

RECORDS AND DESCRIPTIONS OF *BREMUS* AND *PSITHYRUS*  
FROM INDIA (BREMIDAE : HYMENOPTERA).

By THEODORE H. FRISON, *Illinois State Natural History Survey, Urbana, Illinois.*

This paper is a report concerning material sent to me for study and identification by Dr. Hem Singh Pruthi of the Zoological Survey of India, Indian Museum, Calcutta, India. In addition to the records of previously described species and varieties, there are presented the descriptions of two new species of true bumblebees (*Bremus*=*Bombus*) and two new species of the false or inquiline bumblebees (*Psithyrus*).

Types of one of the new species of *Bremus* and the two new species of *Psithyrus* are deposited in the collection of the Indian Museum. The type of the other new species of *Bremus* is deposited in the United States National Museum, Washington, D. C., because the description of this species is based mostly on a series of specimens loaned by this institution. The description is, however, included in this paper because of the presence of one specimen from India.

My thanks are due to Dr. Hem Singh Pruthi and the Indian Museum for the loan of most of this material, to the United States National Museum for the loan of the other material included in this paper, to Dr. O. W. Richards, Oxford, England, for numerous comparisons of typic material in the British Museum and other information, and to Mr. Carl Mohr, Assistant Entomologist, Illinois State Natural History Survey, for making the drawings.

Genus **Bremus** (= *Bombus*).

Subgenus **Orientalibombus** Richards (1929).

**Bremus haemorrhoidalis** (Smith).

37 workers, Pindi Point, Murree, ca. 7242 ft., Punjab, Sta. 33, 23, 24-IX-28 (H. S. Pruthi); 1 worker, Murree near Sunny Bank, 6,500 ft., Punjab, Sta. 1, 3-IX-28 (H. S. Pruthi); 2 workers, Kohala, Murree Subdivision, 2,000 ft., Punjab, Sta. 34, 30-IX-28 (H. S. Pruthi); 3 workers, small vegetable garden near Kuldanna, Murree Subdivision, 7,006 ft., Punjab, Sta. 18, 11-IX-28 (H. S. Pruthi); 4 workers, Country around about Gharial, Murree Subdivision, ca. 6,000 ft., Punjab, Sta. 28, 19-IX-28 (H. S. Pruthi); 2 workers, Tret, Murree Subdivision, 3,306 ft., Punjab, Sta. 38, 5-X-28 (H. S. Pruthi); 1 worker, Kandaghat, Simla Hills, alt. 3,500—4,600 ft., Sta. 2, VIII-25 (B. Chopra); 1 male, Chhangla Gali, Abbotabad district, Punjab, 8,450 ft., 3-X-28 (H. S. Pruthi).

**Bremus haemorrhoidalis** var. **albopleuralis** (Friese).

1 male, Simla, W Himalayas, alt. 6,000—7,000 ft., Sta. 1, jungle, VIII, IX-25 (B. Chopra).

**Bremus monticolans** (Richards).

1 queen, Nampakha, N. Shan States, Burma, ca. 3,700 ft., 17-XII-26 (H. S. Rao); 1 worker, Pangsang, Tawng Peng State, North Shan States, U. Burma, 4,200 ft., Feb.-April—1915 (J. Coggin Brown); 1 worker, Selan, N. Shan States, Burma, 2,500 ft., 8, 9-XII-26 (H. S. Rao).

The queen and one worker from Selan have been compared for me by Dr. O. W. Richards with the types of this species in the British Museum.

**Bremus orientalis** var. **buccinatoris** (Smith).

1 worker, Kurseong, E. Himalayas, alt. 4,700—5,000 ft., 25-VI-10 (N. Annandale).

This worker was compared for me by Dr. O. W. Richards with the type of *buccinatoris* Smith in the British Museum.

Subgenus **Lapidariobombus** Vogt (1911).**Bremus rufofasciatus** var. **ladakhensis** (Richards).

2 queens, Nagaberan, Kashmir, 10,000—10,500, by side of stream (H. Bion).

The yellowish color of the pubescence on the first dorsal abdominal segments, as well as on the prothorax and postscutellum, indicates that these specimens are best considered as the color variety *ladakhensis*. On one of the queens the pubescence on the apical half of the second dorsal abdominal segment is black.

**Bremus simillimus** (Smith).

1 queen, Mt. Hattu near Bagli, Simla Hill States, 10,400 ft., 10-X-21 (S. W. Kemp).

This specimen has been compared for me by Dr. O. W. Richards with the type in the British Museum.

Subgenus **Rufipedibombus** Skorikov (1922).**Bremus eximius** (Smith).

