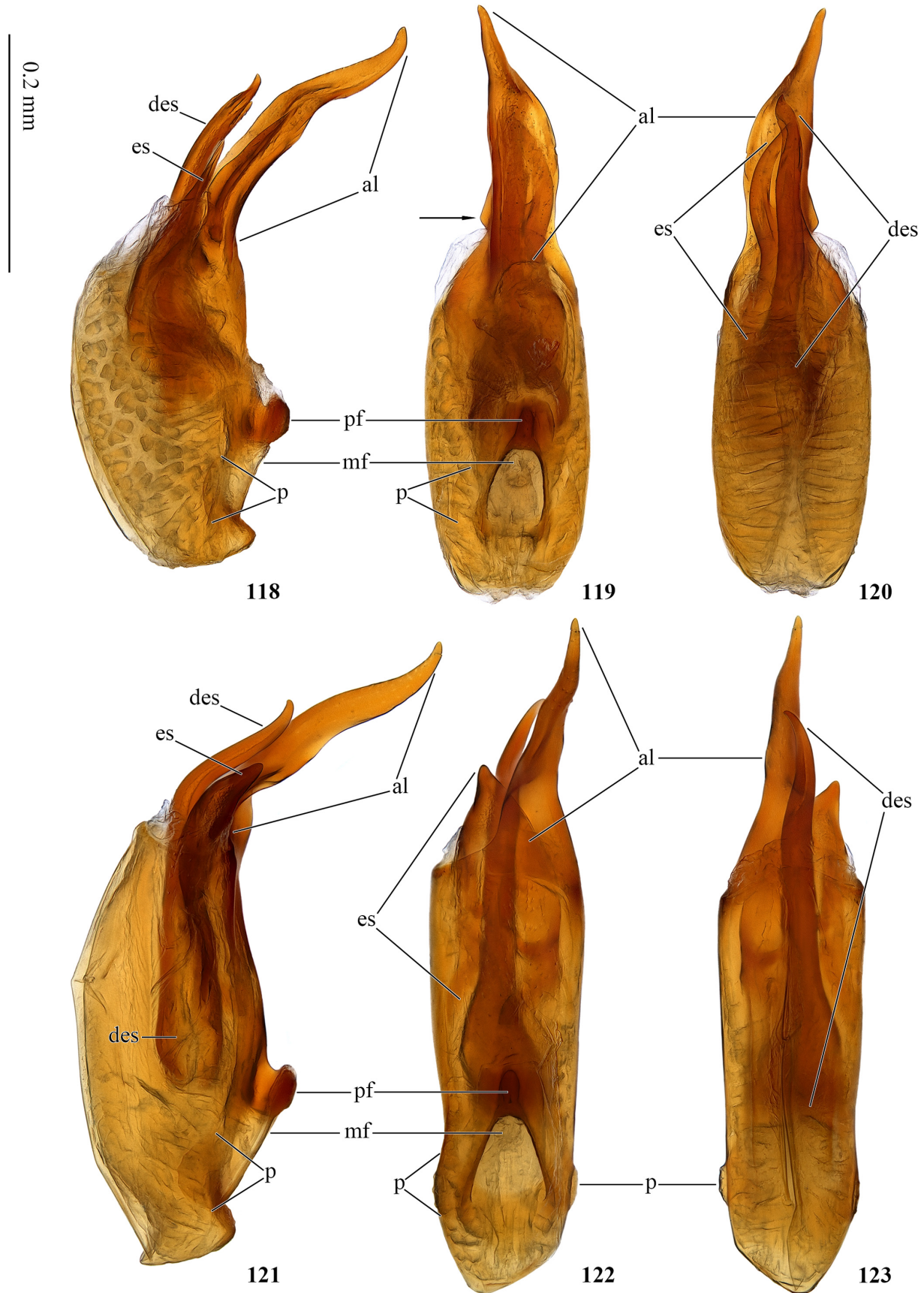
Etymology: The epithet *pedator* (noun, Latin, nominative: pedestrian) refers to the fact that this new species can only travel by walking due to its inability to fly.

***Frischianus uhligi* Frisch, sp. nov.**

(Figs 49, 118–120, 208)

Type specimen: Holotype ♂, Malaysia, Sabah (4°63'50"–4°77'16"N, 117°43'83"–117°70'31"E), 300 m, XI–XII.2011, leg. Ewers *et al.* (SAFE Project) (NHML).

Description: Habitus (Fig. 49). Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color reddish medium brown with head and elytra except for humera darker brown; tip of abdomen, antennae, palps, and legs light brown. Labral denticulation type 2 (cf. Figs 11, 12). Forebody surface microsculpture type 1 (Fig. 1); elytral punctation much denser compared to Fig. 1c. Sutural elytral row of punctures not much impressed, extending over anterior 0.7 of elytral sutural length; medial and lateral row of punctures indistinct, reduced to few, widely spaced punctures. Total body length 3.1 mm; forebody length 1.7 mm.



FIGURES 118–123. Aedeagus in lateral (118, 121), ventral (119, 122), dorsal view (120, 123) of *Frischianus uhligi*, holotype, Malaysia, Sabah (118–120); *F. burckhardti*, holotype, Malaysia, Sabah, Ranau, Poring Hot Spring (121–123). Abbreviations: al—apical lobe; des—dorsal endophallic spine; es—endophallic sclerite; mf—median foramen; p—vestigial paramere; pf—postforamen. Arrow: dextrobasal dilatation of apical lobe (119).

Male: Abdominal sternite VII without diagnostic characters. Abdominal sternite VIII with narrow triangular, medioposterior incision with slightly concave lateral margins, occupying about 0.3 of sternite length (Fig. 208).

Aedeagus (Figs 118–120) with apical lobe situated in sinistral nine-tenth of distal width of aedeagus (Figs 119, 120); apical lobe long, occupying almost half of aedeagal length, in lateral view directed distoventrad, parallel in proximal half, somewhat curved ventrad at about midlength, and afterwards narrowed toward shortly distad curved tip (Fig. 118); in dorsal view, apical lobe broad with short, obtuse, dextrobasal dilatation, faintly concave dextral margin, convex sinistral margin, and gradually tapered toward narrow, acute, somewhat dextrad bent apical end (Fig. 120). Endophallus in dorsal view with base inserted sinistrally in aedeagus (Fig. 120). Endophallic sclerite from wide base sinistrally extended in long, narrow spine almost reaching apical end of dorsal endophallic spine and far protruding from ostium, in dorsal view with sinistral curvature running sinistrally of dorsal endophallic spine (Fig. 120). Dorsal endophallic spine long and slender, reaching about half of length of apical lobe, slightly curved ventrad, and considerably protruding from ostium (Figs 118, 120), with broad (Fig. 120), ventrad curved (Fig. 118) basal end and narrow, somewhat dorsosinistrad curved apical end (Fig. 118) with short, longitudinally directed tip (Fig. 120). Dorsal, midlongitudinal split of phallobase type A (cf. Figs 36–38). Aedeagus with ventral margin between postforamen and apical lobe weakly convex (Fig. 118), in dorsal view oval with lateral margins weakly, equally convex (Fig. 120). Length of aedeagus 0.49 mm.

Female unknown.

Distribution: *Frischianus uhligi* is native to northeastern Borneo. The exact type locality in the Malaysian province of Sabah is unknown, because the holotype label lacks a locality name, and the given coordinates comprise a large area.

Etymology: With naming this new species *uhligi* (Latinized noun, derived from the surname Uhlig, genitive, singular) Johannes Frisch thankfully honours his dear colleague Manfred Uhlig, specialist of *Erichsonius* at the Museum für Naturkunde Berlin, to whom he owes a lot in his life.

***Frischianus burckhardti* Frisch, sp. nov.**
(Figs 50, 121–123, 209, 259)

Type specimens: Malaysia, Sabah: Holotype ♂, Ranau: Poring Hot Springs, 500 m, 8.V.1987, leg. Burckhardt & Löbl (MHNG). Paratypes (6 specimens): 2 ♂, 1 ♀, same data as holotype (MFNB, MHNG); 2 ♀, same data as holotype, but 7.V.1987 and 11.V.1987 (MHNG); 1 ♂, Ranau, Poring Hot Springs: Langanan Falls, 900–950 m, 12.V.1987, leg. Burckhardt & Löbl (MHNG).

Description: Habitus (Fig. 50). Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color unicolored light reddish brown to medium

brown; tip of abdomen, antennae, palps, and legs yellow brown. Labral denticulation types 1 or 2 (Figs 10–12); submedial denticles more or less pointed, longer than or about as long as pointed or obtuse, sublateral denticles. Forebody surface microsculpture type 2 (Fig. 2), but pronotal and elytral punctation coarser than in Figs 2b, 2c. Elytral rows of punctures occupying about anterior 0.7 of elytral sutural length; sutural row of punctures impressed anteriorly; medial and lateral row of punctures often reduced to few, widely spaced punctures. Total body length 3.1–3.4 mm; forebody length 1.6–1.8 mm.

Male: Abdominal sternite VII without diagnostic characters. Abdominal sternite VIII with narrow triangular, medioposterior incision with slightly concave lateral margins, occupying roughly 0.3 of sternite length (Fig. 209).

Aedeagus (Figs 121–123) with apical lobe situated in about sinistral half of distal aedeagal width (Figs 122, 123); apical lobe long and slender, at base strongly and obtuse-angled bent distoventrad, approximately at midlength with slight, dorsally directed curvature, after that gradually tapered toward acute, slightly distad curved apical end (Fig. 121), in ventral view close to base somewhat curved sinistrally, after that slightly undulate and gradually tapered toward thin, acute apical end (Fig. 123). Endophallus in ventral and dorsal view with base inserted submedially in aedeagus (Figs 122, 123). Endophallic sclerite in lateral view slender, notably projecting from ostium but significantly shorter than dorsal endophallic spine, curved distoventrad, and gradually tapered toward subacute end (Fig. 121); endophallic sclerite in dorsal view broadly suboval with almost straight dextral margin and convex sinistral margin, gradually tapered toward acute apical end, and clearly protruding dextrally over dorsal endophallic spine and apical lobe (Fig. 123). Dorsal endophallic spine long and slender, reaching about half of length of apical lobe, straight in proximal two-thirds situated within aedeagus, but in distal third considerably projecting from ostium, strongly curved distoventrad in line with apical lobe, and with shortly dorsad curved apical end (Fig. 121); dorsal endophallic spine in dorsal view straight, aligned longitudinally, with moderately dilated base and acute, sinistrad curved apical end (Fig. 123). Dorsal, midlongitudinal split of phallobase type A (cf. Figs 36–38). Aedeagus with ventral margin between postforamen and apical lobe slightly convex (Fig. 121), in dorsal view narrow with straight lateral margins and somewhat tapered proximad (phallobase collapsed?) (Fig. 123). Length of aedeagus 0.46–0.5 mm.

Female: Gonocoxal plate long, about 2.5 times as long as wide, triangular anteriorly; basal ridge angulate in middle and medially curved at ends; subbasal ridge triangular; lateral margins subparallel; medioposterior emargination short, truncate, and laterally delimited by subacute ends (Fig. 259).

Distribution: *Frischianus burckhardti* occurs in the Malaysian province of Sabah, northeastern Borneo, where it was discovered at Poring Hot Springs east of Mount Kinabalu.

Etymology: With choosing the epithet *burckhardti*

(Latinized noun, derived from the surname Burckhardt, genitive, singular) Johannes Frisch thanks Daniel Burckhardt, phylogeographer and specialist of Psylloidea at Naturhistorisches Museum Basel, Switzerland, who co-collected the type specimens, for friendly advice at an early stage of his work on the Scopaeina.

***Frischianus echinatospinatus* Frisch, sp. nov.**

(Figs 124–126, 210)

Type specimen: Holotype ♂, Malaysia, Sabah, Sandakan: Sepilok, X.1996, leg. Chung (NHML).

Description: Habitus (Fig. 50). Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color unicolored light reddish brown; tip of abdomen, antennae, palps, and legs yellow brown. Labral denticulation type 4 (cf. Fig. 15), but in comparison with closely related species probably non-species-specific, individual variation. Forebody surface microsculpture type 1 (Fig. 1). Elytral rows of punctures long and distinct, extending over anterior 0.7 of elytral sutural length; sutural row of punctures not much impressed. Total body length 3.1 mm; forebody length 1.9 mm.

Male: Abdominal sternite VII without diagnostic characters. Abdominal sternite VIII with narrow triangular, medioposterior incision with slightly concave lateral margins, occupying about 0.3 of sternite length (Fig. 210).

Aedeagus (Figs 124–126) with apical lobe situated in sinistral six-seventh of distal aedeagal width (Figs 125, 126); apical lobe long, occupying half of aedeagal length, in lateral view slender, somewhat curved ventrad, in about apical fourth evenly tapered toward distad curved, acute end (Fig. 124), in dorsal view broad, evenly curved dextrad, and gradually tapered toward abruptly narrowed, slim, acute apical end (Fig. 126). Endophallus in dorsal view with base inserted subsinistrally in aedeagus, with endophallic sclerite and dorsal endophallic spine considerably projecting from ostium (Fig. 126). Endophallic sclerite extended in long, narrow spine almost reaching apical end of dorsal endophallic spine, in lateral view straight and gradually narrowed toward acute apical end (Fig. 124); endophallic sclerite in dorsal view from sinistral, weakly sclerotized base aligned dextrodistad, running dextrally of dorsal endophallic spine, and with tip somewhat curved sinistrad (Fig. 126). Dorsal endophallic spine with ventrad curved, furcate base (Figs 124, 126), in distal half densely studded with laterodistad directed spinules/denticles (echinate, spinulate) except for short, acute, inechinate apical end, in lateral view thin and straight (Fig. 124), in dorsal view feebly inverted S-shaped with echinate portion somewhat widened (Fig. 125). Dorsal, midlongitudinal split of phallobase type A (cf. Figs 36–38). Aedeagus with ventral margin between postforamen and apical lobe straight (Fig. 124), in dorsal view long oval, subparallel with lateral margins weakly, equally curved (Fig. 126). Length of aedeagus 0.43 mm.

Female unknown.

Distribution: *Frischianus echinatospinatus* is known

only from northern Borneo, where it was discovered near Sandakan in the northeast of Sabah, Malaysia.

Etymology: The epithet *echinatospinatus* [adjective, Latin, composed of the adjectives *echinatus* (spiny, thorny, prickly, spinulate) and *spinatus* (indicating a feature of the species related to the spine)] refers to the echinate dorsal endophallic spine of the aedeagus (Figs 124–126).

***Frischianus puthzi* Frisch, sp. nov.**

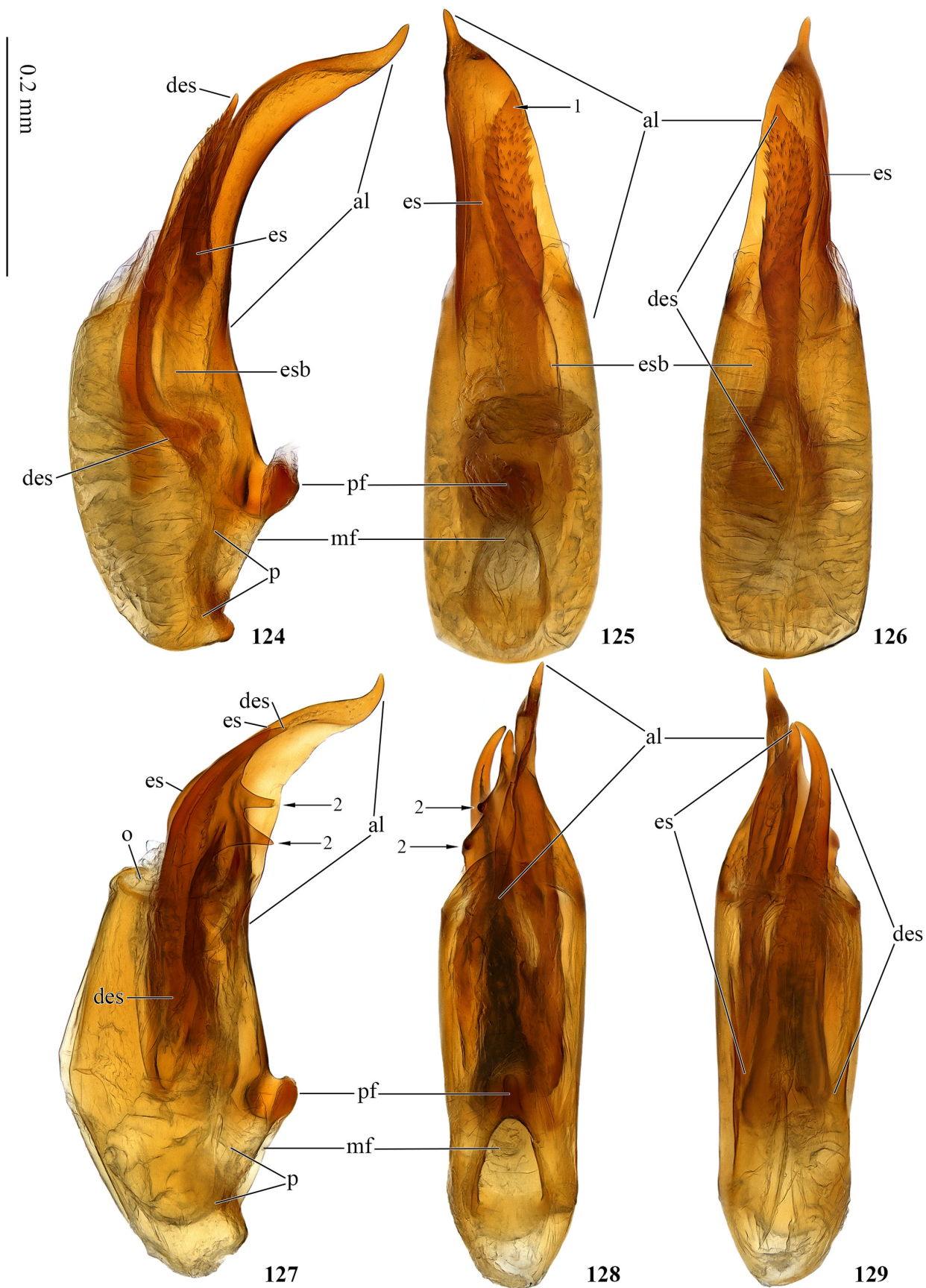
(Figs 51, 127–129, 211, 212, 260)

Type specimens: Holotype ♂, Malaysia, Sabah, 60 km road Tambunan–Mt Kinabalu (Crocker Range), 1270 m, 17.V.1987, leg. Burckhardt & Löbl (MHNG). Paratype: 1 ♀, same data as holotype (MHNG).

Description: Habitus (Fig. 51). Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color unicolored reddish medium brown to dark brown; tip of abdomen, antennae, palps, and legs yellow brown. Labral denticulation type 1 (Fig. 10). Forebody surface microsculpture type 2 (Fig. 2), but pronotal and elytral punctation coarser than in Figs 2b, 2c. Sutural elytral row of punctures impressed anteriorly, occupying approximately anterior 0.7 of elytral sutural length; medial and lateral elytral row of punctures reduced to few, widely spaced punctures. Total body length 3.1 mm; forebody length 1.6 mm.

Male: Abdominal sternite VII without diagnostic characters. Abdominal sternite VIII with short, triangular, medioposterior incision with slightly concave lateral margins, occupying roughly 0.2 of sternite length (Fig. 211).

Aedeagus (Figs 127–129) with apical lobe situated in about sinistral half of distal aedeagal width (Figs 128, 129); apical lobe long, in lateral view from wide base curved ventrad, and gradually tapered toward distad curved, acute apical end (Fig. 127), in ventral view from wide base gradually tapered toward thin distal half with slightly sinistrad bent apical end (Fig. 128). Endophallus in ventral and dorsal view with base inserted medially in aedeagus; dorsal endophallic spine and endophallic sclerite equally long and considerably projecting from ostium (Figs 128, 129). Endophallic sclerite distally extended in long, evenly ventrad curved, spiniform process with two large, subapical, ventrodextral teeth (Fig. 127); endophallic sclerite in dorsal view wide basally, slightly aligned dextrad, with convex sinistral margin and slightly concave, bidentate dextral margin (Fig. 128), somewhat protruding over dextral margin of apical lobe, and gradually tapered toward short, narrow, longitudinally curved apical end (Fig. 129). Dorsal endophallic spine long, evenly curved and gradually tapered ventrad, and extending beyond midlength of apical lobe; ventral margin of dorsal endophallic spine strongly serrate in distal half except apically (Fig. 127); dorsal endophallic spine in dorsal view from broad, excised proximal end somewhat directed distodextrad, and gradually tapered toward sinistrad curved end strongly protruding apical lobe dextrally (Fig. 129). Dorsal, midlongitudinal split of



FIGURES 124–129. Aedeagus in lateral (124, 127), ventral (125, 128), dorsal view (126, 129) of *Frischianus echinatospinatus*, holotype, Malaysia, Sabah, Sandakan, Sepilok (124–126); *F. puthzi*, holotype, Malaysia, Sabah, road Tambunan–Mt Kinabalu (Crocker Range) (127–129). Abbreviations: al—apical lobe; des—dorsal endophallic spine; es—endophallic sclerite; esb—base of endophallic sclerite; mf—median foramen; o—ostium; p—vestigial paramere; pf—postforamen. Arrows: 1—inechinate apex of dorsal endophallic spine (125); 2—ventrodextral teeth of endophallic sclerite (127, 128).

phallobase type A (cf. Figs 36–38). Aedeagus with ventral margin between postforamen and apical lobe straight (Fig. 127), in dorsal view long oval, with almost straight lateral margins gradually tapered proximad (phallobase collapsed?) (Fig. 129). Length of aedeagus 0.46 mm.

Female: Abdominal sternite VIII with very short, concave, posterior emargination (Fig. 212). Gonocoxal plate long, about 2.4 times as long as wide, in anterior half gradually, subtriangularly narrowed with truncate anterior end; basal and subbasal ridge triangular; lateral margins shortly concave in midlength of sternite, but somewhat convex in posterior half of sternite length; posterior margin with short emargination delimited laterally by subacute ends (Fig. 260).

Distribution: *Frischianus puthzi* is known only from the type locality in the Crocker Range in northeastern Borneo, Sabah, Malaysia.

Etymology: Johannes Frisch dedicates this new species to Volker Puthz, Schlitz, Germany, to honour his great life's work on the taxonomy of the Steninae and Euaesthetinae, and to thank Volker for introducing him to the Staphylinidae back when he was a teenager (epithet *puthzi*: Latinized noun, derived from the surname Puthz, genitive, singular).

***Frischianus serratispinatus* Frisch, sp. nov.** (Figs 130–132, 213)

Type specimen: Holotype ♂, Malaysia, Sabah, Lahad Datu: Ulu Segama (Danum Valley Forest Reserve), (04°57'N, 117°48'E), 200 m, 3.–5.XI.2005, leg. Mann, Slade & Villanueva (HECO).

Description: Habitus cf. Fig. 51. Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color reddish medium brown with head and posterior half of elytra slightly darker brown; tip of abdomen, antennae, palps, and legs yellow brown. Labral denticulation type 1 (Fig. 10). Forebody surface microsculpture type 2 (Fig. 2), but pronotal and elytral punctation somewhat coarser than in Figs 2b, 2c. Sutural elytral row of punctures impressed anteriorly, extending over anterior 0.7 of elytral sutural length; medial and lateral elytral row of punctures reduced to few, widely spaced punctures. Total body length 3.1 mm; forebody length 1.6 mm.

Male: Abdominal sternite VII without diagnostic characters. Abdominal sternite VIII with narrow triangular, medioposterior incision with slightly concave lateral margins, occupying roughly 0.3 of sternite length (Fig. 213).

Aedeagus (Figs 130–132) with apical lobe strongly narrowed basally to about sinistral fourth of distal aedeagal width (Fig. 131); apical lobe long and slender, occupying almost half of aedeagal length, in lateral view evenly curved ventrad and gradually tapered toward distad curved tip (Fig. 130); in ventral view, apical lobe narrow, projecting sinistrally over distal process of endophallic sclerite, in distal half somewhat dextracurved and gradually tapered toward thin apical end with tiny, subapical, dextralateral tooth (Fig. 131). Endophallus in

ventral and dorsal view with base inserted medially in aedeagus (Figs 131, 132); endophallic sclerite and dorsal endophallic spine strongly lengthened and considerably projecting from ostium (Figs 130–132). Endophallic sclerite with distal process slightly curved ventrad (Fig. 130); distal process of endophallic sclerite, in dorsal view, long subrectangular, in proximal portion somewhat dextracurved, then narrowed toward sinistracurved distal portion bearing distolaterad pointing sinistropical tooth, distad pointing dextropical tooth, and ventrad pointing subdextropical tooth (Figs 130–132). Dorsal endophallic spine long, evenly curved ventrad, with strongly serrate ventral margin and more finely serrate dorsal margin gradually tapered toward very slender, acute, more strongly ventrad curved apical end (Fig. 130), in dorsal view evenly, moderately curved sinistrad (Fig. 132). Dorsal, midlongitudinal split of phallobase type A (cf. Figs 36–38). Aedeagus with ventral margin between postforamen and apical lobe straight (Fig. 130), in dorsal view long oval with straight lateral margins (Fig. 132). Length of aedeagus 0.53 mm.

