

**THE BEE GENUS *THRINCHOSTOMA* SAUSSURE IN THE SOUTHERN
ASIAN REGION (HYMENOPTERA: HALICTIDAE)**

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Abstract.—A key is provided for the eleven species of *Thrinchostoma* Saussure (Halictinae: Halictini) known from Asia. A hitherto unknown male, apparently of *Thrinchostoma* (*Thrinchostoma*) *afasciatum* Michener, from Borneo is described and illustrated.

Key Words: *Thrinchostoma afasciatum* Michener male, Halictidae, Apoidea, Anthophila, taxonomy, bees, Brunei, Borneo

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The principal objectives of this paper are to make known the probable male of *Thrinchostoma* (*Thrinchostoma*) *afasciatum* Michener and to facilitate identification of the Asian species of the genus in the hope that more specimens will be collected and a revisional study can be made. The distinctive halictine genus *Thrinchostoma* Saussure (Halictinae: Halictini) occurs in Africa, Madagascar, and tropical Asia and nearby islands (Michener 2007). In Africa and Madagascar 35 species and many specimens have been collected. In the Asiatic region, however, specimens have been rarely collected and the genus may be in fact rare. Floral relationships for Asian species are recognized only for *T. asianum* Sakagami, Kato, and Itino, a member of the extraordinarily long-headed subgenus *Diagonozus*, which visits flowers of *Impatiens* in Sumatra (Sakagami et al. 1991). All other species from the Asian region are placed in the subgenus *Thrinchostoma s. str.*

Preparation of this paper is a result of our finding, among miscellaneous unidentified halictid specimens, one specimen of *Thrinchostoma* from the island of Borneo. At first we considered it a new species; later we decided to regard it with high probability as the male of *T. afasciatum* Michener. The latter has been known from only one female specimen from the mountains of Borneo and is now in the Bernice P. Bishop Museum in Honolulu. The male is from the same general area. The male and female are similar in general coloration and agree in a character that is very unusual for the genus, the lack of laterally directed silvery or golden simple setae on the posterior marginal zones of the metasomal terga. Of the species seen by Michener (1978), *T. afasciatum* (female) was the only one lacking such setae. In most bee species experience indicates that wing vein color does not differ between the sexes. Because it does differ between the male and the female *T. afasciatum*, we have some question

* Accepted by Michael W. Gates



Fig. 1. Dorsal aspect of male of *Thrinchostoma afasciatum* Michener.

about the status of the male. In the female, the wings are yellowish and have "veins and stigma dusky brown, at the extreme wing base testaceous, also veins forming marginal cell beyond stigma and beyond third transverse cubital vein [third submarginal crossvein or 2rs-m] testaceous" (Michener 1978). In the

male the wings are not conspicuously yellowish and the pattern of vein coloration is different in that the pterostigma and veins C and R basal to the pterostigma are brownish black. Additionally, the face of the male is clearly elongate (Figs. 1–4), as in most *Thrinchostoma* species, while that of the female is

significantly shorter and much broader (refer to Michener 1978: his fig. 86). Such dimorphism is not uncommon among *Thrinchostoma* species. Regardless, given the paucity of available information and material for Asiatic *Thrinchostoma* we have considered the new material to be conspecific with *T. afasciatum* pending a more expansive study of the genus. It is hoped that this contribution will spark melittologists working in Asia to seek these bees and greatly expand our knowledge of the group.

MATERIALS AND METHODS

Morphological terminology for the key and description follows that of Michener (2007). Microphotography was done (by M.S.E.) using a Nikon D1x camera attached to an Infinity® K2 lens. Abbreviations used are T and S for terga and sterna, so that for example T1 means first metasomal tergum.

RESULTS AND DISCUSSION

Asian Species.—Asiatic species of *Thrinchostoma* are listed in Table 1. The name *brunneum* was proposed by Blüthgen (1926) as a variety of *T. macrognathum* (Friese). Our recognition of it as a species is not based on additional information on these forms.