1 worker, Darjiling district, Singla, alt. 1,500 ft., 1913 (Lord Carmichael's collection).

Subgenus **Pratobombus** Vogt (1911).**Bremus atrocinctus** (Smith).

1 worker, Darjiling district, Singla, alt. 1,500 ft., 1913 (Lord Carmichael's collection).

Subgenus **Diversobombus** Skorikov (1922).**Bremus mimeticus** var. **insidiosus** (Richards) (1931).

1 worker, Murree, Punjab, Sta. 6, ca. 7,242 ft., 4-IX-28 (H. S. Pruthi); 2 workers, Pindi Point, Murree, Punjab, ca. 7,242 ft., Sta. 33, 23, 24-

IX-28 (H. S. Pruthi); 1 worker, Wild grass near Kuldanna, Murree Sub-division, Punjab, ca. 7,006 ft., Sta. 19 (H. S. Pruthi); 3 workers, Simla, W Himalayas, alt. 6,000—7,000 ft., Sta. 1 jungle, VIII, IX-25 (B. Chopra); 1 worker, Kandaghat, Simla Hills, alt. 3,500—4,600 ft., Sta. 2, VIII-25 (B. Chopra).

Data associated with these workers were sent to Dr. O. W. Richards and recorded by him (1931) when this species and variety were originally described. A few of the workers recorded as variety *insidiosus* by Richards from material in my possession but not seen by Richards belong to the variety *geminatus* (Richards) (1931). This variety is parallel in coloration to *B. haemorrhoidalis* (Smith) but is easily separated because of the strongly pointed apex of the mesobasitarsus.

***Bremus mimeticus* var. *geminatus* (Richards) (1931).**

2 workers, Simla, W Himalayas, alt. 6,000—7,000 ft., Sta. 1 jungle, VIII, IX-25 (B. Chopra); 3 workers, Kandaghat, Simla Hills, alt. 3,500—4,600 ft., Sta. 2, VIII-25 (B. Chopra); 1 worker, Ghuma, Simla Hills, alt. 3,700 ft., 8-IX-25, in jungle (B. Chopra).

These specimens were all recorded as var. *insidiosus* (Richards) by Richards (1931) due to my sending to him under the name *mimeticus* all data associated with the above specimens previous to the description of *geminatus*. This is a minor color variety differing from variety *insidiosus* in having sides of thorax whitish or gray instead of black. One worker of this variety has been compared for me by Dr. O. W., Richards with the type in the British Museum.

***Bremus mimeticus* var. *gantokiensis* (Richards) (1931).**

1 large worker, Kurseong, E. Himalayas, ca. 5,000 ft., 7-III-28 (Gopi Ram).

This specimen has been compared for me by Dr. O. W. Richards with the type in the British Museum.

***Bremus mimeticus* var. *turneri* (Richards) (1931).**

1 worker, Shillong, Khasi Hills, Assam, 3-X-26 (R. B. S. Sewell).

This specimen has been compared for me by Dr. O. W. Richards with the type of this variety in the British Museum.

Subgenus ***Bremus*** Jurine, s.s. (1801).

***Bremus tunicatus* (Smith).**

21 workers and 29 males, Chhangla Gali, Abbotabad Dist., Punjab, 8,450 ft., 3-X-28 (H. S. Pruthi).

Subgenus ***Alpigenobombus*** Skorikov (1914).

***Bremus mastrucatus* var. *kashmirensis* Friese).**

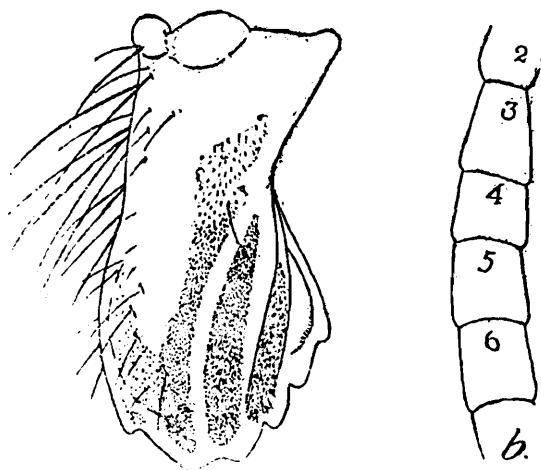
3 queens, Nagaberan, Kashmir, alt. 10,000—10,500 ft., by side of stream (H. B. Bion); one queen, Gilgit Road, 11,000 ft., 25-VI-95.

**Bremus orichalceus** (Friese).

1 worker, Kandaghat, Simla Hills, alt. 3,500—4,600 ft., Sta. 2, VIII-25 (B. Chopra); 1 worker, Simla, W Himalayas, alt. 6,000—7,000 ft., jungle, Sta. 1, VIII, IX-25 (B. Chopra).