Female unknown.

Distribution: *Frischianus serratispinatus* is native to northeastern Borneo and was collected in the Danum Valley in eastern Sabah, Malaysia.

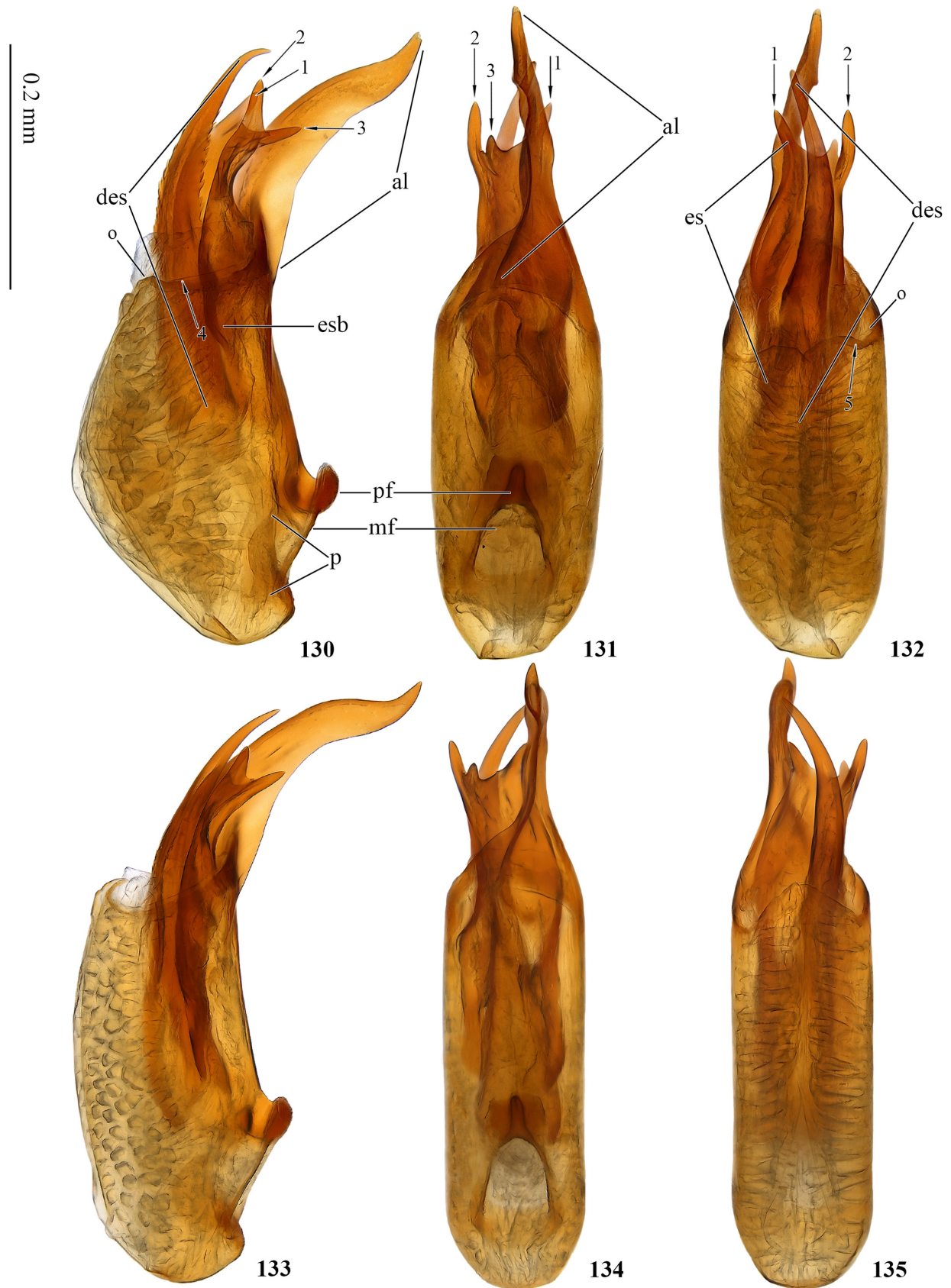
Etymology: The epithet *serratispinatus* [adjective, Latin, composed of the adjectives *serratus* (serrate) and *spinatus* (indicating a feature of the species related to the spine)] refers to the serrate dorsal endophallic spine of the aedeagus (Fig. 130).

Remark: A ♂ and a ♀ of *Frischianus* from the Tawau Hills [Malaysia, Sabah, Tawau (4°24.009'N, 117°53.412'E), 5.IX.2009, leg. Floren (NHMW)], which is situated only about 60 km south of the type locality of *S. serratispinatus*, might be conspecific according to the basically comparable structure of the aedeagus (Figs 133–135). Nevertheless, the aedeagus of the ♂ from Tawau differs by the straight, not dextracurved distal portion of the apical lobe, the almost edentate dorsal endophallic spine, which is only weakly dentate basally, and the distolaterad pointing dextropical tooth of the endophallic sclerite. More material is necessary to answer the question of whether the specimens from the Tawau Hills and the Danum Valley Forest Research represent different species or just intraspecific variations.

2.2.1.3. *Frischianus schuriani* lineage of *F. laticollis* subgroup

Diagnosis: Separated from remaining lineages of *F. laticollis* subgroup (chapter 3.2.2.1.) by straight, not ventrad curved apical lobe of aedeagus (Figs 136–138) and enlarged endophallic sclerite deeply divided in two lateral halves parallel to each other (Figs 136–138). Different from *F. coriaceus* and *F. laticollis* lineages furthermore by absence of dorsal endophallic spine.

Remark: The *Frischianus schuriani* lineage is named after *F. schuriani* sp. nov. from the Malay Peninsula, the only representative so far.



FIGURES 130–135. Aedeagus in lateral (130, 133), ventral (131, 134), dorsal view (132, 135) of *Frischianus serratispinatus*, holotype, Malaysia, Sabah, Lahad Datu, Ulu Segama (Danum Valley Forest Reserve) (130–132); *F. cf. serratispinatus*, Malaysia, Pahang, Tawau Hills (133–135). Abbreviations: al—apical lobe; des—dorsal endophallic spine; es—endophallic sclerite; esb—base of endophallic sclerite; mf—median foramen; o—ostium; p—vestigial paramere; pf—postforamen. Arrows: 1—sinistroapical tooth of endophallic sclerite (130–132); 2—dextroapical tooth of endophallic sclerite (130–132); 3—subdextroapical tooth of endophallic sclerite (130, 131); 4—lateral margin of ostium (130); 5—dorsal margin of ostium (132).

***Frischianus schuriani* Frisch, sp. nov.**

(Figs 136–138, 214)

Type specimen: Holotype ♂, Malaysia, Pahang, 4 mls NE Cameron Highlands, 23.–25.IV.1977, leg. Watrous (FMNH).

Description: Habitus cf. Fig. 50. Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color reddish medium brown with slightly darker brown head; tip of abdomen, antennae, palps, and legs light brown. Labral denticulation type 2 (cf. Figs 11, 12). Forebody surface microsculpture type 1 (Fig. 1). Sutural elytral row of punctures weakly impressed, in about anterior fourth of elytral sutural length densely punctate, afterwards with widely spaced punctures continued posteriorly; medial and lateral elytral row of punctures indistinct, comprising few, widely spaced punctures. Total body length 3.9 mm; forebody length 2.1 mm.

Male: Abdominal sternite VII without diagnostic characters. Abdominal sternite VIII with deep, narrow, medioposterior incision with convex lateral margins occupying about 0.4 of sternite length (Fig. 214).

Aedeagus (Figs 136–138) in lateral view with slender, straight apical lobe at base somewhat bent ventrad (Fig. 136); apical lobe in ventral view occupying median third of aedeagal apical width, lobiform and subparallel laterally with small, dextral indentation and round apical end (Fig. 137). Endophallic sclerite considerably protruding from wide ostium (Figs 136, 138), deeply divided into two lateral halves each remarkably enlarged dorsally in proximal portion, then abruptly curved ventrad

and ending in distal process with short dorsal and longer ventral apical tooth (Fig. 136); base of endophallic sclerite in sinistral position within aedeagus and, both lateral halves taken together, gradually widened toward broad, subparallel median portion abruptly narrowed toward slender, gradually tapered, pointed distal portion (Figs 137, 138). Dorsal, midlongitudinal split of phallobase type B (Fig. 39). Aedeagus with ventral margin between postforamen and apical lobe moderately inverted S-shaped (Fig. 136), in dorsal view oval with dextral lateral margin more strongly curved than sinistral lateral margin (Fig. 138). Length of aedeagus 0.43 mm.

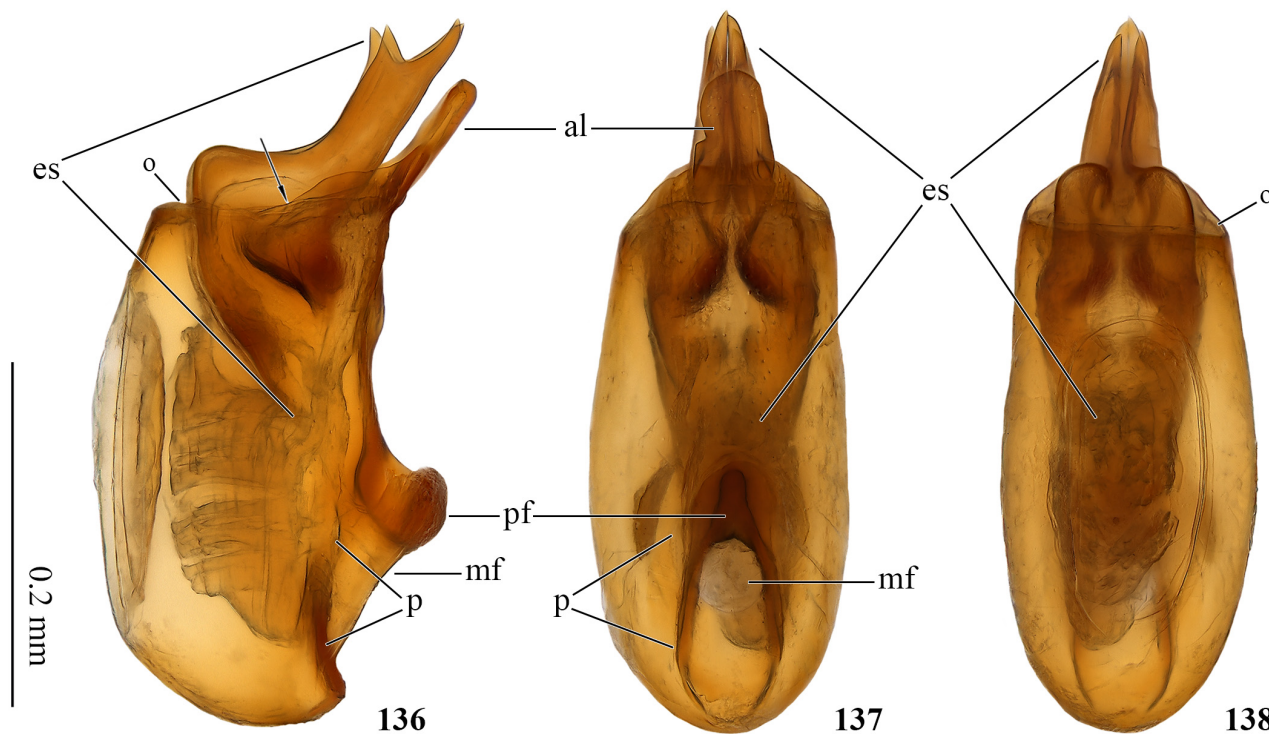
Female unknown.

Distribution: *Frischianus schuriani* is native to the Cameron Highlands, Malay Peninsula.

Etymology: With the dedication of this new species, Johannes Frisch thanks his dear colleague Bernhard Schurian, photographer at the Museum für Naturkunde Berlin, for the perfect high-resolution habitus images published in this article (Figs 1–9, 47, 57) (epithet *schuriani*: Latinized noun, derived from the surname Schurian, genitive, singular).

2.2.1.4. *Frischianus setifer* lineage of *F. laticollis* subgroup

Diagnosis: Separated from remaining lineages of *F. laticollis* subgroup (chapter 3.2.2.1.) by elongate, non-spiniform, non-lobiform, moderately dilated endophallic sclerite with round apical end and usually well visible, subapical endophallic foramen (Figs 139–156). Different



FIGURES 136–138. Aedeagus in lateral (136), ventral (137), dorsal view (138) of *Frischianus schuriani*, holotype, Malaysia, Pahang, Cameron Highlands. Abbreviations: al—apical lobe; es—endophallic sclerite; mf—median foramen; o—ostium; p—vestigial paramere; pf—postforamen. Arrow: Lateral margin of ostium.

from *F. coriaceus* and *F. laticollis* lineages also by absence of dorsal endophallic spine. Separated from *F. schuriani* lineage by ventrad curved apical lobe of aedeagus and different shape of endophallic sclerite (cf. Figs 136–138). Separated from *F. coriaceus*, *F. laticollis*, and *F. schuriani* lineages also by dorsal, midlongitudinal split of phallobase short oval and widely separate from ostium (type C; Fig. 40).

Remarks: The *Frischianus setifer* lineage of the *F. laticollis* subgroup, named after *F. setifer*, whose characters represent this phylogenetic clade well, currently comprises six species, all of which are new to science. They are described below. The *Frischianus setifer* lineage is recorded from the Malay Peninsula, northern Borneo (Sabah, Sarawak), Java, and Sulawesi.

***Frischianus latilobatus* Frisch, sp. nov.**
(Figs 139–141, 215)

Type specimen: Holotype ♂, Malaysia, Sabah (4°63'50"–4°77'16"N, 117°43'83"–117°70'31"E), 300 m, XI–XII.2011, leg. Ewers *et al.* (NHML).

Description: Habitus cf. Fig. 50. Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color medium brown; tip of abdomen, antennae, palps, and legs light brown. Labral denticulation type 2 (Figs 11, 12). Forebody surface microsculpture type 1 (Fig. 1); elytra of holotype lost. Total body length 3.4 mm; length of head and pronotum (elytra missing) 1.3 mm.

Male: Abdominal sternite VII without diagnostic characters. Abdominal sternite VIII with narrow triangular, medioposterior incision with slightly concave lateral margins, occupying about 0.25 of sternite length (Fig. 215).

Aedeagus (Figs 139–141) with large apical lobe arising from sinistral half of distal aedeagal width (Figs 140, 141); apical lobe in lateral view as broad as aedeagus distally, evenly curved ventrad with more strongly ventrad curved, right-angled apical end; ventral margin of apical lobe concave between convex proximal portion studded with few setulae and widely triangular distal portion with small, acute, median tooth (Fig. 139); apical lobe in ventral view from dextrally situated proximal end in moderate, sinistral curve running toward narrow, shortly dextracurved, rounded apical end (Fig. 140). Endophallic sclerite, even though strongly projecting from ostium in dorsal view (Fig. 141), not protruding over aedeagus dorsally (Fig. 139); endophallic sclerite in lateral view moderately curved ventrad, from narrow base gradually thickened toward midlength, after that gradually tapered toward shortly ventrad bent, uncinat apical end (Fig. 139), in dorsal view wide and subparallel, from sinistrally inserted base directed distodextrad, and in distal fifth evenly tapered toward triangular, subacute tip slightly surpassing aedeagus dextrally (Fig. 141); apical portion of endophallic sclerite with clear, wide endophallic foramen with straight proximal margin (Fig. 141). Aedeagus with ventral margin between postforamen and base of apical lobe deeply concave (Fig. 139), in dorsal view long oval

and gradually tapered distad with dextral lateral margin slightly more strongly curved than sinistral lateral margin (Fig. 141). Length of aedeagus 0.46 mm.

Female unknown.

Distribution: *Frischianus latilobatus* was collected in Sabah, Northeast Borneo, where it was discovered north of Tawau. The exact type locality is unknown, because the coordinates of the location label of the holotype comprise a large area.

Etymology: The epithet *latilobatus* [adjective, Latin, composed of the adjectives *latus* (broad) and *lobatus* (indicating a characteristic/feature of the lobe)] refers to the apical lobe of the aedeagus of this new species, which is broad in lateral view compared to the other species of *Frischianus* known so far (Fig. 139).

***Frischianus latilobatooides* Frisch, sp. nov.**
(Figs 142–144, 216)

Type specimen: Holotype ♂, Malaysia, Pahang, 19 mls NE Kuala Lumpur, 28.IV.1977, leg. Watrous (FMNH).

Description: Similar to *Frischianus latilobatus* (cf. Fig. 50), but labral denticulation type 1 (Fig. 10). Elytra moderately shiny with fine and dense, somewhat granular punctation with interspaces smaller than puncture diameters. Sutural elytral row of punctures faintly impressed anteriorly, extending over anterior 0.7 of elytral sutural length; medial and lateral row of punctures indistinct. Smaller than *F. latilobatus*: total body length 3.0 mm, forebody length 1.7 mm, length of head and pronotum 1.1 mm.

Male: Aedeagus (Figs 142–144) similar to that of *F. latilobatus*, but different as follows: Apical lobe, in lateral view, narrower with acute apical end; ventral tooth less pointed and setulose proximoventral margin straight (Fig. 142). Endophallic sclerite with apical end not uncinat (Fig. 142), in ventral and dorsal view narrower medially and with base inserted medially in aedeagus (Figs 143, 144); endophallic foramen without straight proximal margin (Fig. 144). Aedeagus with ventral margin between postforamen and base of apical lobe less concave (Fig. 142). Length of aedeagus 0.4 mm.

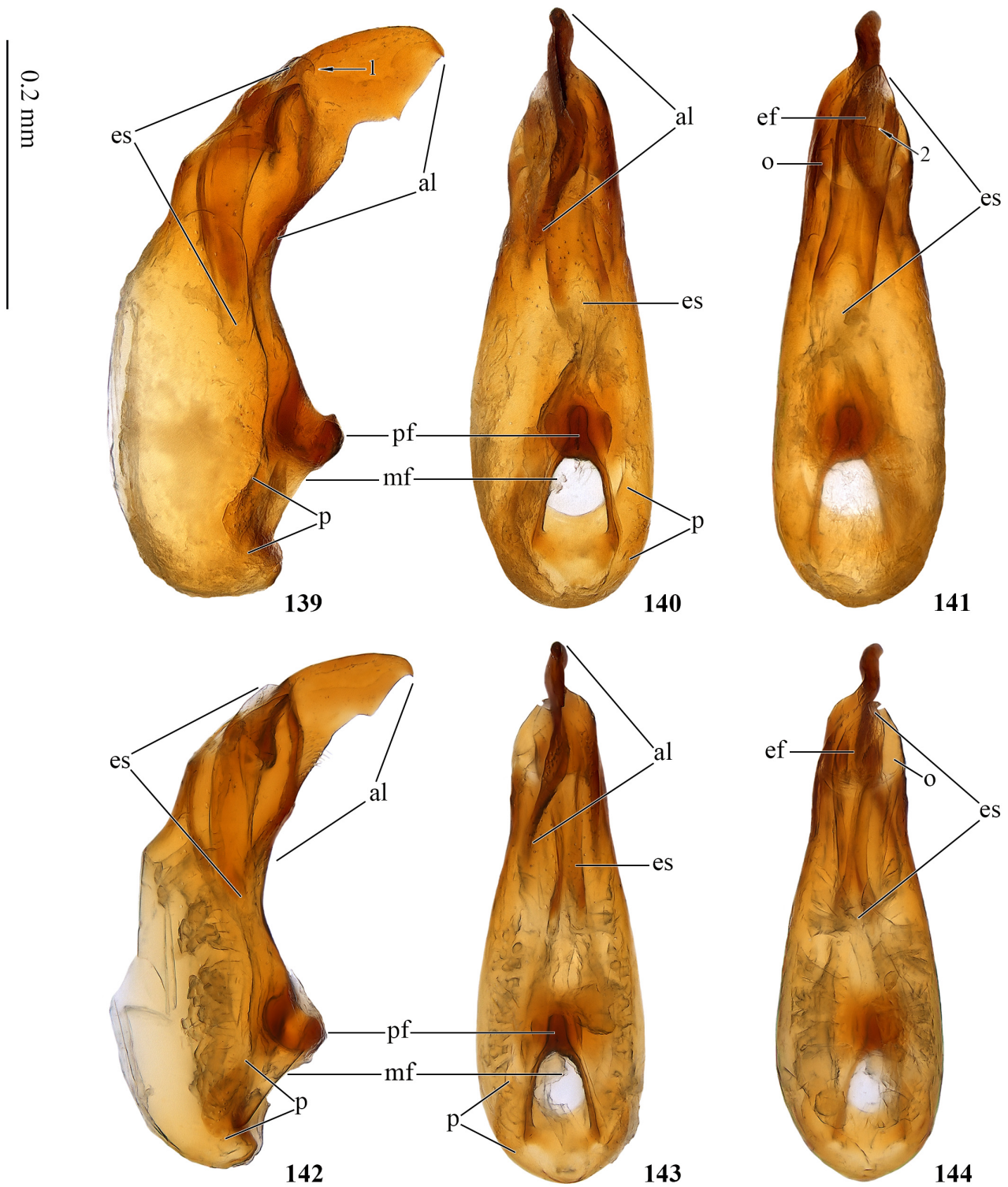
Female unknown.

Distribution: *Frischianus latilobatooides* is native to Pahang in the Malay Peninsula.

Etymology: The epithet *latilobatooides* [adjective, Latin, composed of the adjectives *latus* (broad), *lobatus* (indicating a characteristic/feature of the lobe) and the Greek, Latinized suffix “*oides*” (referring to a similarity)] refers to the resemblance and close relationship of this new species to *Frischianus latilobatus*.

***Frischianus telnovi* Frisch, sp. nov.**
(Figs 52, 145–147, 217, 218, 241, 261)

Type specimens: Malaysia: Holotype ♂, Sabah (04°63'05"–04°77'16"N, 117°43'83"–117°70'31"E), 300 m, II–III.2011, leg. Ewers *et al.* (SAFE-Projekt)



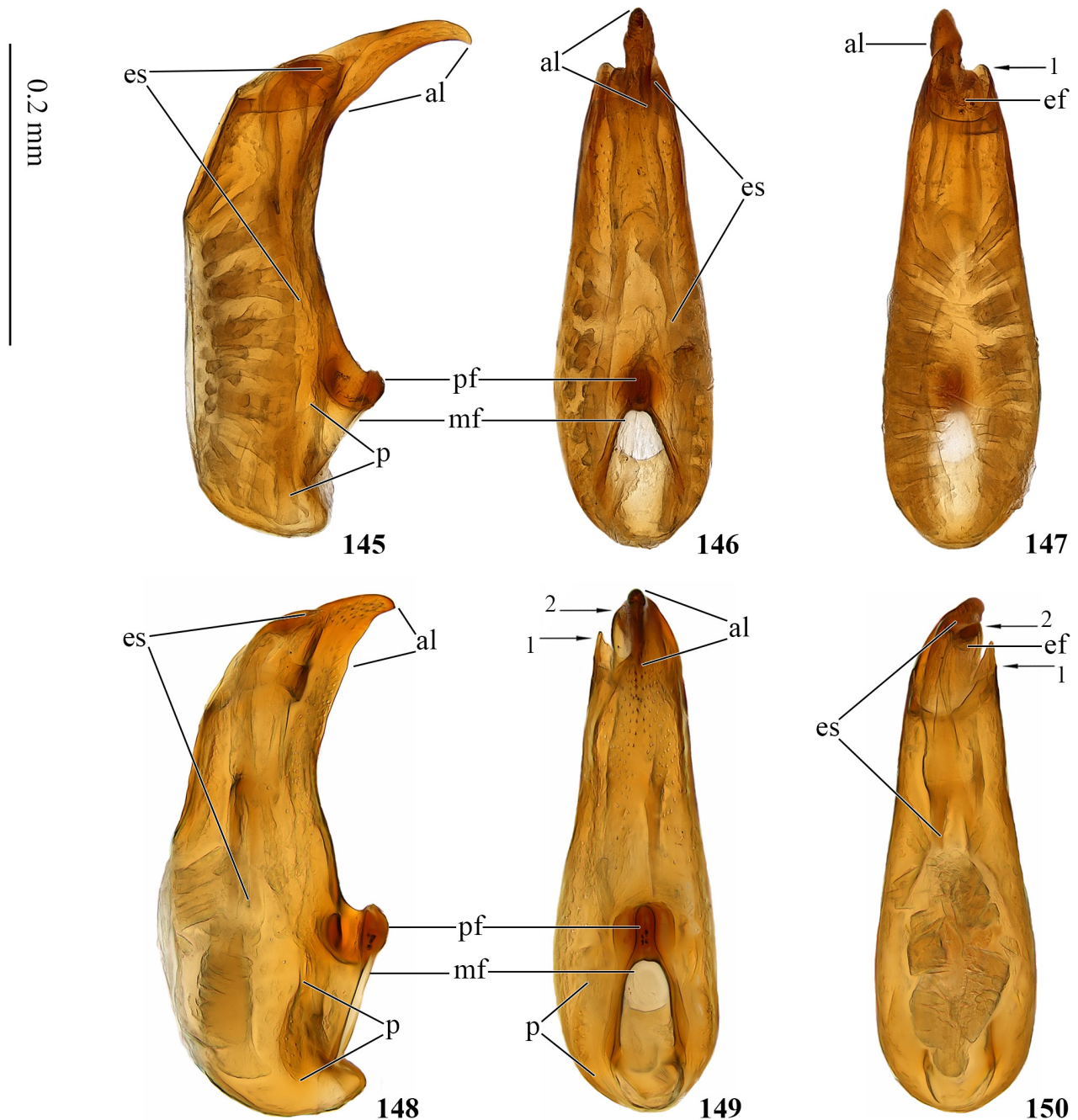
FIGURES 139–144. Aedeagus in lateral (139, 142), ventral (140, 143), dorsal view (141, 144) of *Frischianus latilobatus*, holotype, Malaysia, Sabah (139–141); *F. latilobatoides*, holotype, Malaysia, Pahang, NE Kuala Lumpur (142–144). Abbreviations: al—apical lobe; ef—endophallic foramen; es—endophallic sclerite; mf—median foramen; o—ostium; p—vestigial paramere; pf—postforamen. Arrows: 1—uncinate apical end of endophallic sclerite (139); 2—proximal margin of endophallic foramen (141).

