

## Contribution to the Knowledge of the Earwig Subfamily Pygidicraninae (Dermaptera, Pygidicranidae)\*

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**Abstract.** Five new species of earwigs belonging to *Cranopygia* Burr and *Paracranopygia* Steinm. are described: *C. vietnamensis* sp. n. (North Vietnam), *C. beybienkoi* sp. n. (south China), *C. gialaiensis* sp. n. (South Vietnam), *P. tianshanskyi* sp. n. (southern Australia), and *P. chirurga* sp. n. (Java). The neotype of *C. marmoricrura* (A.-Serv.) is designated and some problems of generic taxonomy are discussed.

**Key words:** Dermaptera; Pygidicranidae; Pygidicraninae; *Cranopygia*; *Paracranopygia*; systematics (new species).

This paper is based on materials from the collection of the Zoological Institute of the Russian Academy of Sciences, St. Petersburg, in which types of all species considered here are preserved.

### *Cranopygia* Burr, 1908

The small amount of material on this genus now in our possession allows us to distinguish at least 3 groups of species differing in the structure of the virga of the ♂ genitalia and the cerci. The first group includes *C. vietnamensis* sp. n. and *C. beybienkoi* sp. n., characterized by asymmetric ♂ cerci, long virga with simple apex, and outer integument membranous in proximal part and weakly sclerotized in distal part (Fig. 3, 1, 5). The second group includes *C. gialaiensis* sp. n., which differs in asymmetric ♂ cerci but a virga which is not as long and of simpler structure and apically split into two parts (Fig. 5, 1). The third group includes *C. marmoricrura* (A.-Serv.) and *C. celebensis* (Borm.), which are characterized by symmetric cerci and a virga with simple structure and with simple apex (Fig. 5, 7).

### *Cranopygia vietnamensis* Gorokhov & Anisyutkin, sp. n. (Figs. 1; 2, 1-3; 3, 1-4)

**Material.** Vietnam: Vin Phu Prov., Tam Dao, about 900 m, 8-13.IV.1986, 1 ♂ (holotype) (A. Gorokhov), Shonla Prov., vicinity of Shongma, 400-600 m, 3-14.V.1986, 1 ♂ (paratype) (A. Gorokhov).

♂ (holotype). General color black-brown. Postclypeus, lateral ocelli, and lateral parts of pronotum pale, yellowish. Palpi pale brown. Legs yellowish, with slightly darkened parts near apex of femur and with dark proximal half of tibia. Thorax ventrally pale brown. Head with distinct sutures, weak (but distinct) carina behind eyes; length of eyes less than distance from posterior margin to posterior margin of head; posterior margin of head emarginate; number of antennal segments more than 25; 1st antennal segment slightly shorter than distance between antennal pits; 2nd-4th antennal segments as in Fig. 1, 1.

\*Originally published in Zoologicheskii Zhurnal, Vol. 72, No. 11, 1993, pp. 40-49.