**Bremus grahami**, sp. nov.

*Worker*.—Face, occipital orbits and occiput with long hairs mostly black but sometimes whitish-gray, short hairs dominantly whitish-gray. Labrum with a conspicuous cup-like depression occupying middle one-third of width, lateral tubercle-like areas prominent, rough and punctate on mesal and upper surfaces and smooth and polished on lower surface; shelf-like projection (lamella) prominent and about one-third width of labrum. Mandibles (Fig. 1a) many-toothed, similar in general to those



TEXT-FIG. 1.—*Bremus grahami*, sp. nov. a. dorsal view of right mandible; b. third, fourth and fifth antennal segments.

of *B. mastrucatus* (Gerst.) and other members of the subgenus *Alpigenobombus* Skorikov (1914). Disk of clypeus smooth and shining, with a few minute and a few medium-sized scattered punctures; anterio-lateral corners and area surrounding disk with numerous punctures. Malar space short, less than its width at articulation of mandibles; about equal in length to third antennal segment, smooth and shining, about one-sixth as long as greatest length of and less than one-half greatest width of compound eye. Ocelli situated just above narrowest part of vertex, lateral ocelli separated from one another by about the same distance as each lateral ocellus is distant from inner margin of the compound eye, each ocellus with a diameter about equal to width of second antennal segment; area directly laterad of each lateral ocellus polished and impunctate for one-third of distance to inner margin of compound eye, remaining two-thirds of area extending to compound eye both polished and with scattered punctures. Flagellum about twice as long as the scape; third antennal segment longer than fifth segment, about as long as malar space, fifth segment longer than fourth (Fig. 1b).

Dorsum of thorax, except for smooth and polished area on disk, with a longitudinal stripe of whitish or grayish-white hair in center,

remainder of dorsum of thorax with black and whitish-gray hairs intermixed; pleurae with upper portion concolorous with lateral portions of dorsum and with lower portions more whitish.

Dorsum of abdomen with whitish hairs on first and basal portion of second segments, remainder of second segment and third segment with black hairs, fourth, fifth and sixth segments with ferruginous hairs. Venter of abdomen with light hairs; hypopygium (sixth ventral segment) without a median carina.

Legs with hairs dominantly black, except for short ferruginous hairs on tarsal segments and long more whitish hairs on coxae and trochanters. Metatarsus of both middle and hind legs without a pronounced, sharp, spine-like projection at outer apical angle.

Wings distinctly darkened but not so much as in *B. orichalceus* (Friese) of the same subgenus.

Length, 15 millimeters; spread of wings, 28 millimeters; width of abdomen at second segment, 6 millimeters.

*Holotype*.—Worker, July 25, 1925, altitude 11,000 ft., Washan, Szechuen, China, collected by D. C. Graham. Deposited in the collection of the United States National Museum. *Paratypes*.—1 worker, July 26, 1925, altitude 11,000 ft., Washan, Szechuen, China (D. C. Graham); 1 worker, Suifu, Szechuen, China (D. C. Graham); 1 worker, June 23-27, 1929, altitude 2,000—5,000 ft., Yachow to Mupin, Szechuen, China (D. C. Graham); 1 worker, August 27, 1921, altitude 6,000 to 7,500 ft., Mt. Omei, Szechuen, China (D. C. Graham); 1 worker, August 10, 1925, altitude 9,500 ft., Gieh Yin Temple, Mt. Omei China (D. C. Graham); 1 worker, 1913, altitude 1,500 ft., Singla, Darjiling District (Lord Carmichael's collection). Two paratypes deposited in the collection of the United States National Museum, 1 paratype from Singla deposited in the collection of the Zoological Survey of India, remaining paratypes in the collection of the author.

Although the type and all but one of the paratypes of this new species are specimens collected in China, this new species is described in this paper because of the presence in the material of the Indian Museum of a single specimen from Singla.

This species is named in honor of D. C. Graham who has collected large series of bumblebees in China for the United States National Museum, Washington, D. C. These specimens are now being studied by the author.

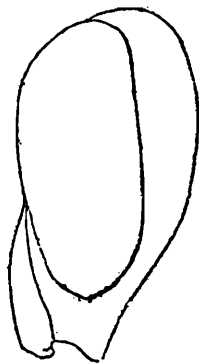
In color *B. grahami* Frison is very suggestive of *B. funerarius* var. *lateritius* (Friese), but it differs from this species in numerous structural characters such as the length of the malar space and tothing of mandibles. Within the subgenus to which it belongs I know of no other species with the same color pattern.