(HECO). Paratypes (29 specimens): 5 ♂, 14 ♀, same data as holotype (HECO, MFNB, NHML); 3 ♂, 5 ♀, Sabah: Tawau (04°66'N, 117°06'E), 100 m, 11.–17.X.2012, leg. Gray (HECO, MFNB); 1 ♂, 1 ♀, Sarawak: Mt Mulu National Park, 50–100 m, V.–VIII.1978, leg. Hammond & Marshall (NHML).

Description: Habitus (Fig. 52). Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color medium brown to dark brown with elytra unicolored dark brown or lighter brown anteriorly in variable extent; tip of abdomen, antennae, palps, and legs light brown. Labral denticulation type 1 or 2 (cf. Figs

10–12). Forebody surface microsculpture type 1 (Fig. 1). Sutural elytral row of punctures impressed, extending over anterior half of elytral sutural length; medial and lateral elytral row of punctures reduced to few, widely spaced punctures. Total body length 2.7–3.4 mm; forebody length 1.6–1.8 mm.

Male: Abdominal sternite VII with midlongitudinal deplanation from about median third of sternite width slightly narrowed toward faintly emarginate posterior sternite margin; posterior third of midlongitudinal deplanation with irregularly limited, indistinct cluster of black macrosetae (Fig. 217). Abdominal sternite VIII with



FIGURES 145–150. Aedeagus in lateral (145, 148), ventral (146, 149), dorsal view (147, 150) of *Frischianus telnovi*, holotype, Malaysia, Sabah (145–147); *F. setifer*, holotype, Indonesia, Banten, Lebak, Citorek Kidul (148–150). Abbreviations: al—apical lobe; ef—endophallic foramen; es—endophallic sclerite; mf—median foramen; p—vestigial paramere; pf—postforamen. Arrows: 1—dextral margin of ostium (147, 149, 150); 2—apex of endophallic sclerite protruding apical lobe laterally (149, 150).

narrow triangular, medioposterior incision with slightly concave lateral margins, occupying about posterior 0.3 of sternite length (Fig. 218).

Aedeagus (Figs 145–147) with long, narrow apical lobe situated in sinistral half of distal aedeagal width (Figs 146, 147). Apical lobe in lateral view strongly curved ventrad and evenly tapered toward more strongly bent apical end (Fig. 145), in dorsal view narrow, somewhat thickened at midlength, and with subacute end (Fig. 147). Endophallic sclerite situated subsinistrally in aedeagus (Figs 146, 147), in lateral view slender basally, somewhat widened toward ventrad curved, acute apical end, not protruding from aedeagus dorsally (Fig. 145); endophallic sclerite in ventral and dorsal view subparallel with narrow, furcate base, at about midlength slightly narrowed, and with wide, truncate apical end (Figs 146, 147). Ostium with dextral margin slightly extended into short, round, dextrodistal lobe (Figs 146, 147). Aedeagus with ventral margin between postforamen and base of apical lobe evenly, moderately concave (Fig. 145), in dorsal view long oval with lateral margins bent almost equally, gradually tapered distad (Fig. 147). Length of aedeagus 0.37–0.4 mm.

Female: Gonocoxal plate short, about 1.5 times as long as wide, without basal and subbasal ridge, with anterior margin triangularly emarginate, lateral margins slightly concave, and posterior margin almost semicircularly emarginate with subacute lateroposterior ends (Fig. 261).

Distribution: *Frischianus telnovi* is distributed in the Malaysian provinces of Sabah and Sarawak, northern Borneo.

Etymology: Johannes Frisch dedicates this new species to his dear colleague Dmitry Telnov, Natural History Museum London, United Kingdom, in gratitude for his generous support during a recent visit to the Coleoptera collection there (epithet *telnovi*: Latinized noun, derived from the surname Telnov, genitive, singular).

Comment: A female of *Frischianus* from the Philippines (Mindanao, E-slope Mt McKinley, 28.VIII.1946, leg. Werner, FMNH) shares with *F. telnovi* the shape of the female gonocoxal plate with a triangularly emarginate basal margin (cf. Fig. 248). It furthermore resembles *F. telnovi* in general appearance and the sculpturing of the body surface, but it differs by somewhat smaller eyes and unicolored medium brown body coloring. It may represent an undescribed species, but males are unknown and in the Scopaeina both coloring and eye size often vary infraspecifically and geographically.

***Frischianus setifer* Frisch, sp. nov.**
(Figs 148–150, 219, 220)

Type specimen: Holotype ♂, Indonesia, Banten, Lebak: Citorek Kidul (06°44'51"S, 106°19'13"E), 870 m, 23.V.2016, leg. Frisch (ZMB).

Description: Habitus cf. Fig. 52. Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Head medium brown; pronotum, elytra, and abdomen light brown; antennae, palps, and legs yellow brown.

Labral denticulation type 2 to 3 (cf. Figs 11–14). Forebody surface microsculpture type 1 (Fig. 1). Sutural elytral row of punctures distinct, but weakly impressed, occupying anterior 0.7 of elytral sutural length; medial and lateral row of punctures reduced to few, widely spaced punctures. Total body length 3.1 mm; forebody length 1.7 mm.

Male: Abdominal sternite VII in basal half with shallow, longitudinal, ovoidal impression occupying median third of sternite width followed posteriorly by two adjacent, submedian clusters of black macrosetae pointing medioposteriorly toward each other (Fig. 219). Abdominal sternite VIII with narrow, medioposterior incision with concave lateral margins, occupying about 0.4 of sternite length (Fig. 220).

Aedeagus (Figs 148–150) with apical lobe situated in sinistral half of distal aedeagal width (Fig. 149). Apical lobe in lateral view about as long as wide and triangular with acute, moderately ventrad curved apical end (Fig. 148), in ventral view with straight dextral margin and evenly dextrad curved sinistral margin gradually tapered toward rounded apical end (Fig. 149). Endophallic sclerite situated submedially in aedeagus (Fig. 150), in lateral view evenly, weakly dilated distad with subacute, moderately ventrad curved apical end slightly protruding from aedeagus dorsally (Fig. 148), in dorsal view from narrow, furcate base weakly curved dextrad with wide, round apical end almost reaching apex of apical lobe; in ventral and dorsal view, endophallic sclerite notably surpassing dextral margin of apical lobe (Figs 149, 150). Ostium with dextral margin strongly extended into long, longitudinally directed, dextrodistal spine of half length of apical lobe (Figs 149, 150). Aedeagus with ventral margin between postforamen and base of apical lobe concave (Fig. 148), in dorsal view long oval with both lateral margins bent equally, gradually tapered distad (Fig. 150). Length of aedeagus 0.36 mm.

Female unknown.

Distribution: *Frischianus setifer* is native to western Java and was discovered in the east of Banten Province.

Etymology: The epithet *setifer* [adjective, Latin, composed of the noun *seta* (bristle) and the verb *ferre* (to carry)] refers to the remarkable pair of posterior clusters of bristles of abdominal sternite VII of this new species, the arrangement of which is unique within *Frischianus* so far (Fig. 219).

***Frischianus barclayi* Frisch, sp. nov.**
(Figs 151–153, 221, 222)

Type specimens: Holotype ♂, Malaysia, Penang: Penang Island, X.1913, leg. Bryant (NHML). Paratype: 1 ♂, Perak, leg. Doherty (NHML).

Description: Habitus cf. Fig. 52. Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color reddish medium brown with light brown antennae, palps, and legs. Labral denticulation type 2 (cf. Figs 11, 12). Forebody surface microsculpture type 1 (Fig. 1). Sutural elytral row of punctures distinct, but weakly impressed, occupying about anterior half of elytral sutural

length; medial and lateral elytral row of punctures weakly developed. Total body length 3.1 mm; forebody length 1.7 mm.

Male: Abdominal sternite VII with shallow, midlongitudinal deplanation from about median third of basal sternite width slightly narrowed toward truncate posterior sternite margin; midlongitudinal deplanation in about posterior fifth with two adjacent, not clearly separated, submedial clusters of short, black macrosetae each slightly aligned medioposteriad (Fig. 221). Abdominal sternite VIII with narrow triangular, medioposterior incision with concave lateral margins, occupying about 0.3 of sternite length (Fig. 222).

Aedeagus (Figs 151–153) with long, slender apical lobe arising from sinistral half of distal aedeagal width (Figs 152, 153). Apical lobe in lateral view slightly curved ventrad, parallel basally, in distal half moderately, convexly dilated ventrally, after that evenly tapered toward acute, slightly ventrally curved apical end (Fig. 151); in dorsal view, apical lobe narrow, slightly bent dextrad in basal half, at about midlength somewhat dilated, afterwards feebly curved longitudinally with thin, blunt end (Fig. 153). Endophallic sclerite in aedeagus situated dextrally (Figs 152, 153), relatively slender, in lateral view with ventrad curved, notably dilated apex (Fig. 151), in dorsal view narrow, subparallel, with deeply furcate base and wide, sinistrally curved, subacute apical end slightly protruding from ostium (Fig. 153). Ostium with dextral margin extended into longitudinally aligned, dextral tooth (Figs 152, 153). Aedeagus with ventral margin between postforamen and apical lobe convex proximally and concave distally (Fig. 151), in dorsal view long oval with lateral margins curved equally, and gradually tapered distad (Fig. 153). Length of aedeagus 0.43 mm.

Female unknown.

Distribution: *Frischianus barclayi* is distributed in the Malay Peninsula and known from the neighbouring provinces of Penang and Perak.

Etymology: With choosing the epithet *barclayi* (Latinized noun, derived from the surname Barclay, genitive, singular) Johannes Frisch warmly thanks Max Barclay, Natural History Museum, London, United Kingdom, for his hospitality during a recent visit to the Coleoptera collection there.

***Frischianus huijbregtsi* Frisch, sp. nov.**

(Figs 154–156, 223, 224, 242, 262)

Type specimens: Holotype ♂, Indonesia, Sulawesi Tengah, Banggai: N Kayutanyo (Matanyo Forest), 120 m, 2.–7.XI.1989, leg. Krikken & van der Blom (NBCL). Paratype: 1 ♀, same data as holotype (NBCL).

Description: Habitus cf. Fig. 52. Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color unicolored reddish medium brown with light brown antennae, palps, and legs. Labral denticulation type 2 (cf. Figs 11, 12). Forebody surface microsculpture resembling type 1 (Fig. 1), but very dense pronotal

punctuation not umbilicate. Sutural elytral row of punctures distinct, but weakly impressed, occupying anterior half of elytral sutural length; medial elytral row of punctures reduced to few, widely spaced punctures; lateral elytral row of punctures indistinct. Total body length 3.6 mm; forebody length 1.8 mm.

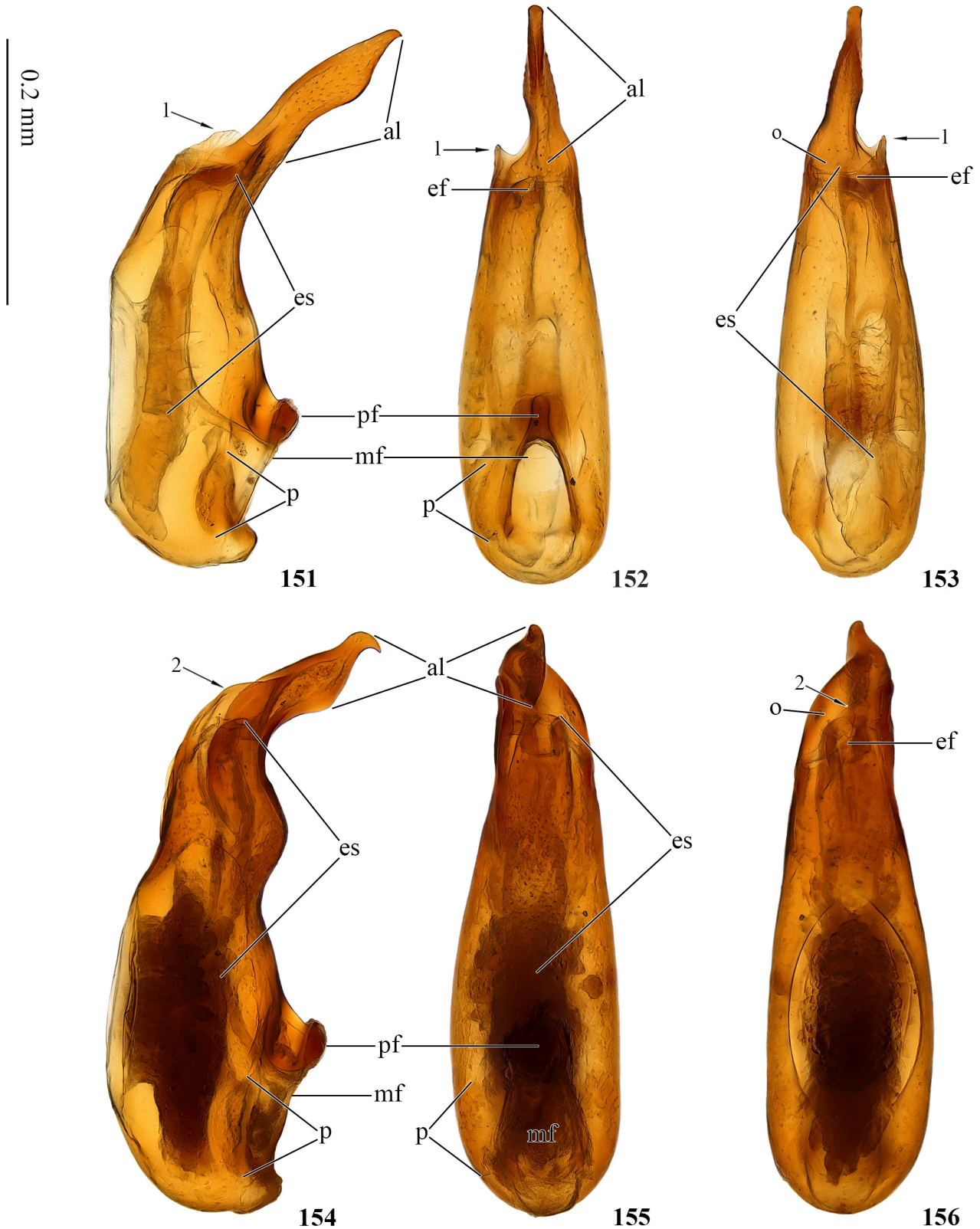
Male: Abdominal sternite VII with shallow, midlongitudinal deplanation gradually narrowed from median third of basal sternite width to slightly concave median sixth of posterior sternite margin; midlongitudinal deplanation with sparse primary setation, on either side delimited with irregular row of black macrosetae increasingly more densely arranged posteriad (Fig. 223). Abdominal sternite VIII with narrow, medioposterior incision with concave lateral margins, occupying roughly 0.3 of sternite length (Fig. 224).

Aedeagus (Figs 154–156) with dextrad curved distal end and apical lobe notably shifted dextrally (Figs 155, 156); apical lobe in lateral view long, curved ventrad at base, with straight dorsal and convex ventral margin at about midlength, then gradually tapered toward strongly ventrad curved, uncinately apical end (Fig. 154); apical lobe in ventral and dorsal view with strongly convex dextral margin and moderately convex sinistral margin strongly tapered toward subacute tip; dextral margin of apical lobe shortly concave apically (Figs 155, 156). Endophallic sclerite situated subdextrally in aedeagus (Figs 155, 156), not much protruding from ostium (Fig. 156), in lateral view slender with strongly ventrad curved apical end (Fig. 154), in ventral and dorsal view broad, in about distal half somewhat convexly widened, ending in strongly dextrad curved, minutely pointed apical end (Figs 155, 156). Ostium with dorsodextral margin convexly enlarged (Fig. 154); dorsodextral margin in dorsal view from sinistral side of aedeagus running obliquely distodextrad (Fig. 156). Aedeagus with ventral margin between postforamen and base of apical lobe feebly convex proximally but strongly convex distally (Fig. 154), in dorsal view long oval with dextral lateral margin somewhat more strongly convex than almost straight, sinistral lateral margin, and gradually tapered distad (Fig. 156). Length of aedeagus 0.46 mm.

Female: Gonocoxal plate short, about 1.3 times as long as wide, widest across line-like thin, concave basal ridge, without subbasal ridge; lateral margins straight, gradually narrowed toward more strongly narrowed posterior seventh; posterior emargination narrow, almost semicircular, delimited laterally by subacute ends (Fig. 262).

Distribution: *Frischianus huijbregtsi* is native to Sulawesi, where it was found in the Matanyo Forest, Sulawesi Tengah, Indonesia.

Etymology: The epithet *huijbregtsi* (Latinized noun, derived from the surname Huijbregts, genitive, singular) honours Hans Huijbregts, Naturalis Biodiversity Center, Leiden, the Netherlands, who kindly hosted Johannes Frisch during a visit to the Coleoptera collection there where this new species was discovered.



FIGURES 151–156. Aedeagus in lateral (151, 154), ventral (152, 155), dorsal view (153, 156) of *Frischianus barclayi*, holotype, Malaysia, Penang, Penang Island (151–153); *F. huijbregtsi*, holotype, Indonesia, Sulawesi Tengah, Banggai, Kayutanyo (Matanyo Forest) (154–156). Abbreviations: al—apical lobe; ef—endophallic foramen; es—endophallic sclerite; mf—median foramen; o—ostium; p—vestigial paramere; pf—postforamen. Arrows: 1—dextral margin of ostium (151–153); 2—dorsodextral margin of ostium (154, 156).

2.2.2. *Frischianus rufulus* subgroup of *F. laticollis* species group

Diagnosis: Separated from *F. laticollis* subgroup (chapter 3.2.1.1.) as follows: Labral denticulation variable, but tending to type 4 (Fig. 15); labrum usually short with submedial denticles reduced to triangular tooth or obtuse angle not protruding over anterior labral margin; submedial denticles usually not longer or even shorter than pointed or obtuse sublateral denticles. Abdominal sternite VIII of ♂ with wide, triangular, medioposterior emargination with abruptly narrowed anterior end aligned longitudinally or somewhat dextrad (Figs 226–230). Aedeagus with long, prominent, distoventrally oriented ventral process (Figs 157–180); apical lobe absent (Figs 157–162) or present (Figs 163–180), neither shifted sinistrad nor curved dextrad (homology with apical lobe of *F. laticollis* subgroup questionable); endophallic sclerite hypertrophic with well developed foramen often enlarged laterally. Gonocoxal plate of ♀ (unknown in three of six species included) with posterior margin narrowly, triangularly incised (Figs 263–265).

Remarks: The *Frischianus rufulus* subgroup comprises *F. rufulus* comb. nov., the first described species of this phylogenetic clade, *F. miscellus* comb. nov., and four species new to science, that are described or redescribed below. The *F. rufulus* subgroup is recorded from Myanmar, Thailand (Chiang Mai), and the Malay Peninsula.

Frischianus crassiphallatus Frisch, sp. nov. (Figs 157–159, 225, 226)

Type specimens: Holotype ♂, Thailand, Chiang Mai: Doi Chiang Dao, 880 m, 21.II.1986, leg. Schwendiger (MHNG). Paratype: 1 ♂, same data as holotype, but 760 m, 16.10.1986 (MFNB).

Description: Habitus cf. Fig. 54. Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color unicolored medium brown with light brown tip of abdomen, palps, and legs; antennae from medium brown scapus gradually lighter to light brown distal segments. Labral denticulation type 4 (cf. Fig. 15). Forebody surface microsculpture not assignable to types 1–4 (Figs 1–4); cephalic punctation as in Fig. 3a; pronotum polished with very dense, non-umbilicate punctation; elytral punctation slightly coarser and less dense than cephalic punctation, not clearly granular. Sutural elytral row of punctures notably impressed anteriorly, occupying about anterior 0.7 of elytral sutural length; medial and lateral elytral rows of punctures indistinct. Total body length 4.2 mm; forebody length 2.1 mm.

Male: Abdominal sternite VII with very short, wide emargination of posterior margin and shallow, mid-longitudinal depression gradually widened posteriorly to middle third of sternite width and here covered with two adjacent, submedial clusters of few, short, black macrosetae (Fig. 225). Abdominal sternite VIII in posterior 0.3 of length with widely triangular emargination

continued anteriorly into narrow, longitudinally aligned end (Fig. 226).

Aedeagus (Figs 157–159) without apical lobe. Long ventral process arising from aedeagus shifted far proximodextrally with apical end reaching apical end of endophallic sclerite; ventral process in lateral view thin with incrassate, dorsally denticulate basal third directed distoventrally and sublongitudinally aligned distal two-thirds (Fig. 157), in ventral view with narrow base situated close to dextral margin of aedeagus, followed by strongly sinistrad curved midlength portion sinistrally strongly convexly dilated, after that evenly dextracurved and gradually tapered toward narrow, blunt apical end (Fig. 158). Endophallic sclerite in ventral and dorsal view situated medially in aedeagus (Figs 158, 159), in lateral view from narrow, dorsad curved base remarkably widened distad and extended in massive apical portion convexly dilated dorsally, projecting from ostium, and directly at margin of ostium strongly curved ventrad (Fig. 157); apical portion of endophallic sclerite with thin, apical spine pointing proximad (Fig. 157), dextrodorsad pointing ventral tooth (Figs 157, 158), and short, sinistral tooth pointing proximolaterad (Figs 158, 159). Endophallic foramen remarkably triangularly enlarged dextrally with denticulate distal margin (Figs 158, 159). Dorsal endophallic spine present, long and slender with acute apex, in lateral view adjacent to endophallic sclerite, curved ventrad, and with slightly distad curved end faintly protruding over apical portion of endophallic sclerite distally, in dorsal view with distal half somewhat curved dextrad (Fig. 159). Ostium oblique, with sinistrally convex, dextrally concave dorsal margin, extended dextrodistad and beveled sinistroproximad (Figs 157–159). Dorsal, midlongitudinal split of phallobase type C (cf. Figs 40, 41). Aedeagus with ventral margin distal of postforamen straight (Fig. 157), in dorsal view short oval with convex lateral margins (Fig. 159). Length of aedeagus 0.51 mm.

Female unknown.

Distribution: *Frischianus crassiphallatus* occurs in the very north of Thailand in the province of Chiang Mai and is the northernmost known representative of the genus.

Etymology: The epithet *crassiphallatus* [adjective, Latin, composed of the adjectives *crassus* (thick) and *phallatus* (derived from the noun *phallus* with suffix *-atus*, expressing a quality/attribute of the species related to the phallus) refers to the thick, robust endophallic sclerite of this new species (Figs 157–159).

