Three new species of Rhiniinae from Thailand (Diptera: Calliphoridae)*

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Abstract: Three new species of Thai Rhiniinae are described and illustrated. These are *Stomorphina siamensis* sp. nov., *Borbororhinia laojanae* sp. nov. and *Sumatria chiekoae* sp. nov.

INTRODUCTION

The subfamily Rhiniinae is represented in Thailand by a small number of the previously known species which were listed in A Catalog of Diptera of the Oriental Region (James, 1977). According to James's catalog (James, 1977), the following 9 species were previously recorded from Thailand: *Rhinia apicalis* (Wiedemann, 1830), *Stomorphina discolor* (Fabricius, 1794), *Idiella mandarina* (Wiedemann, 1830), *Cosmina bicolor* (Walker, 1856), *C. biplumosa* (Senior-White, 1924), *Isomyia lugubris* James, 1970, *I. facialis* James, 1970, *I. dotata* (Walker, 1856), and *I. cupreoviridis* (Malloch, 1928). They seem to be little investigated on bionomics. Dear (1977) mentioned the rhiniine blow flies are associated with Hymenoptera, Isoptera and Orthoptera. Adult flies prefer to visit flower-

ing plants rather than decaying matter. They are seldom attracted to baited traps. Among the calliphorid subfamilies, this group of flies is also taxonomically unworked because of scantiness of material. This report is based on the collection of calliphorid flies made by ourselves in Thailand, on the Zoogeographical Survey of the Dipterous Insects of Medical Importance in the South East Asia (Tokyo Medical and Dental University Overseas Scientific Research Project 1975, August to December). Examination of the material has revealed the presence of three new species of the subfamily Rhiniinae. These new species are characteristic and easily distinguished from the related species by the external morphology adopted in the keys.

Key to *Stomorphina discolor* and *S. siamensis* sp. nov.

1. Basicosta yellowish brown; R₅ narrowly open at wing margin; alar and thoracic squamae yellowish brown; 2nd antennal segment reddish *S. discolor* (Fabricius)
- Basicosta black; R₅ closed at wing margin; squamae largely fuscous black; an-

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tennae entirely fuscous black
 S. siamensis sp. nov.

***Stomorhina siamensis* sp. nov.**

Male. Head: Eyes bare, holoptic; frons linear at narrowest point; frons index <0.01 ; frontal stripe black, widened anteriorly and posteriorly, obliterated at narrowest point of frons; parafrontalia narrow, black, subshining, bare, provided with about 7 pairs of *ori*; parafacialia narrower than width of 3rd antennal segment, black, subshining, bare, with silvery spot at level of 2nd antennal segment under certain incidence of light; face black, subshining, slightly gray-dusted on upper parts under 3rd antennal segment; facialia black shining, with a few black setulae just above vibrissae; medianae very narrow, black, subshining; vibrissaria very narrow, black shining, bare; vibrissae developed; epistome projecting forward, black shining, not demarcated from face; genae black shining and sparsely haired on anterior half, gray-dusted and yellowish white hairs, hairs with obscure piliferous spot; postgenae concolorous with genae, not demarcated from genae, with yellowish white hairs; occiput concolorous with genae, clothed with yellowish white hairs on lower half, upper parts along posterior eye margins black shining, bare; 2nd antennal segment blackish, subshining; 3rd antennal segment blackish, brownish pubescent, slightly more than 2 times as long as 2nd; arista pectinate, blackish apically, yellowish brown on basal $1/3$; palpi blackish, with black setulae.

Thorax: bronze with blue tinge, thickly blackish punctate, gray-dusted, black haired on dorsum; humeri, postalar calli and scutellum concolorous with dorsum; mesopleura and sternopleura brownish gray-dusted except for anterior $1/3$ of the latter glossy black; prosternum with yellow hairs; propleura bare; suprspiracular convexity pubescent, without long upstanding hairs; several yellow hypopleural hairs present just below row of hypopleural bristles; other pleural hairs also yellow; mesothoracic spiracle yellow; metathoracic one blackish; postalar declivity largely bare except for a few yellow setulae below anterior *pa*; tympanic tuft absent; anterior and posterior parasquamal tufts absent.

