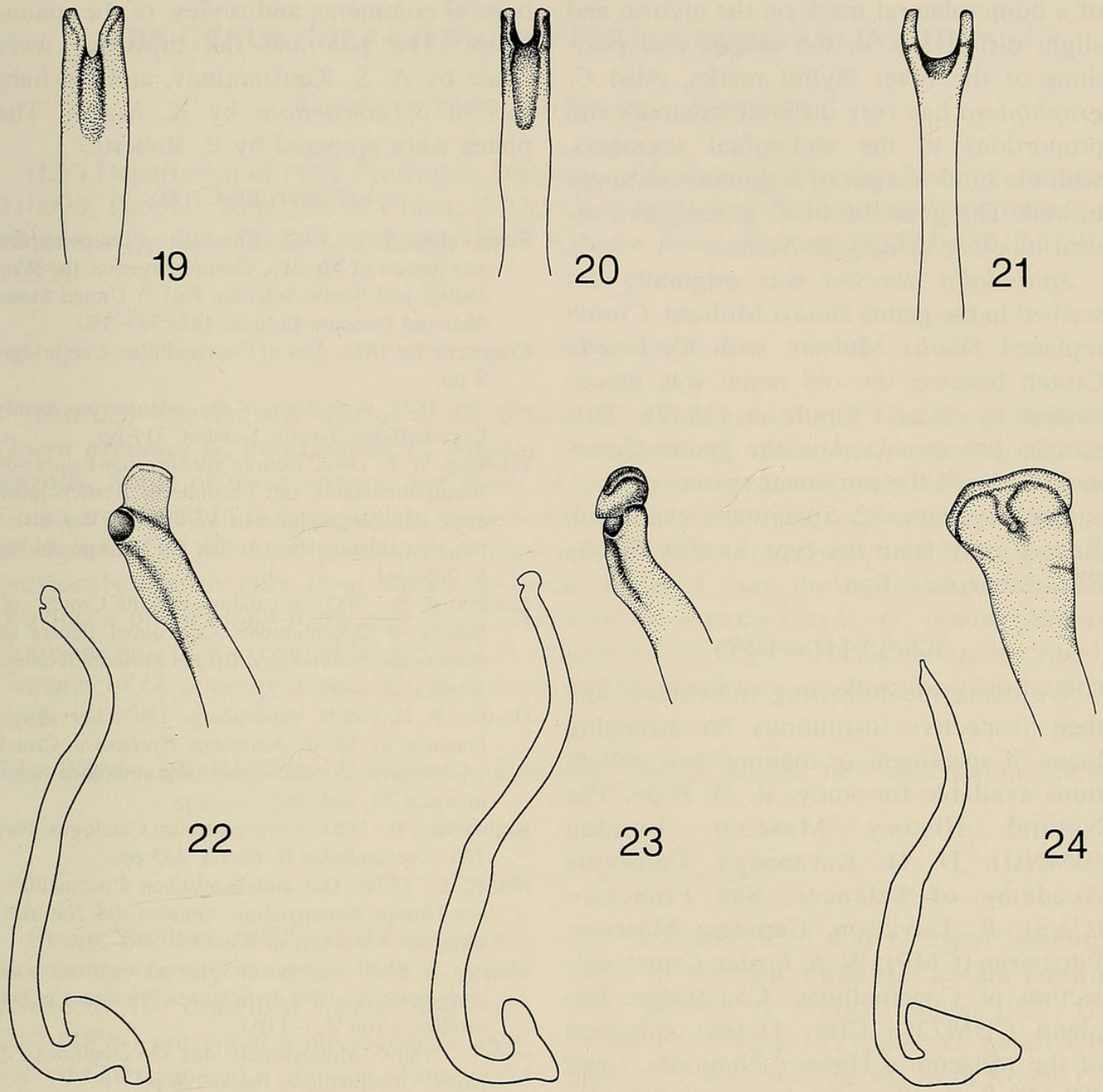

Figs. 19–24. Male genitalia. 19–21, Basal lobe. 19, *Spilindolla vigintiduonotata.* 20, *S. constellata.* 21, *S. darestei.* 22–24, Lateral view of whole sipho (below) and detail of apex (above) (note: detail of apex rotated 90 degrees in Fig. 24 to provide homologous view). 22, *S. vigintiduonotata.* 23, *S. constellata.* 24, *S. darestei.*

pronotal hypomeron and elytral epipleuron same color as dorsal surface; fovea of elytral epipleuron marked with a brown spot. Genitalia as in Figs. 21, 24.

Female.—Same as male except for sexual characters. Genitalia not examined.

Type material.—LECTOTYPE (Gordon 1987) (CUMZ): male "type [blue label]/Darestei Ega Bates [green label]/type Darestei Backw"; PARALECTOTYPE (Gordon 1987) (CUMZ) "Darestei Ega Backw."

Variation.—Length 4.3 to 4.8 mm, width 4.2 to 4.8 mm. Ground color of dorsal surface yellow ivory to light yellowish brown. Dorsal marks at middle of elytron sometimes confluent.

Remarks.—*Spilindolla darestei* can be easily distinguished from its two congeners on the basis of the dorsal color pattern (Fig. 3) and male genitalia (Figs. 21, 24). *Cycloneda graphiptera* (Mulsant) has a dorsal color pattern which is similar to *S. darestei,* but it can be distinguished by the absence

of a humerolateral mark on the elytron and slight differences in the shapes and positions of the other elytral marks. Also *C. graphiptera* has very different contours and proportions to the abdominal segments, with the hind margin of segment 4 strongly bowed. The genitalia of *C. graphiptera* reveal its close affinity to *Neda.*

Spilindolla darestei was originally described in the genus *Daulis* Mulsant. Crotch replaced *Daulis* Mulsant with *Cycloneda* Crotch because the old name was preoccupied by *Daulis* Erichson (1842). This species has remained in the genus *Cycloneda* up until the present revision.

Locality data.—2 Specimens examined. Known only from the type locality. BRASIL: Amazonas: Ega.

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THE GENUS *GOERA* (TRICHOPTERA: GOERIDAE) IN CHINA

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Abstract.—Seven new species of the genus *Goera* Stephens from China are described: ***Goera arcuata, G. bicuspidata, G. morsei, G. ramosa, G. redacta, G. spinosa,*** and ***G. spiralis.*** Some of these species and some of the eleven species already described from China are placed in two previously defined and one newly defined species group. Possible relationships of the unassigned species are suggested. *Goera interrogationis* Botoşăneanu, previously known only from Korea, is herein reported from the northeastern Chinese provinces of Hei-long-jiang and Ji-lin. Males of *G. armata* Navás, *G. interrogationis* Botoşăneanu, *G. martynowi* Ulmer, and *G. altofissura* Hwang (= Huang) are redescribed. Females of *G. interrogationis, G. martynowi,* and *G. altofissura* are described for the first time.

Key Words: Caddisflies, Trichoptera, Goeridae, *Goera,* China, new descriptions, new species groups

Goera Stephens (1829) is the largest genus in the family Goeridae and is represented by 107 described species. Recently, Gall (1994) presented a phylogenetic analysis of Goeridae and a revision of the world genera. *Goera* has essentially a Laurasian distribution (Gall 1994), with the greatest diversity in the Oriental region (Malicky and Chantaramongkol 1992). Schmid (1991) described 21 new species from India, Malicky and Chantaramongkol (1992) described 15 new species from southeast Asia, including 10 from Thailand.

Eleven species were previously described from mainland China: *Goera altofissura* Hwang (= Huang), 1957; *G. armata* Navas, 1933; *G. clavifera* Schmid, 1965; *G. crassata* Schmid, 1965; *G. digitata* Martynov, 1931; *G. fissa* Ulmer, 1926; *G. foliacea* Schmid, 1965; *G. latispina* Schmid, 1965; *G. martynowi* Ulmer, 1932; *G. quadripunctata* Schmid, 1959; and *G. tecta* Schmid, 1965. In addition, three species are known from Taiwan: *G. minuta* Ulmer, 1927; *G. prominens* Ulmer, 1911; and, *G. tenuis* Ulmer, 1927; and, two species from Korea: *G. interrogationis* Botoşăneanu, 1970 and *G. japonica* Banks, 1906.

Seven unknown species were identified from specimens collected in China during 1990 and 1991. These bring the total number of known species in the genus to 114. To date, only two species groups, *Goera raghu* Group (Schmid 1991) and *G. minor* Group (Malicky and Chantaramongkol 1992) have been defined. In the process of placing these new species within the genus, one new species group is proposed. The group relationships of some of the remaining species are suggested. A complete examination of the genus worldwide, including a phylogenetic analysis, is planned

for the near future by B. Armitage (Ohio Biological Survey) and W. Gall (Buffalo Museum of Science).