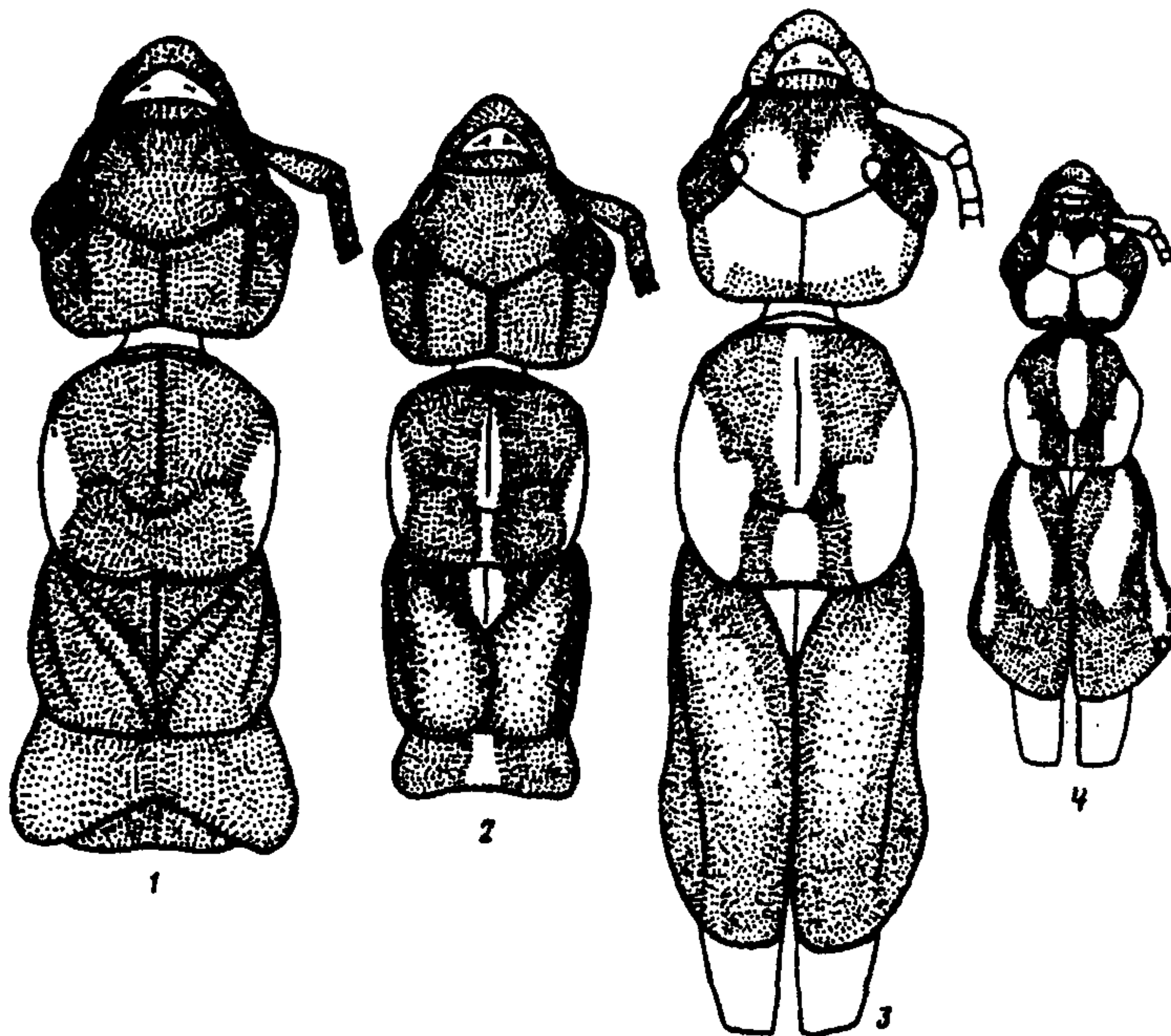


Fig. 1. Anterior part of body of ♂ (holotypes): 1) *Cranopygia vietnamensis* sp. n., 2) *C. gialaiensis* sp. n., 3) *Paracranopygia tianshanskyi* sp. n., 4) *P. chirurga* sp. n.

Pronotum almost as long as wide, somewhat rounded (in dorsal view); posterior margin in center slightly emarginate; medial groove in anterior part distinct; border between prozone and metazone rather distinct. Elytra strongly shortened, shorter than pronotum, narrowed at base, where joining scutellum open with distinct medial groove, posteriorly gradually widened and meeting each other with medial, narrowly rounded margins; lateral elytral carinae powerful; 1 additional, weak median carina on each side; entire elytron (and also pronotum and posterior part of head) with dense short setae. Hindwings absent; metanotum large, widened, with pair of lateral lobes (Fig. 1, 1). Abdomen weakly flattened; last tergite convex, without carinae, but with medial groove; posterior margin and slightly asymmetric cerci with only small teeth on medial margins as in Fig. 2, 1. Genital plate with narrow emargination on apex dividing pair of narrowly rounded lobes (Fig. 2, 2). Genitalia with characteristic shape of metaparameres (Fig. 3, 1), weakly bifurcate; virga long, weakly sclerotized outer distal part slender and almost half length of remaining (outwardly membranous) part; apex of virga with infundibuliform, obliquely truncate barely widened part (Fig. 3, 4); genital lobes (preputial sacs) without widened parts.

**Variations.** Paratype with scutellum of mesothorax pale, and darkened parts on femora absent; paler color may be caused by being teneral. This is also confirmed by its weakly sclerotized genitalia (Fig. 3, 2, 3). Cerci more powerful and more asymmetric than in holotype, possibly because of allometry, because the paratype is larger (Fig. 2, 3).

♀ not known.

Length in mm: body less cerci 15.5-21; pronotum 2.5-2.9; elytra 2.2-2.6; cerci 4.5-5.

The new species is closest to *C. manipurensis* Srivast. in structure of the elytra, cerci, and ♂ genitalia (although structure of virga in this species was not examined), but differs from it in emargin-