Chaetotaxy; *ac* 0+1?, *dc* 0+4?, *ia* 0+1?, *h* 1-2, *ph* 1 as outer *ph*, *prs* 1, *sa* 2-3, *pa* 2, *st* 1+1, *sc* 2-3+0, *n* 2, *pp* 2, *pst* 0, several fine long bristle present on posterior half of scutum, but not arranged in rows.

Wings: Brownish hyaline, with a darkened spot apically; veins brown; epaulet black; basicosta black; subcostal sclerite brown, brownish pubescent; node of 2nd and 3rd longitudinal veins with a few black setulae above only; 4th longitudinal vein gently curved forward; R_s closed in the margin or short petiolate; section of the 4th vein from bend to wing edge slightly curved along the margin; squamae brown to fuscous black, externally yellowish at base of thoracic squama, thoracic one not lobulate, tongue-like, bare on dorsal surface. Halteres yellow, darkened basally.

Legs: Femora bronze black, tibiae and tarsi yellowish brown, darkened apically; fore tibia with 1 *pv*; mid tibia with 1-2 *ad*, 1 *av*, 1 *p*, 1 *pd*, and 1 *pv*; hind tibia with 1 *av*, row of short *ad* and 4 rather long *ad*, with incomplete row of *pd* (2-4 *pd*).

Abdomen: Testaceous yellow basally, metallic on tergites 4-5; tergite 1+2 testaceous yellow except for its posterior border metallic bronze black; tergite 3 testaceous yellow usually with median broad stripe and marginal band, lateral sides of tergite 3 sometimes darkened; tergites 4 metallic bronze black, sometimes testaceous on lateral sides limited anteriorly; tergite 1+2 with fine and rather long lateral marginal bristles; tergite 3-4 with incomplete row of marginal bristles, 1-3 lateral marginals erect; tergite 5 with erect marginals and several lateral discals; sternites 1-3 testaceous yellow, clothed with fine yellow hairs, sternite 3 also with black hairs on posterior margin; sternites 4-5 metallic, bronze black, mainly black haired except for yellow hairs on anterior part of sternite 4; venter of tergites 1+2-3 yellow, clothed with yellow hairs. Hypopygium relatively small, metallic, bronze black, as shown in Fig. 1.

Female. Head: Eyes separated at vertex by a distance equal to 0.25-0.28; frontal stripe black, broad, parallel-sided, slightly narrowed anteriorly and posteriorly, about 2 times width of one of parafrontalia just in front of anterior ocellus; parafrontalia black,

Fig. 1 *Stomorhina siamensis* sp. nov., male hypopygium.

a, epandrium, cercus and parolobus, lateral view; b, cerci and parolobi, caudal view; c, aedeagus, lateral view; d, aedeagus, posterior view; e, anterior and posterior parameres, lateral view.

subshining, very sparsely setulose anteriorly, provided with about 8 pairs of *ori*; *ors* 4 (fine) + 1; each frontal bristle provided with glossy spot at base; *oc* weakly developed; *acoc* absent; *pooc* small; *ov* and *iv* well developed; *poc* small, divergent; *occ* absent.

Thorax: Dorsum with more bluish tinge than that of male; mesopleura and sterno-

pleura yellowish-gray dusted, with yellowish white hairs; *ac* 0+1; *dc* 0+1-2; *ia* 0+1 as prescutellar bristle; *sc* 3+0.

Wings: Squamae pale brown, whitish on external part of thoracic squama and inner half of alar one.

Legs: Hind tibia with 4 *ad*, 3 *pd*, 1 *av* and incomplete row of short *ad*.

Abdomen: Entirely bronze, with bluish tinge laterally, median part largely subshining, dully coppery tinged; sternites 1–2 and ventral margin of tergites 1+2–3 sometimes brownish in part; abdominal bristles weak, decumbent on tergites 4–5. Ovipositor of oviparous type. Otherwise same as for ♂.

Length. 5.5–6.5 mm.

Holotype ♂. THAILAND: Fang, Doi Huai Hwer, 1,231 m, 27. IX. 1975, H. Kurahashi.