Male genitalia in the genus *Goera* exhibit diversity in the presence and absence of various associated structures, in their development, and in their elaboration. Segment IX exhibits a range of forms including upright and continuous from dorsum to venter, reclined and continuous, or reclined with the subventral portion absent. Tergum X generally bears median dorsal and ventrolateral processes. These latter were described by Schmid (1983) as belonging to tergum IX. The median dorsal processes can be absent or represented by a simple elongate lobe with a rounded apex. There is generally a pair of ventrolateral processes. These processes are represented by a similar range of variability, including multiple branching. When the median dorsal processes is absent, the ventrolateral processes assume a more dorsal position. The preanal appendages are the least variable genitalic structure, typically represented by elongate, cylindrical lobes with rounded apices. The inferior appendages demonstrate the most variability. The distal segment is reduced, often fused with the basal segment, and usually produced into a dorsal lobe of varying length, directed posteriad. An inner, mesal process of the distal segment is usually present, but not always directly associated. The reduction in the distal segment has resulted in this inner process often being located at the junction of the basal and distal segments. There is much variation among species in the length and shape of either portion of the distal segment. The basal segment is large and bears one or two processes of varying length. In species in which the subventral portion of segment IX is reduced or missing, the basal segment of the inferior appendage is comparatively larger, occupying the space normally filled by segment IX. Parameres are usually absent. The aedeagus is either simple and tubular, or bears membranous portions of varying complexities.

Types of new species and redescribed species are deposited in the collections of Nanjing Agricultural University, P.R. China (NAU, not specifically indicated in the text), or partly in NAU and partly in the Clemson University Arthropod Collection (CUAC).

Goera raghu Group, Schmid 1991

Characters used to establish this Group include the absence of the subventral portion of abdominal segment IX and the articulation of the inferior appendage's distal segment. In this Group, the basal segment of the inferior appendage is usually enlarged and upright, occupying the position normally assumed by sternum IX's subventral portion. Abdominal sternum VI bears one fingerlike process. *Goera clavifera* Schmid from China is a member of this Group. The following new species is proposed for inclusion in this species Group.

Goera bicuspidata Yang and Armitage, New Species

(Figs. 1A–1E)

Description.—Body yellowish brown, forewing testaceous with hairs concolorous, male antennal scape 3 to 3.5 times as long as wide; distal segment of maxillary palp oval, 2 times as long as wide, each with inner lobe covered with dark brown scales; sternite VI bearing one fingerlike process, 3.5 times as long as wide.

Male genitalia (Fig. 1).—Dorsum IX broad in lateral view, and with subventral portion missing. Preanal appendages slender and clavate, with apical taper. Dorsal process of tergum X present, represented by single, slightly clavate lobe. Lower, paired processes of tergum X simple and terete, not sclerotized. Basal segment of each inferior appendage much enlarged, bearing elongate, dorsal spinelike process, and shorter ventral process with apex pointed slightly mesad. Distal segment of inferior appendage completely fused with basal segment, and consisting of elongate dorsal lobe with apex flattened apically as seen in dor-

sal and ventral view; and short, subtending point also pointing slightly mesad. Phallus a simple tube, laterally compressed near apex, with no parameres. Phallic apodeme forming acute angle anteriorly.

Length of forewing.—Male 5–5.2 mm.

Immature stages and female.—Unknown.

Holotype male.—Yunnan Province. Wen-shan-xian, 5 km N of Wen-shan, Sanjiao-tang, 9 July 1990, 1300 m elev., Li Youwen and Ke Xin. Paratype: 15 males (NAU); 5 males (CAUC).

Etymology.—Latin, "two points", with reference to the shape of the inferior appendages viewed ventrally.

Diagnosis.—This species is similar to several species within the *Goera raghu* Group in having inferior appendages each with two distinctive acute processes in ventral view, but differs: (1) in segment IX roughly forming an equilateral triangle in lateral view; (2) in the dorsal process of each inferior appendage with apex flattened apically; and, (3) in the basal segment of each inferior appendage oriented vertically, heightened, about one third as wide as high.

Distribution.—Known only from the type locality in southwestern China.

Unnamed Species Grouping No. 1

A second group of species within the Chinese fauna, similar to the *Goera raghu* Group, is suggested, but awaits a more complete examination of the world *Goera* fauna. This group, like the *G. raghu* Group, lacks the subventral portion of abdominal segment IX and has an enlarged basal segment of each inferior appendage, which occupies the position normally assumed by the subventral portion of sternum IX. In contrast, the long, dorsal, spinelike distal process on the inferior appendage is absent. Sternum VI bears one fingerlike process. Current species from China which exhibit these character states include *G. quadripunctata* Schmid and *G. foliacea* Schmid. The following new species appears related to these species.

Goera spiralis Yang and Armitage, New Species

(Figs. 2A–2E)

Description.—Specimen rather denuded in alcohol, maxillary palpi broken. Body yellowish brown, forewings with trace of yellowish brown hairs. Sternite VI bearing one, very short process, 1.5 times as long as wide.

Male genitalia (Fig. 2).—Dorsum IX reduced in size compared to other species, wider than tall in lateral view, and with subventral portion missing; ventrum IX represented by small triangular patch in ventral view. Preanal appendages slender and clavate. Dorsal process of tergum X present, represented by single, slightly clavate lobe; lower, paired processes of tergum X simple and terete, not highly sclerotized. Basal segment of each inferior appendage much enlarged and semispherical in lateral view; dorsal spinelike process of *G. raghu* Group absent. Distal segment of each inferior appendage consisting of arcuate dorsal process directed ventrolaterad apically and shorter ventral process twisted in relation to former process in ventral view. Phallus simple tube, with no parameres. Phallic apodeme quadrate.

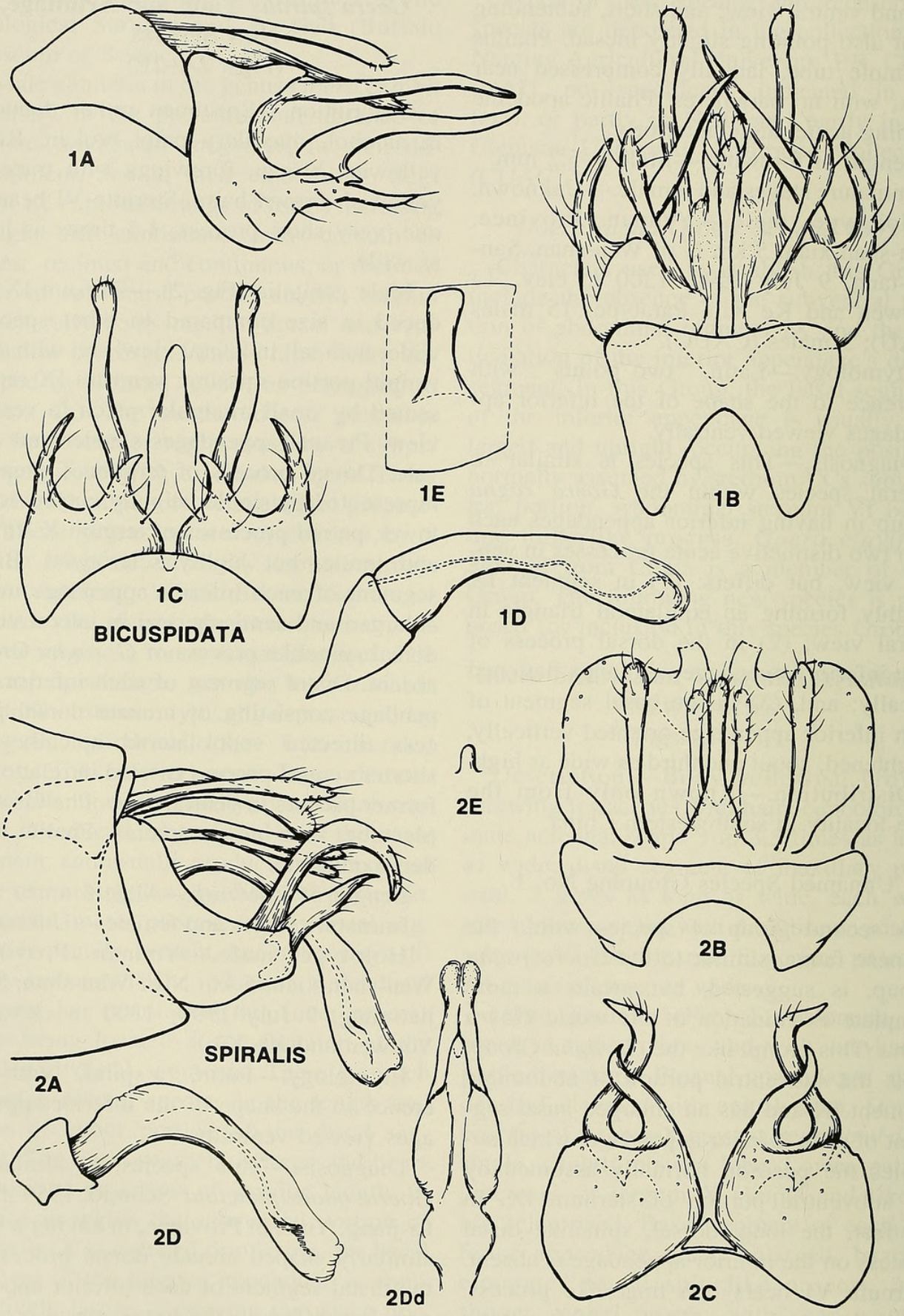
Length of forewing.—Male 5 mm.