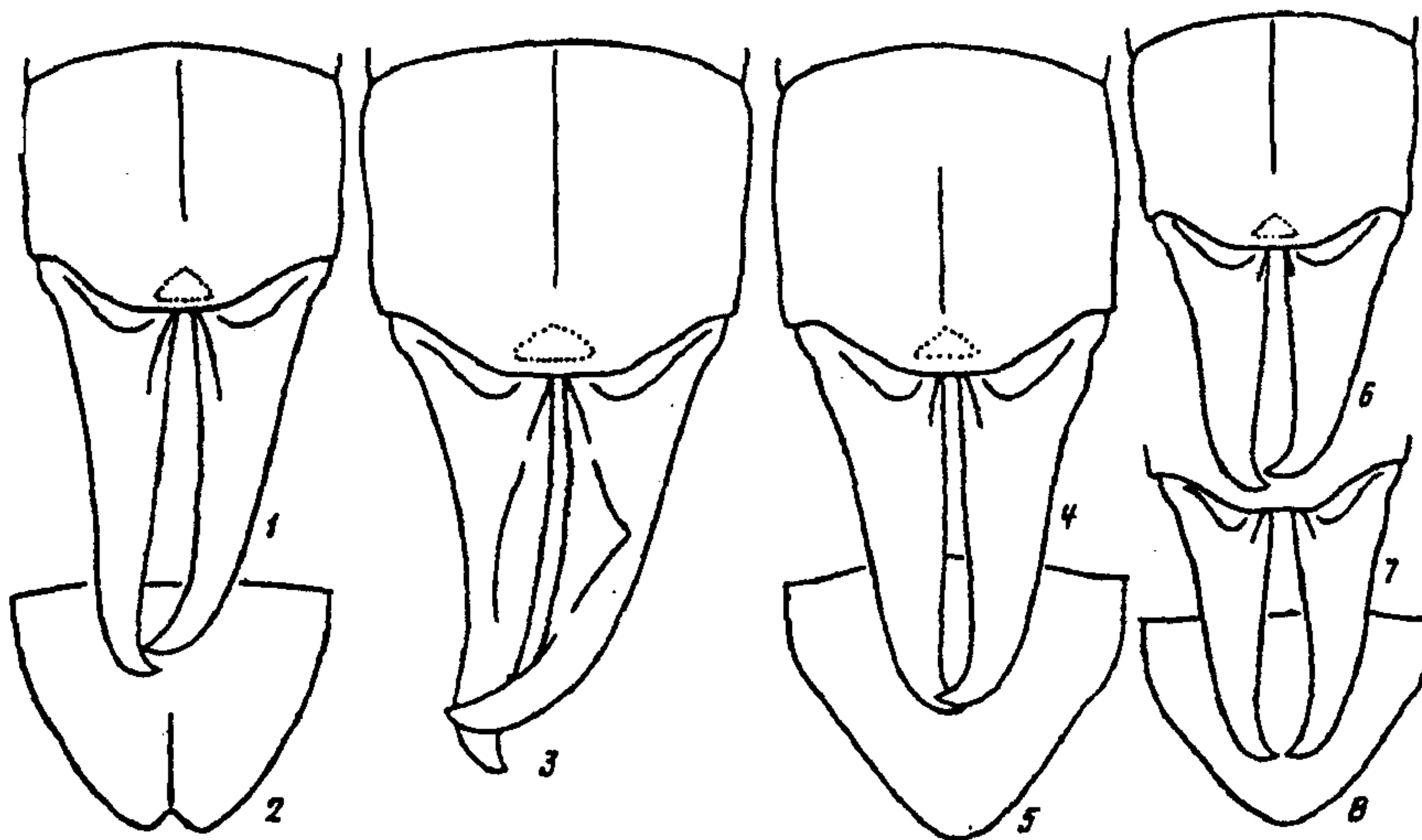


Fig. 2. Apex of abdomen (1, 3, 4, 5, 7) in dorsal view and genital plate (2, 5, 8) in ventral view: 1-3) *Cranopygia vietnamensis* sp. n. (♂s: 1, 2) holotype, 3) paratype), 4, 5) *C. beybienkoi* sp. n. (♀, paratype), 6-8) *C. gialaiensis* sp. n. (6—♂, holotype; 7, 8—♀, paratype).

ate middle posterior margin of pronotum, clearly more strongly convex lobe in center of posterior margin of abdominal tergite, and also uniformly dark color of pronotum, elytra, and metanotum. The new species differs from other species of the genus without hindwings in ♂ genitalia.

*Cranopygia beybienkoi* Gorochov & Anisyutkin, sp. n.  
(Figs. 2, 4, 5; 3, 5-8)

= *C. modesta*, Bey-Biyenko, 1959.

**Material.** China, Yunnan Prov.: vicinity of Symao, 1300 m, 29.VIII-5.IV.1957, 1 ♂ (holotype), 2 ♀s (paratypes) (D. Panfilov), Lyusakhe gorge near Chaly, 31.III.1957, 1 ♂ and 1 ♀ (paratypes) (A. Monchadskiy).

♂ (holotype). In habitus not distinguishable from *C. vietnamensis* (color as in holotype, and cerci as in paratype of this species). Major differences observed in structure of ♂ genitalia (Fig. 3, 5); metaparameres with clearly more convex lobes along medial margin (proximal to uncate metaparameres), externally weakly sclerotized distal part of virga twice as robust as in preceding species (Fig. 3, 8), and almost 1.5 times as long as remainder of externally membranous part; and genital lobes (preputial sacs) strongly widened.

**Variations.** Paratype smaller, and therefore cerci as in *C. vietnamensis*. Genitalia (Fig. 3, 6, 7) with lobes somewhat less widened than in holotype, probably due to somewhat rugulose surface appearing after desiccation.

♀. Similar to ♂, but with symmetric cerci (Fig. 2, 4) and genital plate narrowly rounded at apex (Fig. 2, 5).

Length in mm: body of ♂s less cerci 18-21, ♀ 18-20; pronotum of ♂ 2.6-2.8, ♀ 2.7-2.9; elytra of ♂ 2.3-2.5, ♀ 2.4-2.6; cerci of ♂ 4.3-5, ♀ 4.3-4.7.