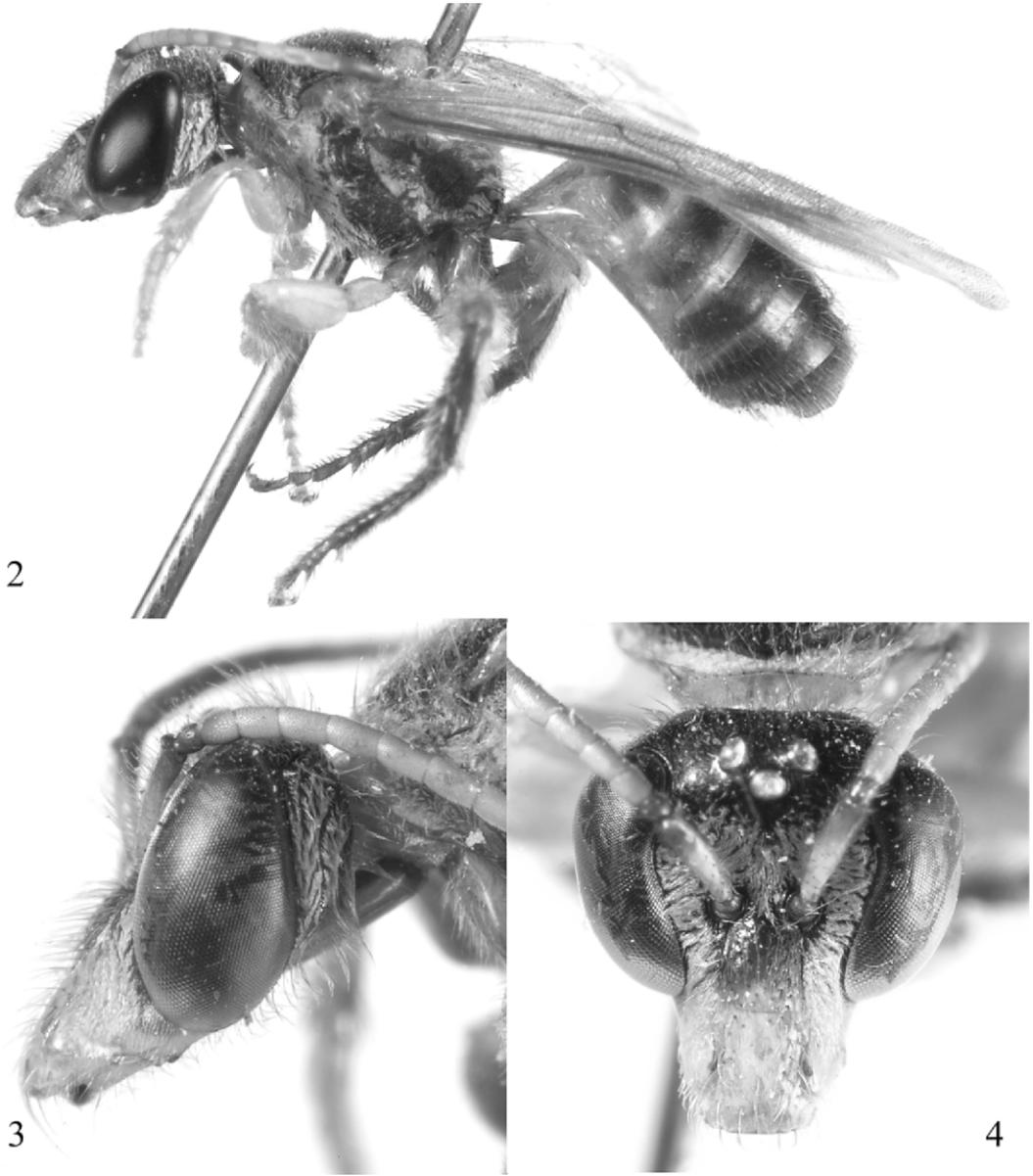
We hope that nomenclateral problems will be clarified when the group is revised. As discussed by Blüthgen (1926, 1931), both Cockerell (1913) and Friese (1914) independently named *T. sladeni* based on incorrectly associated sexes of Indian species, as indicated by Sladen (1915). The group should be revised and lectotypes designated to stabilize the names. An additional name for an Indian species that is probably a *Thrinchostoma* is *T. wroughtoni* (Cameron 1897); it may well have priority over one of the other names.

The key below is largely based on the descriptions and keys of Blüthgen

(1926, 1928), translated and modified by incorporation of subsequently described species. Blüthgen did not always use comparable characters on either side of his couplets. Reflecting this we have placed some of his key characters in brackets. In addition we have modified some of Blüthgen's characters to reflect current usage of morphological terminology and understanding of diagnostic traits within the genus. We have not restudied specimens of various species and are dependent on Blüthgen's wording for many characters, accordingly some statements are somewhat ambiguous (e.g., it is unclear what he meant by "weakly swollen"). It is hoped that this will aid an eventual revision of the genus at which time such matters may be clarified.