Paratypes. THAILAND: 8♂ 57♀, same data as holotype, R. Kano, H. Kurahashi and W. Tumrasvin; 2♂ 12♀, Doi Inthanon, Ban Yang, 1,400 m, 23. IX. 1975, H. Kurahashi and W. Tumrasvin; 1♂ 10♀, Fang, Fang Exp. St., 25. IX. 1975, R. Kano and H. Kurahashi; 1♂ 6♀, Ban Pong Din, 10 km NE of Doi Saket, 20. IX. 1975, R. Kano and H. Kurahashi; 1♂, C. Chiang Mai, Doi Pui, 1,685 m, 16. IX. 1975, H. Kurahashi.

Other material examined. THAILAND: 8♀, Khao Khiaw, 1,351 m, 6. X. 1975, H. Kurahashi; 1♀, Fang, nr Burma Bord., 1,200 m, 26. IX. 1975, W. Tumrasvin; 2♀, Kanchana Buri, nr Sai Yok, 500 m, 8. IX. 1975, 9. IX. 1975, 11. IX. 1975, R. Kano and H. Kurahashi; 1♀, Kanchana Buri, Sai Yok, 500 m, 9–13. XII. 1975, S. Shinonaga; 2♀, Chiang Mai, Doi Suthep, 20–21. XII. 1975, S. Shinonaga.

Type depository. Holotype is deposited in National Science Museum, Tokyo. Paratypes in Bishop Museum, Honolulu; Natural History Museum, London; Faculty of Tropical Medicine, Mahidol University, Bangkok; National Institute of Health Thailand, Nonthaburi.

Remarks. The specific name is derived from the old name of Thailand.

Bionomics. Adults frequent on blossoms in forest areas. Females are sometimes attracted to decaying animal matter.

Distribution. Thailand.

Key to *Borbororhinia bivittata* and *B. laojanae* sp. nov.

1. Palpi blackish at least on basal half in ♂, entirely black in ♀; parafrontalia reddish brown, snowy-dusted anteriorly, greasy at narrowest point of frons and the level of anterior 3 pairs of *ori*; basi-

costa fuscous brown; male eyes subholoptic, frons widened anteriorly and posteriorly, narrowest at middle; frons index 0.10–0.13 in ♂, 0.23–0.30 in ♀ ..
..... *B. bivittata* (Walker)

- Palpi entirely or largely orange; parafrontalia yellowish brown, snowy-white dusted on entire length, without greasy spot at the level of anterior 3 pairs of *ori*; basicosta yellowish; male frons dichoptic, parallel-sided, slightly widened anteriorly; frons index 0.20–0.30 in ♂, 0.24–0.29 in ♀ *B. laojanae* sp. nov.

Borbororhinia laojanae sp. nov.

Male. Head: Eyes bare, dichoptic, separated at narrowest point by a distance slightly more than twice width of ocellar triangle; frons index 0.20–0.30; frontal stripe testaceous yellow, broad, parallel-sided, very slightly widened anteriorly and posteriorly, slightly more than 4 times as wide as one of parafrontalia just in front of anterior ocellus; parafrontalia testaceous, more or less snowy-white dusted, bare, provided with 7 pairs of *ori*; parafacialia narrow, testaceous, more or less snowy-white dusted, lower half black shining, bare; face brown, darkened laterally, subshining, without median carina; facialia testaceous, blackish laterally, subshining, bare; medianae narrow, yellowish brown, bare; vibrissaria narrow, yellowish brown, bare; vibrissae developed; epistome testaceous, blackish laterally, subshining, projecting forward more than width of 3rd antennal segment; genae blackish on anterior upper corner, yellowish white posteriorly, clothed with yellow hairs; postgenae concolorous with posterior part of genae, clothed with yellow hairs; occiput concolorous with posterior part of genae, clothed with yellow hairs on central and lower portions, upper parts behind eye margin black, shining, upper occiput behind vertex testaceous yellow, bare, subshining; 2nd antennal segment testaceous yellow; 3rd antennal segment testaceous yellow, sometimes slightly darkened dorsally, yellowish pubescent, equal to 2 times as long as 2nd; arista blackish apically, yellowish on basal 1/3, long-plumose; palpi orange, with black setulae.