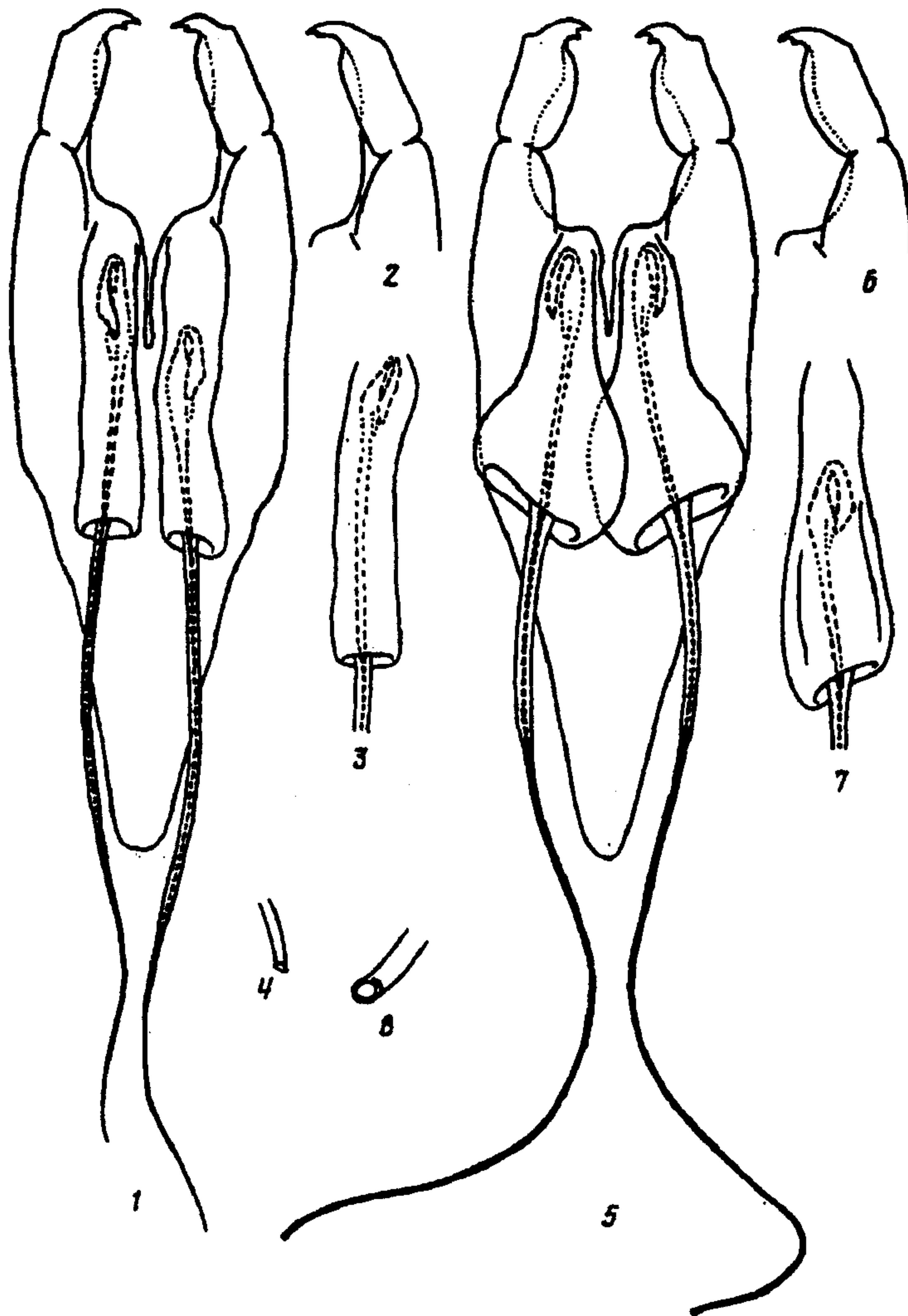


Fig. 3. ♂ genitalia (1, 5—entire genitalia; 2, 6—metaparamere; 3, 7—genital lobe; 4, 8—apex of virga): 1-4) *Cranopygia vietnamensis* sp. n.: 1, 4) holotype; 2, 3) paratype; 5-8) *C. beybienkoi* sp. n.; 5, 8) holotype, 6, 7) paratype.

It differs from other species of the genus in the same characters as cited for *C. vietnamensis*. It should be noted that the specimens used to describe the new species were mentioned in the literature as *C. modesta* (Borm.) (Bey-Biyenko, 1959). However, the latter species is easy to distinguish by the presence of short hindwings and the structure of the ♂ genitalia. The new species is named in memory of G. Ya. Bey-Biyenko, who contributed much to the study of earwigs.

*Cranopygia gialaiensis* Gorochoy & Anisyutkin, sp. n.  
(Figs. 1, 2; 2, 6-8; 5, 1-3)

**Material.** Vietnam, Zyalai-Kontum Prov., vicinity of Kannak, 8-16.XI.1988, 1 ♂ (holotype), and 1 ♀ (paratype) (A. Gorokhov).