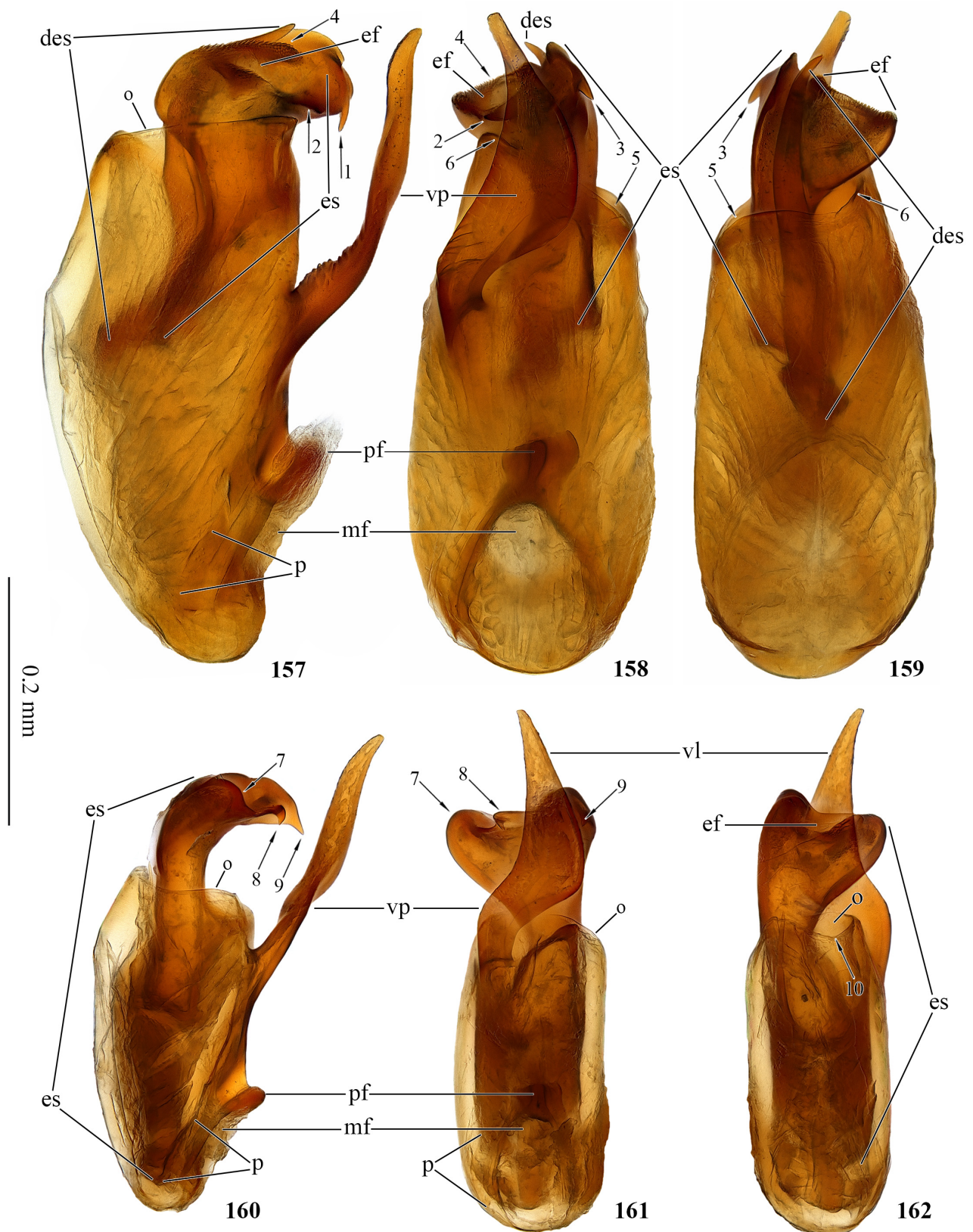
Frischianus rufulus (Kraatz), comb. nov. (Figs 53, 160–162, 227)

Lithocharis rufulus Kraatz, 1859: 140, 141.

Medon (subg. *Lithocharis*) *rufulus*; Bernhauer & Schubert 1912: 243.

Scopaeus rufulus; Cameron 1931: 171, 177.

Type specimen examined: Lectotype ♂, Myanmar; labelled “76.” (handwritten), “India/orient.” (handwritten),



FIGURES 157–162. Aedeagus in lateral (157, 160), ventral (158, 161), dorsal view (159, 162) of *Frischianus crassiphallatus*, holotype, Thailand, Chiang Mai, Doi Chiang Dao (157–159); *F. rufulus*, lectotype, Myanmar (160–162). Abbreviations: al—apical lobe; des—dorsal endophallic spine; ef—endophallic foramen; es—endophallic sclerite; mf—median foramen; o—ostium; p—vestigial paramere; pf—postforamen; vp—ventral process. Arrows: 1—apical spine of endophallic sclerite (157); 2—ventral tooth of endophallic sclerite (157, 158); 3—sinistral tooth of endophallic sclerite (158, 159); 4—denticulate margin of endophallic foramen (157, 158); 5—sinistral margin of ostium (158, 159); 6—dextral margin of ostium (158, 159); 7—dextral end of endophallic sclerite (160, 161); 8—median denticle of endophallic sclerite (160, 161); 9—sinistral tooth of endophallic sclerite (160, 161); 10—dorsal margin of ostium (162).

“Holotypus” (red, printed), “Lithochar. / rufulus Kr.” (handwritten), “Coll. Kraatz” (printed), “Coll. DEI / Eberswalde” (printed), “Lectotype / *Lithocharis rufulus* / Kraatz, 1859 / des. Frisch & Herman, 2025” (SDEI); here designated.

The number of specimens from which Kraatz (1859: 140, 141) described *Lithocharis rufulus* is not stated in the original description, but as male characters are described, at least one male must have been available to the author. Kraatz also did not designate a “type” [holotype by original designation (ICZN 1999: Article 73.1.1.)]. Thus, to stabilize the name *Lithocharis rufulus* according to ICZN 1999, Article 74.1., the only available specimen is designated the lectotype, a male from the Kraatz collection at SDEI, which is labelled “Holotype”, whose locality label is in accordance with the original description, and which bears handwritten labels which agree with the example of Kraatz’s handwriting in Horn *et al.* (1990: 482).

New record: Thailand, Ranong, Kapoe: Khlong Nakha Wildlife Sanctuary (Phuket Mountain Range), 30 m, 29.I.1991, leg. Schwendinger (MFNB, MHNG).

Redescription: Habitus (Fig. 53). Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color unicolored medium brown; tip of abdomen, antennae, palps, and legs yellow brown. Labral denticulation type 4 (cf. Fig. 15); in lectotype sublateral labral denticles asymmetrically developed, obtuse dextrally and short-pointed sinistrally. Forebody surface microsculpture type 3 (Fig. 3). Sutural elytral row of punctures weakly impressed anteriorly, extending over approximately anterior 0.7 of elytral sutural length; medial and lateral elytral rows of punctures indistinct. Total body length 3.6 mm; forebody length 1.9 mm.

Male: Abdominal sternite VII with very shallow, triangular emargination in median third of posterior margin. Abdominal sternite VIII in roughly posterior 0.2 of length with widely triangular incision continued anteriorly into very narrow, longitudinally aligned end (Fig. 227).

Aedeagus (Figs 160–162) without apical lobe. Ventral process arising from aedeagus subapically and far dextrally and exceeding apical end of endophallic sclerite considerably in length; ventral process in lateral view thin, directed distoventrad, seemingly somewhat twisted in proximal half followed by somewhat wider distal half with slightly ventrad curved, subacute apical end (Fig. 160), in ventral view with narrow base close to dextral aedeagal margin, after that strongly curved distosinistrad toward sinistrally and convexly widened midlength portion, and gradually tapered toward narrow, acute, somewhat dextrad curved apical end (Fig. 162). Endophallic sclerite in dorsal and ventral view with elongate base almost as wide as width of aedeagus and in aedeagus situated medially (Figs 161, 162); endophallic sclerite mainly sinistrally expanded into huge, lobiform apical portion evenly curved ventrad, about heart-shaped in dorsal view, and considerably projecting from ostium (Figs 160–162); apical portion of endophallic sclerite at broad, emarginate apex ventrally extended in round dextral

lobe (Figs 160, 161), shorter, narrow median denticle with proximad pointing tip (Figs 160, 161), and longer, wider sinistral tooth with ventroproximad pointing tip (Figs 160, 161). Endophallic foramen with smooth proximal margin, situated in median third of subapical width of apical end of endophallic sclerite (Fig. 162). Dorsal endophallic spine absent. Ostium with convex ventral margin and dorsal margin somewhat emarginate dextrally (Figs 161, 162). Shape of dorsal, midlongitudinal split of phallobase between types B and C (cf. Figs 39–41). Aedeagus in dorsal view narrow with parallel lateral margins (Fig. 162). Length of aedeagus 0.42 mm.

Female unknown.

Distribution: *Frischianus rufulus* was most probably described from southern Myanmar. The species that Kraatz (1859) described from “India orient” were collected by Helfer 1836–1839 in the very south of Myanmar between Dawei [Tavoy] and the Tenasserim Range (cf. Kraatz 1859: 3, Schmidt-Göbel 1849: III). 130 years later, the species was eventually rediscovered in the south of Thailand.

***Frischianus miscellus* (Cameron), comb. nov.**
(Figs 54, 163–165, 228, 243, 263)

Medon miscellus Cameron, 1932: 128–130.

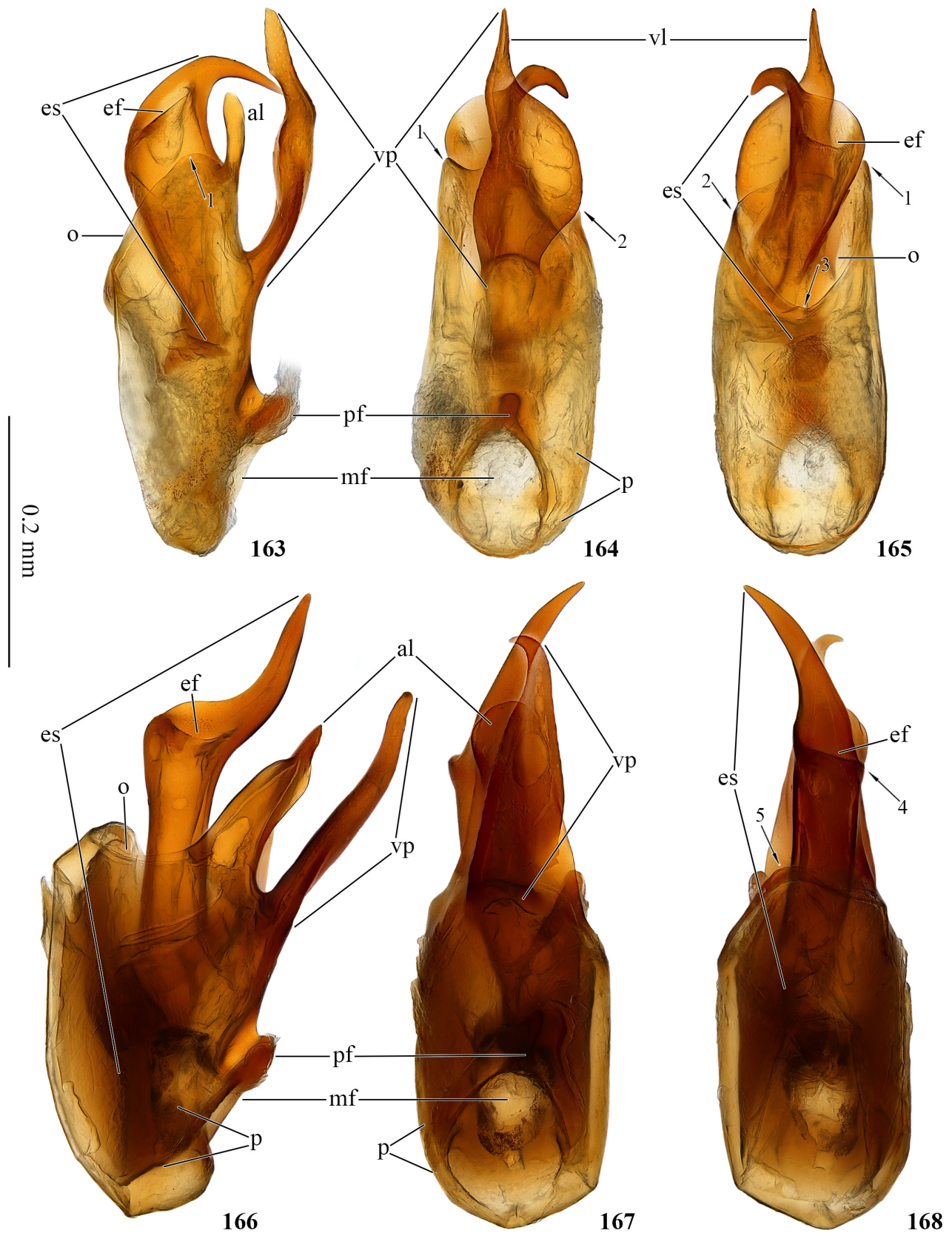
Scopaeus miscellus; Cameron 1950: 15.

Type specimens: Lectotype ♂, Malaysia, Penang, leg. Cameron; labelled “Penang, / Dr. Cameron.” (printed), “Paddy (handwritten) / Debris” (printed), “M. / miscellus / TYPE Cam.” (handwritten, “TYPE” in red), “M. Cameron / Bequest / B.M.1955-147.” (printed), “Lectotype / *Medon miscellus* / Cameron, 1932 / des. Frisch & Herman, 2025” (NHML); here designated. Paralectotypes (1 ♂, 2 ♀), same locality label as lectotype, paralectotype labels by Frisch & Herman, 2025 (NHML).

In the original description, Cameron (1932: 128–130) neither stated the number of specimens from which he described *Medon miscellus* nor did he designate a holotype by original designation (ICZN 1999: Article 73.1.1.). Thus, a lectotype designation is required to stabilize the name *Medon miscellus* according to ICZN 1999, Article 74.1. From among the four syntypes from Penang, the male which Cameron had labelled as “TYPE”, judging from the example of Cameron’s handwriting in Horn *et al.* (1990: 477), is selected as the lectotype.

New record: Malaysia, Penang, Penang Island: Penang Hill, 700 m, 9.XI.1999, leg. Cuccodoro & Löbl (MHNG).

Redescription: Habitus (Fig. 54). Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color unicolored medium brown, or head slightly darker brown and elytra with darker brown to blackish brown lateroposterior angles in variable extent up to blackish brown lateral thirds leaving only wide suture strip and humera median brown; tip of abdomen, antennae, palps, and legs yellow brown. Labral denticulation variable; submedial denticles pointed and



FIGURES 163–168. Aedeagus in lateral (163, 166), ventral (164, 167), dorsal view (165, 168) of *Frischianus miscellus*, lectotype, Malaysia, Penang (163–165); *F. tridens*, holotype, Malaysia, Selangor: Sungai Buloh (166–168). Abbreviations: al—apical lobe; ef—endophallic foramen; es—endophallic sclerite; mf—median foramen; o—ostium; p—vestigial paramere; pf—postforamen; vp—ventral process. Arrows: 1—ventrodextral margin of ostium (163–165); 2—ventrosinistral margin of ostium (164, 165); 3—dorsoproximal margin of ostium (165); 4—slightly, dextrally protruding endophallic foramen (168); 5—distosinistral projected dorsal margin of ostium (168).

longer than pointed sublateral denticles (type 1, cf. Fig. 10), or submedial denticles very short, triangular, and sublateral denticles reduced (type 4, Fig. 15). Forebody microsculpture type 3 (Fig. 3), but elytral punctation less granular than in Fig. 3c. Sutural elytral row of punctures weakly impressed anteriorly, occupying roughly anterior 0.7 of elytral sutural length; medial and lateral rows of punctures indistinct. Total body length 3.3–3.5 mm; forebody length 1.8–1.9 mm.

Male: Abdominal sternite VII with very short, triangular emargination in median third of posterior margin. Abdominal sternite VIII in roughly posterior 0.3 of length with widely triangular incision continued anteriorly into very narrow, slightly dextrally aligned end (Fig. 228).

Aedeagus (Figs 163–165) with thin apical lobe running longitudinally between ventral process and process of endophallic sclerite (Fig. 163). Ventral process long, exceeding apical end of endophallic sclerite considerably in length, in lateral view thin with longitudinally curved, somewhat incrassate median third followed by first shortly narrowed, then moderately widened apical third with subacute tip (Fig. 163); in ventral view, ventral process arising from aedeagus medially, from base strongly widened toward median portion with concave dextral and convex sinistral margin, afterwards strongly, evenly tapered toward thin, acute, longitudinal apical end (Fig. 164). Endophallic sclerite spiniform and considerably projecting from ostium, with base inserted in aedeagus sinistrally (Fig. 165); endophallic sclerite in lateral view uncinat and from wide median portion gradually tapered toward thin, acute, evenly ventroproximad curved apical tip (Fig. 163), in dorsal view relatively broad, somewhat directed dextrad, gradually, weakly widened and protruding over apical lobe dextrally, afterwards abruptly narrowed into thin, sinistral, sinistroproximad curved apical spine (Fig. 165). Endophallic foramen with extremely finely denticulate proximal margin, situated in about subapical midwidth of wide portion of endophallic sclerite (Fig. 165). Dorsal endophallic spine absent. Ostium ventrally obliquely projected distodextrad (Figs 163–165), dorsally strongly concave proximad (Fig. 165). Dorsal, midlongitudinal split of aedeagus type B (cf. Fig. 39). Aedeagus in dorsal view oval with subparallel lateral margins (Fig. 165). Length of aedeagus 0.43–0.44 mm.

Female: Gonocoxal plate stout, about 1.6 times as long as wide, with trapezoidal basal ridge, without subbasal ridge, from enlarged lateroposterior ends of basal ridge concavely narrowed toward deep posterior emargination laterally delimited by acute lateroposterior ends (Fig. 263).

Distribution: *Frischianus miscellus* was described from Penang, Malaysia, but the exact type locality was not published by Cameron (1932: 129, 130). It was later collected on Penang Island.

***Frischianus tridens* Frisch, sp. nov.**

(Figs 166–168, 229)

Type specimens: Holotype ♂, Malaysia, Selangor: Sungai Buloh, 27.VII.1972, leg. Jaccoud (MHNG).

Description: Habitus cf. Fig. 55. Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color medium brown with head and lateroposterior angles of elytra slightly darker brown; tip of abdomen, antennae, palps, and legs yellow brown. Labral denticulation type 4 (cf. Fig. 15), with submedial labral denticles strongly reduced to obtuse angle, not protruding over anterior labral margin, and not longer than obtuse sublateral labral denticles. Forebody surface microsculpture not assignable to types 1–4 (Figs 1–4); cephalic punctation as in Fig. 3a; pronotum polished with very dense, non-umbilicate punctation; elytral punctation slightly coarser and less dense than cephalic punctation. Sutural elytral row of punctures weakly impressed anteriorly, occupying about anterior 0.7 of elytral sutural length; medial and lateral rows of punctures indistinct. Total body length 3.3 mm; forebody length 1.9 mm.

Male: Abdominal sternite VII with extremely short, inconspicuous, median emargination of posterior margin. Abdominal sternite VIII in roughly posterior 0.3 of length with widely triangular incision continued anteriorly into very narrow, somewhat dextrally aligned end (Fig. 229).

Aedeagus (Figs 166–168) with large apical lobe somewhat displaced dorsodextrad (Fig. 166); apical lobe in lateral view broad with narrow, abruptly tapered apex, running distoventrad between ventral lobe and spiniform endophallic sclerite, shorter than ventral lobe, and only half as long as from ostium protruding portion of endophallic sclerite (Fig. 166); apical lobe in ventral view lobiform with broadly convex end, somewhat directed dextrad (Fig. 167). Ventral process long, arising from aedeagus subapically (Fig. 166) and subdextrally (Fig. 167), in lateral view thin and directed distoventrad with slightly distad curved apical end (Fig. 166), in ventral view close to base notably dilated sinistrally, somewhat aligned sinistrad, and over almost entire length gradually tapered toward strongly dextrad bent, acute apical end (Fig. 167). Endophallic sclerite spiniform, significantly projecting from ostium, and situated sinistrally in aedeagus (Fig. 168); basal portion of endophallic sclerite straight with parallel margins, in lateral view aligned longitudinally (Fig. 166), in dorsal view aligned somewhat dextrad (Fig. 168); endophallic sclerite in lateral view notably incrassate at about midlength, after that strongly curved ventrad toward gradually tapered, distad curved apical portion (Fig. 166); in dorsal view, apical portion of endophallic sclerite evenly curved sinistrad and gradually tapered toward acute apical end (Fig. 168). Endophallic foramen (Figs 166, 168) narrow, slightly protruding beyond dextral margin of endophallic sclerite (Fig. 168), with straight, slightly denticulate proximal margin. Dorsal endophallic spine absent. Ostium with dorsal margin convexly projected distosinistrad (Fig. 168). Dorsal, midlongitudinal split of phallobase type B (cf. Fig. 39). Aedeagus stout, in lateral view from broad distal end

(without distal lobes) strongly narrowed proximad (Fig. 166), in dorsal view short oval and with subparallel lateral margins (Fig. 168). Length of aedeagus 0.53 mm.

Female unknown.

Distribution: *Frischianus tridens* is known only from Sungai Buloh near Kuala Lumpur in the province of Selangor, Malaysia.

Etymology: The epithet *tridens* (noun, Latin, nominativ: trident) was selected to reflect the shape of the aedeagus (Fig. 166), which is reminiscent of a trident, a forklike instrument or weapon.

***Frischianus rubiginicollis* Frisch, sp. nov.**

(Figs 3, 55, 169–174, 230, 244, 264)

Type specimens: Malaysia, Pahang: Holotype ♂, Ringlet, 1250 m, 26.III.1993, leg. Calame & Löbl (MHNG). Paratypes (4 specimens): 2 ♀, same data as holotype (MHNG); 1 ♂, 1 ♀, Tanah Rata (Cameron Highlands), 19.–23.III.2008, leg. Hammond (MFNB, NHML).

Description: Habitus (Figs 3, 55). Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Specimens from Ringlet medium brown or reddish brown with head slightly darker brown; specimens from Tanah Rata darker colored with dark brown head, contrasted reddish brown pronotum, dark brown elytra except for reddish brown humera, and medium brown abdomen gradually darker posteriorly; tip of abdomen, antennae, palps, and legs yellow brown to light brown. Labral denticulation type 4 (cf. Fig. 15), variable; submedial denticles pointed, somewhat longer than triangular sublateral denticles, or submedial denticles reduced to obtuse angle not protruding over anterior labral margin and not longer than reduced sublateral denticles. Forebody surface microsculpture type 3 (Fig. 3). Sutural elytral row of punctures weakly impressed anteriorly, occupying about anterior 0.7 of elytral sutural length; medial and lateral rows of punctures indistinct. Total body length 3.3–3.6 mm; forebody length 1.8–2.0 mm.

Male: Abdominal sternite VII without modification. Abdominal sternite VIII in about posterior 0.3 of length with widely triangular incision continued anteriorly into very narrow, somewhat dextrally aligned end (Fig. 230).

Aedeagus (Figs 169–174) with apical lobe strongly displaced dorsodextrad, thus located just ventral to midwidth of dextral ostial margin (Figs 169, 172); apical lobe spiniform, pointing distally, shorter than midlength of ventral process, not reaching apex of endophallic sclerite (Figs 169, 172), and not projecting over ventral process laterally (Figs 170, 173). Ventral process arising from aedeagus ventroapically (Figs 169, 172) and subdextrally (Figs 170, 173) and aligned distoventrally (Figs 169, 172); ventral process in lateral view with very narrow base, somewhat incrassate at midlength, and slightly narrowed toward subacute apical end (Figs 169, 172), in ventral view aligned longitudinally and from slightly sinistrally widened base evenly tapered toward shortly dextracurved, acute apical end (Figs 170, 173). Endophallic sclerite spiniform, significantly projecting

from ostium, with base situated sinistrally in aedeagus (Figs 171, 174); endophallic sclerite in lateral view with broad, ventrally convexly dilated, longitudinally aligned basal portion (Figs 169, 172), at endophallic foramen abruptly narrowed, and continuing in distoventrad bent, thin distal portion with slight, dorsally convex curvature gradually tapered toward thin, acute apical end; in dorsal view, endophallic sclerite clearly directed distodextrad, with straight, parallel basal portion, expanded median portion with convex sinistral margin and strongly, triangularly dextrad protruding endophallic foramen with concave, denticulate proximal margin, and strongly tapered, somewhat sinistrad curved apical portion (Figs 171, 174). Dorsal endophallic spine absent. Ostium with dorsal margin convexly projected distosinistrad (Figs 171, 174). Dorsal, midlongitudinal split of aedeagus type C (cf. Figs 40, 41), indistinct in dorsal view. Aedeagus stout, with dextrad shifted median foramen (Figs 170, 173), in lateral view from broad distal end strongly narrowed posteriorly (Figs 169, 172), in dorsal view short oval with convex lateral margins (Figs 171, 174). Length of aedeagus 0.54 mm.

Female: Gonocoxal plate long, about 2.0 times as long as wide, with narrow, transverse basal ridge, without subbasal ridge, in posterior half gradually narrowed toward narrow, triangular posterior emargination laterally delimited by subacute ends (Fig. 264).

Distribution: *Frischianus rubiginicollis* was discovered near the towns of Ringlet and Tanah Rata in the Cameron Highlands, Malay Peninsula.

Etymology: The epithet *rubiginicollis* [adjective, Latin, composed of the adjective *rubiginosus* (reddish brown) and the noun *collum* (neck)] is derived from the reddish brown pronotum of the specimens from Tanah Rata, that is contrasted with darker head and elytra.