Immature stages and female.—Unknown.

Holotype male.—Yunnan Province. Wen-shan-xian, 5 km N of Wen-shan, Sanjiao-tang, 9 July 1990, 1300 m elev., Li Youwen and Ke Xin.

Etymology.—Latin, "a spiral," with reference to the shape of the inferior appendages viewed ventrally.

Diagnosis.—This species is similar to *Goera quadripunctata* Schmid 1959 from Li-jiang, Yunnan Province, in having a very similarly shaped arcuate dorsal process of the distal segment of each inferior appendage, but differs in the lower mesal process of the appendage's distal segment which in this new species is much developed and twisted in relation to the dorsal process in ventral view.



Figs. 1–2. 1, *Goera bicuspidata.* Male genitalia: A, left lateral view; B, dorsal view; C, ventral view; D, phallus, left lateral view. Sternite VI: E, ventral view. 2, *G. spiralis.* Male genitalia: A, left lateral view; B, dorsal view; C, phallus, left lateral view; Dd, phallus dorsal view. Sternite VI: E, ventral view.

Distribution.—Known only from the type locality in southwestern China.

Goera minor Group, Malicky and Chantaramongkol 1992

The *Goera minor* Group is defined by the absence of subventral sternum IX and by the long, arcuate process arising from the distal segment of each inferior appendage. Sternite VI bears a single, tonguelike process. No previously described species from China belongs to this group. However, the following new species collected during this study is proposed for inclusion.

Goera arcuata Yang and Armitage, New Species

(Figs. 3A–3E, 18A–18C)

Description.—Body yellow brown. Basal two segments of male maxillary palp dark brown, distal segment elongate oval, with golden yellow hairs; on latter's inner surface, apparent narrow aperture present, possibly to internal sac of non-pigmented scales. Forewings faded in alcohol, sparsely covered with yellowish brown hairs. Sternite VI bearing one finger-like process, 2.5 to 3 times as long as wide.

Male genitalia (Fig. 3).—Dorsum IX appearing as subequilateral triangle in lateral view; subventral portion of abdominal segment IX absent; and, ventral portion of abdominal segment IX present as a broad, subtriangular plate in ventral view. Dorsal process of tergum X clavate, about as long as preanal appendages; ventrolateral processes of abdominal segment X closely appressed to each other, 1.3 times as long as dorsal process. Basal segment of each inferior appendage subrectangular, bearing long, curved, heavily sclerotized spine dorsally; distal segment completely fused with basal segment and represented by an arcuate mesodorsal process with an inflated apex, curved posteroventrad in lateral view, sinuate in dorsal and ventral view. Phallus tube-like; phalicata not distinct.

Female genitalia (Fig. 18).—Preanal appendages fused with tergum X, slightly divergent in dorsal or ventral view; in lateral view, subparallel-sided dorsoventrally, three times as long as high. Lamellae subtruncate with lower lateral portion extremely convex in lateral view, each with apicomesal point slightly produced in ventral view. Gonopod plate broad, subrectangular, 2.5 times as wide as long in ventral view, with median apicomesal lobe two-fifths as long as base. Spermathecal plate generally anchor-shaped, roughly 2.2 times as long as wide.

Length of forewing.—Male, 4 mm; female, 5 mm.

Immature stages.—Unknown.

Holotype male.—Yunnan Province, He-kou-xian, stream 5 km N of Nan-xi-he-zhen, 20 July 1990, 300 m elev., Li You-wen.

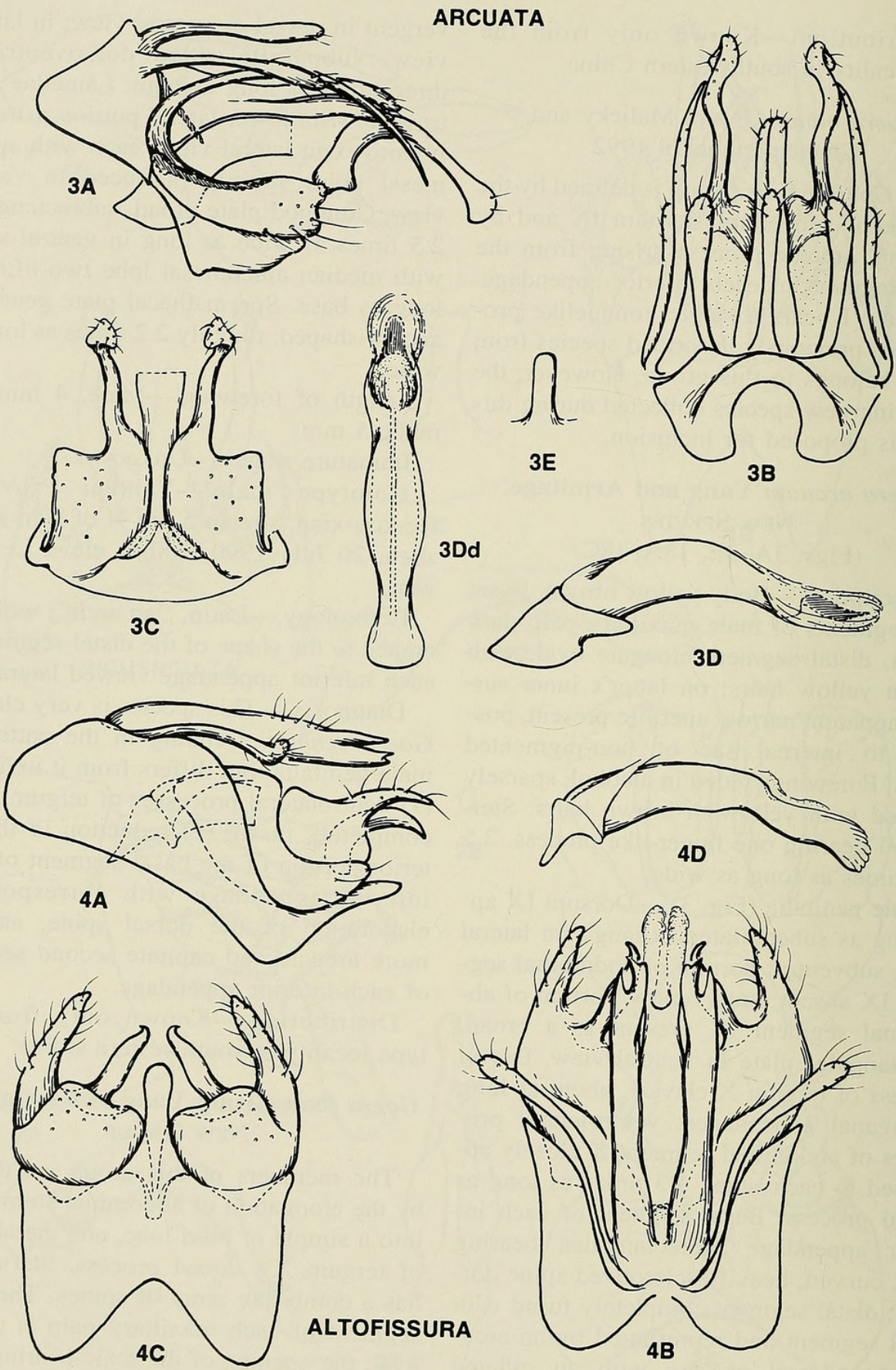
Etymology.—Latin, "an arch"; with reference to the shape of the distal segment of each inferior appendage viewed laterally.

Diagnosis.—This species is very close to *Goera schmidi* Denning in the pattern of male genitalia, but differs from it in having (1) ventrolateral processes of tergum X not completely fused, (2) reduction in the anterior portion of the basal segment of each inferior appendage with corresponding elaboration of the dorsal spine, and (3) more arcuate and capitate second segment of each inferior appendage.

Distribution.—Known only from the type locality in southwestern China.