KEY TO ASIAN SPECIES OF *THRINCHOSTOMA*

- 1. Lower part of head greatly elongate, malar area more than twice as long as basal mandibular width; coloration brown to black, without yellow or rust colored areas *T. (Diagonozus) asianum* Sakagami, Kato, & Itino
- Lower part of head less elongate, malar area less than twice as long as basal mandibular width; body and legs commonly with areas of yellow or rust color [*T. (Thrinchostoma) s. str.*] 2
- 2. Females 3
- Males 8
- 3. Malar area only about one-third as long as basal mandibular width 4
- Malar area at least as long as basal mandibular width 5
- 4. Metasomal terga with posterior marginal zones hairless; T1 and T2 brownish black and testaceous. *T. afasciatum* Michener
- Metasomal terga with short, simple, laterally-directed setae on posterior marginal zones; T1 and T2 largely bright red *T. sladeni* Cockerell
- 5. Scape, clypeus, and legs entirely rust yellow *T. flaviscapus* Blüthgen
- Scape reddish brown; legs at least in part darkly marked 6



Figs. 2-4. Male of *Thrinchostoma afasciatum* Michener. 2, Lateral habitus. 3, 4. Lateral and facial aspects of head.

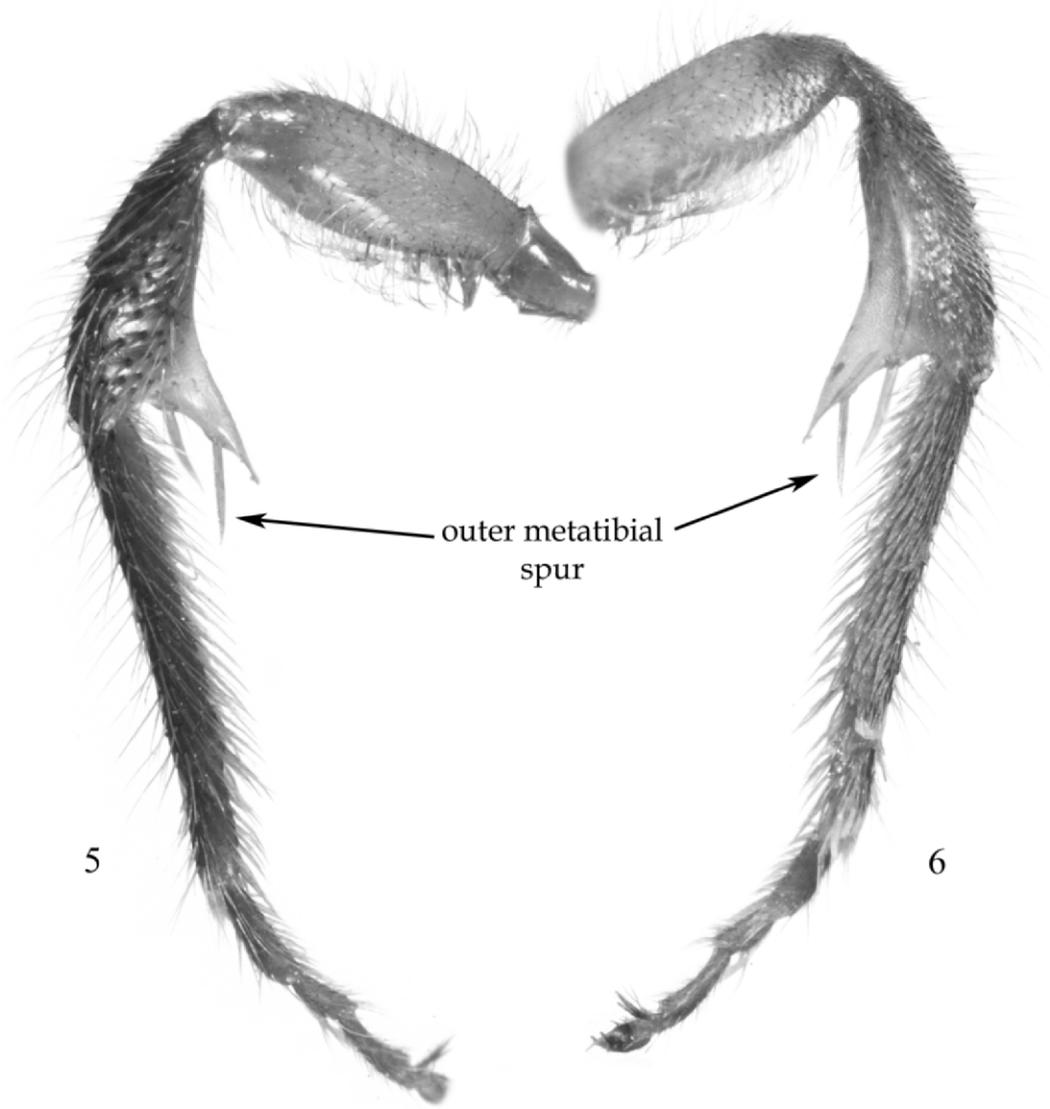
- 6. T1 chagreened, disk with microscopically fine, very dense punctures; clypeus rust yellow *T. aciculatum* Blüthgen
- T1 polished, very sparsely punctured or impunctate; clypeus variously colored 7
- 7. Clypeus rust yellow *T. assamense* Sladen
- Clypeus reddish brown, only at the apex dimly rust yellow *T. brunneum* Blüthgen
- 8. Metatrochanter ventrally with angular projection; metafemur and metatibia strongly swollen; second submarginal crossvein sigmoid so that anterior end is in front part of setal patch; apical