***Frischianus karneri* Frisch, sp. nov.**

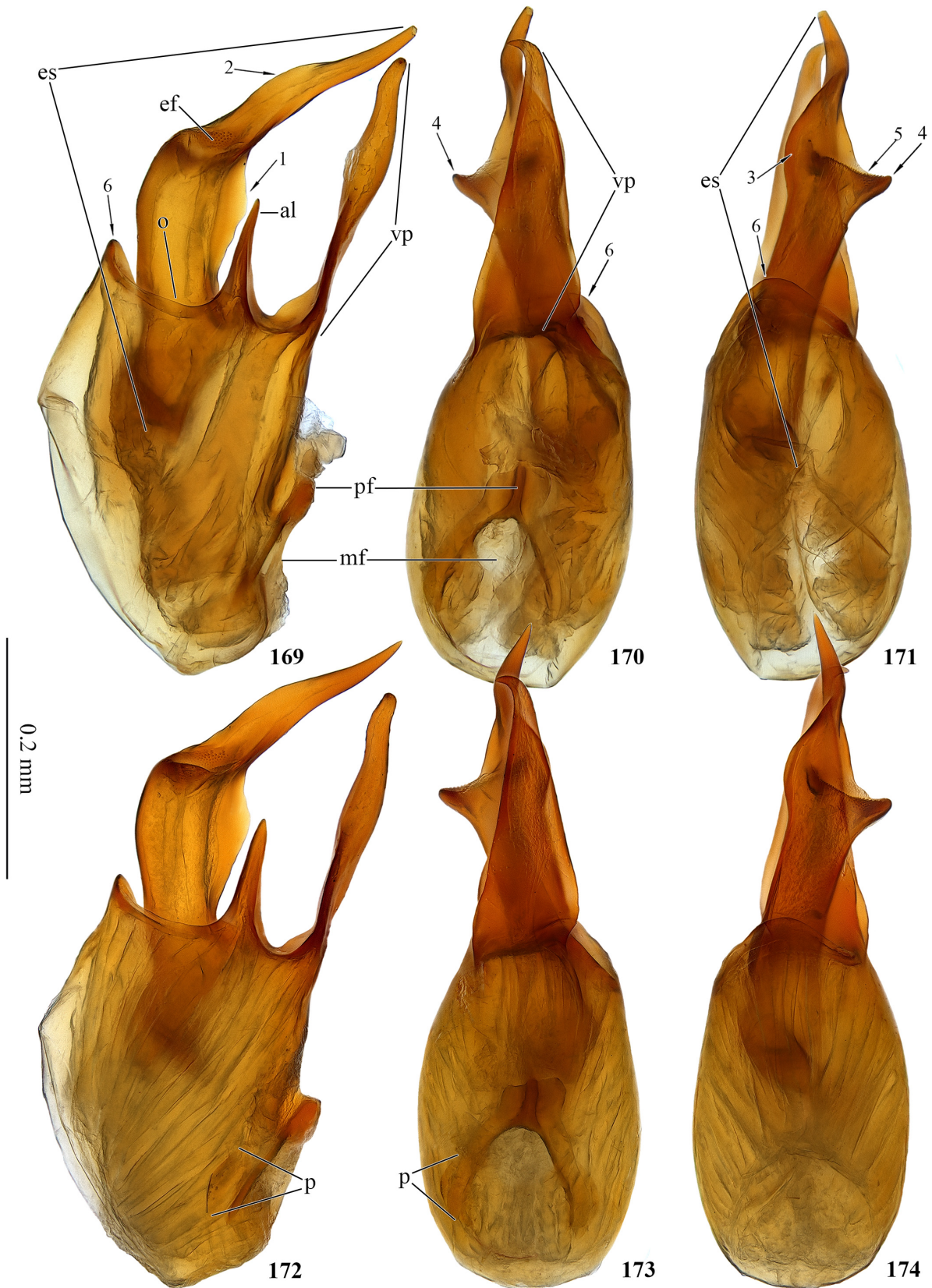
(Figs 56, 175–180, 265)

Type specimens: Malaysia: Holotype ♂, Selangor, The Gap, 900 m, 14.III.1993, leg. Calame & Löbl (MHNG). Paratypes (4 specimens): 1 ♂, 1 ♀, Selangor, Gombak Valley, 460 m, 13.VII.1968, leg. Taylor (MFNB, MHNG); 1 ♂, Pahang, 19 km NE Kuala Lumpur, 28.IV.1977, leg. Watrous (FMNH); 1 ♀, Pahang, 15 km N Kuala Lumpur, 29.IV.1977, leg. Watrous (FMNH).

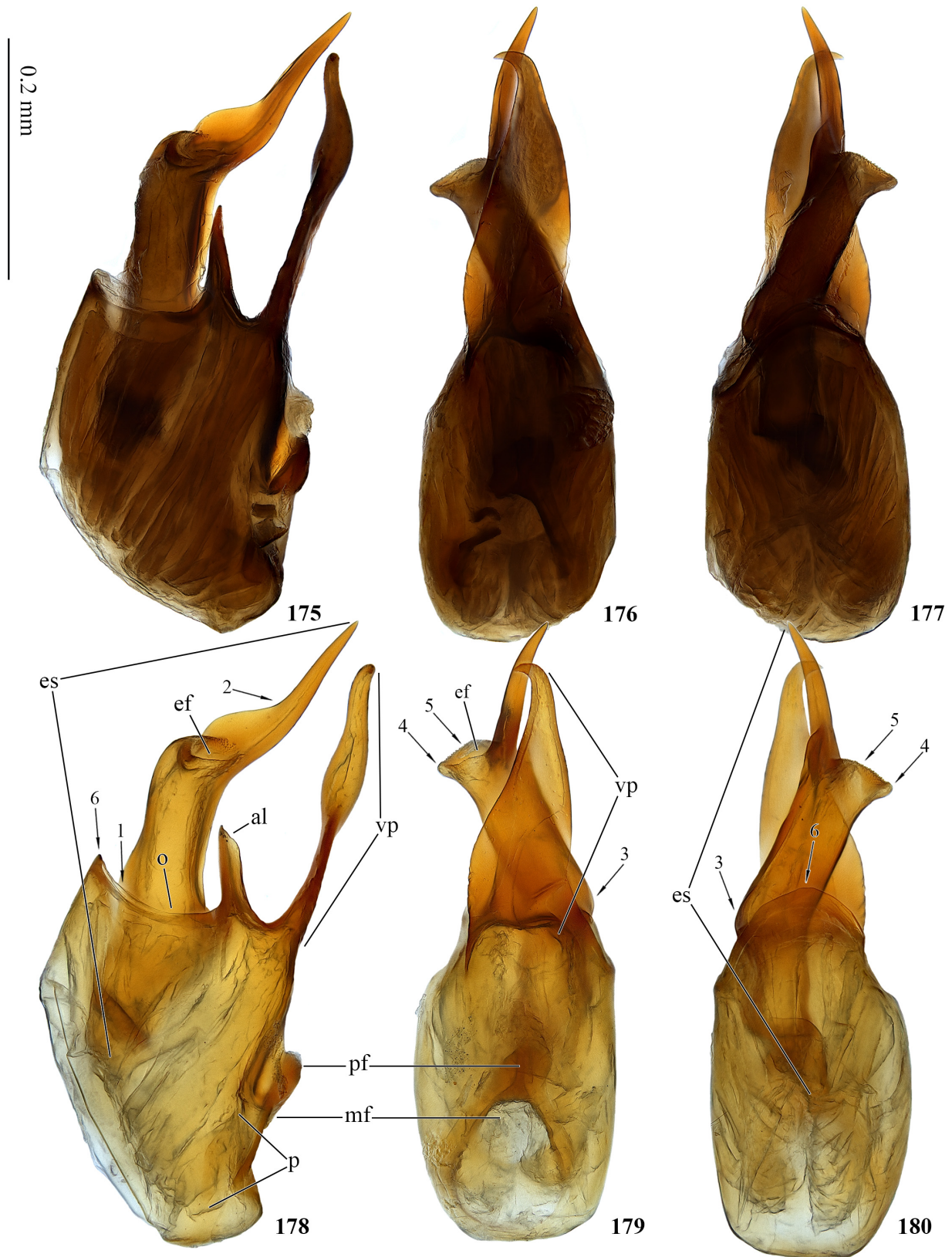
Description: Habitus (Fig. 56), exoskeletal characters (cf. Fig. 3), and shape of abdominal sternite VIII of ♂ (cf. Fig. 230) as in *Frischianus rubiginicollis*, but different as follows.

Body color unicolored light reddish brown (teneral?) to reddish medium brown with slightly darker brown head and dark brown lateroposterior angles of elytra. Total body length 3.4–3.6 mm; forebody length 1.8–1.9 mm.

Male: Aedeagus (Figs 175–180) with apical lobe aligned distad (Fig. 175) or feebly bent dorsad (Fig. 178). Endophallic sclerite in lateral view with moderate to slight, convex, dorsal dilatation in basal portion and thinner, dorsally concave apical portion (Figs 175, 178);



FIGURES 169–174. Aedeagus of *Frischianus rubiginicollis* in lateral (169, 172), ventral (170, 173), dorsal view (171, 174); holotype, Malaysia, Pahang, Ringlet (169–171); paratype, Malaysia, Pahang, Tanah Rata (172–174). Abbreviations: al—apical lobe; ef—endophallic foramen; es—endophallic sclerite; mf—median foramen; o—ostium; p—vestigial paramere; pf—postforamen; vp—ventral process. Arrows: 1—ventral dilatation of basal portion of endophallic sclerite (169); 2—dorsally convex apical portion of endophallic sclerite (169); 3—sinistrally dilated median portion of endophallic sclerite (171); 4—dextrally protruding endophallic foramen (170, 171); 5—concave, denticulate proximal margin of endophallic foramen (171); 6—distosinistrad projected dorsal margin of ostium (169–171).



FIGURES 175–180. Aedeagus of *Frischianus karneri* in lateral (175, 178), ventral (176, 179), dorsal view (177, 180); holotype, Malaysia, Selangor, Gombak Valley (175–177); paratype, Malaysia, Selangor, The Gap (178–180). Abbreviations: al—apical lobe; ef—endophallic foramen; es—endophallic sclerite; mf—median foramen; o—ostium; p—vestigial paramere; pf—postforamen; vp—ventral process. Arrows: 1—dorsal dilatation of basal portion of endophallic sclerite (178); 2—dorsally concave apical portion of endophallic sclerite (178); 3—curve between longitudinally aligned base and distodextrally pointing median portion of endophallic sclerite (179, 180); 4—dextrally protruding endophallic foramen (179, 180); 5—convex, denticulate proximal margin of endophallic foramen (179, 180); 6—distomedial projected dorsal margin of ostium (178, 180).

in dorsal view, endophallic sclerite with notably thinner, longitudinally aligned basal portion clearly set off from sinistrally dilated, dextrad pointing median portion followed by spiniform, moderately sinistrad curved apical portion (Figs 177, 180). Endophallic foramen apparently more strongly projecting dextrally due to narrow base of apical spine of endophallic sclerite, and with convex proximal margin (Figs 177, 180). Dorsal margin of ostium convexly projected distomedial (Fig. 180). Length of aedeagus 0.5–0.53 mm.

Female: Gonocoxal plate subrhomboid, about 2.0 times as long as wide, from widest diameter at midlength equally narrowed both anteriorly and posteriorly, with less narrow triangular posterior emargination laterally delimited by less pointed ends (Fig. 265).

Distribution: *Frischianus karneri* was collected in the mountainous border region of the neighboring Malay provinces of Pahang and Selangor northeast of Kuala Lumpur.

Etymology: Johannes Frisch dedicates this new species to his dear friend Michael Karner, Frankfurt am Main, specialist of *Psammoecus* (Silvanidae), in memory of joint entomological expeditions and in gratitude for inspiring discussions about entomology (e.g. clear taxa delimitations versus rice pudding) and life in general (epithet *karneri*: Latinized noun, derived from the surname Karner, genitive, singular).

2.3. The *Frischianus strigaticollis* species group

Diagnosis: Separated from *F. laticollis* species group (chapter 3.2.2.) as follows: Pronotal punctures tend to fuse longitudinally, forming somewhat undulate, longitudinal grooves continuous or joined in places and separated by alternating ridges formed by longitudinally confluent puncture interspaces (pronotal microsculpture type 4); alternating pronotal furrows and ridges clear (Fig. 4b) or only partially developed with visibility depending on lighting conditions (Figs 57, 58). Aedeagus symmetrical (Figs 187–198) or slightly asymmetrical (Figs 181–186); apical lobe absent, dorsal lobe present; parameres placed transversely, on their narrow side shortly contiguous with circoforamen and extended dorsad, therefore in ventral and dorsal view protruding laterally from contours of phallobase (e.g. Figs 181–183), possibly absent in one species; dorsal, midlongitudinal split of aedeagus narrow, but widely opened into ostium, with lateral margins curved toward each other or overlapping at midlength (type D, Fig. 42). Gonocoxal plate of ♀ (unknown in one of five species included) strongly enlarged anteriorly, hypertrophic (Figs 266–269). Bursal duct at transition to sperm pump strongly curved or undulate (Figs 245–247). Distribution in India (Kerala, Tamil Nadu).

Remarks: In Figs 181–198, the transverse parameres of the *F. strigaticollis* species group are little contrasted, often indistinct and thus in the print version of this publication probably hardly recognizable in the lateral view of the aedeagus, but certainly well visible in a high-resolution pdf. The laterad protruding parameres

are well discernible in the ventral and dorsal view of the aedeagus.

The *Frischianus strigaticollis* species group currently comprises five species new to science, which are described below. Due to their considerable differences in male and female sexual characters, it can be assumed that they represent different clades, but the introduction of subgroups is not yet appropriate given the presumably large number of undiscovered species throughout India.

Frischianus parentium Frisch, sp. nov.

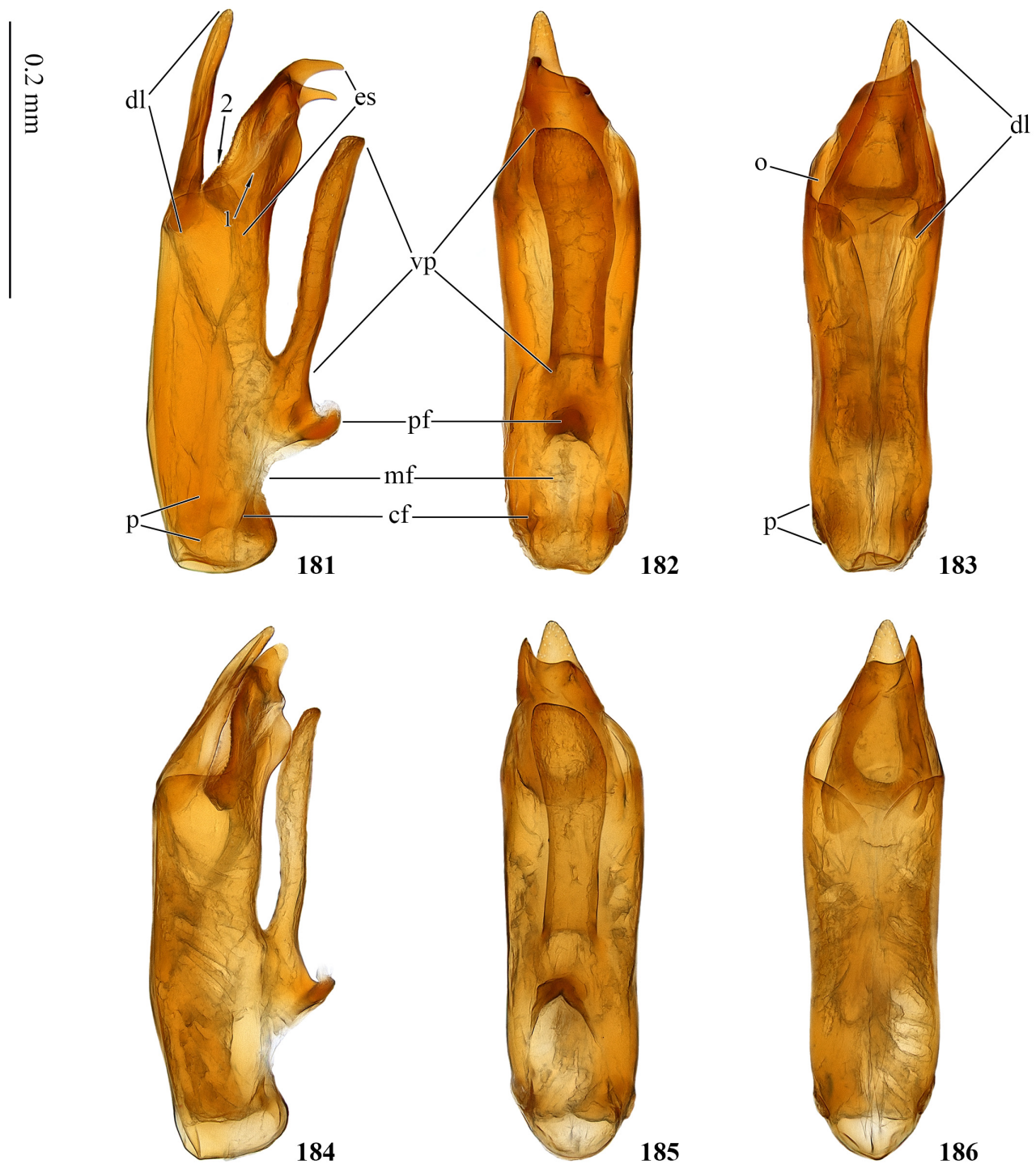
(Figs 57, 181–186, 231, 245, 266)

Type specimens: India, Tamil Nadu: Holotype ♂, 16 km E Kodaikanal (Palni Hills), 1400 m, 15.XI.1972, leg. Besuchet, Löbl & Mussard (MHNG). Paratypes (44 specimens): 17 ♂, 19 ♀, same data as holotype (MFNB, MHNG); 6 ♂, 2 ♀, 23 km E Kodaikanal (Palni Hills), 1200 m, 16.XI.1972, leg. Besuchet, Löbl & Mussard (MFNB, MHNG).

Description: Habitus (Fig. 57). Presumably pterodimorphous with small eyes and palisade fringe of abdominal tergite VII. Type specimens micropterous with short, narrow elytra; elytral width equal to pronotal width; elytral sutural length about 0.2 times shorter than pronotum; elytra with shallow, transverse, subbasal elytral depression; metathoracic wings strongly reduced in length, usually 1.1–1.2 times as long as elytral sutural length; macropterous specimens expected to appear at least temporarily due to presence of palisade fringe of abdominal tergite VII in micropterous specimens. Body color unicolored reddish light brown to medium brown, elytra rarely darker brown lateroposteriorly; tip of abdomen, antennae, palps, and legs light brown. Labral denticulation type 1 or 2 (cf. Figs 10–12). Forebody surface microsculpture not assignable to types 1–4; head little shiny with fine, compacted, setose punctation; pronotal punctation similar type 3 (Fig. 3b), in places puncture interstices confluent to very narrow, somewhat undulate, indistinct, longitudinal ridges; elytra shiny with punctation slightly coarser and less dense than cephalic punctation, vaguely granular. Suturel elytral row of punctures shallow, usually not exceeding anterior half of elytral sutural length; medial and lateral elytral row of punctures reduced to few, indistinct punctures obscured by elytral sculpturing. Total body length 2.7–3.0 mm; forebody length 1.5–1.6 mm.

Male: Abdominal sternite VII without modification. Abdominal sternite VIII with narrow, medioposterior incision with straight lateral margins, occupying about 0.2 of sternite length (Fig. 231).

Aedeagus (Figs 181–186) asymmetrical with apical portion slightly aligned dextrad (Figs 182, 183). Dorsal lobe movably attached to aedeagus, somewhat longer than endophallic sclerite, in lateral view straight and thin (Figs 181, 184), in dorsal view triangular and somewhat aligned dextrad (Figs 183, 186). Ventral process close to ventrally projected postforamen, in lateral view slender, straight, and pointing distad (Figs 181, 184), in ventral view about as wide as third of aedeagal width and gradually widened



FIGURES 181–186. Aedeagus of *Frischianus parentium* in lateral (181, 184), ventral (182, 185), dorsal view (183, 186); holotype, India, Tamil Nadu, E Kodaikanal (Palni Hills) (181–183); paratype, same locality as holotype (184–186). Abbreviations: cf—circoforamen; dl—dorsal lobe; es—endophallic sclerite; mf—median foramen; o—ostium; p—vestigial parameres; pf—postforamen; vp—ventral process. Arrows: 1—lateral margin of ostium (181); 2—dorsoproximal setulae of endophallic sclerite (181).

toward round, slightly dextrad curved end (Figs 182, 185). Endophallic sclerite elongate, strongly protruding beyond ostium, in ventral and dorsal view lobate, gradually narrowed distad, and extended into longer, dextral apical tooth and shorter, sinistral apical tooth (Figs 182, 183, 185, 186) both curved ventrad (Fig. 181); apical teeth of endophallic sclerite often reduced (Figs 184–185);

endophallic sclerite finely setulose dorsoproximally with setulae visible in lateral view (Figs 181, 184). Aedeagus in lateral view slender with ventral margin distal of ventral process almost straight with convex, subapical dilatation (Figs 181, 184), in dorsal view narrow with slightly concave lateral margins (Figs 183, 186). Length of aedeagus 0.23–0.4 mm.

Female: Gonocoxal plate from enlarged anterior portion moderately narrowed toward setose posterior fourth; posterior margin of gonocoxal plate weakly, concavely emarginate; enlarged anterior portion of gonocoxal plate membranous and hyaline with strongly sclerotized, thin, sublateral bands densely lined with medioposteriorly pointing spinules in few, close, irregular rows (Fig. 266).

Distribution: *Frischianus parentium* is native to the Palni Hills in Tamil Nadu in the south of India.

Etymology: With choosing the epithet *parentium* (noun, Latin, genitive: of the parents) Johannes Frisch dedicates this new species to his beloved parents Gisela (†) and Walther Frisch (†), Fulda, Germany, who supported his passion for entomology from the start.

***Frischianus strigaticollis* Frisch, sp. nov.**
(Figs 58, 187–189, 232, 267)

Type specimens: India: Holotype ♂, Kerala, Pambanar-Peermade, 950 m, 5.–9.XI.1972, leg. Besuchet, Löbl & Mussard (MHNG). Paratypes (67 specimens): Kerala: 7 ♂, 9 ♀, same data as holotype (MFNB, MHNG); 5 ♂, 1 ♀, 5 km E Kumily (Cardamom Hills), 1000 m, 6.XI.1972, leg. Besuchet, Löbl & Mussard (MFNB, MHNG); 1 ♀, Nelliampathi Hills, 900 m, 30.XI.1972, leg. Besuchet, Löbl & Mussard (MHNG); 2 ♂, Kumily, Periyar Wildlife Sanctuary, 2.IX.1989, leg. Riedel (SMNS); 3 ♂, 10 km SW Kumily: Vallakadavu (Cardamom Hills) (09°31'N, 77°7'E), 1000 m, 24.XII.1993, leg. Boukal & Kejval (NHMW). Tamil Nadu: 22 ♂, 9 ♀, 18 km N Valparai (Anaimalai Hills), 1250 m, 18.XI.1972, leg. Besuchet, Löbl & Mussard (MFNB, MHNG); 4 ♂, 4 ♀, Valparai (Anaimalai Hills), 1100 m, 20.XI.1972, leg. Besuchet, Löbl & Mussard (MFNB, MHNG).

Description: Habitus (Fig. 58). Pterodimorphous with small eyes and palisade fringe of abdominal tergite VII in both macropterous and micropterous specimens. Macropterous specimens: elytra somewhat wider than pronotal width; elytral sutural length subequal to pronotal length; metathoracic wings fully developed. Micropterous specimens: elytral width equal to pronotal width; elytral sutural length subequal to or up to 0.2 times shorter than pronotum; elytra with shallow, transverse, subbasal depression; metathoracic wings reduced in length to varying degrees, in examined specimens longer than elytral sutural length. Body color unicolored medium brown to blackish brown, or medium brown with elytra darker brown posteriorly in variable extent; tip of abdomen, antennae, palps, and legs light brown to medium brown. Labral denticulation variable, types 1 to 3; submedial denticles usually pointed, longer than pointed (cf. Fig. 10) to widely obtuse (Fig. 14) sublateral denticles. Forebody surface microsculpture type 4 (Fig. 4), but cephalic punctation finer than in Fig. 4a and pronotal furrows and ridges much finer, denser, and less distinct than in Fig. 4b. Sutural elytral row of punctures shallow, short, usually not exceeding anterior half of elytral sutural length; medial and lateral elytral row of punctures reduced

to few, indistinct punctures. Total body length 3.0–3.3 mm; forebody length 1.5–1.7 mm.

Male: Abdominal sternite VII without modification. Abdominal sternite VIII in about posterior 0.15 of length with narrow incision (Fig. 232).

Aedeagus (Figs 187–189) symmetrical. Dorsal lobe movably attached, in lateral view thin and straight (Fig. 187), in dorsal view triangular and gradually tapered toward somewhat dextrad curved, thin, subacute apical end (Fig. 189). Ventral process situated close to postforamen, in lateral view slender, slightly curved distad, with strong, dorsal subapical tooth and moderately ventrad curved apical end (Fig. 187), in ventral view about half as wide as aedeagus, parallel with wide, round apical end (Fig. 188). Endophallic sclerite triangular, protruding beyond ostium distoventrally (Fig. 187), in ventral view with transverse, rectangular apical end (Fig. 188). Aedeagus in lateral view with ventral margin distal of ventral process almost straight (Fig. 187), in dorsal view very narrow with slightly concave lateral margins (Fig. 189). Ostium of aedeagus with convex lateral margins (Fig. 187). Length of aedeagus 0.46–0.5 mm.