Goera fissa Group Yang and Armitage, New Group

The members of this group are defined by the elongation of abdominal sternum IX into a simple or bifid lobe, and the absence of tergum X's dorsal process. Sternite VI has a comb-like array of spines. The distal segment of each maxillary palp is usually oval; the opening of the scale-bearing inner lobe appears as a short, longitudinal, narrow aperture bearing pigmented, closely appressed scale-like setae, sometimes arranged as one or two stripes. Current species from China which fall into this group



Figs. 3–4. 3, *Goera arcuata.* Male genitalia: A, left lateral view; B, dorsal view; C, ventral view; D, phallus left lateral view. Sternite VI: E, ventral view. 4, *G. altofissura.* Male genitalia: A, left lateral view; B, dorsal view; C, ventral view, D, phallus, left lateral view.

include *Goera altofissura* Hwang (= Huang), *G. fissa* Ulmer, *G. latispina* Schmid, and *G. martynowi* Ulmer. A previously described Korean species recorded here for the first time from China, *G. interrogationis* Botoşăneanu, is also a member. Two new species are proposed for inclusion, *Goera ramosa* and *G. redacta.*

Goera altofissura Hwang 1957
(Figs. 4A–4D, 12A–12C)

Goera altofissura Hwang, 1957: 397–398, figs. 112–117; holotype male; type locality = Fujan Province, P.R. China; type depository = P.R. China?, unknown

Goera altofissura was collected from seven localities in four provinces. Males and females were taken at six of the sites. Distal segment of male maxillary palp oval, 2 times as long as wide, its outer surface covered with golden hairs, inner surface bare; opening of scale-bearing inner lobe appearing as short, longitudinal, narrow aperture, bearing darkly pigmented, closely appressed scale-like setae as two dark stripes. Male genitalia have been redrawn (Fig. 4). Sternite IX produced into finger-like process rounded at apex, not quite one half as long as main portion of segment IX. Ventrolateral branches of tergum X sclerotized, stout and straight, each with shallow, apical bifurcations. Preanal appendages divergent, apical portion of each preanal appendage blunt and bent dorsad. Dorsal and mesal processes of each inferior appendage's second segment arcuate, pointed in lateral view, and with mesal process pointed slightly laterad in ventral view.

Female genitalia (Fig. 12).—Preanal appendages fused with tergum X, finger-like, 3 to 3.5 times as long as wide each with rounded apex in lateral view. Lamellae each with distinctive constriction around its middle surface such that each seems to be divided into two lobes in lateral view. Gonopod plate subquadrate with apicomesal lobe broad, about 4 times as wide as its length in ventral view. Spermathecal sclerite simple and viola-shaped in ventral view, constricted at basal one third distance.

Length of forewing.—Male, 8.5 to 9 mm; female, 10 mm.

Immature stages.—Unknown.

Material examined.—Anhui Province. 2 males and 2 females, Dong-zhi-xian, Feng-shui-cun, Qiou-pu-qiao-he, 11 km SE of Dong-zhi, 7 June 1990, 30 m elev., J. C. Morse, Yang Lianfang, and Sun Changhai (CUAC); 1 male, Jiuhua Mt., 5 June 1989, Sun Changhai; 2 males and 2 females, Xi-xian, Yang-jia-tan, Feng-yuan-shui, 24 May 1990, 215 m elev., J. C. Morse and Sun Changhai; 2 males and 3 females, Xi-xian, Shang-feng, 23 June 1991, Sun Changhai and Zhao Lixin. Zhejiang Province. 1 male, 26 June 1986, Yang and Hu. Jiangxi Province. 2 males and 1 female, Yu-shan-xian, San-qing-shan, Shuang-xi-he, 80 km S of Yu-shan, 27–28 May 1990, J.C. Morse and Sun Changhai. Hubei Province. 8 males and 1 female, Ma-cheng-xian, 15 km NE of Ma-cheng, Zheng-shui-he, 1 km S of Gui-shan Tea Farm, 13 July 1990, J. C. Morse and Wang Shida.

Distribution.—Previously known from Fujan Province in southeastern China; now known from six other localities in southeastern China.

***Goera ramosa* Yang and Armitage, New Species**
(Figs. 5A–5E, 13A–13C)

Description.—Body brown, covered with brown to dark brown hairs. Distal segment of male maxillary palp shaped similar to that of *Goera altofissura,* but inner lobe opening appears only as one dark scale-bearing stripe. Sternite VI bearing comb-like array of spines with middle spine sturdy.

Male genitalia (Fig. 5).—Dorsum IX long in lateral view, with apicomesal process of sternum IX developed into single rounded lobe at least two-thirds as long as main body of segment IX. Preanal appendages slender and clavate. Dorsal process of tergum X absent; ventrolateral processes

highly sclerotized and branched, each process with inner branch bifurcate and with outer branch slightly shorter than inner branch. Basal segment of each inferior appendage about three times as long as tall. Distal segment of each inferior appendage well developed compared to most species, with broad basal portion clearly separated from basal segment, with dorsal portion developed into elongate, flattened lobe, and with separate, mesal sclerotized arm with apex acute and hooked laterad. Phallus simple tube with no parameres. Phallic apodeme forming acute angle anteriorly.

Female genitalia (Fig. 13).—Preanal appendages fused with tergum X, elongate in lateral view, at least 5 times as long as wide. Lamellae distinctively bilobed in both lateral and ventral views. Gonopod plate about 1.5 times as broad as long, apicomesal process 2.5 times as wide as long in ventral view. Spermothecal sclerite simple, with anterior portion broadly rounded.

Length of forewing.—Male, 9.5–10 mm; female, 10–10.5 mm.

Immature stages.—Unknown.

Holotype male.—Sichuan Province. Qing-sheng-shan, 32 km SW of Guan-xian, Wei-jiang-he, 730 m elev., 20 June 1990, J. C. Morse, Yang Lianfang, and Chen Xiaoen. Paratypes, 5 males and 5 females (NAU), 2 males and 1 female (CUAC), same data as holotype; 8 males and 7 females, Du-jiang-yan, 6 km W of Guan-xian, Bai-shui-he, 780 m elev., 18 June 1990, Yang Lianfang and Chen Xiaoen.

Etymology.—Latin, "full of branches", with reference to the branching processes of male tergum X.

Diagnosis.—This species, *Goera altofissura* Hwang (= Huang) and *G. redacta* sp. n. are very closely related in sharing the following homologue: a notched inner apical projection of each lower lateral process of tergum X; the notch is very weak in *G. altofissura,* but very distinctive in this species and *G. redacta.* In male genitalia, *G. ramosa* differs from *G. altofissura* in having deep branching of each lower lateral process of tergum X and from *G. redacta* by the greater length of its lateral branch. The ventral process of sternum IX is broader than that of *G. redacta.* Finally, the interior, mesal process of the inferior appendage's distal segment in ventral view has an acute apex which is hooked laterad. In female genitalia, *G. ramosa* differs from *G. altofissura* in the transversely broad gonopod plate with a relatively smaller apicomesal process and in the spermathecal sclerite without constriction near its base; it differs from *G. redacta* in having elongate lateral lobes on tergum X; and it differs from both of these related species by its conspicuous bilobed lamellae.

Distribution.—Known only from type series in southwestern China.