Subgenus **Sibiricobombus** Vogt (1911).

***Bremus oculatus***, sp. nov.

*Male*.—Clypeus with a small bare and polished area on mesal anterior portion near clypeal-labral suture; short pubescence on interior portion black but whitish on posterior portion, long hairs black. Labrum

with slightly elevated, polished, and rather weakly separated linear areas on posterior half, anterior portion somewhat concave, moderately punctate, and with dark or golden brown hairs. Mandibles bidentate at tip, with long brownish or golden-tipped hairs fringing lower edge. Black pubescence surrounding bases of antennae, that on posterior portion of occiput and on occipital orbits whitish or whitish mixed with black. Malar space (Fig. 2) about as long as its width at



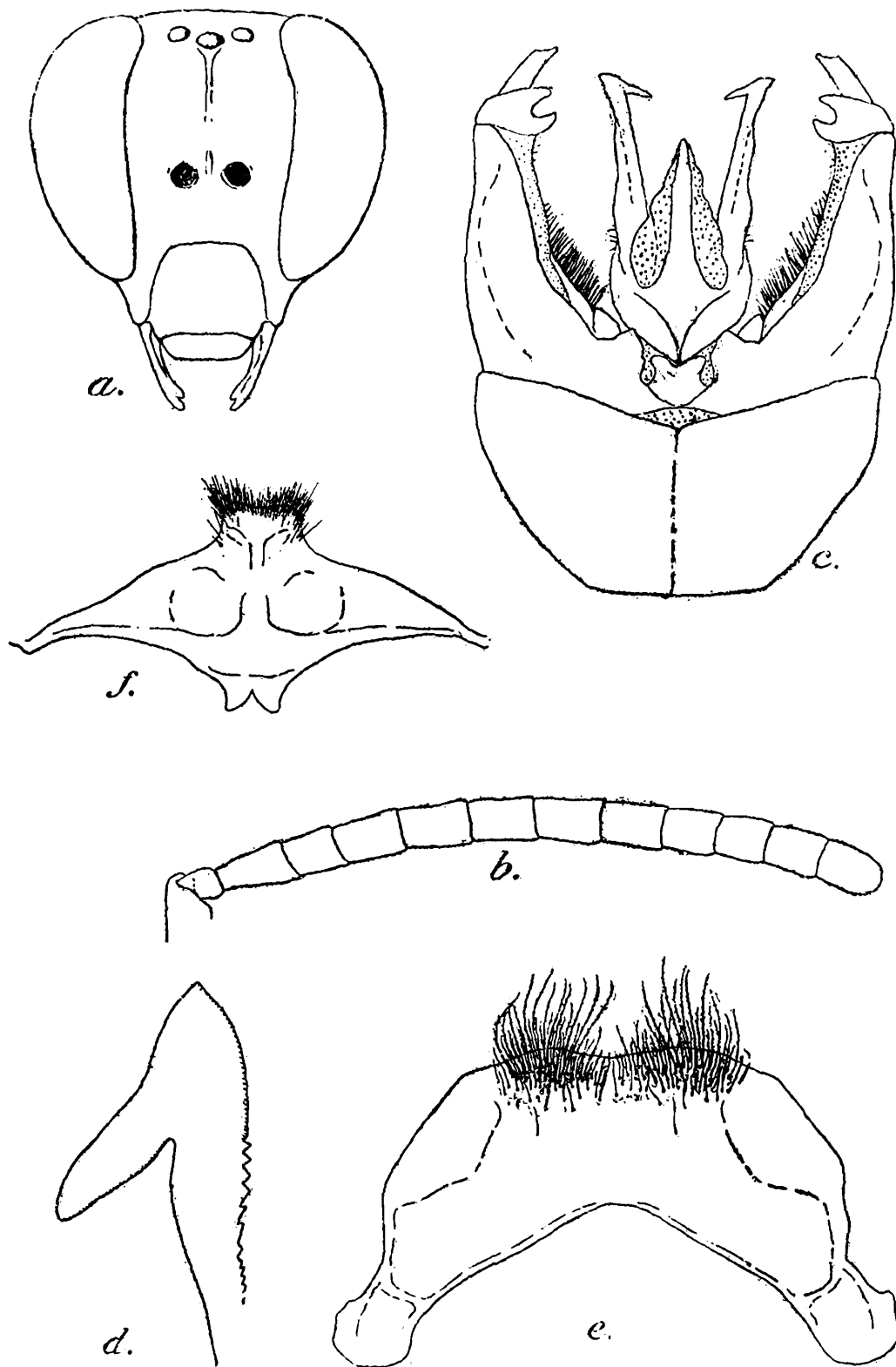
TEXT-FIG. 2.—*Bremus oculatus*, sp. nov. Lateral view of head showing comparative width of malar space.