Female: Gonocoxal plate from enlarged anterior portion strongly narrowed toward subparallel, setose posterior fourth with concavely emarginate posterior margin; enlarged anterior portion of gonocoxal plate membranous and hyaline with strongly sclerotized, sublateral bands densely lined with medioposteriorly pointing spinules in few, loose, irregular rows (Fig. 267).

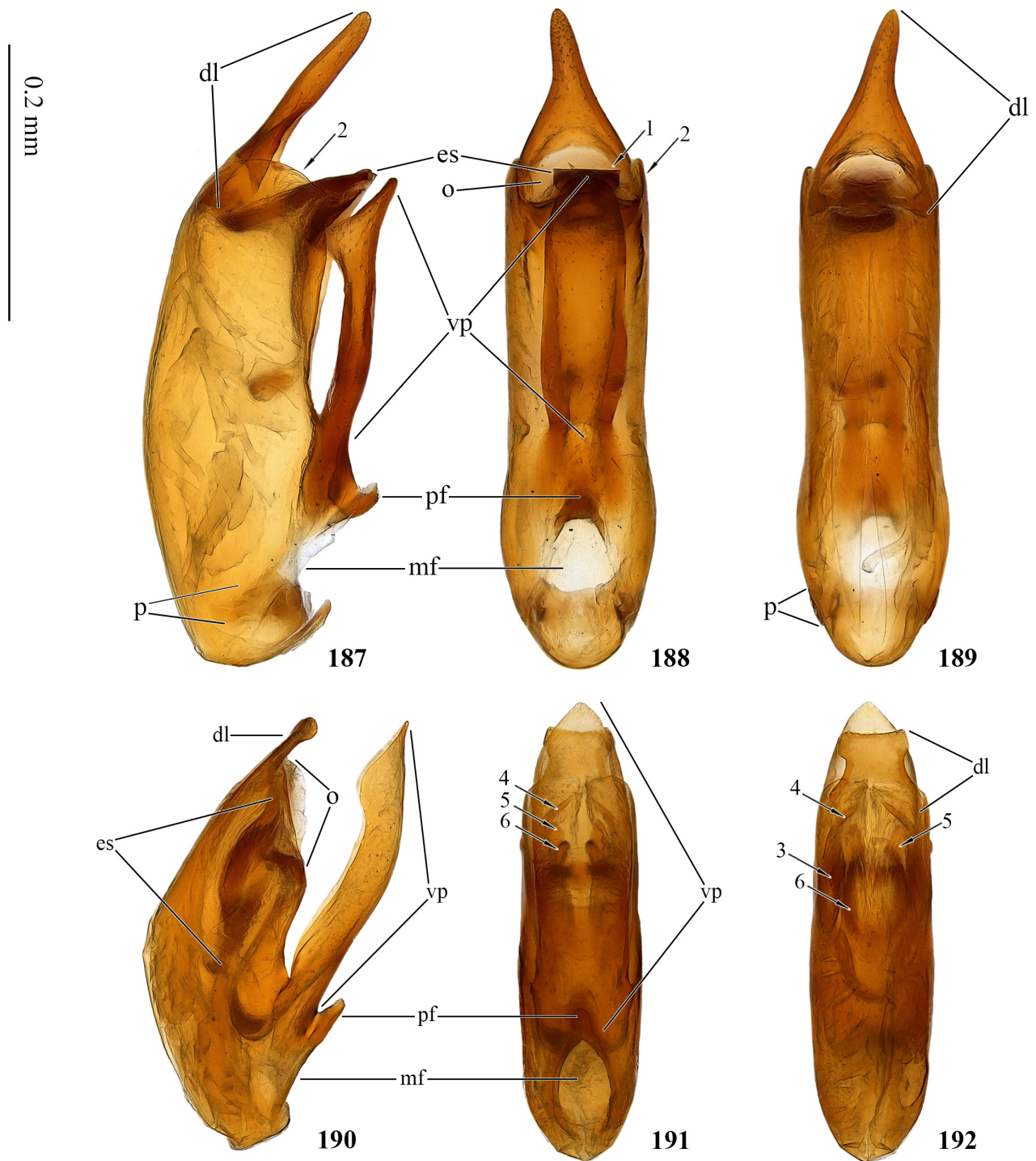
Distribution: *Frischianus strigaticollis* is distributed across the mountains of Southwest India and recorded from the Nelliampathi Hills in Tamil Nadu as far south as the Cardamom Hills, Kerala.

Etymology: The epithet *strigaticollis* [adjective, Latin, composed of the adjective *strigatus* (striped) and the noun *collum* (neck)] refers to the longitudinally lineate, strigate sculpture of the pronotal surface of this new species (Fig. 58).

***Frischianus keralensis* Frisch, sp. nov.**
(Figs 59, 190–192, 233, 234, 246, 268)

Type specimens: India, Kerala: Holotype ♂, Nelliampathi Hills, 900 m, 30.XI.1972, leg. Besuchet, Löbl & Mussard (MHNG). Paratypes (94 specimens): 11 ♂, 78 ♀, same data as holotype (MFNB, MHNG); 1 ♂, 2 ♀, 10 km SW Kumily: Vallakadavu (Cardamom Hills) (09°31'N, 77°7'E), 1000 m, 24.XII.1993, leg. Boukal & Kejval (NHMW); 1 ♂, 1 ♀, Periyar, 800 m, 13.I.1972, leg. Mussard (MHNG).

Description: Habitus (Fig. 59). Macroptalmous, macropterous with palisade fringe of abdominal tergite VII. Body color reddish medium brown with darker brown head and lateroposterior angles of elytra up to dark brown body with black head and blackish brown elytra; tip of abdomen, antennae, palps, and legs light brown to medium brown. Labral denticulation type 1 or 2 (cf. Figs 10–12). Forebody surface microsculpture type 4 (Fig. 4), but cephalic punctation finer than in Fig. 4a



FIGURES 187–192. Aedeagus in lateral (187, 190), ventral (188, 191), dorsal view (189, 192) of *Frischianus strigaticollis*, holotype, India, Kerala, SW Kumily, Vallakadavu (Cardamom Hills) (187–189); *F. keralensis*, holotype, India, Kerala, Nelliampathi Hills (190–192). Abbreviations: dl—dorsal lobe; es—endophallic sclerite; mf—median foramen; o—ostium; p—vestigial paramere; pf—postforamen; vp—ventral process. Arrows: 1—rectangular apical end of endophallic sclerite (188); 2—convex lateral margin of ostium (187, 188); 3—outer sclerite of endophallic sclerite (192); 4—distal spine of outer sclerite of endophallic sclerite (191, 192); 5—distal, inner sclerite of endophallic sclerite (191, 192); 6—proximal, inner sclerite of endophallic sclerite (192).

and pronotal furrows and ridges finer and denser than in Fig. 4b, indistinct. Sutural elytral row of punctures shallow, occupying about anterior half of sutural length with densely arranged punctures; medial and lateral row of punctures reduced to few punctures. Total body length 2.4–2.7 mm; forebody length 1.4–1.5 mm.

Male: Abdominal sternite VII with median strip of ventral surface flattened and somewhat widened toward shortly emarginate median third of posterior margin delimited by strongly sclerotized, lateroposterior angles (Fig. 233). Abdominal sternite VIII in about posterior 0.15 of length with wide, triangular emargination with

straight, strongly sclerotized lateral margins and obtuse-angled anterior end (Fig. 234).

Aedeagus (Figs 190–192) symmetrical. Dorsal lobe short, not protruding apex of ventral process distally, in lateral view thin with moderately dilated, round apical end (Fig. 190), in dorsal view about as wide as aedeagus, but in apical portion on both sides concavely narrowed toward broad, transversely rectangular apical end (Fig. 192). Ventral process very close to postforamen, directed distoventrad, and reaching apex of dorsal lobe; in lateral view, distal third of ventral process somewhat curved dorsad, dorsally convexly widened, and gradually tapered toward acute apical end (Fig. 190); ventral process in ventral view almost as wide as aedeagus, subparallel, and in apical third gradually tapered toward subacute apical end (Fig. 191). Endophallic sclerite in lateral view oblong with tapered, subacute distal and proximal ends (Fig. 190), made up of three lateral, paired, elongate sclerites (Fig. 192) extended into processes directed toward each other visible in ventral view (Fig. 191): outer paired sclerites both extended into thin spine aligned distomedially; distal, inner paired sclerites short, lobiform, and aligned longitudinally; proximal, inner paired sclerites both extended into stout, apically round process aligned distomedially. Aedeagus strongly convex dorsally and with ventral margin distal of ventral process almost obtuse-angled curved (Fig. 190), in dorsal view narrow with subparallel lateral margins (Fig. 192). Length of aedeagus 0.34–0.37 mm.

Female: Gonocoxal plate enlarged basally, but without huge, oval, hyaline, laterally spinulose anterior portion of other species of *F. strigatocollis* group; gonocoxal plate from wide, deeply emarginate proximal portion gradually tapered toward subparallel, setose posterior third with emarginate posterior margin; basal ridge delimiting deep, anterior emargination of gonocoxal plate, strongly sclerotized only at proximolateral angles and shortly laterad of middle of sclerite; anterior emargination of gonocoxal plate filled membranously and exhibits two lateral, medioposteriorly curved straps followed proximally by lateral, strongly sclerotized, shortly ribbed strips (Fig. 268).

Distribution: *Frischianus keralensis* is native to southwestern India and recorded from the Nelliampathi Hills in the north as far south as the Cardamom Hills.

Etymology: The epithet *keralensis* (adjective, Latin: from Kerala) refers to the distribution of this new species in the Indian federal state of Kerala.

***Frischianus lineolatus* Frisch, sp. nov.**
(Figs 193–195, 235)

Type specimen: Holotype ♂, India, Kerala, 50 km SO Munnar: Valara Waterfalls, 450–500 m, 25.XI.1972, leg. Besuchet, Löbl & Mussard (MHNG).

Description: Habitus cf. Fig. 60. Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color reddish brown with head slightly darker reddish brown and elytra dark brown in about posterior

two-thirds; tip of abdomen, antennae, palps, and legs light brown. Labral denticulation type 3 (cf. Figs 13, 14). Forebody surface microsculpture type 4 (Fig. 4), but cephalic punctation and alternating furrows and ridges of elytra finer than in Figs 4a, 4b. Sutural elytral row of punctures shallow, not exceeding anterior half of elytral sutural length; medial and lateral row of punctures reduced to few, indistinct punctures obscured by elytral punctation. Total body length 2.9 mm; forebody length 1.6 mm.

Male: Abdominal sternite VII without modification. Abdominal sternite VIII with medioposterior incision with convex lateral margins and narrow anterior end, occupying about 0.4 of sternite length (Fig. 235).

Aedeagus (Figs 193–195) symmetrical with testaceous dorsal lobe with wide, shallowly emarginate apex (Figs 194, 195) and ventrad curved lateral margins enclosing endophallic sclerite dorsally (Fig. 193). Ventral process situated distally of postforamen, in lateral view thin, slightly curved distad and with dorsal apical tooth (Fig. 193), in ventral view long triangular and gradually tapered toward narrow, round end (Fig. 194). Endophallic sclerite in lateral view long subrectangular with tapered basal end and deeply emarginate distal end extended in wider dorsoapical lobe with round end and narrower ventroapical lobe with dilated, slightly undulate, truncate end protruding beyond dorsal lobe ventrally (Fig. 193); in ventral view, endophallic sclerite nearly as broad as aedeagus, gradually, convexly narrowed toward shortly emarginate apical ends of dorsoapical and ventroapical lobes (Fig. 194); endophallic sclerite in dorsal view in wide, oval median portion with lateral rows of mediolateral pointing setulae (Fig. 195) slightly projecting beyond dorsal margin of endophallic sclerite in lateral view (Fig. 193). Ostium strongly, concavely retracted both ventrally and dorsally (Figs 194, 195), with lateral margins strongly projected at right angles distally (Figs 193, 195). Aedeagus in dorsal view narrow with subparallel lateral margins (Figs 195). Length of aedeagus 0.44 mm.

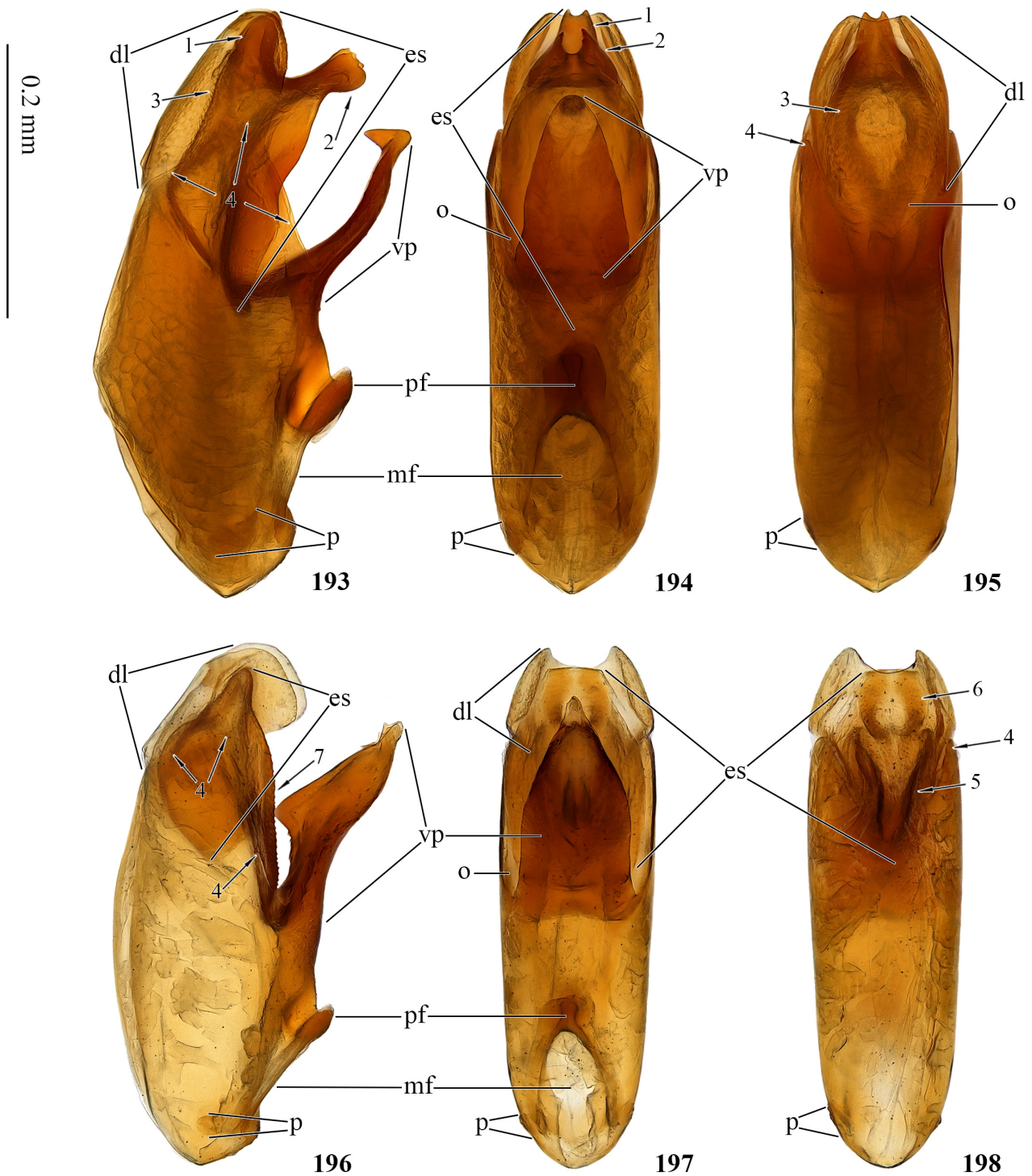
Female unknown.

Distribution: *Frischianus lineolatus* is known only from the type locality Valara Waterfalls in Kerala in the southwest of India.

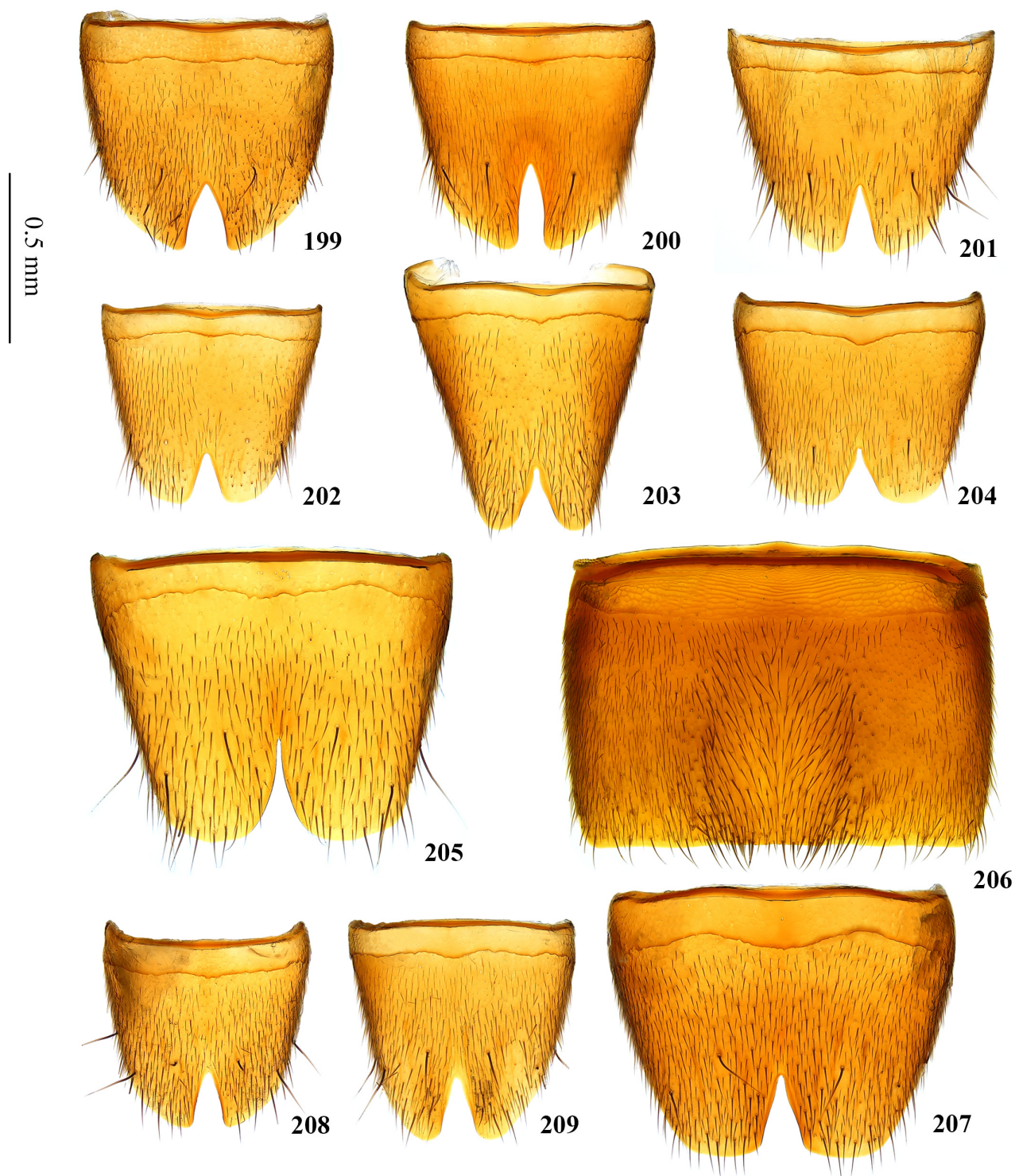
Etymology: The epithet *lineolatus* (adjective, Latin: weakly lineate) refers to the finely lineate pronotum of this new species.

***Frischianus lineatocollis* Frisch, sp. nov.**
(Figs 60, 196–198, 236, 247, 269)

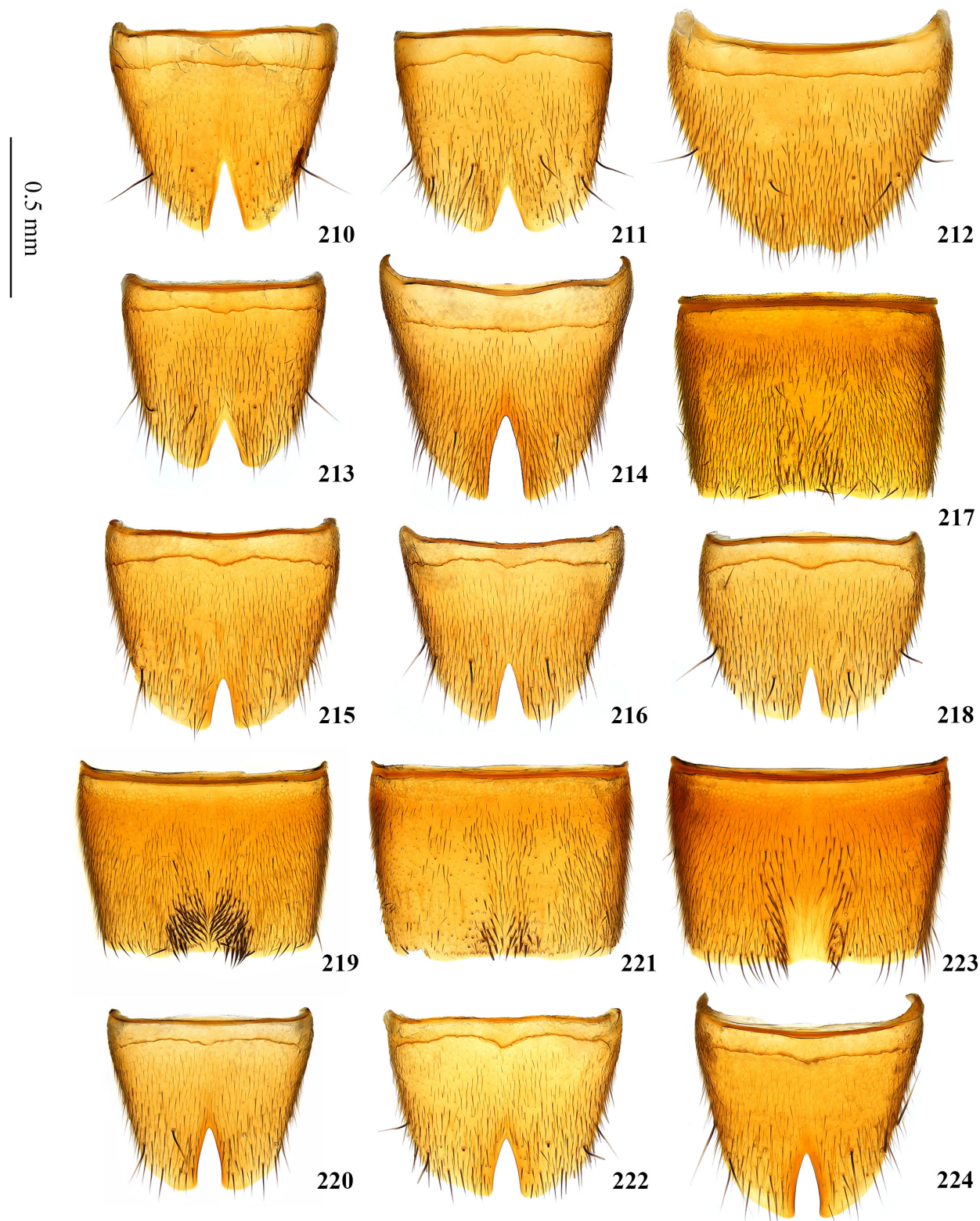
Type specimens: India, Kerala: Holotype ♂, 10 km SW Kumily: Vallakadavu (Cardamom Hills) (09°31'N, 77°7'E), 1000 m, 24.XII.1993, leg. Boukal & Kejval (NHMW). Paratypes (9 specimens): 1 ♂, 2 ♀, same data as holotype (MFNB, NHMW); 1 ♂, Nelliampathi Hills, 300 m, 30.XI.1972, leg. Besuchet, Löbl & Mussard (MFNB); 3 ♂, Kumily: Periyon Wildlife Sanctuary (Cardamom Hills), 900 m, 7.XI.1972, leg. Besuchet, Löbl & Mussard (MHNG); 1 ♂, Wayanad: Kottiyoor, 650 m, 7.IV.1969, leg. Soans & Brown (MHNG).