Thorax: Testaceous yellow, brownish on

dorsum, two silver-white submedian stripes present on anterior 2/3 of dorsum, a narrow fuscous stripe present laterad to silver white one, lateral side just above notopleuron also fuscous striped; humeri yellowish white, clothed with yellow hairs on lateral surface, but dorsal surface fuscous, with black setulose hairs; notopleura yellowish white, with black setulose hairs; postalar calli concolorous with thoracic dorsum, with a few black hairs; scutellum concolorous with thoracic dorsum, with black hairs on dorsal surface, ventral one with fine yellow hairs; prosternum yellow, with yellow fine hairs; propleura yellowish white, largely bare, sometimes with several fine yellow hairs anteriorly; supra-spiracular convexity yellowish pubescent; a few hypopleural hairs present below row of bristles; other pleural hairs fine, yellow, except for black ones on anteroventral surface of sternopleura; mesothoracic spiracle yellowish white; metathoracic one small, yellowish white; postalar declivity bare; tympanic tuft absent; anterior parasquamal tuft absent. Chaetotaxy; *ac* 0+1 as prescutellars, *dc* 1+1-2, *ia* 1+1, *h* 2, *ph* 1 as inner *ph*, *prs* 1, *sa* 2, *pa* 2, *st* 1+1, *sc* 3+0-1, *n* 2, *pp* 1, *pst* 0.

Wings: Entirely yellowish hyaline; veins yellowish brown; epaulet yellowish white; basicosta yellowish brown; subcostal sclerite yellowish brown, bare; node of 2nd and 3rd longitudinal veins with 1 black setula above, bare below; 4th longitudinal vein gently curved; section of the 4th vein from bend to wing edge sigmoid; squamae yellowish brown, thoracic one not lobulated, tongue-like, bare on upper surface. Halteres yellow.

Legs: Testaceous yellow, darkened on apical 2-4 segments of tarsi, black haired; fore tibia with 1 *p*; mid tibia with 1 *ad* and 1 *p*; hind tibia with 2 *ad*, 1 *pd* and 1 *av*.

Abdomen: Testaceous, darkened caudally, black haired on dorsal surface of tergites, yellow ground hairs present on ventral surface of tergites 1+2-4 and sternites 1-4; tergites 1+2-4 with row of decumbent marginal bristles; tergite 5 with row of erect marginal and 1-2 lateral discal bristles; sternites fuscous, sternite 2 with a pair of marginal bristles; sternite 3 elongate, with a pair of marginal bristles, intermixed with black and yellow hairs. Hypopygium prominent, dark red, subshining, as shown in Fig. 2.

Female. Head: Eyes bare, separated at vertex by a distance equal to 0.24-0.29 of head width; frontal stripe testaceous yellow, broad, parallel-sided, 5 times width of one of parafrontalia just in front of anterior ocellus, without interfrontal hairs; parafrontalia testaceous yellow, more or less snowy-white dusted, provided with ca 5 pairs of *ori*; *ors* 0-1+1 as preverticals; *oc* developed; *acoc* absent; *pooc* absent; *ov* and *iv* well developed; *poc* divergent; *occ* 0.

Thorax: Similar to that of ♂, *ia* 1+1-2.

Wings: Similar to that of ♂.

Legs: Mid tibia with 1 *ad*, 1 *pd*, 1 *p* and 1 *v*; hind tibia with 1-2 *ad*, 1 *pd* and 1-2 *av*.

Abdomen: Similar to that of ♂; bristles decumbent and weaker than that of ♂. Otherwise same as for ♂.

Length. 5.5-7.0 mm.

Holotype ♂. THAILAND: nr Sai Yok, 500 m, Kanchana Buri, 8. IX. 1975, H. Kurahashi.

Paratypes. THAILAND: 9♂ 9♀, same locality, 6. IX. 1975, 8. IX. 1975, R. Kano, H. Kurahashi and W. Tumrasvin; 1♂ 2♀, Sai Yok, Kanchana Buri, 9-13. XII. 1975, S. Shinonaga.

Type depository. Holotype (♂) is preserved in National Science Museum, Tokyo; paratypes in National Science Museum, Tokyo; Bishop Museum, Honolulu; Natural History Museum, London; Faculty of Tropical Medicine, Mahidol University, Bangkok; National Institute of Health Thailand, Nonthaburi.

Remarks. The specific name is dedicated to Mrs. Laojana Chohanadisai, Department of Medical Entomology, National Institute of Health, Thailand, who is a local entomologist studying the taxonomy of blow flies from Indochina and Thailand.

Bionomics. Adults are attracted to decaying meat in native forests.