Table 1. Published locality records for Asian *Thrinchostoma* (Halictinae: Halictini). All species are placed in the subgenus *Thrinchostoma s. str.* except for *T. asianum* which is in the subgenus *Diagonozus*.

Taxon	Sex Known	Locality
<i>Thrinchostoma aciculatum</i> Blüthgen 1928	♀	Peninsular Malaysia
<i>Thrinchostoma afasciatum</i> Michener 1978	♀ ♂	Borneo: Kalimantan (Indonesia) & Brunei
<i>Thrinchostoma affine</i> Blüthgen 1928	♂	Peninsular Malaysia
<i>Thrinchostoma asianum</i> Sakagami et al. 1991	♀ ♂	Sumatra (Indonesia)
<i>Thrinchostoma assamense</i> Sladen 1915	♀ ♂	Assam (India)
<i>Thrinchostoma brunneum</i> ¹ Blüthgen 1926	♀	Sumatra (Indonesia)
<i>Thrinchostoma bryanti</i> Meade-Waldo 1914	♂	Borneo: Sarawak (Malaysia)
<i>Thrinchostoma flaviscapus</i> Blüthgen 1926	♂	Sumatra (Indonesia)
<i>Thrinchostoma macrogathum</i> (Friese 1914)	♀	Java (Indonesia)
<i>Thrinchostoma sladeni</i> Cockerell 1913	♀ ♂	India
<i>Thrinchostoma tonkinense</i> Blüthgen 1926	♂	Vietnam

¹ Originally proposed as a variety of *Thrinchostoma macrogathum* by Blüthgen (1926).

- margin of S2 straight, unmodified
- *T. sladeni* Cockerell
- Metatrochanter unmodified ventrally; metafemur weakly swollen; second submarginal crossvein nearly straight, not in front of distal part of setal patch 9
- 9. Posterior marginal zones of metasomal terga hairless; S5 with peglike setae of paramedian rows densely spaced, in contact with one another; S2 with apical margin straight, unmodified
- *T. afasciatum* Michener
- Posterior marginal zones of metasomal terga with simple, laterally directed setae; S5 with peglike setae more or less widely spaced; S2 medioapically with more or less short, tongue-like extension 10
- 10. Clypeus extensively dark brown; T1 and T2 dark reddish brown; hind legs dark brown, fore- and mid-legs more or less dark brown 11
- Clypeus yellow, at most with dark marks laterally; T1 and T2 yellowish red (usually with transverse brown bands of varying development); all legs entirely or at least predominantly rust yellow . . . 12
- 11. Labrum and mandible rust yellow (the latter with red apex); flagellum ventrally reddish brown; fore- and mid-legs extensively rust yellow [S5 with 4–5 long, brown, peglike bristles]
- *T. brunneum* Blüthgen
- Labrum and mandible reddish brown; antenna blackish brown; legs dark brown with exception of metatibial projection *T. bryanti* Meade-Waldo
- 12. Scape rust yellow; clypeus uniformly rust yellow 13
- Scape dark reddish brown, sometimes lighter at apex; clypeus variable 14
- 13. Mesepisternum shining, with dense, fine punctures; forewing yellowish (like parchment); T1 and T2 pale reddish yellow [T6 with 7–8 closely spaced, peglike setae decreasing gradually in length laterad, basal disk at middle longitudinally and flatly wrinkled]
- *T. flaviscapus* Blüthgen
- Mesepisternum ventrally matte, not shining, with fewer fine punctures; forewing somewhat infuscate; T1 and T2 reddish brown *T. affine* Blüthgen
- 14. Clypeus yellow, without dark marks laterally [S5 with four widely spaced peglike bristles of uniform length on each side]. *T. assamense* Sladen
- Clypeus with dark marks laterally . . . 15
- 15. Metafemur in apical third expanded, ventrally flattened; disc of S6 medially with lancet-like ridge from basal hump reaching to apical depression
- *T. macrogathum* Friese
- Metafemur unmodified; disc of S6 with a low hump separated by small area of level integument from apical depression, apically triangular depression or pit [apicalmost tergum yellowish red, with reddish brown transverse bands of various development]
- *T. tonkinense* Blüthgen