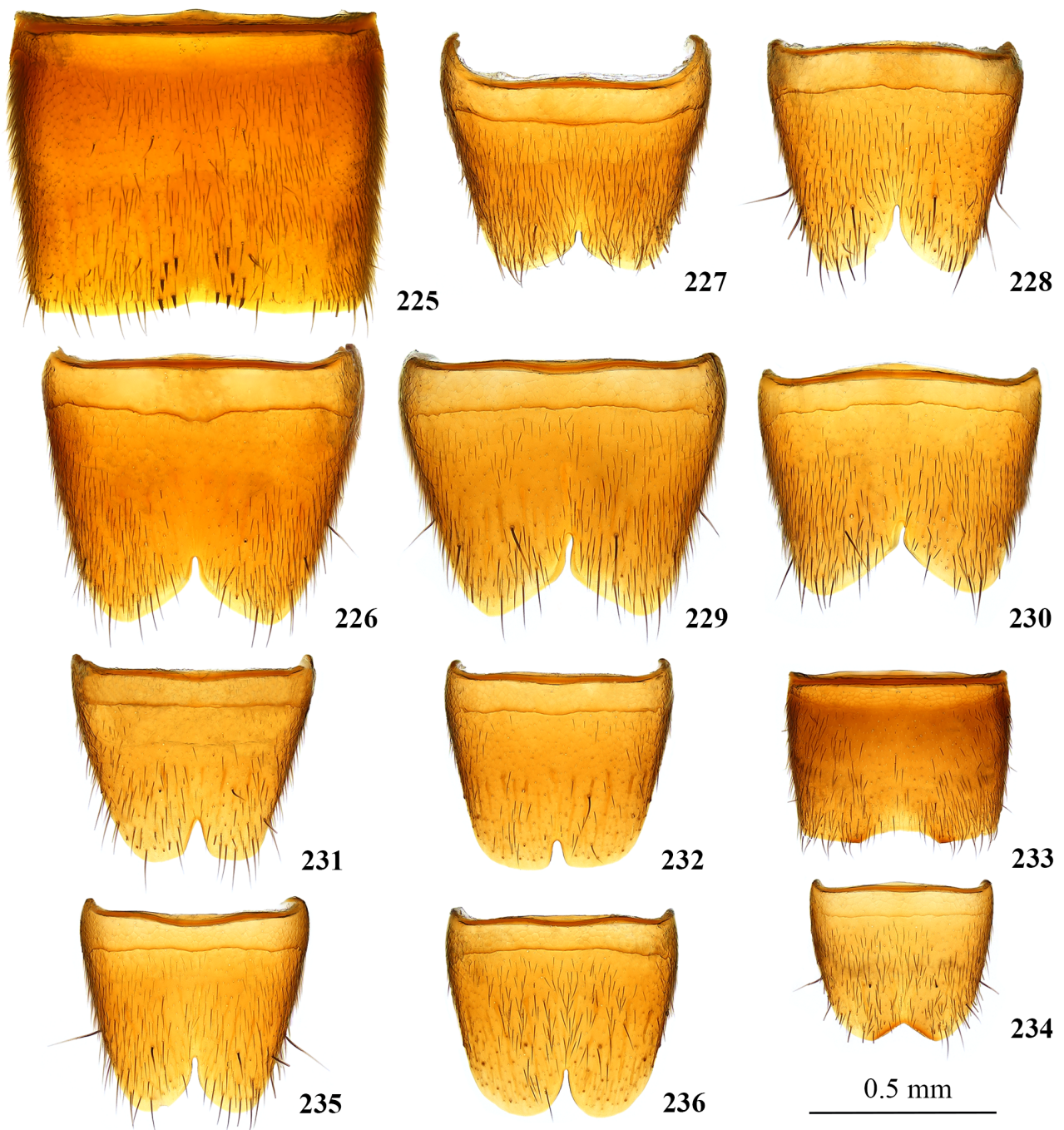
FIGURES 193–198. Aedeagus in lateral (193, 196), ventral (194, 197), dorsal view (195, 198) of *Frischianus lineolatus*, holotype, India, Kerala, SO Munnar, Valara Waterfalls (193–195); *F. lineatocollis*, holotype, India, Kerala, SW Kumily, Vallakadavu (Cardamom Hills) (196–198). Abbreviations: dl—dorsal lobe; es—endophallic sclerite; mf—median foramen; o—ostium; p—vestigial paramere; pf—postforamen; vp—ventral process. Arrows: 1—dorsoapical lobe of endophallic sclerite (193, 194); 2—ventroapical lobe of endophallic sclerite (193, 194); 3—dorsal, mediolateral pointing setulae of endophallic sclerite (193, 195); 4—lateral margin of ostium (193, 195, 196, 198); 5—V-shaped dorsal margin of proximal portion of endophallic sclerite (198); 6—subcircular distal portion of endophallic sclerite (198); 7—finely serrate ventral margin of aedeagus (198).



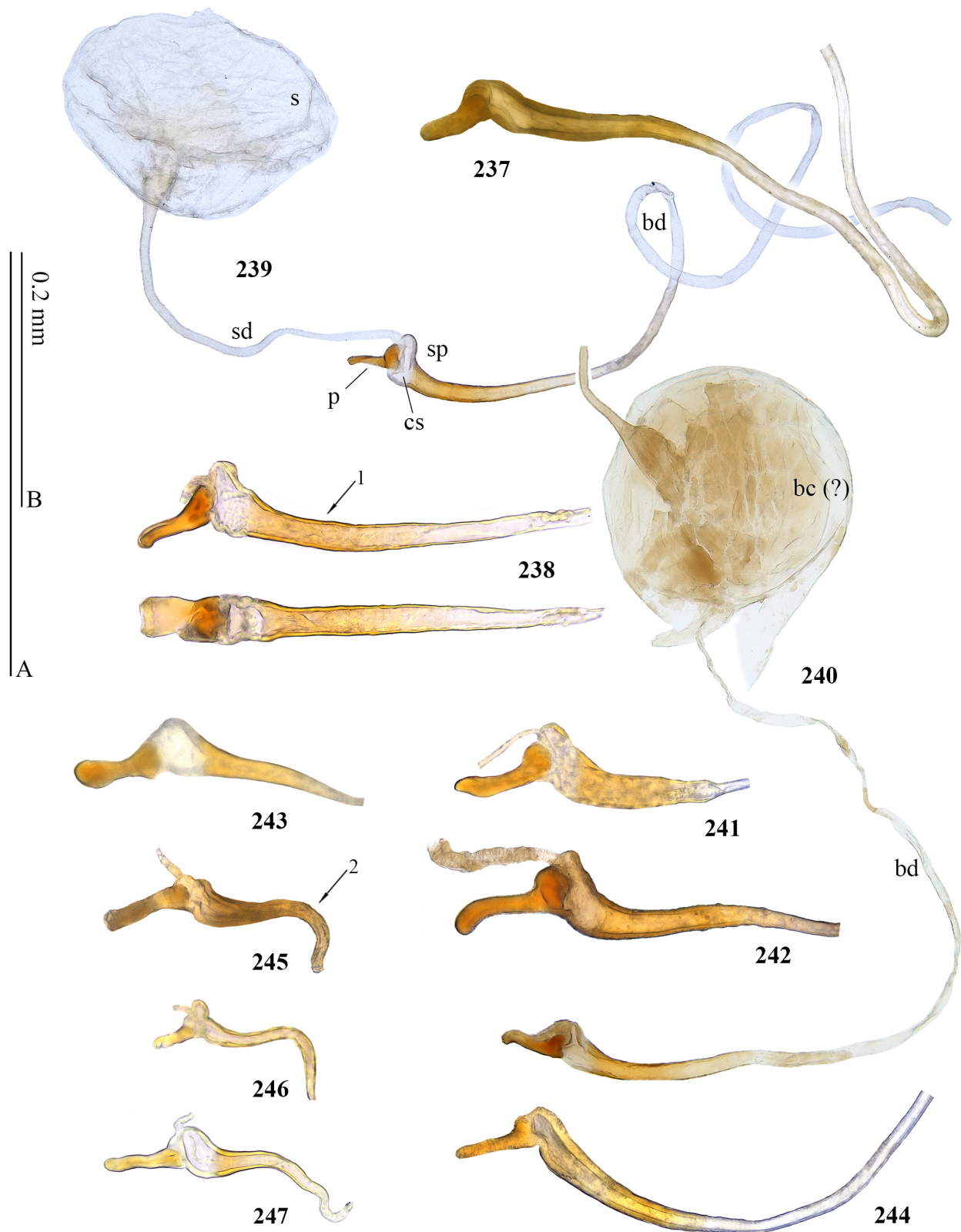
FIGURES 199–207. Abdominal sternite VII of ♂ (206) and abdominal sternite VIII of ♂ (199–205, 207–209) of *Frischianus coriaceus*, lectotype, Malaysia, Selangor, The Gap (199); *F. laticollis*, Indonesia, Jawa Barat, Sukabumi, Sirnarasa (200); *F. mariae*, holotype, Malaysia, Perak, Cascade Sungei Simei (Cameron Highlands) (201); *F. brenneri*, holotype, Malaysia, Sabah, Sandakan, Lokan (202); *F. hamatus*, holotype, Indonesia, Jambi, Kerinci, Mt Tujuh Lake (203); *F. loebli*, holotype, Indonesia, Sumatera Utara, Karo, Brastagi, Tongkoh (204); *F. subalpinus*, holotype, Indonesia, Jambi, Kerinci, Mt Kerinci (205); *F. pedator*, holotype, Indonesia, Sumatera Barat, Bukittinggi, Mt Singgalang (206, 207); *F. uhligi*, holotype, Malaysia, Sabah (208); *F. burckhardtii*, holotype, Malaysia, Sabah, Ranau, Poring Hot Spring (209).



FIGURES 208–224. Abdominal sternite VII (217, 129, 221, 223) and abdominal sternite VIII (210, 211, 213–216, 218, 220, 222, 224) of ♂ and abdominal sternite VIII of ♀ (212) of *Frischianus echinatospinatus*, holotype, Malaysia, Sabah, Sandakan, Sepilok (210); *F. puthzi*, holotype, Malaysia, Sabah, road Tambunan–Mt Kinabalu (Crocker Range) (211), paratype, same data as holotype (212); *F. serratispinatus*, holotype, Malaysia, Sabah, Lahad Datu, Ulu Segama (Danum Valley Forest Reserve) (213); *F. schuriani*, holotype, Malaysia, Pahang, Cameron Highlands (214); *F. latilobatus*, holotype, Malaysia, Sabah (215); *F. latilobatoides*, holotype, Malaysia, Pahang, NE Kuala Lumpur (216); *F. telnovi*, holotype, Malaysia, Sabah (217, 218); *F. setifer*, holotype, Indonesia, Banten, Lebak, Citorek Kidul (219, 220); *F. barclayi*, holotype, Malaysia, Penang, Penang Island (221, 222); *F. huijbregtsi*, holotype, Indonesia, Sulawesi Tengah, Banggai, Kayutanyo (Matanyo Forest) (223, 224).



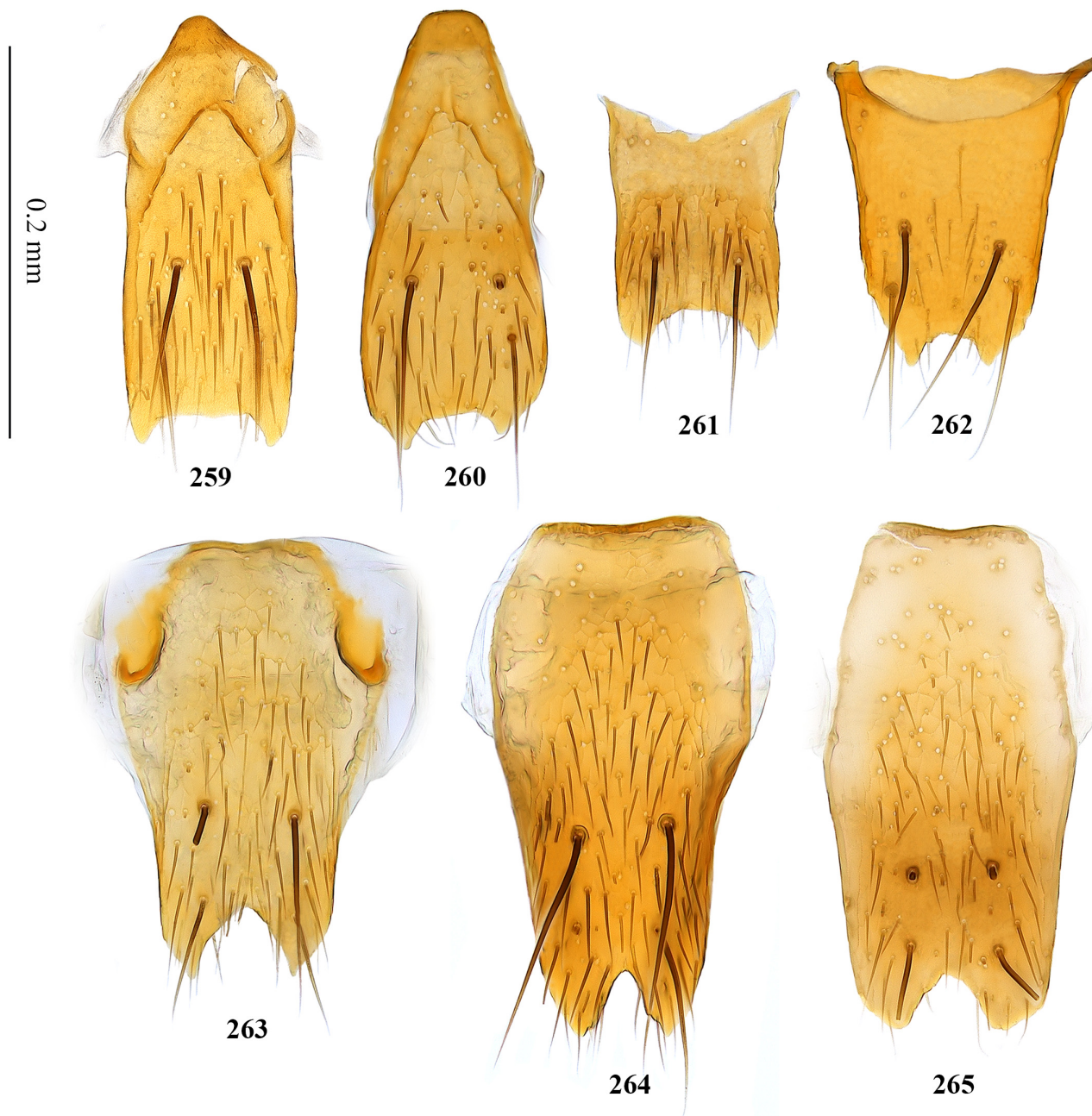
FIGURES 225–236. Abdominal sternite VII (225, 233) and abdominal sternite VIII (226–232, 234–236) of ♂ of *Frischianus crassiphallatus*, holotype, Thailand, Chiang Mai, Doi Chiang Dao (225, 226); *F. rufulus*, lectotype, Myanmar (227); *S. miscellus*, lectotype, Malaysia, Penang (228); *F. tridens*, holotype, Malaysia, Selangor, Sungai Buloh (229); *F. rubiginicollis*, holotype, Malaysia, Pahang, Ringlet (230); *F. parentium*, holotype, India, Tamil Nadu, E Kodaikanal (Palni Hills) (231); *F. strigaticollis*, holotype, India, Kerala, SW Kumily, Vallakadavu (Cardamom Hills) (232); *F. keralensis*, holotype, India, Kerala, Nelliampathi Hills (233, 234); *F. lineolatus*, holotype, India, Kerala, SO Munnar, Valara Waterfalls (235); *F. lineatocollis*, holotype, India, Kerala: SW Kumily, Vallakadavu (Cardamom Hills) (236).



FIGURES 237–247. Sperm pump of *Frischianus coriaceus*, Malaysia, Pahang, Bukit Fraser (237); *F. laticollis*, Indonesia, Jawa Barat, Sukabumi, Sirnarasa (238); *F. similis*, paratype, Indonesia, Banten, Lebak, Citorek Kidul (239); *F. communis*, paratype, Indonesia, Jawa Barat, Sukabumi, Sirnaresmi (240); *F. telnovi*, paratype, Malaysia, Sabah, Tawau (241); *F. huijbregtsi*, paratype, Indonesia, Sulawesi Tengah, Banggai, N Kayutanyo (Matanyo Forest) (242); *F. miscellus*, paralectotype, Malaysia, Penang (243); *F. rubiginicollis*, paratype, Malaysia, Pahang, Tanah Rata (Cameron Highlands) (244); *F. parentium*, paratype, India, Tamil Nadu, Palni Hills (245); *F. keralensis*, paratype, India, Kerala, Nelliampathi Hills (246); *F. lineatocollis*, paratype, India, Kerala, Cardamom Hills (247). Abbreviations: bd—bursal duct; bc—bursa copulatrix; cs—chamber segment of sperm pump; p—terminal process of sperm pump; s—spermatheca; sd—spermathecal duct; sp—sperm pump. Arrows: Bursal duct at transition to sperm pump 1—straight (238); 2—curved (245). Scale bar A: Figs 239, 240; scale bar B: Figs 237, 238, 241–247.



FIGURES 248–258. Gonocoxal plate IX of ♀ of *Frischianus coriaceus*, Malaysia, Pahang, Tanah Rata (248); *F. coriaceus*, Malaysia, Pahang, Bukit Fraser (249); *F. laticollis*, lectotype, Indonesia, Jawa Barat, Cibodas (250); *F. similis*, paratype, Banten, Lebak, Citorek Kidul (251); *F. communis*, paratype, Indonesia, Jawa Barat, Sukabumi, Simaresmi (252); *F. mariae*, paratype, Malaysia, Perak, Cascade Sungei Simei (Cameron Highlands) (253); *F. hamatus*, paratype, Indonesia, Jambi, Kerinci, Mt Tujuh Lake (254); *F. loebli*, paratype, Indonesia, Sumatera Utara, Karo, Brastagi, Tongkoh (255); *F. subalpinus*, paratype, Indonesia, Jambi, Kerinci, Mt Kerinci (256); *F. curtipennis*, holotype, Indonesia, Jambi, Kerinci, Mt Kerinci (257); *F. pedator*, Indonesia, Sumatera Barat, Bukittinggi, Mt Singgalang (258).



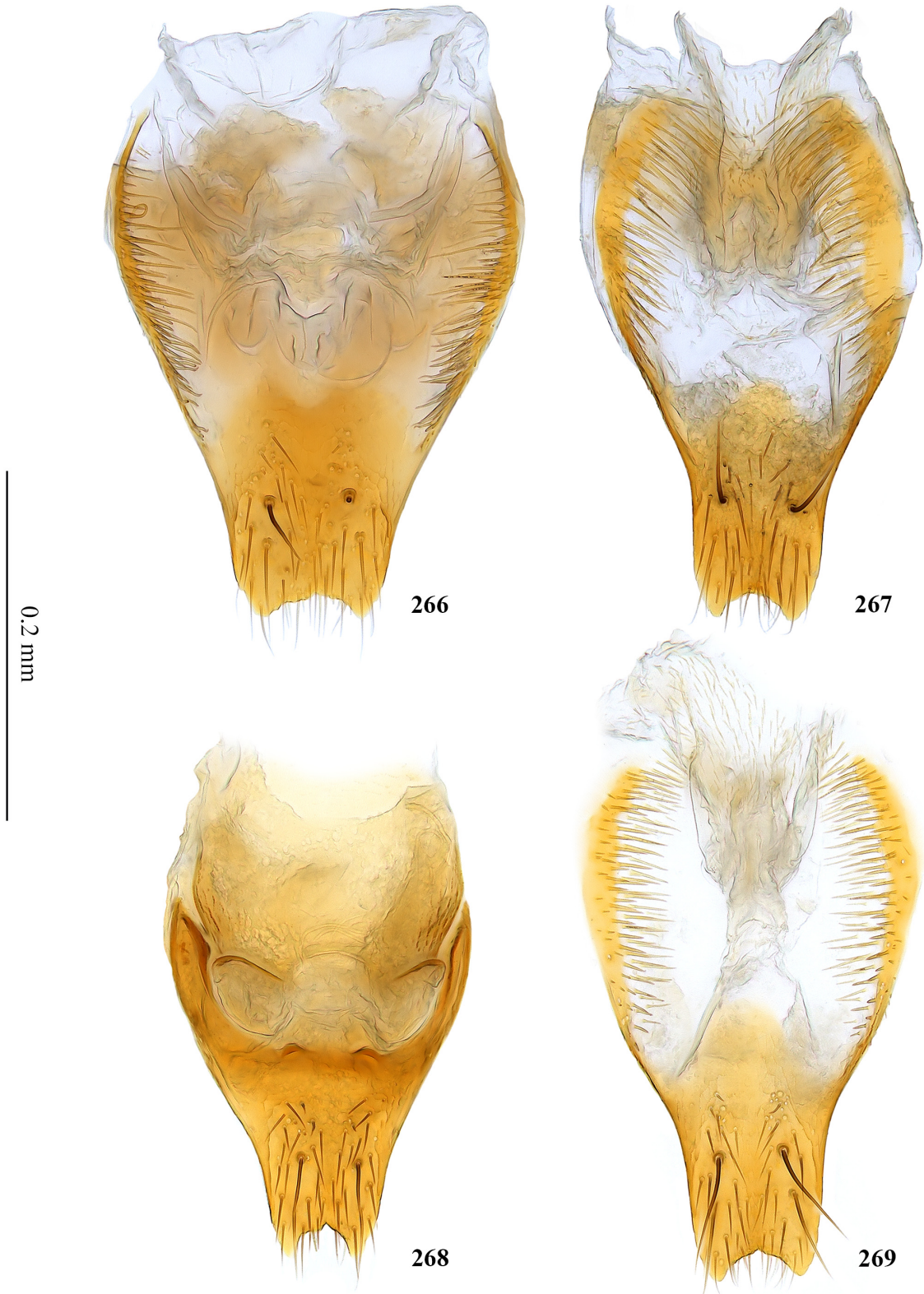
FIGURES 259–265. Gonocoxal plate IX of ♀ of *Frischianus burckhardti*, paratype, Malaysia, Sabah, Ranau, Poring Hot Spring (259); *F. puthzi*, paratype, Malaysia, Sabah, road Tambunan–Mt Kinabalu (Crocker Range) (260); *F. telnovi*, paratype, Malaysia, Sabah, Tawau (261); *F. huijbregtsi*, paratype, Indonesia, Sulawesi Tengah, Banggai, N Kayutanyo (Matanyo Forest) (262); *F. miscellus*, paralectotype, Malaysia, Penang (263); *F. rubiginicollis*, paratype, Malaysia, Pahang, Ringlet (264); *F. karneri*, paratype, Malaysia, Selangor, Gombak Valley (265).

Description: Habitus (Figs 4, 60). Macrophthalmous, macropterous with palisade fringe of abdominal tergite VII. Body color light reddish brown to reddish medium brown; head slightly darker reddish brown, elytra dark brown in about posterior two-thirds; tip of abdomen, antennae, palps, and legs light brown. Labral denticulation type 3 (cf. Figs 13, 14), sublateral labral denticles obtusely angled or convex. Forebody surface microsculpture type 4 (Fig. 4). Sutural elytral row of punctures impressed with punctures densely arranged, usually not exceeding anterior half of elytral sutural length; medial and lateral

row of punctures reduced to few punctures. Total body length 2.9–3.2 mm; forebody length 1.6–1.8 mm.

Male: Abdominal sternite VII with very short, wide, posterior emargination feebly convex in median fourth. Abdominal sternite VIII with medioposterior incision with convex lateral margins and narrow anterior end, occupying about posterior 0.3 of length (Fig. 236).

Aedeagus (Figs 196–198) symmetrical. Dorsal lobe testaceous and subhyaline with wide, emarginate apex, ventrally strongly expanded with convex lateral margins enclosing endophallic sclerite dorsally (Figs 196–198).



FIGURES 266–269. Gonocoxal plate IX of ♀ of *Frischianus parentium*, India, Kerala, Palni Hills (266); *F. strigaticollis*, paratype, India, Kerala, SW Kumily, Vallakadavu (Cardamom Hills) (267); *F. keralensis*, paratype, India, Kerala, Nelliampathi Hills (268); *F. lineatocollis*, paratype, India, Kerala, SW Kumily, Vallakadavu (Cardamom Hills) (269).

Ventral process situated distally of postforamen, but connected with postforamen by thick sclerotization, in lateral view stocky, somewhat curved ventrad, bearing large, right-angled dorsal tooth, and gradually tapered toward subacute apical end armed with minute, dorsoapical denticle (Fig. 196); in ventral view, ventral process long subtriangular with convex lateral margins, gradually tapered toward acute apical end (Fig. 197). Endophallic sclerite stout, convex dorsally, and triangularly extended distally (Fig. 196), in ventral view nearly as wide as aedeagus, and in distal third gradually narrowed toward wide, truncate end (Fig. 197), in dorsal view proximally with V-shaped dorsal margin and distally subcircular (Fig. 198). Ostium strongly, concavely retracted both ventrally and dorsally (Figs 197, 198) with rounded lateral margins strongly projected distally (Figs 196, 198). Aedeagus with ventral margin distal of ventral process straight and finely serrate (Fig. 196), in dorsal view narrow with subparallel lateral margins (Figs 198). Length of aedeagus 0.37–0.4 mm.

Female: Gonocoxal plate with enlarged, hyaline, anterior portion with strongly sclerotized, thin, sublateral bands densely lined with medially directed spinules in few, loose, irregular rows; anterior portion of gonocoxal plate strongly narrowed toward subparallel, setose, posterior fourth with concave posterior margin (Fig. 269).