♂ (holotype). General color black-brown. Lateral ocelli, lateral parts of pronotum, longitudinal medial stripe extending from anterior pronotum to posterior part of abdominal tergite I pale and

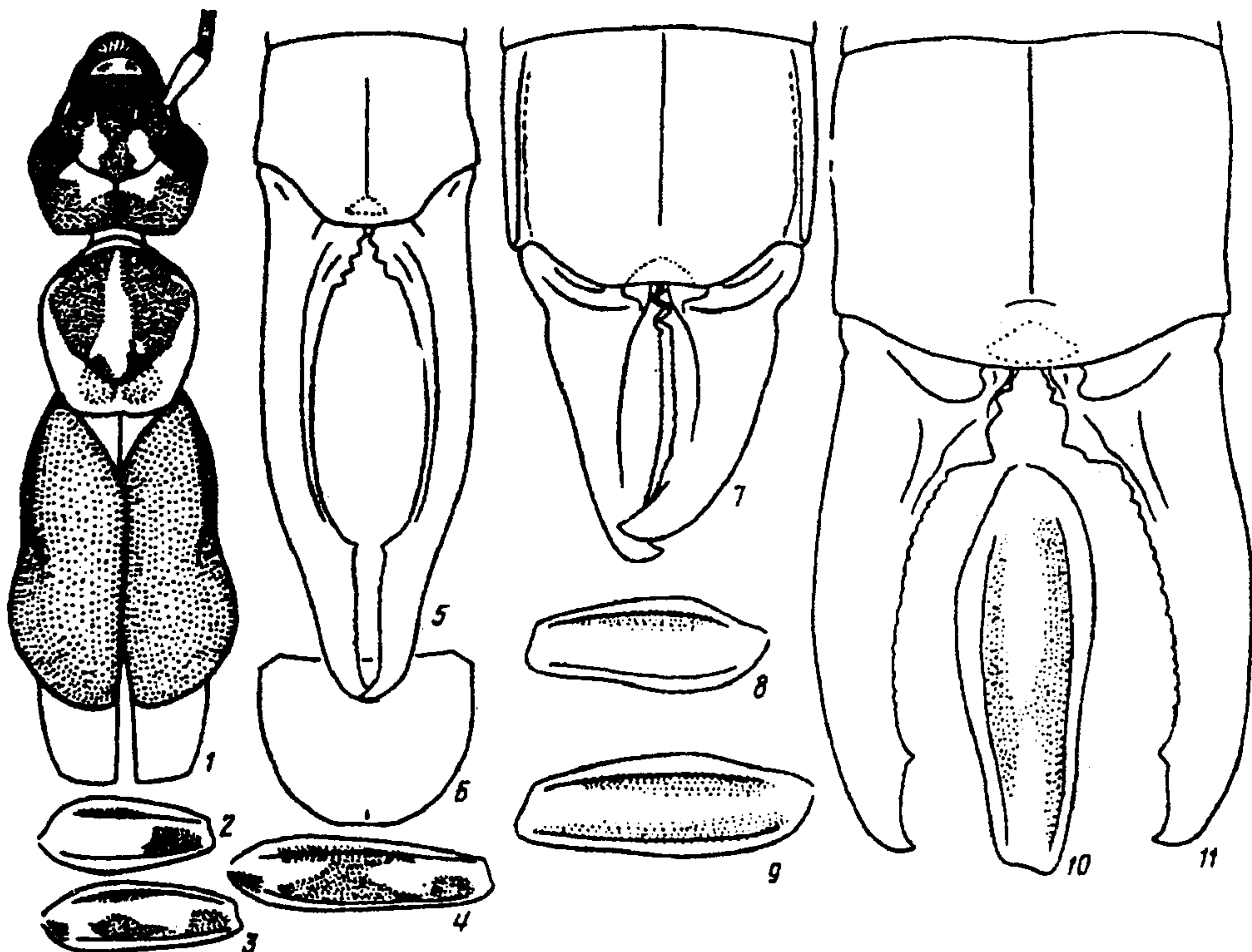


Fig. 4. Anterior part of body (1) in dorsal view, forefemur (2, 8); midfemur (3, 9), and hindfemur (4, 10) in anterior view, apex of abdomen (5, 7, 11) in dorsal view and genital plate (6) in ventral view ( $\sigma$ s): 1-6) *Cranopygia marmoricrura* (A.-Serv.) (neotype), 7) *Paracranopygia tianshanskyi* sp. n. (holotype), 8-11) *P. chirurga* sp. n. (holotype).

yellowish. Postclypeus, palpi, and upper part of elytra brown-gray. Femora dark, with pale proximal and distal parts (on forefemora these parts connected with each other by upper and lower, slender, barely visible pale lines); remaining parts of legs yellowish, with darkened proximal half of foretibia and midtibia. Thorax ventrally pale brown. Head as in preceding species (Fig. 1, 2). Pronotum almost as long as wide, somewhat rectangular (in dorsal view); posterior margin in center slightly emarginate; medial groove in anterior part distinct; border between prozone and metazone rather distinct. Elytra shortened, slightly longer than pronotum, narrowing at base, where large scutellum with distinct medial groove remains free, posteriorly gradually widening and slightly overlapping each other with medial, widely rounded margins; lateral elytral carinae powerful; other elytral carinae not developed; entire elytron (and also pronotum and posterior part of head) with dense, short setae. Hindwings absent; metanotum small, rather narrow, covered by elytra (Fig. 1, 2). Abdomen as in preceding species (Fig. 2, 6), but genital plate with rather broad and shallow emargination (Fig. 5, 3). Genitalia with peculiarly shaped metaparameres (Fig. 5, 1), weakly divided; virga of medium length, rather robust, entirely sclerotized; apex shallowly furcate and of peculiar shape (Fig. 5, 2); genital lobes (preputial sacs) without widened parts.