Distribution. Thailand.

Key to *Sumatria flava*, *S. vittata* and *S. chiekoae* sp. nov.

1. Dorsum of thorax orange, with paired narrow longitudinal brownish stripes which are separated by a median silver-gray dusted area
..... *S. flava* (Villeneuve)

Fig. 2 *Borbororhinia laojanae* sp. nov., male hypopygium.

a, epandrium, cercus and paralobus, lateral view; b, cerci and paralobi, caudal view; c, aedeagus, lateral view; d, aedeagus, posterior view; e, anterior and posterior parameres, lateral view.

- Dorsum of thorax testaceous, with three dark longitudinal stripes which are separated by silver-gray dusted areas *S. chiekoae* sp. nov.
- Dorsum of thorax testaceous, with three dark longitudinal stripes, without silver

gray pruinosity *S. vittata* Peris

***Sumatria chiekoae* sp. nov.**

Male. Head: Eyes bare, dichoptic, separated at narrowest point by a distance trice

the width of ocellar triangle; frons index 0.30; frontal stripe fuscous, yellowish anteriorly, broad, parallel-sided, very slightly widened anteriorly and posteriorly, about 5 times as wide as one of parafrontalia just in front of anterior ocellus; parafrontalia black subshining, yellowish anteriorly, subshining except for silver-dusted spot near middle, bare, provided with ca 8 pairs of *ori* and a few fine interstitials; *ors* 0+1 as preverticals; parafacialia narrow, testaceous yellow, upper half densely silver-dusted, bare; face testaceous yellow, subshining, without median carina; facialia flat, testaceous yellow, lower part slightly darkened laterally, subshining, with black setulae on lower 1/3 above vibrissae; medianae narrow, yellowish brown, bare; vibrissaria narrow, yellowish brown, largely bare except for a few black setulose hairs; vibrissae developed; epistome testaceous yellow, subshining, projecting forward more than half width of 3rd antennal segment; genae black on anterior half, subshining, clothed with black hairs, posterior half yellowish brown, with yellow dustings, clothed with yellow hairs; postgenae concolorous with posterior part of genae, clothed with yellow hairs; lower half of occiput concolorous with posterior part of genae, clothed with yellow hairs, upper half blackish, clothed with yellow hairs except for glossy behind eye margin; 2nd antennal segment yellowish orange; 3rd antennal segment fuscous brown dorsally, yellowish orange ventrally, entirely yellowish pubescent, equal to 2.5 times as long as 2nd; arista blackish apically, brownish on basal 1/2, long-plumose; palpi orange, with black setulae.

Thorax: Testaceous, three narrow fuscous longitudinal stripes present on dorsum, presutural areas between median and lateral fuscous stripes silver-gray dusted; humeri, postalar calli and scutellum concolorous with thoracic dorsum, clothed with black hairs, humeri intermixed with yellow hairs on lateral surface; prosternum narrow, with yellow hairs; propleura slightly yellowish-white dusted, with yellow hairs; suprascapular convexity bare; a few fine yellow hypopleural hairs present below row of bristles; other pleural hairs fine, yellow, except for black ones on anteroventral surface of sternopleura; mesothoracic spiracle small, yellowish white;

metathoracic one small, yellowish white; postalar declivity bare; tympanic tuft absent; anterior and posterior parasquamal tufts absent. Chaetotaxy; *ac* 0+1 as prescutellars, *dc* 0+1 as prescutellars, *ia* 0+1, *h* 1, *ph* 1 as inner *ph*, *prs* 0, *sa* 2, *pa* 2, *st* 1+1, *sc* 3+0, *n* 2, *pp* 1, *pst* 1.

Wings: Entirely yellowish hyaline; veins yellowish brown; epaulet yellowish brown; basicosta yellowish brown; subcostal sclerite yellowish brown, bare; node of 2nd and 3rd longitudinal veins with a few black minute setulae above, bare below; 4th longitudinal vein gently curved; section of the 4th vein from bend to wing edge sigmoid-curved; squamae yellowish brown, thoracic one not lobulated, tongue-like, bare on upper surface. Halteres yellow.

Legs: Testaceous, darkened on apical 2–4 segments of tarsi and apices of fore and hind tibiae, black haired, several fine yellow hairs present on base of fore coxa; fore tibia without *p*; mid tibia 1 *ad* and 1 *pd*; hind tibia 2 *ad* and 2 *pd*.