articulation of mandibles, about one-fifth as long as length of compound eye. Compound eyes large and bulging from sides of head (Fig. 3a) somewhat as in *B. (Sibiricobombus) niveatus* (Kriechbaumer); distinctly punctate on lower half near articulation with mandibles, upper half smooth and shiny. Ocelli rather large, situated in narrowest part of vertex, each lateral ocellus separated from median ocellus by about one-half of its diameter, each lateral ocellus separated from inner margin of compound eyes by a distance slightly less than combined diameters of two ocelli, area between each lateral ocellus and inner margin of compound eye smooth and polished except for a few punctures near margin of compound eye. Flagellum (Fig. 3b) about two and one-half times as long as scape, third flagellar segment longer than fourth and about as long as fifth.

Dorsum of thorax with center or disk with a small longitudinal smooth and impunctate area. Dorsum, pleurae, and sternum covered with short, even, whitish or hoary pubescence, a few black hairs intermixed on metapleurae.

Dorsum of abdomen with pubescence on segments colored as follows: first whitish or hoary; second whitish—except that basal lateral portions are shaded with pale fulvous; third dominantly black with some whitish along posterior margin; fourth to seventh segments with bright ferruginous pubescence, except for occasional whitish hairs or whitish-tipped hairs. Pubescence on sides blackish, that on most of sternum whitish except for short ferruginous hairs on edge of hypopygium. Hypopygium with a well developed carina along apical border, carina indented in middle; area anterior to carina shiny, slightly shagreened and with small punctures; a membranous flap posterior to carina,

Sagittae of genitalia (Fig. 3c) long and slender, heads (Fig. 3d) with V-shaped hooks which are slightly toothed on outer margins ; volsellae



TEXT-FIG. 3.—*Bremus oculatus*, sp. nov. a. front view of head showing bulging eyes ; b. flagellum of antennae ; c. dorsal view of male genitalia ; d. head of sagitta of male ; e. outer spatha of male ; f. inner spatha of male.

elongated and projecting far forward beyond squamae, toothed on inner apical angles ; squamae deeply indented on inner margin ; uncus elongate or linear. Outer spatha (Fig. 3e) and inner spatha (Fig. 3f) as in figures.

Long hairs on tibiae and tarsi black tipped with whitish, hairs on femora and trochanters black tipped with whitish or all whitish, short hairs on tarsi golden brown. Metatarsus of hind leg but slightly arcuate on upper edge; outer surface slightly concave; upper apical angle not sharply produced; about four times as long as wide. Metatarsus of middle leg without a pronounced projection.

Wings light, slightly stained with brown, nervures prominent.

Length, 20 millimeters; spread of wings, 37 millimeters; width of abdomen at second segment, 8 millimeters.

*Holotype*.—Male, "Baghi, Simla Hill States, 8,800 ft., 7, 8-X-21, S. W Kemp" *Paratypes*.—Two males with same data as holotype and one male "Mt. Hattu near Baghi, Simla Hill States, 10,400 ft., 10-X-21, S. W Kemp" Holotype and the paratype from Mt. Hattu deposited in the collection of Indian Museum, Calcutta, India, two paratypes with same data as type deposited in the collection of the author.

The head of this species and large size of the compound eyes are suggestive of *B. (Sibiricobombus) niveatus* (Kriechbaumer). It differs, however, in shape of volsella, comparative lengths of antennal segments, difference in coloration of thorax, etc.

### Genus **Psithyrus**.

Subgenus **Psithyrus** (*s. s.*) Lepeletier (1832).