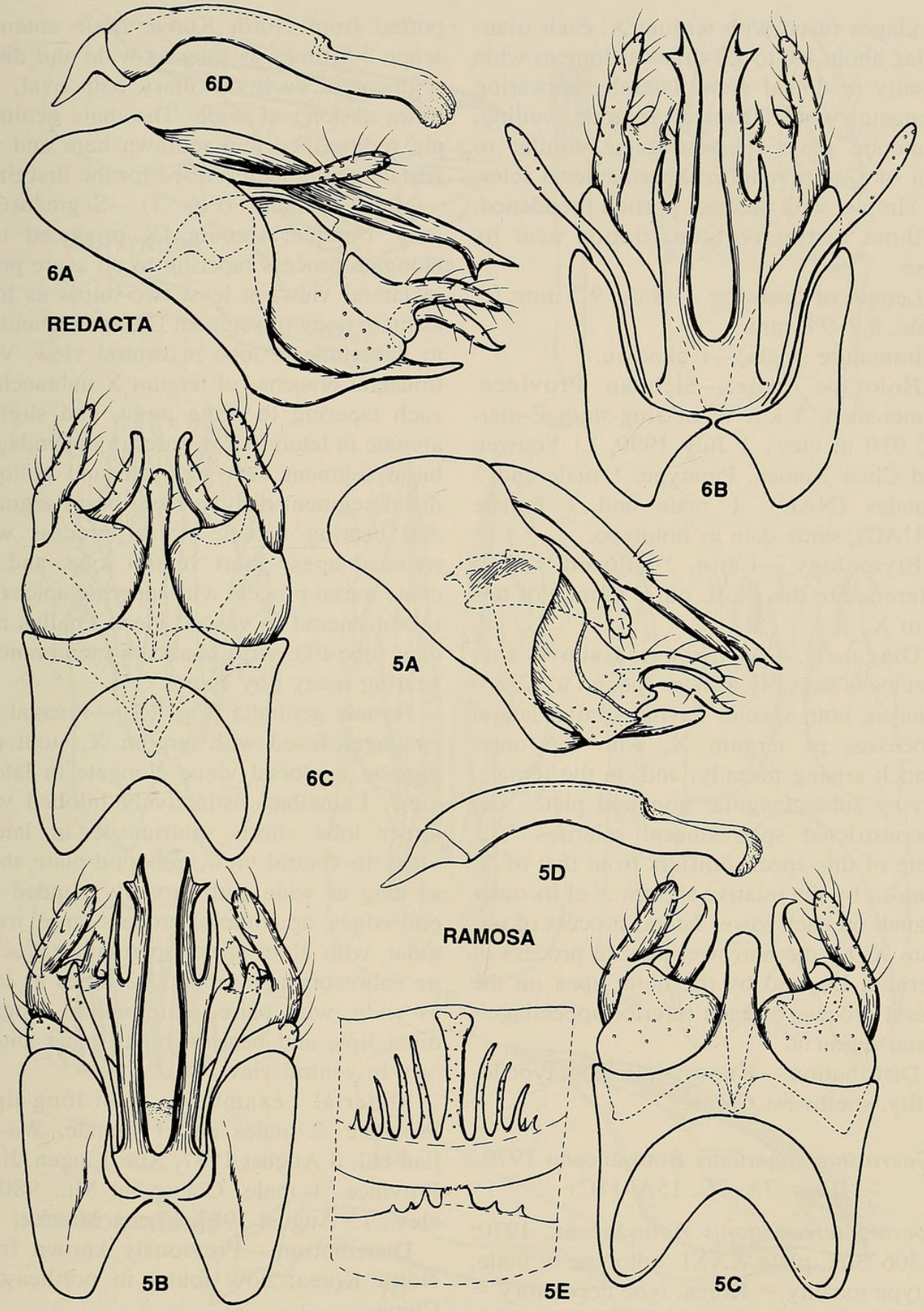
Goera redacta Yang and Armitage, New Species

(Figs. 6A–6E, 14A–14C)

Description.—Body brown, forewings covered with golden brown hairs. Maxillary palps similar in structure and appearance to those of *Goera ramosa.* Sternite VI bearing comb-like array of spines with middle spine sturdy.

Male genitalia (Fig. 6).—Dorsum IX, apicomesal process of sternum IX, and preanal appendages similar to those of *Goera ramosa.* Dorsal process of tergum X absent; ventrolateral, paired processes of tergum X highly sclerotized and branched; each with inner branch deeply notched at apex, forming two acute apical spines; outer branch much shorter than inner branch, and arising from midpoint of process. Basal segment of each inferior appendage one half as long as high. Distal segment of each inferior appendage similar to that of *G. ramosa,* with broad basal portion clearly separated from basal segment and developed dorsally into an elongate, flattened lobe, interior, mesal sclerotized arm with apex acute and hooked dorsad. Phallus simple tube with no parameres. Phallic apodeme forming acute angle anteriorly.

Female genitalia (Fig. 14).—Preanal ap-



Figs. 5–6. 5, *Goera ramosa.* Male genitalia: A, left lateral view; B, dorsal view; C, ventral view; D, phallus, left lateral view. Sternite VI: E, ventral view. 6, *G. redacta.* Male genitalia: A, left lateral view; B, dorsal view; C, ventral view, D, phallus, left lateral view.

pendages fused with tergum X, each triangular, about 1.6 to 1.7 times as long as wide basally in dorsal view; laterally appearing elongate, with subapical ventral swelling. Gonopod plate subrectangular, similar to that of *Goera ramosa.* Spermathecal sclerite simple, with anterior portion broadened, without distinctive constriction near its base.

Length of forewing.—Male, 9.7 mm; female, 8.8–9.8 mm.

Immature stages.—Unknown.

Holotype male.—Sichuan Province. E-mei-shan, 3 km W of Jing-shui, E-mei-he, 910 m elev., 1 July 1990, Li Youwen and Chen Xiaoen. Paratype, 1 male and 3 females (NAU), 1 male and 1 female (CUAC), same data as holotype.

Etymology.—Latin, "reduced", with reference to the short, outer branch of tergum X.

Diagnosis.—As discussed above, this species is possibly a sister species to *Goera ramosa,* both species having similar lateral processes of tergum X, with the outer branch arising mesally; and, in the female, having subrectangular gonopod plates and unconstricted spermathecal sclerites. The male of this species differs from that of *G. ramosa* by the relative shortness of its outer branch on each lower lateral process of tergum X, by the narrower ventral process of sternum IX, and by the blunt apex on the mesal process of each inferior appendage's distal segment.

Distribution.—Known only from type locality, southwest China.

Goera interrogationis Botoşăneanu 1970 (Figs. 7A–7E, 15A–15C)

Goera interrogationis Botoşăneanu, 1970: 306–307, plate XXXI; holotype = male; type locality = Korea; type depository = Zoological Institute of the Polish Academy of Sciences (Warsaw).

Goera interrogationis was collected from two localities in two northeastern Chinese provinces. Previously it had only been reported from North Korea. Male antennal scape 3.5 times as long as wide and distal segment of each maxillary palp oval, 1.7 times as long as wide. The male genitalia are redescribed and redrawn here and the female genitalia described for the first time.

Male genitalia (Fig. 7).—Segment IX long, oblique; sternite IX produced into elongate process tapering to an acute point in lateral view, at least two-thirds as long as main body of segment IX, and expanding to flat, truncate lobe in ventral view. Ventrolateral branches of tergum X unbranched, each tapering to acute point, and slightly arcuate in lateral view. Inferior appendage's basal segment very elongate and oblique; distal segment distinct from basal segment and bearing arcuate dorsal process with rounded apex, short ventral lobe, and arcuate mesal process with tapering apices directed laterad in ventral view. Phallus regular, tube-like with phalicata membranous, bearing many tiny spines.

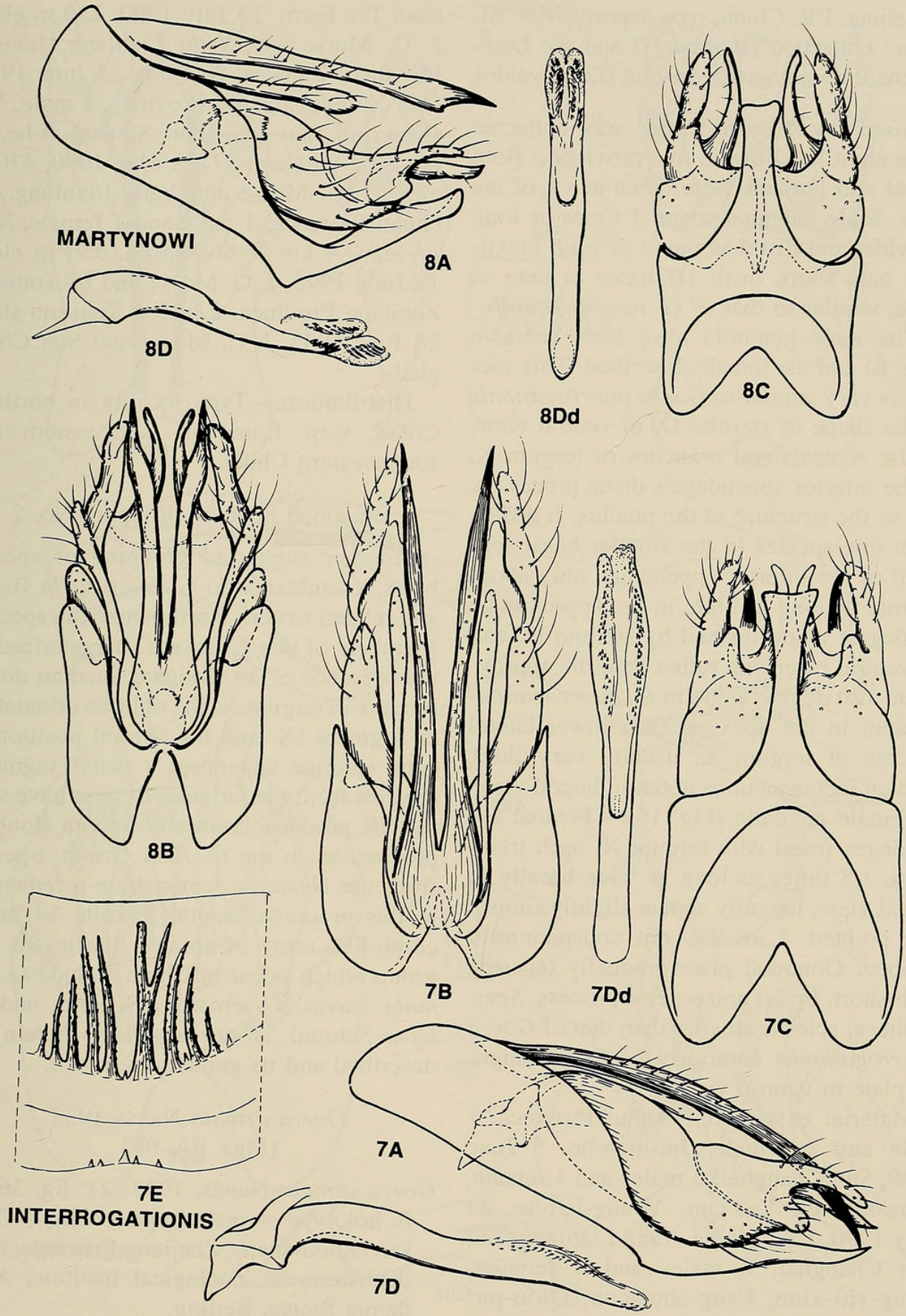
Female genitalia (Fig. 15).—Preanal appendages fused with tergum X, stout and digitate in dorsal view, elongate in lateral view. Lamellae distinctively bilobed with upper lobe short, subtruncate in lateral view. In ventral view, gonopod plate about as long as wide with broadly rounded lateral edges; apicomesal process large, triangular, with blunt apex. Spermathecal sclerite subrectangular, about 2.2 times as long as wide, with paired anteromesal longitudinal lips, and bearing broad plate anteriorly in ventral view.