$\sigma$ . Similar to  $\sigma$ , but with symmetric cerci (Fig. 2, 7), apically rounded genital plate (Fig. 2, 8), and slightly shorter and more slenderer pale longitudinal medial stripe (from pronotum to transverse abdominal tergite).



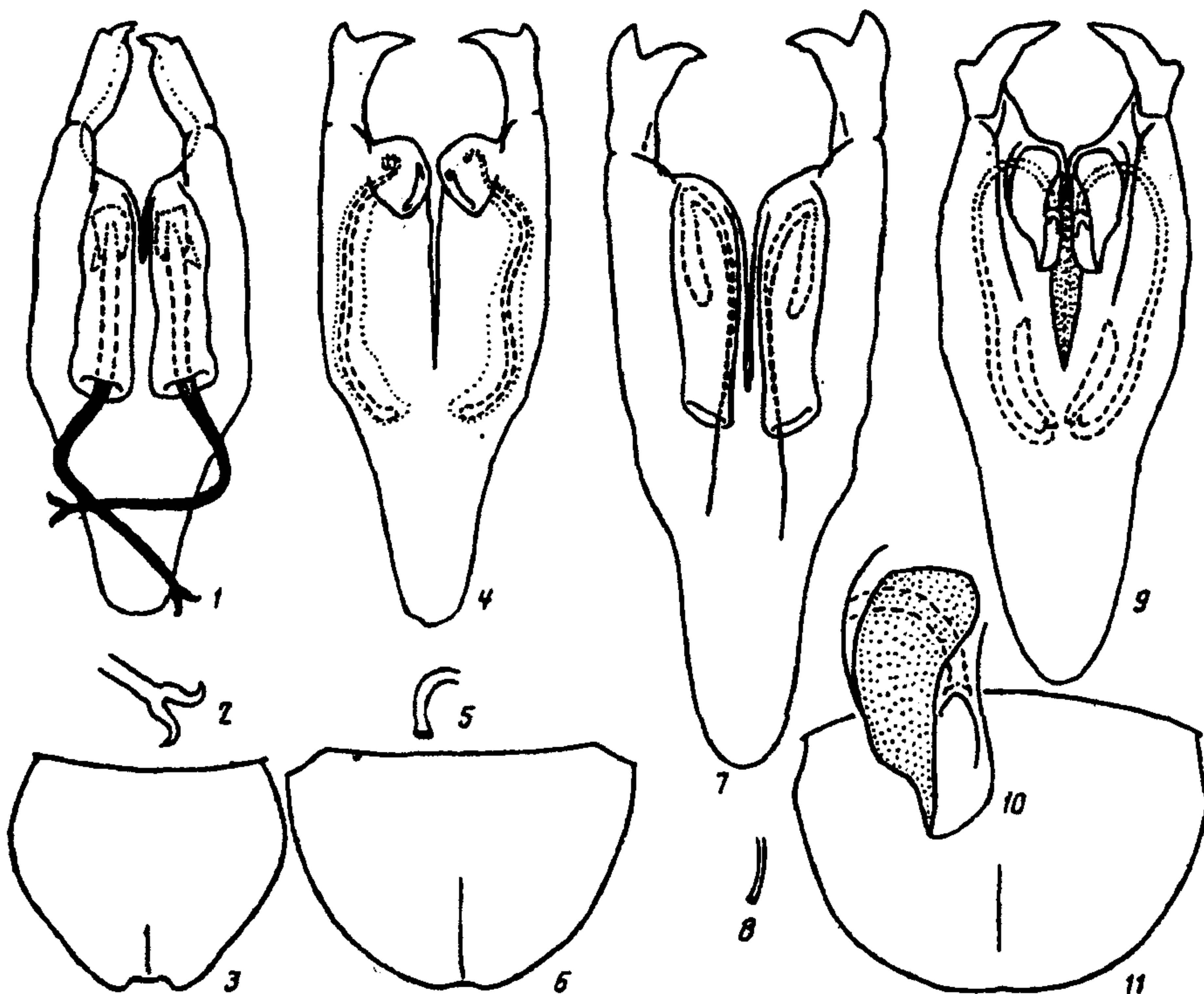


Fig. 5. ♂ genitalia (1, 4, 7, 9—complete; 2, 5, 8—apex of virga, 10—genital lobe) and genital plate of ♂ (3, 6, 11) in ventral view: 1-3) *Cranopygia gialaiensis* sp. n. (holotype), 4-6) *Paracranopygia tianshanskyi* sp. n. (holotype), 7, 8) *C. marmoricrura* (A.-Serv.) (neotype), 9, 10, 11) *P. chirurga* sp. n. (holotype).