Figs. 5-6. Hind leg of male *Thrinchostoma afasciatum* Michener, anterior view and inner posterior view.

Thrinchostoma (Thrinchostoma)
afasciatum Michener
(Figs. 1-13)

Thrinchostoma afasciatum Michener
1978: 537 [♀].

Description.—*Male*. Total body length about 10 mm; forewing length (including tegula) 9.0 mm; head width

2.6 mm; head length (anterior margin of clypeus to summit of vertex) 3.0 mm; mesosomal width (between outer margins of tegulae) 2.6 mm.

Coloration: Head black except yellowish white as follows: ill-defined spot on lower margin of supraclypeal area near upper clypeal margin, clypeus except ill-defined broad dusky band extending down along angle between

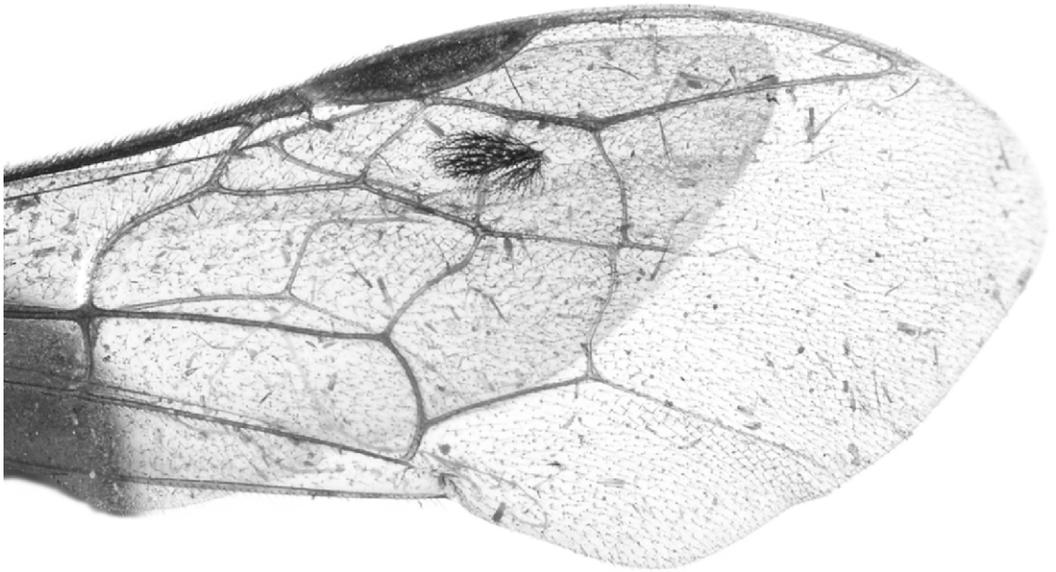
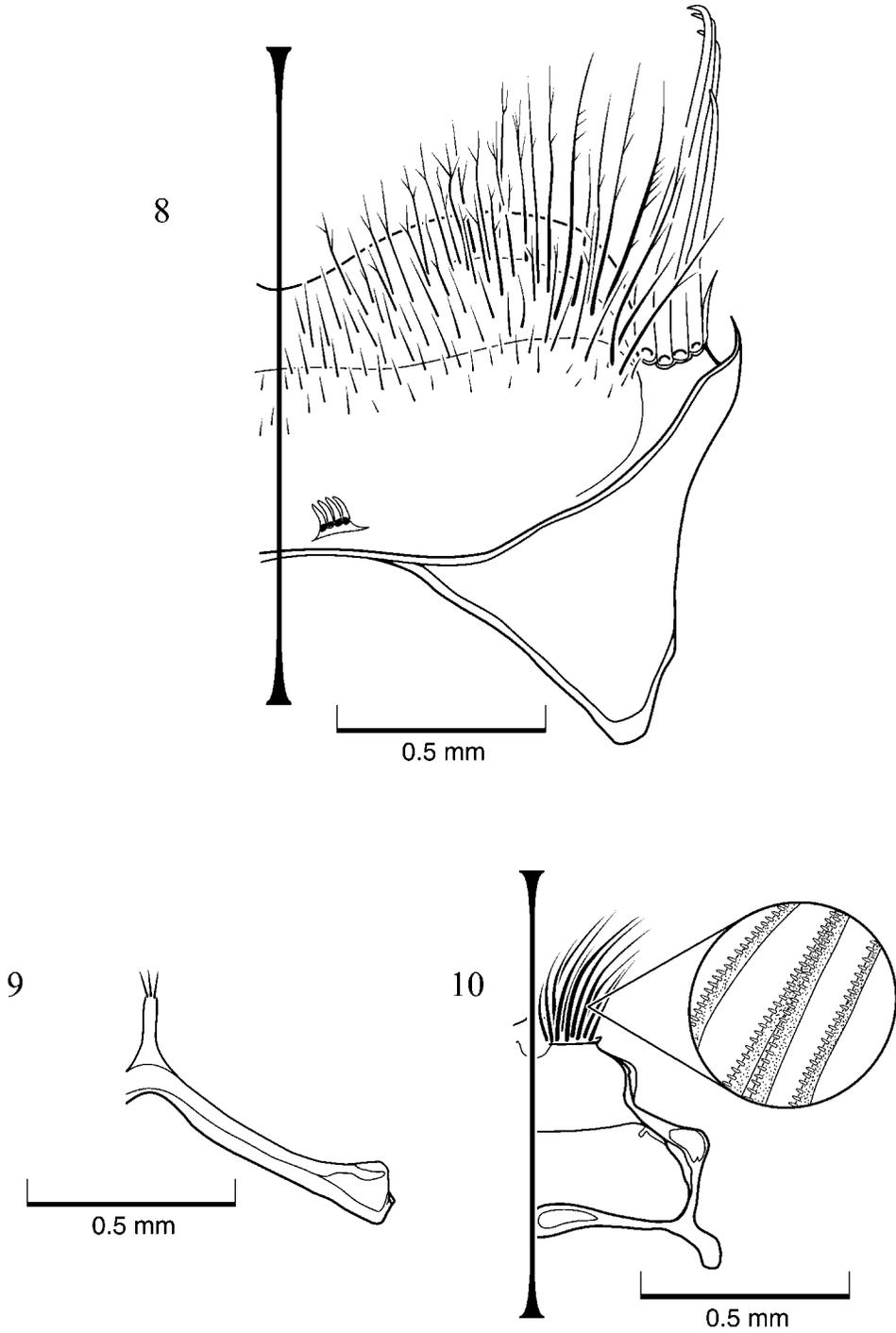