#### **Psithyrus cornutus**, sp. nov.

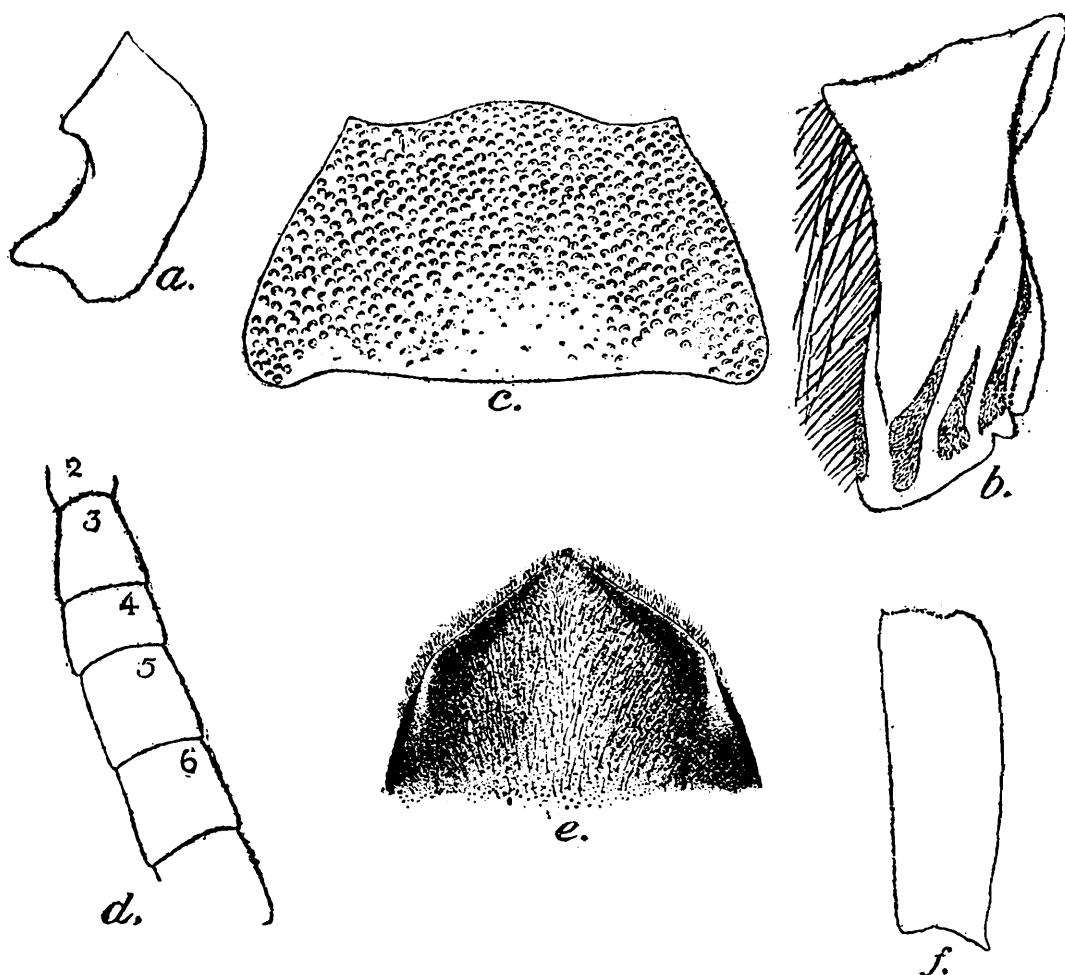
*Female*.—Long hairs on face, occipital orbits and occiput black short hairs light yellowish. Labrum with lateral tubercles well developed and distinctly separated by an impunctate depression, median anterior portion of labrum developed into a large conical tubercle much higher than lateral tubercles (Fig. 4a). Mandibles as illustrated (Fig. 4b). Clypeus with numerous coarse punctures except on median anterior margin (Fig. 4c). Malar space about as long as wide at articulation of mandibles, smooth and polished, with some scattered minute punctures; about equal in length to third and fourth antennal segments combined. Ocelli situated just above narrowest part of vertex, lateral ocelli separated about as far as each lateral ocellus is distant from inner margin of compound eye, about equal in size to second antennal segment; area directly laterad of each lateral ocellus smooth and impunctate for about one-half of distance to inner margin of compound eye, remaining half adjacent to compound eye coarsely punctate. Flagellum about twice as long as scape, scape with numerous punctures and not smooth and polished; third and fifth antennal segments about equal in length and the fourth much shorter than either (Fig. 4d).

Dorsum and pleurae of thorax covered with yellow hairs except for a broad transverse band of black hairs between bases of wings.

Dorsum of abdomen with yellow hairs on first segment, second and third segments black except for a few yellow hairs on basal middle portions, fourth and fifth segments covered with long whitish hairs, hairs on sixth segment very short and fulvous or tawny in color. Sixth



dorsal segment with numerous punctures except on basal median portion and longitudinal line on meson where it is smooth and polished. Hairs on venter of abdomen mostly pale fulvous. Sixth ventral segment (Fig. 4e) with a more or less impunctate, polished median longitudinal slightly convex ridge, remainder of integument well punctate except basal portion, ridges on sides of segment angular and prominent as in the subgenus *Psithyrus* (s. s.).



TEXT-FIG. 4.—*Psithyrus cornutus*, sp. nov. a. lateral view of labrum showing conical tubercle on lower portion; b. dorsal view of right mandible; c. clypeus showing punctures; d. third, fourth and fifth antennal segments; e. sixth ventral abdominal segment; f. metatarsus of left hind leg.