Material examined.—Hei-long-jiang Province. 2 males and 1 female, Wu-da-lian-chi, 8 August 1987, Xue Yingen. Ji-lin Province. 1 male, Chang-bai Mt., 980 m elev., 15 August 1983, Zhang Manfu.

Distribution.—Previously known from North Korea; now found in northeastern China.

Goera martynowi Ulmer 1932 (Figs. 8A–8E, 16A–16C)

Goera martynowi Ulmer, 1932: 69–70, figs. 44–45; holotype = male; type locality =



Figs. 7–8. 7, *Goera interrogationis*. Male genitalia: A, left lateral view; B, dorsal view; C, ventral view; D, phallus, left lateral view. Dd, phallus, dorsal view. Sternite VI: E, ventral view. 8, *G. martynowi*. Male genitalia: A, left lateral view; B, dorsal view; C, ventral view, D, phallus, left lateral view; Dd, phallus, dorsal view. Sternite VI: E, ventral view.

Beijing, P.R. China; type depository = Ulmer collection (Hamburg?) and the Deutsche Entomologische Institut (Eberswalde).

Goera martynowi Ulmer was collected from eight localities in five provinces. Both males and females were taken at six of the sites. Male antennal scape 4 times as long as wide, and distal segment of each maxillary palp short, oval, 1.7 times as long as wide, similar to that of *G. interrogationis.*

The male genitalia have been redrawn (Fig. 8) and the female described. This species is very similar to *Goera interrogationis* in the shape of sternite IX in ventral view, of the ventrolateral branches of tergum X, of the inferior appendage's distal processes, and of the structure of the phallus. It differs from this species in the smaller basal segment of the inferior appendage, only about 2 times as long as high; in the approximate 90 degree angle formed by sternite IX and its ventral extension rather than the approximate 120 degree angle in *G. interrogationis*; and, in the apex of each lower lateral process of tergum X, usually very thick with an inconspicuous notch in lateral view.

Female genitalia (Fig. 16).—Preanal appendages fused with tergum X, each triangular, 1.5 times as long as wide basally in dorsal view; laterally appear slightly sinuate and pointed. Lamellae not conspicuously bilobed. Gonopod plate gradually tapering with short, broad apicomesal process. Spermathecal sclerite smaller than that of *Goera interrogationis,* anteriorly bearing triangular plate in ventral view.

Material examined.—Anhui Province. 1 male and 1 female, Jiu-hjua-he, 5 June 1989, Sun Changhai; 3 males and 1 female, Lang-xi-xian, Yao-cun, Young-fen-he, 23 May 1990, J. C. Morse, Yang Lianfang, and Sun Changhai; 8 males and 4 females, Dong-zhi-xian, Feng-shui-cun, Qiou-pu-qiao-he, 11 km SE of Dong-zhi, 7 June 1990, 30 m elev., J. C. Morse and Yang Lianfang. Hubei Province. 1 male and 2 females, Ma-cheng-xian, 15 km NE of Ma-cheng, Zheng-shui-he, 1 km S of Guishan Tea Farm, 13 July 1990, 250 m elev., J. C. Morse and Yang Lianfang. Jiangsu Province. 2 males, Nanjing, 21 June 1989, Chu Xuping. Jiangxi Province. 1 male, Yu-shan-xian, San-qing-shan, Shuang-xi-he, 80 km S of Yu-shan, 27–28 May 1990, 470 m elev., J. C. Morse and Yang Lianfang. Sichuan Province. 1 male and 1 female, Xin-jin-xian, 4 km N of Xin-jin, 550 m elev., 18 June 1990, J. C. Morse and Li Youwen. Zhejiang Province. 2 males, Tian-mu-shan, 26 June 1985, J. C. Morse and Sun Changhai.

Distribution.—Type locality in northern China; now found in southeastern and southwestern China.