Fig. 7. Forewing venation of *Thrinchostoma afasciatum* Michener male; hind wing venation visible behind forewing.

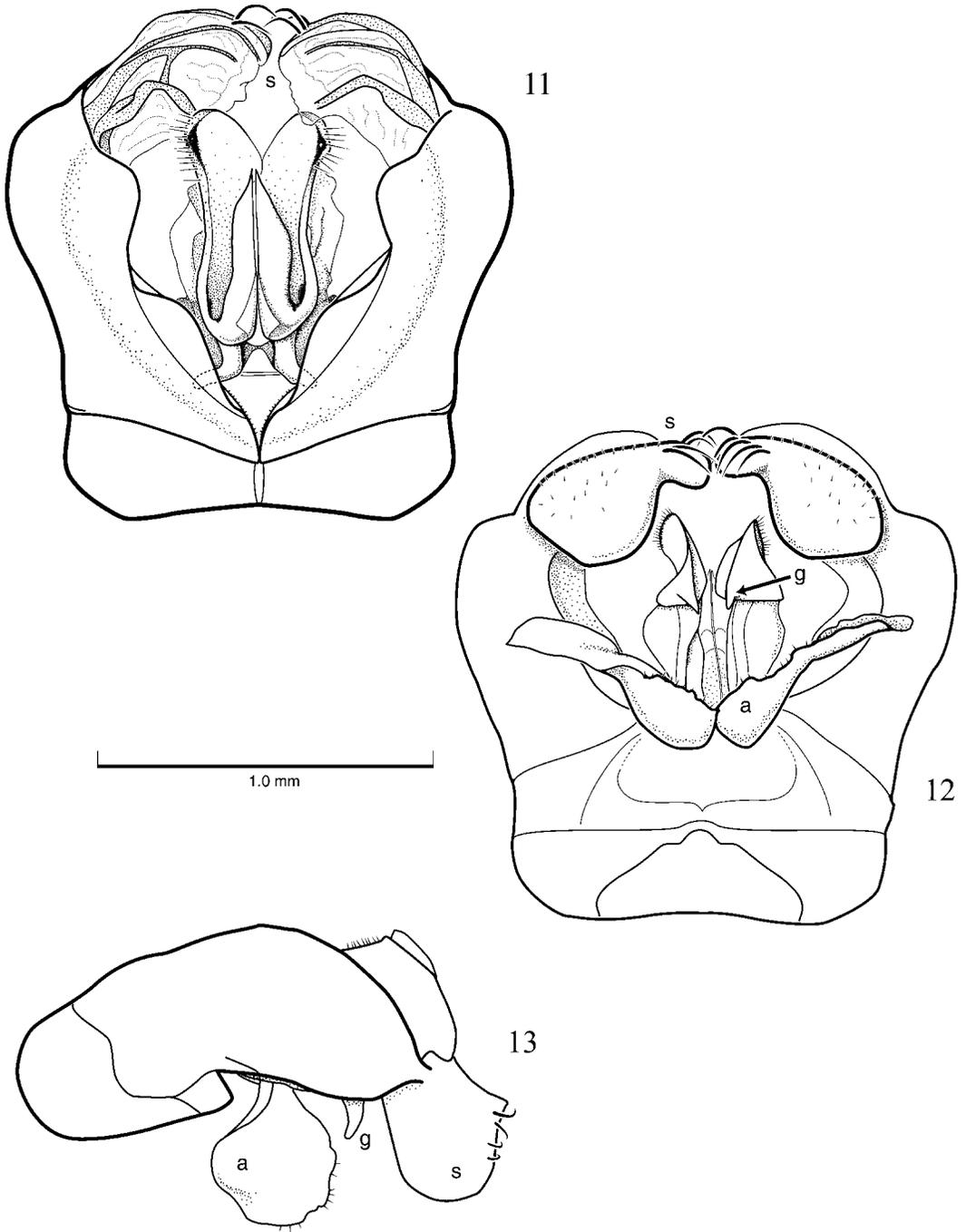
anterior and lateral surfaces almost to anterolateral angle of clypeal margin, malar area (dusky along compound eye margin), mandible (except black apical third). Labrum and labiomaxillary complex dusky. Antenna with scape yellowish white, apex and upper surface blackish; pedicel black; flagellum with article 11 black, otherwise yellowish, palest (lower surfaces whitish) on articles 8–10, all articles except 11 paler (more yellowish white) on lower surfaces and darker (more dusky yellowish) on upper surfaces. Mesosoma black except prothorax dusky yellowish, palest on dorsum of pronotum; mesoscutellum, metanotum, and propodeum dusky yellowish, anterolateral parts of propodeum grading into blackish. Tegula translucent dusky testaceous. Wings clear, very slightly grayish; veins mostly dusky testaceous except pterostigma and veins C and Sc+R basal to pterostigma brownish black and veins forming distal half of marginal cell and veins 2rs-m and 2m-

cu testaceous. Legs yellow, coxae dusky yellowish; metatibia and tarsus black, dusky yellowish on under surface of tibia; pro- and mesotibiae and tarsi slightly grayish; metatibial spurs and ventroapical projection of metatibia translucent yellowish. Metasoma yellow, T1 to T6 each with broad black zone extending from side to side (Figs. 1, 2), basal yellow zone on T1 including entire dorsoanterior part of T1, on all terga basal yellow extending only slightly behind graduli; apical yellow zones consisting of posterior marginal translucent zones through which basal yellow zones of following terga can be seen; black zones somewhat broader than intervening yellow zones.

Pubescence: Yellowish, sparse, not hiding surface except for dense plumose setae on paraocular area from lower end up to midlevel between antennal socket and lower tangent of midocellus (Fig. 4), continuing to cover frons between antennal sockets up to about one ocellar diameter below lower midocellar tan-



Figs. 8-10. Terminalia of male *Thrinchostoma afasciatum* Michener. 8, Sternum V. 9, Sternum VII. 10, Sternum VIII. Only left half of each sternum illustrated.