Legs with long light yellowish hairs on ventral parts of coxae; trochanters and femora; hairs on tibiae and basal portion of metatarsi mostly black; short hairs on most of metatarsi and remaining tarsal segments ferruginous. Metatarsi of middle and hind legs (Fig. 4f) with a pronounced spine-like projection.

Wings rather deeply and uniformly stained with brown.

Lengths, 18 millimeters; spread of wings, 35 millimeters; width of abdomen at second segment, 7 millimeters.

*Holotype*.—Female, June 14, altitude 11,000 feet, Andarban, Garhwal, W Himalayas (Tytlor). Deposited in the collection of the Indian Museum, Calcutta, India.

This new species runs in the recent key of Popov (1931) to the subgenus *Psithyrus* (s. s.). It is possible, however, that the male of this

new species when discovered may show structural characters of the subgenus *Ashtonipsithyrus* Frison. As Popov (1931, p. 133) has already noted, the females of the North American *suckleyi* Greene have a sixth ventral abdominal segment very suggestive of the subgenus *Psithyrus* (s. s.).

It is separated from *rupestris* Fabr. and *branicki* Rad. by having the sixth dorsal abdominal segment slightly polished and not shagreened or wrinkled. It differs from *chinensis* (F. Mor.) and *morawitzi* Friese by the presence of its prominent conical projection or tubercle on middle anterior portion of labrum and in color pattern. The prominent conical tubercle on the middle anterior portion of the labrum, not developed to such an extent upon any other species of *Psithyrus* studied by me, is an exceptional character for the recognition of this species.