Abdomen: Testaceous, posterior part of tergite 1+2 narrowly fuscous-black banded; tergite 3 with marginal band and trace of median stripe; tergites 4–5 fuscous, tergite 5 reddish posteriorly and laterally; tergites black-haired largely on dorsal surface; tergite 1+2 with yellow hairs basally and ventrally, with a few rather strong bristly hairs laterally; tergite 3 with fine decumbent marginal bristles, clothed with yellow hairs ventrally; tergites 4–5 with row of erect marginal bristles, without discals; sternites 1–2 yellowish, clothed with yellow hairs, sternite 2 with a pair of marginal bristles; sternites 3–4 fuscous black with yellow margin, clothed with black hairs, with a pair of marginal bristles and several bristly hairs along lateral margins, sternite 3 with some yellow hairs anteriorly. Hypopygium normal in size, testaceous, as shown in Fig. 3.

Female. Head: Eyes bare, separated at vertex by a distance equal to 0.31 of head width; frontal stripe yellowish anteriorly, fuscous black posteriorly, broad, parallel-sided, 5 times width of one of parafrontalia just in front of anterior ocellus, without interfrontal hairs; parafrontalia fuscous black, subshining anteriorly and posteriorly, median portion with spot of silver dustings, provided

Fig. 3 *Sumatria chiekoae* sp. nov., male hypopygium.

a, epandrium, cercus and parolobus, lateral view; b, cerci and parolobi, caudal view; c, aedeagus, lateral view; d, aedeagus, posterior view; e, anterior and posterior parameres, lateral view.

with ca 9 pairs of *ori*; *ors* 0+1 as preverticals; *oc* developed; *acoc* absent; *pooc* not developed; *ov* and *iv* well developed; *poc* parallel; *occ* 0.

Thorax: *dc* 2+5, presutural 2 and anterior 3-4 pairs of postsutural *dc* fine; *ia* 1+2, presutural and anterior 1 pair of post-

sutural *ia* fine; *h* 2; *ph* 2 including internal *ph*; *prs* 1.

Wings: Similar to that of ♂.

Legs: Fore coxa, hind coxa and posterior surface of base of hind femur with yellow hairs; fore tibia with 1 *ad* and 1 *p*; mid tibia with 1 *ad*, 1 *pd*, 1 *p* and 1 *v*; hind tibia with

2 *ad*, 2 *pd* and 1 *av*.

Abdomen: Testaceous yellow except for disc fuscous black; marginal bristles on tergites 3–4 decumbent; tergite 5 with several lateral discal bristles; sternites 2–3 fuscous. Otherwise same as for ♂.

Length. 5.5 mm.

Holotype ♂. THAILAND: Doi Inthanon, top, 2,667 m, 23. IX. 1975, W. Tumrasvin.

Paratype. THAILAND: 1 ♀, Ban Yang, 1,400 m, Doi Inthanon, 23. X. 1975, H. Kurahashi.

Type depository. Holotype (♂) and paratype (♀) are deposited in National Science Museum, Tokyo.

Remarks. The specific name is dedicated to Miss Chieko Shudo, Department of Medical Entomology, National Institute of Health, Tokyo.

Bionomics. Unknown.

Distribution. Thailand.

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摘 要

タイ国産のツマグロキンバエ亜科の3新種
(双翅目: クロバエ科)

1975年に行われた南アジア太平洋地域における衛生上重要な双翅類昆虫の動物地理学的研究(文部省海外学術調査)の際タイ国で採集された標本を検査した結果、ツマグロキンバエ亜科の3新種が見出されたので、ここに *Stomorphina siamensis* sp. nov. サイアムツマグロキンバエ(新称), *Borbororhinia laojanae* sp. nov. ラオジャナツマグロキンバエ(新称), *Sumatria chiekoae* sp. nov. チエコツマグロキンバエ(新称)として記載し、雄外部生殖器の特徴を図示した。いずれも検索表にとり上げた外部形態の特徴により、近縁種 *Stomorphina discolor* (Fabricius), *Borbororhinia bivittata* (Walker), *Sumatria flava* (Villeneuve), *S. vittata* Peris から区別される。