Figs. 11–13. Male genital capsule of *Thrinchostoma afasciatum* Michener. 11, Dorsal aspect. 12, Ventral aspect. 13, Lateral aspect [s = gonostylus; g = penis valve apex; a = ventral retrorse lobe].

gent; plumose setae similarly largely covering surface on midgenal area, anterior part of mesepisternum including behind pronotal lobe, areas on metepisternum and side of propodeum. Undersurfaces of tarsi densely setose. Otherwise setae sparser, simple or with few barbs or branches, short except about twice an ocellar diameter on clypeus, supraclypeal area, posterior part of vertex, metanotum, posterior surface of propodeum, metasomal terga, and legs. Lower margin of clypeus with four very long, downcurved bristles and a few shorter ones laterally.

Structure: Inner orbits converging below except upper thirds which are subparallel so that inner orbits are broadly emarginate at this level (Fig. 4); lower ocular tangent slightly below upper margin of clypeus; profiles of clypeus and supraclypeal area independently slightly convex and sloping downward and forward so that clypeus is strongly protuberant (Fig. 3). Lower paraocular area produced as rounded lobe extending into lower part of clypeus (Figs. 3–4). Compound eye widest in lateral view below middle (Fig. 3), genal area widest above middle where it is over half as wide as maximum compound eye width; ocellus about as wide as width of second flagellar article, ocellocular distance slightly more than interocellar distance; distance between median and lateral ocelli about one-third ocellar diameter; preoccipital ridge rounded, not carinate, separated from lateral ocelli by about 1.5 times ocellar diameter. Mandible simple [seen only in closed position]. Antenna 13-segmented, scape reaching about middle of median ocellus (Fig. 4); pedicel about spherical; first flagellar article almost 1.5 times as long as wide, only basal third narrowed toward base; second and third flagellar articles each 1.5 times as long as broad, subsequent articles progressively longer to article 6 which is

almost twice as long as broad and article 10 which is twice as long as broad; article 11 nearly three times as long as broad; flagellum scarcely widened distally, article 11 widest at basal third. Pronotum with narrow, sharp, transverse carina extending from posterior lobe across dorsum in front of posterior setose depression. Mesoscutum only slightly downcurved at anterior edge. Mesoscutellum weakly biconvex posteriorly (perhaps damaged by pin). Propodeal triangle sharply defined, shining, hairless, entirely on dorsum, surface entirely covered by about thirty longitudinal or laterally radiating striae. Legs slender, not obviously modified except for metatibia. Pro- and mesotibial spurs not attaining middles of respective basitarsi. Slightly less than distal half of under surface of metatibia drawn out to form ventral apical projection (Figs. 5, 6) that is flattened apically and hence forms sharp, slender apex in lateral view but rounded in ventral view, one spur arising near base of projection, the other beyond middle. Wing venation as in Fig. 7. Setae of wing surface rather long, some as long as ocellar diameter. Terminalia illustrated in Figs. 8–13.

Surface sculpturing: Lower and lateral parts of clypeus with large, irregularly shaped punctures, some of them adjacent; remainder of clypeus and supraclypeal area with more regular coarse punctures mostly separated by one-half to one puncture diameter; rest of head with punctures much finer, upper frons and vertex largely impunctate; ground between punctures of head rather shiny. Mesosomal punctation fine except for some coarse punctures on posterior part of mesoscutum and base of mesoscutellum; punctures of mesoscutum mostly separated by about a puncture width of dull shining ground due to microsculpture, but some lateral median areas nearly impunctate; convexities of mesoscutellum largely impunctate; mesepis-

ternum with small rather dense punctures but irregular shiny spaces present in some areas, hypopimeral area shiny, convex, almost impunctate; metepisternum and sides of propodeum dull with minute dense punctures; remainder of propodeum shining with scattered small punctures (absent on propodeal triangle); metasoma shiny with scattered small punctures and setal bases except posterior marginal zones of terga and sterna which are impunctate.

Female: Described in detail by Michener (1978) and therefore not repeated herein.

Material.—Male, labeled “Brunei [Negara Brunei Darussalam, officially “State of Brunei, Abode of Peace”], Bt. Ladan [District of Totuong, Ladan Hills Forest Reserve, East of Lake Maribun near border with Sarawak, Malaysia], 23-5-1982 [23 May 1982], MJS, Hymenoptera, for index”; deposited in Division of Entomology (Snow Entomological Collection), University of Kansas Natural History Museum. Judging from the debris on the only known specimen it appears to have been captured in a trap of some kind.

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