Length in mm: body of ♂ less cerci 16, ♀ 16; pronotum of ♂ 2.4, ♀ 2.6; elytra of ♂ 2.6, ♀ 2.8; cerci of ♂ 3.5, ♀ 3.7.

In habitus and in structure of metaparameres it is similar to *C. vitticollis* (Stål), but is easy to distinguish by shorter and specialized apex of virga. In structure of apex of virga it resembles *C. bifurcata* Srivast., but differs well in the shape of metaparamere and considerably shorter virga. It differs from other species of the genus in ♂ genitalia, color, structure of wings, and cerci of ♂.

***Cranopygia marmoricrura* (Audinet-Serville, 1839)**  
(Figs. 4, 2-6; 5, 7, 8)

This species was described from Java. Later it became the type species of *Kalocrania* Zacher, 1910, which is now considered a junior synonym of *Cranopygia*, although it is possible that this genus should be restored either as a distinct genus or a subgenus. However, it is impossible to determine to which species this name should be applied, because several species fitting the original description exist that are distinguishable only by the ♂ genitalia, and the type was not described completely and is apparently lost (Hincks, 1959). Therefore, to obviate further confusion we consider it necessary to designate a neotype of this species.

**Material.** E Java Id., 1 ♂ (neotype with labels "Ost. Java," "*Pygidicrana marmoricrura* Serv.,

"Brunner v. W. det.," "*Kalocrania marmoricrura* Serv., L. Mistshenko det., 1936."

♂ (neotype). Color spotty. Head dorsally dark brown, with characteristic yellowish pattern (Fig. 4, 1), pale brown postclypeus, and ventrally pale brown; palpi and antennae pale brown (1st antennal segment paler than other segments). Pronotum dorsally yellowish, with dark brown and brownish spots as in Fig. 4, 1. Elytra unicolorous dark brown. Scutellum of mesothorax and visible parts of hindwings yellowish. Thorax ventrally brown. Abdomen reddish brown and dark. Legs yellow, with brownish spots on femora (on posterior side of forefemur and midfemur 1 distal spot present on each, and position of spots on anterior side of femora as shown in Figs. 4, 2-4). Head with distinct sutures, without distinct carinae behind eyes; length of eyes greater than distance from posterior eye margin to posterior margin of head; posterior margin of head slightly emarginate; 1st antennal segment slightly shorter than distance between antennal pits; 2nd-4th antennal segments as in Fig. 4, 1. Pronotum slightly longer than wide, slightly narrowed posteriorly, with posterior margin slightly emarginate, weak medial groove, and rather distinct border between prozone and metazone. Elytra not shortened, with widened and rounded lateral part, relatively small scutellum with distinct medial groove remaining free, and elytra slightly overlapping each other with weakly curved medial margins; lateral elytral carinae in form of oblique (but distinct) fold; other carinae absent. Hindwings well developed, in folded state extending posteriorly from under elytra. Abdomen slightly flattened; last tergite convex, without carinae, but with medial groove; posterior margin and symmetric cerci with teeth as in Fig. 4, 5. Genital plate (Fig. 4, 6) with truncate apex. Genitalia with characteristic metaparameres (Fig. 5, 7), deeply furcate; virga short and slender in distal part, approximately half length of genitalia; apex of virga in infundibuliform, obliquely truncate, and weakly widened (Fig. 5, 8); genital lobes (preputial sacs) without widened parts.

Length in mm: body less cerci 28.2; pronotum 3.7; elytra 7; cerci 11.8.

#### *Paracranopygia* Steinmann, 1986

In the description of this genus (Steinmann, 1986) characters to distinguish it from *Cranopygia* have never been cited. Moreover, in the original description they symmetry of the cerci was cited as a diagnostic character, but in the same paper species with obviously asymmetric cerci were included. Such an understanding of this genus was also maintained in a later review by the same author (Steinmann, 1989). It is possible that for the separation of *Paracranopygia* and *Cranopygia* it is necessary to use the position of the virga of the ♂ genitalia in the resting state, which in the first genus is submerged in the body of the proparamere that its basal plate is within the proximal part of the genitalia, and the apex in the short genital lobe (the preputial sac) (Fig. 5, 4, 9), while in the second genus the base of the virga is in the genital lobe, and its apex protrudes (Figs. 3, 1, 5; 5, 1, 7). The 3 species of *Paracranopygia* that are in our possession represent 2 different types of ♂ genitalia. The first type is typical of *P. tyanshanskyi* sp. n., having deeply divided proparameres without distinct sclerotized areas between them in the area of the genital lobe and base of the virga (Fig. 5, 4). The second type is seen in *P. tonkinensis* (Hincks) and *P. chirurga* sp. n.; their proparameres are shallowly divided by an extended sclerotized area between them (in Fig. 5, 9 this sclerotized area is punctate), sclerotization of the genital lobe (in Fig. 5, 10 this part is punctate) and the basal plate of the virga are well developed. It is interesting that the 2 latter species, while being very similar in the structure of the ♂ genitalia, have very different ♂ cerci, which are more or less symmetric in *P. chirurga* sp. n. and very asymmetric (like in *P. tyanshanskyi* sp. n.) in *P. tonkinensis*.