Distribution: *Frischianus lineatocollis* is widely distributed across Southwest India, where it is recorded from Kottiyoor southward to the Cardamom Hills. A female from Goa (NHMW), which is not included into the type series, is probably conspecific.

Etymology: The epithet *lineatocollis* [adjective, Latin, composed of the adjective *lineatus* (lineate) and the noun *collum* (neck)] describes the lineate, strigate, longitudinal sculpture of the pronotum of this new species (Fig. 4b).

Discussion

A phylogenetic analysis of *Frischianus* is beyond the intended scope of this taxonomic contribution. Nevertheless, an attempt is made to discuss both the relationships of the new genus within the Scopaeina, based on the recent generic revision of the subtribe by Herman (2023), and its infrageneric classification. Newly discovered species and a future genomic approach might change the picture.

1 Relationships of *Frischianus* within the Scopaeina

Three characters that distinguish *Frischianus* from the other genera of the Scopaeina we consider apomorphic. These are the well-developed, knife-edged epigenal ridge (Figs 5–9), the polished groove extending from the trichobothrium to the antennal hump dorsal of and contiguous with the epigenal ridge (Figs 5–9), and the unipartite gonocoxal plate of the females (Figs 248–269).

The contrasting character states are largely identical in the remaining scopaeine genera and thus probably ancestral. These are rounded genae [Herman 2023: Figs 266, 267 (*Micranops*), Fig. 297 (*Orus*)] and the medially divided gonocoxal plate of the females [Frisch *et al.* 2002: Fig. 30 (*Scopaeus*); Frisch & Oromí 2006: Figs 17, 20 (*Micranops*); Herman 2023: Figs 78–80 (*Scopaeus*), Fig. 264 (*Micranops*), Fig. 290 (*Orus*), Fig. 332 (*Trisunius*)]. A similar genal ridge is also found in *Hyperscopaeus*, but in the great minority of species only. The genal ridge of *Hyperscopaeus* is steeper, S-shaped curved ventrad, without the dorsally contiguous groove, and it rarely reaches the eye. When it does reach the eye, it meets it further anteriorly than in *Frischianus* and is therefore—in the few species examined for this character—not connected to the trichobothrium.

The most important apomorphic character of *Frischianus* is probably the unipartite gonocoxal plate of the females, while paired, separate gonocoxites represent the plesiomorphic character state both in Coleoptera in general (Beutel 2003: 429; Lawrence *et al.* 2011: 49, 60) and the Staphylinidae (Naomi 1985: 5; Thayer 2016: 416). Consequently, secondary fusion of the gonocoxites, which is known in staphylinids (Thayer 2016: 416), can be interpreted as an apomorphic feature of the respective taxa. Even though the gonocoxites are absent in some paederine genera [(e.g. *Pinophilus*, *Paederus*, *Lithocharis* (Naomi 1989: 732)], also in the Paederinae and the other genera of Scopaeina separate gonocoxites are the common and ancestral character state.

However, *Frischianus* also exhibits features that are difficult to evaluate phylogenetically. The genus differs from the remaining genera of the Scopaeina according to an on average wider, subhexagonal pronotum, which is only 1.01–1.13 times longer than wide with an average value of 1.07 (Figs 1–4, 43–60). In his earlier works, Frisch published the length/width ratio of the pronotum of 128 species of various species groups of *Scopaeus*. As a result, the pronotal length/width ratio of this representative selection of *Scopaeus* species ranges from 1.04 to 1.35 with an average value of 1.2. Fagel (1973: 50–125, 52–64) described the pronotal length/width ratio of 61 Afrotropical species of *Hyperscopaeus* as ranging from 1.09–1.4 ($\bar{\text{O}}$ 1.24). The pronotal length/width ratio of the Australian *H. spinosophallatus* (Frisch 2012) measures 1.19 (Frisch 2012: 298–300). The few *Micranops* species for which measurements are available exhibit pronotal length/width ratios from 1.16 in *M. pilicornis* (Baudi, 1869) (Frisch 1997: 97) up to even 1.53 in the troglobitic *M. spelaeus* Frisch & Oromí (Frisch & Oromí: 2006: 34). From the absolute measurements published in Herman (1965a, 1965b) it can be deduced that the pronotum of *Orus* is 1.02–1.29 ($\bar{\text{O}}$ 1.19) times as long as wide. Finally, according to Assing (2012–2014), the pronotum of *Trisunius* is 1.05–1.14 ($\bar{\text{O}}$ 1.08) times as long as wide—considerably shorter than in *Hyperscopaeus*, *Micranops*, *Orus*, and *Scopaeus*, but close to the range of the pronotal length/width ratios in *Frischianus*. Even though the pronotum of *Frischianus* is wider on average than that of *Hyperscopaeus*, *Orus*, and *Scopaeus*, the length/

width ratios of the pronotum of these genera overlap. Nevertheless, the members of *Frischianus* (e.g. Figs 39, 40) exhibit noticeably pronounced anterior angles of the pronotum, which are rather unusual in the Scopaeina and reminiscent of the Medonina Casey, 1905. It should be remembered that *F. coriaceus*, *F. miscellus*, and *F. rufulus* were originally described in medonine genera.

Three rows of aetose punctures on the elytra, that extend from near the anterior elytral margin to about one to two thirds of the elytral length, are absent in the remaining genera of the Scopaeina and thus a probable apomorphy of the genus. In *Scopaeus*, a sutural impression laterad of the scutellum is frequent but does not exhibit a clear row of punctures that reaches as far posteriorly as in *Frischianus*. The medial and lateral rows of punctures, which are situated in more or less indistinct, shallow, longitudinal striae, are certainly present in all species of *Frischianus*, but sometimes poorly developed, made up of a few, widely spaced punctures only, clearly visible with suitable lighting only, and often hardly perceptible if the elytral sculpturing is coarse. For example, the median and lateral rows of punctures are no longer recognizable in the coarse elytral sculpturing of the brachypterous *F. curtipennis*, *F. pedator*, and *F. subalpinus*.

All species of *Frischianus* exhibit an outer, apical, metatibial comb (Figs 30–33). In *Scopaeus*, this character is absent. Examples of *Micranops* and *Orus*, which we examined for the outer metatibial comb, lack it as well. In ten unidentified species of *Hyperscopaeus* representing different phylogenetic lineages only one from Thailand has the outer metatibial comb (Fig. 35). Only two unidentified species of *Trisunius* from India and Borneo were examined for this character. Since the outer metatibial comb was found in both of them, it is expected to be widespread in *Trisunius* or even diagnostic for this genus. In the examined species of *Trisunius*, the setae of the comb are, however, shorter than in *Frischianus* and *Hyperscopaeus*, almost triangular (Fig. 34). Thus, the outer metatibial comb is not unique to *Frischianus*, but is nevertheless a distinguishing feature from *Micranops*, *Orus*, and *Scopaeus*.

The aedeagus of *Frischianus* (Figs 61–198) mainly exhibits ancestral (plesiomorphic) characters on the generic level. The dorsal, midlongitudinal, membranous split (Figs 36–42) is also present in the remaining scopaeine genera (*Hyperscopaeus*, *Micranops*, *Orus*, *Trisunius*) except for *Scopaeus* (cf. Herman 2023: 27) and *Orus*, subgenus *Leucorus* (Herman 2023: 137). The aedeagus of *Frischianus* agrees with that of *Micranops*, *Orus*, and *Trisunius* according to the “normal-sized” median lobe with the median foramen situated right at or close to the proximal end [e.g. Assing 2011: Figs 8, 15, 25 (*Trisunius*); Frisch & Oromí 2006: Figs 8, 9 (*Micranops*); Herman 2023: Figs 324, 325 (*Orus*)], while in *Scopaeus* (e.g. Frisch *et al.* 2002: Figs 10–20) and *Hyperscopaeus* (e.g. Frisch 2012: Figs 1, 2) the proximal portion of the median lobe, the phallobase in Frisch’s works (e.g. Frisch *et al.* 2002: 34), is usually more or less lens-shaped (*Hyperscopaeus*) or bubble-like (*Scopaeus*) enlarged proximad with the median foramen consequently in a more distal position. The smaller median lobe of *Frischianus*,

Micranops, *Orus*, and *Trisunius* probably represents the ancestral character state, since it is found both within the Paederinae and their sister group Staphylininae [Thayer 2016: 422 (cladogram), 429]. Paederine genera across many subtribes, e.g. the *Astenina* Hatch, 1957, *Lathrobiina* Laporte, 1835, *Medonina*, and *Paederina* Fleming, 1821, exhibit the small median lobe with the median foramen close to the proximal end. These genera also have in common the absence of the sclerotized ring of the median lobe of *Scopaeus* and *Hyperscopaeus*, a presumably stabilizing, strongly sclerotized, dark colored structure that separates the proximal phallobase and the distal portion of the aedeagus, which contains the endophallic sclerites and from which the poststernal lobes extend (Frisch *et al.* 2002: 34, Figs 7–21). For *Hyperscopaeus*, Herman (2023: 111, Fig. 250) termed this character a black, median pigmentation of the median lobe. The aedeagus of *Frischianus* differs, however, from that of *Micranops*, *Orus*, and *Trisunius*, which agree in their “simple”, plesiomorphic build with short, more or less membranous poststernal lobes and small, often weakly sclerotized endophallic structures [e.g. Assing 2011: 197, Figs 50, 56 (*Trisunius*); Frisch *et al.* 2002: 31, 34 (*Micranops*); Frisch & Oromí 2006: Figs 5–10 (*Micranops*); Herman 1965a: Figs 1b–3b, 2023: Fig. 325 (*Orus*)] by extended, strongly sclerotized poststernal and/or ventral processes and larger, strongly sclerotized, often hypertrophic endophallic sclerites (Figs 61–198). These structures are, however, variable at infrageneric level and only diagnostic for species groups (see following chapter 4.2). It is beyond the scope of this contribution to examine the homologies between the enlarged endophallic structures of *Frischianus* and the much smaller, often weakly sclerotized endophallus of the other scopaeine genera with ancestral aedeagal characters (*Micranops*, *Orus*, *Trisunius*), but the pure size of the endophallic components in *Frischianus* is certainly apomorphic and supports a monophyletic *Frischianus*. In summary, the aedeagus of *Frischianus* lacks the apomorphic characters of *Hyperscopaeus* and *Scopaeus*, which in the main are the annular, median sclerotization of the median lobe, a characteristic set of poststernal lobes (cf. Frisch *et al.* 2002: 31–38), and the entirely sclerotized, unsplit dorsal surface of the median lobe of *Scopaeus* (Herman 2023: 27, 68, 70). *Frischianus* shares plesiomorphic aedeagal characters of the more ancestral scopaeine genera *Micranops*, *Orus*, and *Trisunius*, but stands out due to its enlarged, strongly sclerotized endophallic sclerites.

The primary female sexual characters of *Frischianus* represent the plesiomorphic basic type of the Scopaeina. The sperm pump (Figs 237–247) is made up of a simple chamber segment with an elongate, somewhat spatulate, terminal process and resembles that of *Micranops* (Frisch *et al.* 2002: Fig. 22) and *Orus* (Herman 1965a: 117). The sperm pump of *Trisunius* was described neither in the generic description (Assing 2011: 196–198) nor in subsequent publications on the genus (Assing 2012–2014). The sperm pumps of *Hyperscopaeus* and *Scopaeus* exhibit genus-specific apomorphic characters described and illustrated in Frisch *et al.* (2002: 30; Figs 23–29) that

deviate from the basic type in *Frischianus*, *Micranops*, and *Orus*.

2 Infrageneric relationships of *Frischianus*

The characters of the informal, infrageneric clades of *Frischianus* are sufficiently described both in the identification key and the diagnostic paragraphs (chapter 3.2). As they are not regarded as pure identification groups but as hypotheses of phylogenetic units, the following identifies derived features that support their monophyly.

***Frischianus laticollis* and *F. strigaticollis* species groups:** *Frischianus* shows two distinct phylogeographic lineages, the *F. laticollis* and *F. strigaticollis* species groups, that differ both in their distribution and morphology. While the *F. laticollis* species group is distributed Southeast Asian, the *F. strigaticollis* species group is distributed much further west and known only from the southwest of India. The *F. laticollis* group comprises 29 species to date and thus is much more speciose than the *F. strigaticollis* group with five known species only, but this is certainly an artifact caused by the much more intense collecting activities in Southeast Asia compared to India. However, *Frischianus* is probably widely distributed across the Indian subcontinent, and the areals of both species groups appearing allopatric may meet or overlap. Furthermore, the characters of undiscovered species from regions in between the widely separate distributions of the *F. laticollis* and *F. strigaticollis* species groups may blur or support their currently clear morphological and geographical delimitations.

The ***Frischianus laticollis* species group** is considered monophyletic according to some distinctive characters of the aedeagus. First of all, its aedeagus is clearly asymmetrical (e.g. Figs 68, 131, 161) unlike the bilateral-symmetrical basic shape of the aedeagus of the *F. strigaticollis* species group (e.g. Figs 188, 194, 197) and the other genera of the Scopaeina. The bilateral-symmetrical, postostial lobes of the remaining Scopaeina [e.g. Assing 2011: Fig. 26 (*Trisunius*); Frisch *et al.* 2002: Figs 4–6, 10–21 (*Micranops*, *Scopaeus*), Figs 7–9 (*Hyperscopaeus*); Herman 2023: Fig. 250 (*Hyperscopaeus*), Fig. 324 (*Orus*)] and of the *F. strigaticollis* species group (Figs 181–198) are absent (Figs 157–162) in the *F. laticollis* group or replaced by a single, unpaired apical lobe, which more or less arises from the ventral ostial margin and is shifted laterad in variable extent (Figs 61–156). The asymmetrical appearance of the aedeagus is also strengthened by the strongly derived, asymmetrical endophallic sclerites, which are made up of a ventral endophallic sclerite and a dorsal endophallic spine (Figs 61–135, 157–159). Both endophallic sclerites are distinct, often hypertrophic, and often strongly projecting from the ostium (e.g. Figs 115–135). The dorsal endophallic spine is, however, absent in some species (Figs 136–156, 160–180), but they doubtlessly belong to the *F. laticollis* species group according to characters described below. Interestingly, the ventral endophallic sclerite exhibits at its dorsoapical end the endophallic foramen, the distal

opening of the ejaculatory duct (gonopore). One would have expected instead the ejaculatory duct to run through the dorsal endophallic spine, because it resembles the so-called flagellum of *Scopaeus* (Frisch *et al.* 2002: Figs 10–21), through which the ejaculatory duct runs and which has an apical gonopore. However, the dorsal endophallic spine neither has an inner duct nor an apical opening. The endophallic foramen of the endophallic sclerite is clearly visible in some subgroups of the *F. laticollis* species group (e.g. Figs 157–180), but less clear (e.g. Fig. 141) or invisible (e.g. Figs 118–138) in others.

The ***Frischianus strigaticollis* species group** from India exhibits a finely, longitudinally striate pronotal surface (Fig. 4b) that separates it from the Southeast Asian *F. laticollis* group and is moreover unique in the Scopaeina and considered an apomorphic feature. The feebly undulate, in places irregular pronotal furrows and alternating ridges are the result of the confluence of pronotal punctures and interstices. In some species (Figs 57–59) this character is only weakly developed and clearly visible only in suitable lighting. Looking at the variable aedeagal shape of the members of the *F. strigaticollis* group (Figs 181–198), one would doubt that they are closely related. However, their aedeagi have in common a large dorsal lobe, the lateroproximal angles of which are attached within the ostium close to its dorsal margin (e.g. Figs 181, 183)—a character missing in the *F. laticollis* species group. Similar, strongly developed, probably homologous dorsal lobes are, however, also characteristic of *Scopaeus* (e.g. Frisch *et al.* 2002: Figs 10–21). Dorsal lobes, even though less developed and often membranous, also occur in *Micranops* (Frisch *et al.* 2002: 31, Figs 4–6), *Hyperscopaeus* (Frisch *et al.* 2002: 31, Figs 7–9), and possibly in *Orus* and *Trisunius*. Thus, the dorsal lobe of the *F. strigaticollis* species group is an ancestral character. Nevertheless, the aedeagus of the *F. strigaticollis* group exhibits a probable synapomorphy, the specific shape of the vestigial parameres, that are placed transversely, lie on their narrow side against the circoforamen, and extend dorsad, which is why they slightly protrude laterally from the contours of the aedeagus (e.g. Figs 196–198). In both the *F. laticollis* species group (Figs 61–180, lateral views) and most genera of the Scopaeina [e.g. Assing 2011: Fig. 8 (*Trisunius*); Frisch *et al.* 2002: Figs 10–21 (*Scopaeus*); Herman 2023: 111 (*Hyperscopaeus*), Figs 324, 325 (*Orus*)], the vestigial parameres lie longitudinally against the circoforamen. In *Micranops*, the parameres are reduced completely (Herman 2023: 123; Frisch *et al.* 2002: Figs 4, 5; Frisch & Oromí 2006: Figs 5, 8).

The female sexual characters also provide putative apomorphies of the *F. strigaticollis* species group. The unipartite gonocoxal plate of the females is enormously enlarged basally (Figs 266–269), but of normal size in the *F. laticollis* species group (Figs 248–265). The bursal duct is curved at the transition to the sperm pump (Figs 245–247), but straight in the *F. laticollis* species group (Figs 237–244). In summary, the *F. strigaticollis* group is assumed to be monophyletic according to the longitudinally striate pronotum, the transverse parameres, the enormously enlarged basal portion of the gonocoxal

plate of the females, the curved bursal duct, and the—as far as currently known—South Indian distribution.

Separating the *F. strigaticollis* species group into subgroups does not make sense currently in view of the few species known and the presumably large number of unknown species. Nevertheless, *F. parentium* (Figs 181–186) and *F. strigaticollis* (Figs 187–189) seem to be closely related to each other due to the triangular, slightly asymmetrical, movably attached dorsal lobe, whereas the other species of the *F. strigaticollis* species group do not exhibit coinciding derived characters.

Subgroups of the *Frischianus laticollis* species group: The 29 associated species give first insights into the phylogenetic subunits of the *F. laticollis* species group. According to the shape of the posterior emargination of the abdominal sternite VIII of the males and aedeagal characters, two lineages can be distinguished, the *F. laticollis* and *F. rufulus* subgroups.

The *F. laticollis* subgroup currently comprises 22 species, that have in common a narrow, medioposterior incision of the abdominal sternite VIII of the males (e.g. Figs 199–205). Similar, narrow incisions are common in the more ancestral genera of the Scopaeina [e.g. Assing 2011: Figs 7, 14, 24 (*Trisunius*); Frisch *et al.* 2002: Fig. 31 (*Micranops*); Frisch & Oromí 2006: Figs 12, 14 (*Micranops*); Herman 1965: Figs 1a, 2a, 3a (*Orus*)], but in the *F. laticollis* subgroup the incisions of the abdominal sternite VIII of the males show a clear tendency toward more or less concave lateral margins (e.g. Figs. 199, 200), a putative apomorphy. Two characters of the aedeagus of the *F. laticollis* subgroup support monophyly. The asymmetrical apical lobe is shifted sinistrad at base and in basal portion curved dextrad—often strongly (e.g. Figs 68, 122, 131), sometimes hardly perceptible (e.g. Figs 108, 117, 177). The aedeagus of the *F. laticollis* subgroup also lost the ventral lobe, an ancestral character of the more basal scopaeine genera *Micranops* (e.g. Frisch *et al.* 2002: Figs 4–6; Frisch & Oromí 2006: Figs 5–9), *Orus* (Herman 1965: 117), and *Trisunius* (Assing 2011: Figs 25, 33, 39, 45, 79), which is retained in the *F. rufulus* subgroup (Figs 177–180).

The *F. rufulus* subgroup is a probable monophyletic clade according to the derived shape of the medioposterior emargination of abdominal sternite VIII of the males, which is widely triangular and exhibits an abruptly narrowed, thin medioanterior end, that is aligned longitudinally or somewhat distodextrally (Figs 226–230)—a form that deviates notably from the above described, narrow incision of abdominal sternite VIII of the males of the *F. laticollis* subgroup, *Micranops*, *Orus*, and *Trisunius* (see preceding paragraph). A strong apomorphy of the *F. rufulus* subgroup is the hypertrophic endophallic sclerite (Figs 157–180), which exhibits a remarkably enlarged endophallic foramen (e.g. Figs 159, 162, 171). The monophyly of the *F. rufulus* subgroup is also supported by the restricted, contiguous areal in Thailand and the Malay Peninsula of the six species assigned. Within the *F. rufulus* subgroup, *F. crassiphallatus* is the only species that exhibits the dorsal endophallic spine (Figs 157–159). With *F. rufulus*, it has in common the lack of the apical lobe

of the aedeagus, but a closer relationship is questionable as *F. rufulus* does not have the dorsal endophallic spine. *Frischianus tridens*, *F. rubiginicollis*, and *F. karneri* are obviously close relatives according to the similar, highly derived shape of the aedeagus (Figs 166–180) with a stout phallobase, a long, lobiform or spiniform apical lobe, a long, strongly apicad shifted ventral lobe, and a spiniform endophallic sclerite with transversely enlarged endophallic foramen.

Species lineages of the *F. laticollis* subgroup: The 23 species of the *F. laticollis* subgroup show a great variation of aedeagal characters that reveals four terminal phylogenetic lineages. Two of which, the *F. coriaceus* and *F. laticollis* lineages, are linked by the presence of the dorsal endophallic spine (Figs 61–135), while this character lacks in the *F. schuriani* and *F. setifer* lineages (Figs 136–156).

The *F. coriaceus* lineage currently holds *F. coriaceus* from Malaysia only. Judging by the strongly derived formation of the ventral endophallic sclerite and the gonocoxal plate of the females, the species represents a phylogenetic lineage of its own. The endophallic sclerite is deeply divided in a ventral lobe, which is extended in two elongate lateral lobes, and two dorsolateral spines (Figs 61–66). The gonocoxal plate of the females is membranously widened proximolaterad and triangularly extended proximad (Figs 248, 249).

The *F. laticollis* lineage comprises 14 species, which have both the dorsal endophallic spine and the ventral endophallic sclerite. *Frischianus laticollis*, *F. similis*, *F. communis*, *F. mariae*, and *F. brenneri* appear closely related according to the strongly ventrad curved, undulate, apically moderately widened dorsal endophallic spine (Figs 67–105), a probable apomorphy of this cluster of species. These close relatives also share the short apical lobe of the aedeagus (Figs 67–105) and the small, simple endophallic sclerite (Figs 67–105)—characters that appear, however, plesiomorphic in view of their various derived states in the following species. This species cluster is widely distributed and recorded from Bali, Java, Malay Peninsula, and Borneo. *Frischianus hamatus* and *F. loebli* from Sumatra have in common the straight, parallel dorsal endophallic spine with sagittate base and round, finely denticulate end (Figs 106–111), a probable synapomorphy. *Frischianus uhligi*, *F. burckhardti*, *F. echinatospinatus*, *F. puthzi*, and *F. serratispinatus*, all from Sabah (northern Borneo), form a distinctive species cluster according to the long, ventrad curved, spiniform apical lobe with distad curved apical end (Figs 118–132), and the strong modifications of both the enlarged, lengthened endophallic sclerite and the dorsal endophallic spine (Figs 118–132), both of which protrude far from the ostium. Among these species, females are only known of *F. burckhardti* and *F. puthzi*. Their gonocoxal plates agree in having triangular basal and subbasal ridges (Figs 259, 260), perhaps another apomorphy of this species cluster, which certainly holds undescribed species across Borneo. Within the *F. laticollis* lineage, the brachypterous, Sumatran mountain species *F. subalpinus* (Figs 112–114) and *F. pedator* (Figs 115–117) appear to be isolated

with respect to the shape of both the aedeagus and the gonocoxal plates of the females (Figs 256, 258).

The *F. schuriani* lineage is proposed for *F. schuriani* from the Malay Peninsula. Just like the following *F. setifer* lineage, it lacks the dorsal endophallic spine, a presumed apomorphy. The hypertrophic endophallic sclerite of *F. schuriani* is deeply divided in two lateral halves (Figs 136–138)—a shape very different from that of the remaining species of the *F. laticollis* subgroup and certainly a derived character.

The *F. setifer* lineage is distinguished from the other lineages of the *F. laticollis* subgroup by the derived shape of the elongate endophallic sclerite, that is subparallel in dorsal view, has an obtuse or subacute end (Figs 139–156), and exhibits a notable, wide, subapical foramen (e.g. Figs 141, 144, 156). The allopatric *F. latilobatus* from Borneo and *F. latilobatooides* from the Malay Peninsula are obvious adelphotaxa, because the shape of the aedeagus, especially the apical lobe, is similar (Figs 139–144). *Frischianus telnovi* (Borneo), *F. setifer* (Java), *F. barclayi* (Malay Peninsula), and *F. huijbregtsi* (Sulawesi) represent a widespread cluster of allopatric species. A putative apomorphy of this species cluster is the medioposterior macrosetation of the abdominal sternite VII of the males (Figs 217, 219, 221, 223).

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