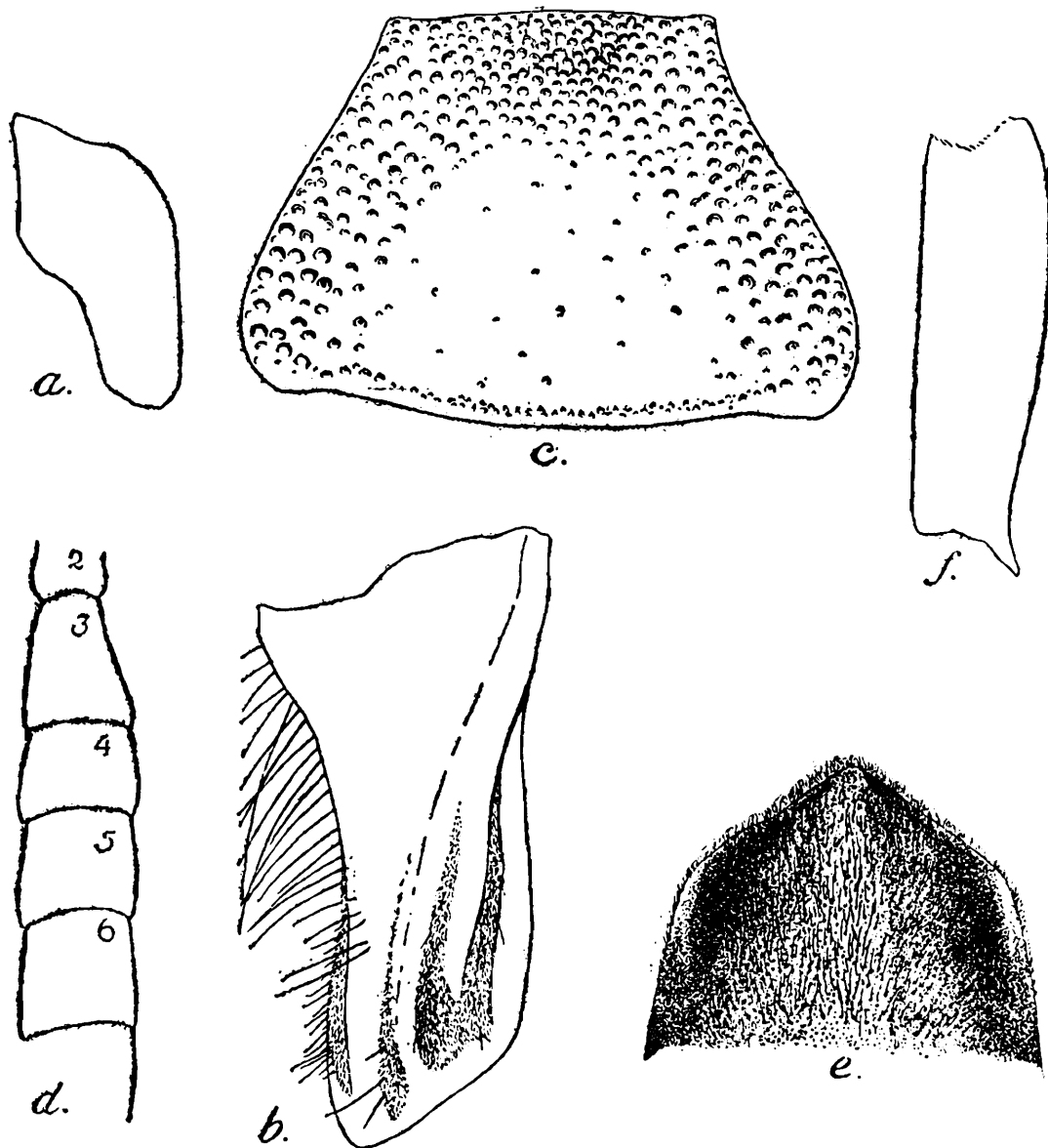
### ***Psithyrus novus*, sp. nov.**

*Female*.—Hairs on face, occiput and occipital orbits black. Labrum with lateral tubercles well developed and widely separated by a depression which is polished and impunctate above, areas below and on sides of lateral tubercles coarsely punctate and slightly shagreened; median anterior portion of labrum with a broad shelf-like projection or lobe (Fig. 5a). Mandibles as illustrated (Fig. 5b). Clypeus with numerous coarse punctures on sides and upper portion, disk polished and with scattered punctures (Fig. 5c). Malar space about as long as width at articulation of mandibles, about as long as third and fourth antennal segments combined, half adjacent to compound eye polished but with numerous, distinct small punctures, lower half adjacent to mandibles impunctate and polished. Ocelli situated above narrowest part of vertex, lateral ocelli separated by a distance slightly less than each lateral ocellus is distant from inner margin of compound eye, anterior ocellus larger than lateral ocelli, diameter of lateral ocelli about equal to that of second antennal segment; area directly laterad of each lateral ocellus smooth and impunctate for about one-half of distance to inner margin of compound eye, remaining half with numerous coarse punctures. Flagellum about twice as long as scape, scape although with scattered small setiferous punctures, mainly smooth and polished so that it contrasts with flagellum; third antennal segment much longer than fifth, the fifth longer than fourth (Fig. 5d).

Dorsum of thorax tawny except for a poorly defined black transverse band between bases of wings; pleurae with upper anterior portions concolorous with dorsum, lower and posterior portions with pubescence becoming more brown.

Dorsum of abdomen with first and second segments covered with dull yellowish pubescence, third and fourth segments with black pubescence, fifth segment with pubescence on basal and middle portions black and that on posterior and lateral margins brownish or ferruginous, sixth segment with short, fine brownish-black pubescence. Sixth dorsal segment closely punctate except on basal middle portion and slightly shagreened. Hairs on venter of abdomen brownish-black. Sixth ventral segment (Fig. 5e) slightly convex in middle, shiny but with

numerous punctures over most of surface; ridges on sides of segment angular and well developed as in the subgenus *Psithyrus* (*s. s.*).



TEXT-FIG. 5.—*Psithyrus novus*, sp. nov. a. lateral view of labrum showing lack of pronounced tubercle on lower portion; b. dorsal view of right mandible; c. clypeus showing punctures; d. third, fourth and fifth antennal segments; e. sixth ventral abdominal segment; f. metatarsus of left hind leg.

Legs clothed with black or brownish hairs except for short ferruginous hairs on tarsi. Metatarsi of middle and hind legs (Fig. 5f) with a pronounced spine-like projection.

Wings well stained with brown.

Length, 20 millimeters; spread of wings, 37 millimeters; width of abdomen at second segment, 8 millimeters.

*Holotype*.—Female, by side of stream, altitude 10,000—10,500 ft., Nagaberan, Kashmir (H. Bion). Deposited in the collection of the Indian Museum, Calcutta, India.

This new species runs in the recent key of Popov (1931) to the subgenus *Psithyrus* (*s. s.*). It is possible, however, that the male of this new species when discovered may show structural characters of the subgenus *Ashtonipsithyrus* Frison. As Popov (1931, p. 133) has already noted the females of the North American *suckleyi* Greene have a sixth

ventral abdominal segment very suggestive of the subgenus *Psithyrus* (s. s.).

It differs in color and structure from the species *branicki* Rad. and *rupestris* Fabr. in having the lateral tubercles on labrum well developed and deeply separated and by not having the sixth dorsal abdominal segment as wrinkled, closely punctate or shagreened. It differs from *chinensis* (F. Mor.) in color and in having the hind metatarsus more than three times as long as broad; and from *morawitzi* Friese in the absence of ferruginous pubescence on the third and fourth dorsal abdominal segments.

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