#### *Paracranopygia tianshanskyi* Gorochoy & Anisyutkin, sp. n. (Figs. 1, 3; 4, 7; 5, 4-6)

**Material.** Australia, New S Wales, 1 ♂ (holotype) (collection of Semenov-Tyan-Shanskiy).



♂ (holotype). General color brownish. Head yellowish, with slightly brownish mandibles, labrum, and anteclypeus and more intense brown pattern of epicranium as in Fig. 1, 3. Pronotum yellowish, with brown spots as in Fig. 2, 3. Elytra brown with pale brown, nonhyaline spot on dorsal part. Scutellum of mesothorax and visible parts of hindwings yellowish. Thorax ventrally pale brown. Abdomen dark brown. Legs more or less unicolorous, ventrally pale brown. Head with visible sutures, without distinct carina behind eyes; length of eyes greater than distance from posterior margin to posterior margin of head; posterior margin of head almost straight; 1st antennal segment slightly shorter than distance between antennal pits; 2nd-4th antennal segments as in Fig. 1, 3. Pronotum distinctly longer than wide, very slightly widened posteriorly, with slightly emarginate posterior margin, weak medial groove, and distinct (although not very clear) border between prozone and metazone. Elytra not shortened, rounded, but hardly widened in posterior lateral part; small scutellum with distinct medial groove remaining free, and elytra slightly overlapping each other with weakly curved medial margins; lateral elytral carinae in form of distinctly sloped fold; other elytral carinae absent. Hindwings well developed, in folded state extending posteriorly from beneath elytra. Abdomen slightly flattened; last tergite convex, with pair of lateral longitudinal carinae and with medial groove; posterior margin and symmetric cerci as in Fig. 4, 7. Genital plate with very oblique apical emargination (Fig. 5, 6). Genitalia with metaparamere bearing on apex acute, but fairly short medial tooth (Fig. 4), deeply furcate; virga short and relatively robust, rather shorter than genitalia; apex as in Fig. 5, 5; genital lobes (preputial sacs) short and membranous.

♀ not known.

Length in mm: body without cerci 17; pronotum 2.8; elytra 4.5; cerci 3.7.

The species is named in memory of A. P. Semenov-Tyan-Shanskiy, who contributed much to the collection of earwigs of the Zoological Institute of the Russian Academy of Sciences. The new species is similar to *P. comata* (Hincks) and possibly also to *P. angustata* (Dohrn), but differs from the first species in pale tibia and considerably shorter virga, and from the second species in the absence of contrasty color of femora. It differs well from other species of the genus in the shape of the metaparameres and cerci of the ♂, and from the closest Australian species of *Cranopygia* (*C. daemeli* (Dohrn), *C. ophthalmica* (Dohrn), and *C. lueddemanni* Srivast) in the position of the virga and completely different shape of the metaparamere.

*Paracranopygia chirurga* Gorochoy & Anisyutkin, sp. n.  
(Figs. 1, 4; 4, 8-11; 5, 9-11)

**Material.** Java. "Buitenzorg," 1 ♂ (holotype) (collection of Semenov-Tyan-Shanskiy).

♂ (holotype). Color spotty. Head yellowish with brown mandibles, labrum, and anteclypeus and dark brown pattern of epicranium as in Fig. 1, 4. Pronotum yellowish, with brown spots as in Fig. 1, 4. Elytra brown, with pale spot on dorsal part and longitudinal stripe in middle of lateral area. Scutellum of mesothorax and visible parts of hindwings yellowish. Thorax ventrally pale brown. Abdomen dark brown. Legs pale brownish, with 1-2 dark longitudinal spots on anterior side of femora (Fig. 4, 8-10). Structure of head as in *P. tianshanskyi*. Pronotum of approximately equal length and width, widest in midpart; posterior margin straight; medial groove indistinct; border between prozone and metazone distinct. Elytra not shortened, with rounded and widened lateral part, small scutellum with weak medial groove remaining free, and elytra slightly overlapping each other with curved medial margins; lateral elytral carinae and hindwings as in *P. tianshanskyi*. Abdomen weakly flattened; last tergite convex, without carinae, but with medial groove; posterior margin and symmetric cerci as in Fig. 4, 11. Genital plate with minute apical emargination (Fig. 5, 11). Genitalia with metaparamere bearing on apex hardly pointed, long, medial tooth (Fig. 5, 9), weakly furcate parts with extended sclerotized area be-



tween proparameres; virga short, robust, rather shorter than genitalia; apex as in Fig. 5, 10; genitalic lobe (preputial sac) slightly extended and equipped with sclerotized plate.

♀ not known.

Length in mm: body without cerci 21; pronotum 2.9; elytra 5.7; and cerci 6.

The new species in structure of ♂ genitalia is similar to *P. siamensis* (Dohrn), *P. proxima* (Hincks), and *P. similis* (Zach.), but differs from the first species somewhat in the shape of the metaparamere and color (elytra are not black, and antennae are not dark); from the second species it differs in the shape of cerci of ♂ and generally longer ♂ genitalia, and from the third species it differs in the shape of the metaparamere and possibly in the lesser size. *P. chirurga* sp. n. differs from the other species of the genus in cerci and genitalia of ♂.

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