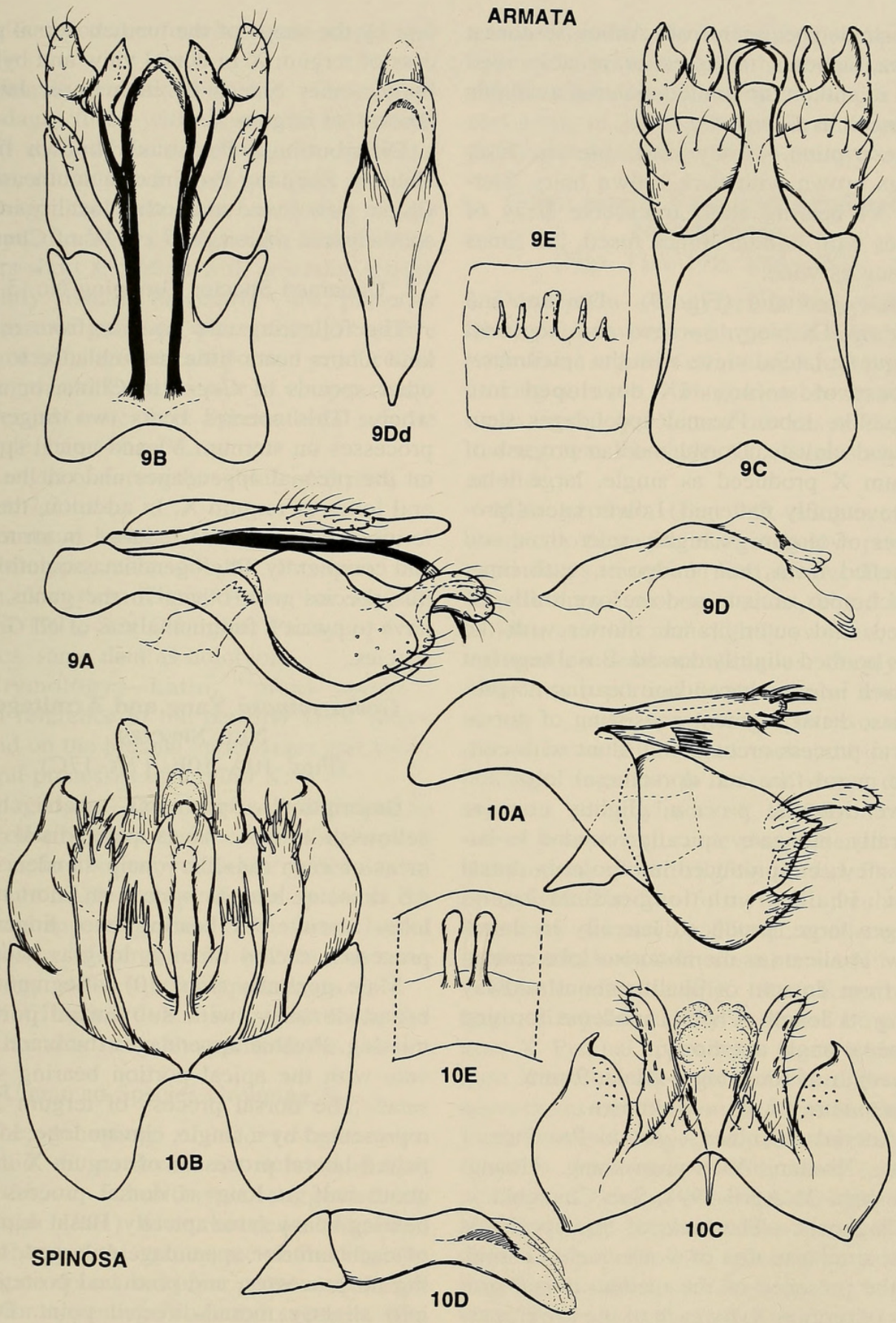
Unnamed Species Grouping No. 2

Another suggested grouping of species bears resemblance to *Goera fuscula* Banks and related eastern North American species. Members of this group are characterized by the presence of an elongate, median dorsal process in tergum X, the oblique orientation of segment IX, and the ventral position of each inferior appendage's distal segment. Species from the Oriental Region have sternite IX produced ventrally into an elongate process, as in the *G. fissa* Group. Species from the Nearctic demonstrate a reduction in this process's length. Sternite VI has a comb-like array of spines. Species in this group which occur in China include *G. armata* Navás, *G. crassata* Schmid, and *G. tecta* Schmid. *Goera armata* is herein redescribed and its genitalia redrawn.

Goera armata Navás 1933
(Figs. 9A–9E)

Goera armata Navás, 1933: 21, fig. 36: a, b. holotype = male, type locality—Chusan (Zhou-shan), Zhejiang Province; type depository = Zoological Institute, Academia Sinica, Beijing.

The senior author was able to see the type specimen, but was not allowed to clear the genitalia. Navás's figure for the male genitalia of this species was rather simple.



Figs. 9–10. 9, *Goera armata.* Male genitalia: A, left lateral view; B, dorsal view; C, ventral view; D, phallus, left lateral view. Dd, phallus, dorsal view. Sternite VI: E, ventral view. 10, *G. spinosa.* Male genitalia: A, left lateral view; B, dorsal view; C, ventral view, D, phallus, left lateral view. Sternite VI: E, ventral view.

Our single specimen from Anhui, southeast China, appears to agree reasonably well with it, and on the limited material available is placed as *G. armata.*

Description.—Body dark brown, forewings brown with dark brown hairs. Sternite VI bearing short transverse array of spines with middle spines fused, 2.5 times as long as wide.

Male genitalia (Fig. 9).—Dorsum and sternum IX very narrow and segment oblique in lateral view, with the apicomesal process of sternum IX developed into tonguelike lobe. Preanal appendages slender and clavate. Dorsal median process of tergum X produced as single, large lobe, dorsoventrally flattened. Lower lateral processes of tergum X highly sclerotized and branched from their midpoint, with inner branch apex arcuate and mesoventrally directed, and outer branch shorter with the apex pointed slightly dorsad. Basal segment of each inferior appendage bearing no processes; distal segment consisting of dorsolateral process arcuate and blunt with concave mesal face and dorsomesal lobe, and of ventromesal process, slightly concave laterally, elongate, apically rounded in lateral view, but produced into point in dorsal view. Phallus with longitudinal lateral flanges large, produced laterally in dorsal view. Phalicata as membranous lobe emerging from dorsum of phallus about midway along its length. Phallic apodeme forming an acute angle anteriorly.

Length of forewing.—Male, 9 mm.

Immature stages.—Unknown.

Material examined.—Anhui Province, 1 male, Xi-xian, Yian-yuan-xiang, Huangbuo-shan, 21 April 1991, Sun Changhai.

Diagnosis.—The male of this species is most similar to that of *Goera tecta* Schmid, by the presence of the median dorsal process of tergum X, by each of the lower mesal processes of tergum X branched from its midpoint, by the dorsal and mesal processes of each inferior appendage's distal segment, and by the phallus with its large dorsal flange expanded laterad. This species differs by the shape of the median dorsal process of tergum X in dorsal view and by the longer inner branch of each lower lateral process of tergum X.

Distribution.—Previously known from Chusan, Zhejiang Province in southeastern China; now found at another locality in the southeastern region, 375 km W of Chusan.

Unnamed Species Grouping No. 3

The following new species from mainland China bears little resemblance to any other species of *Goera* in China, or elsewhere. This species bears two fingerlike processes on sternum VI and apical spines on the preanal appendages and on the lateral lobes of tergum X. In addition, the inferior appendages are reduced in structure and complexity. Phylogenetic association of this species with others in the genus will have to await a future analysis of all *Goera* species.

Goera spinosa Yang and Armitage, New Species

(Figs. 10A–10E, 17A–17C)

Description.—Specimens teneral, body yellowish brown, wings pale, distal segment of each maxillary palp slender, 4 to 4.5 times as long as wide with short basal lobe. Sternite VI bearing two, fingerlike processes, each 4 times as long as wide.

Male genitalia (Fig. 10).—Segment IX broad dorsally, with subventral portion missing. Preanal appendages thick and clavate with the apical portion bearing stout setae. The dorsal process of tergum X is represented by a single, clavate lobe; lower, paired lateral processes of tergum X thick, about half as long as dorsal process and bearing heavy setae apically. Basal segment of each inferior appendage enlarged, bearing no processes, and produced posteriorly into slightly mesad-directed point. Distal segment of each inferior appendage consisting of mesal process bearing small spines on ventral surface and ventral, triangular lobe. Phallus short and tubular with membranous apex and with no parameres.

Phallic apodeme forming acute angle apically.

Female genitalia (Fig. 17).—Preanal appendages fused with tergum X and mostly with each other, subrectangular in lateral view, roughly 1.6 times as long as wide. Supragenital plate ovate, extending nearly to apical margin of tergum X. Lamellae appears short and blunt with posterior margin slightly sinuate. In ventral view, posterior margin of gonopod plate deeply concave submesally, apicomesal portion produced in triangular lobe with a pair of clasper receptacles just beneath it. Spermathecal sclerite simple, heart-shaped.

Length of forewing.—Male, 6.3 mm; female, 7.2 mm.

Immature stages.—Unknown.

Holotype male.—Anhui Province. Xixian, Yan-yuan-Xiang, Huang-bai Mt., 21 April 1991, Sun Changhai. Paratype, 4 females, same data as holotype.

Etymology.—Latin, "many spines," with reference to the peculiar thick spines found on the preanal appendages and lower lateral processes of tergum X.

Diagnosis.—This species is not close to any other species assigned to this genus. It differs in the two club-like processes of sternum VI, in the spiniferous apices of the preanal appendages and of the lower lateral processes of tergum X, and in the morphology of the inferior appendages.

Distribution.—Known only from the type locality in southeastern China.

Unnamed Species Grouping No. 4

The grouping of *Goera paramika* Schmid, *G. paramahansa* Schmid and *G. parabhava* Schmid was suggested by Schmid (1991) when he described them. Members of this group are defined by the elongate dorsal and inner processes of each inferior appendage's second segment. The ventrolateral paired processes of tergum X are each broad at the base, tapering to an acute apex. Sternite VI bears a single, tonguelike process. No previously described species from China belong to this group. However, the following new species appears to be related. We have deferred, as did Schmid, from formally creating a species group to include these taxa until a more thorough examination of the genus is made.

***Goera morsei* Yang and Armitage, New Species**
(Figs. 11A–11E, 19A–19C)

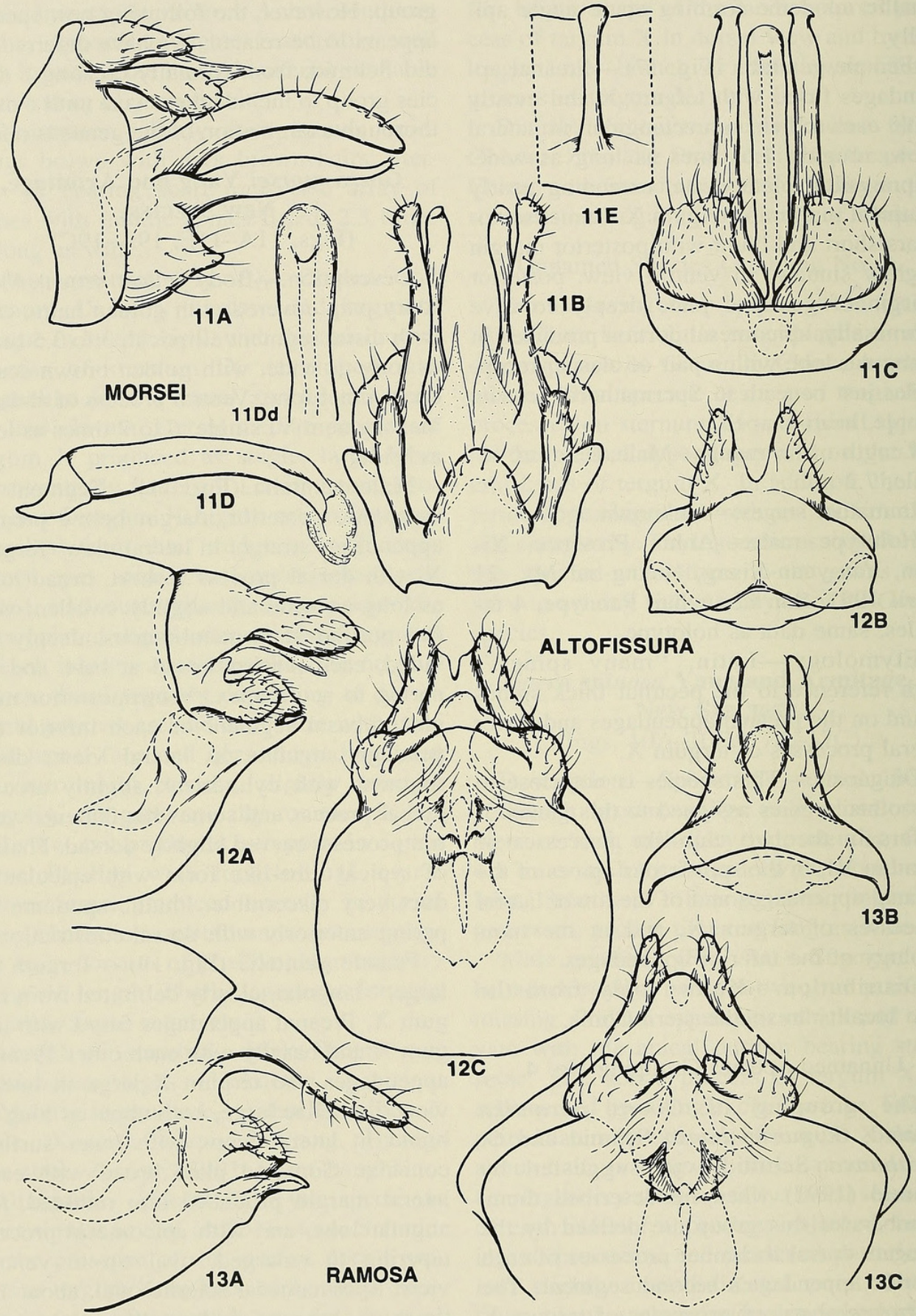
Description.—Body yellow brown. Maxillary palp covered with golden hairs; each with distal segment elliptical, 3 to 3.5 times as long as wide, with golden brown scales on its inner lobe. Ventral process of abdominal segment VI single, 6 to 7 times as long as wide.

Male genitalia (Fig. 11).—Segment IX complete, posterior margin below preanal appendages straight in lateral view. Tergum X with dorsal process a short, broad lobe, as long as wide and slightly swollen; ventral portion semi-membranous, deeply divided, each portion broad at base and tapering to acute apex. Ventroposterior margin of basal segment of each inferior appendage angulate in lateral view; distal segment with cylindrical, slightly arcuate dorsal process and somewhat flattened ventral process, curved slightly dorsad. Phallus of typical tube-like form with ejaculatory duct very discernible. Phallic apodeme tapering anteriorly with dorsal constriction.

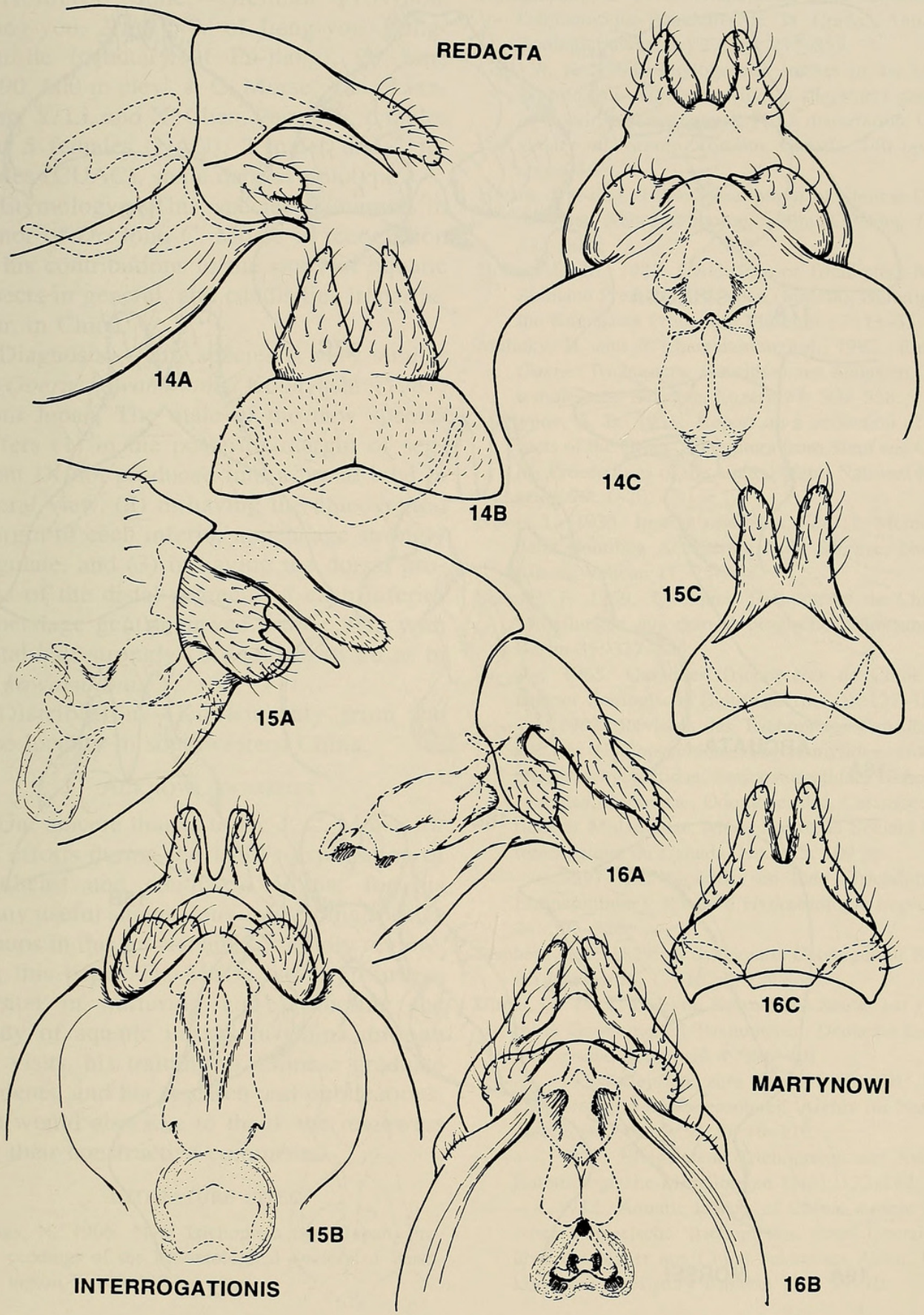
Female genitalia (Fig. 19).—Tergum IX large, triangular, clearly delimited from tergum X. Preanal appendages fused with tergum X and basally with each other. Preanal appendages and tergum X large in lateral view. Lamellae large, each about as long as broad in lateral view, with inner surface concave. Gonopod plate broad with each lateral margin produced into rounded, triangular lobe, and with apicomesal process tapering to enlarged, oval tip in ventral view. Spermathecal sclerite oval, about 1.3 times as long as wide with anterior end abruptly narrowed.

Length of forewing.—Male, 7 mm; female, 8 mm.

Immature stages.—Unknown.



Figs. 11–13. 11, *Goera morsei.* Male genitalia: A, left lateral view; B, dorsal view; C, ventral view; D, phallus, left lateral view. Dd, phallus, dorsal view. Sternite VI: E, ventral view. 12, *G. altofissura.* Female genitalia: A, left lateral view; B, dorsal view; C, ventral view. 13, *G. ramosa.* Female genitalia: A, left lateral view; B, dorsal view; C, ventral view.



Figs. 14–16. 14, *Goera redacta*. Female genitalia: A, left lateral view; B, dorsal view; C, ventral view. 15, *G. interrogationis*. Female genitalia: A, left lateral view; B, dorsal view; C, ventral view. 16, *G. martynowi*. Female genitalia: A, left lateral view; B, dorsal view; C, ventral view.