

NEW AND LITTLE-KNOWN INDIAN CRANEFLIES (DIPTERA : TIPULIDAE)-VI.

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ABSTRACT. Five new species of Indian Tipulidae are described, one being from Arunachal Pradesh (NEFA), *Molophilus (Molophilus) neovaruna*, and the others from South India, Kerala and Madras, *Erioptera (Teleneura) acanthapophysis*, *Molophilus (Molophilus) hardyi*, *M. (M.) peculiaris*, and *M. (M.) sublancifer*. Insufficiently known previously described species in the genera *Dolichozepe* and *Erioptera* are recorded.

The preceding part under this title was published in *Oriental Ins.*, 6: 351-358, July 1972. The present materials were collected by Dr. Fernand Schmid who has added vastly to our knowledge of the Indian Tipulidae and many other groups of insects, including his own especial order, the Trichoptera. The materials here considered are preserved in the Alexander Collection.

SUBFAMILY TIPULINAE

1. *Dolichozepe (Nesopeza) himalayae* Alexander (Fig. 8)

This species is a renaming of *Dolichozepe (Nesopeza) obscura* Brunetti, 1912, preoccupied by *Dolichozepe (Orozepe) obscura* (Johnson), 1909 (Nearctic). The present name is proposed in *Ann. Mag. Nat. Hist.*, (12) 4 : 1091; 1952.

Brunetti described his species from two specimens that were taken by Annandale at Kurseong in the Eastern Himalaya, the male lectotype (designated by Joseph) taken on April 14, 1911, and preserved in the collection of the Zoological Survey of India. The second specimen, a female, was taken on June 29, 1910, and is in the Alexander Collection through an exchange with Brunetti in 1919; designated as allotype.

The type specimen is broken and the male hypopygium is not described by Joseph in his excellent review of the Brunetti types in the Tipulidae (Part IV, in Press). By comparison with the allotype above mentioned, I regard materials from Sikkim (Teng, 4600 feet, 12.v.1959, collected by Schmid) as representing this species and am describing and figuring the male genitalia that is quite distinct from other species.

Male hypopygium (Fig. 8) with the ninth tergite, *t*, heavily sclerotized and blackened, its conformation as shown. Dististyles, *d*, with inner style stout, outer third forming a subtriangular head, the beak obtuse, the upper part with long black setae. Aedeagus, *a*, long and slender, narrowed gradually outwardly.

Eighth sternite, δs , very large, posterior border subtruncate, with two subapical glabrous flattened blades, the terminal membrane with numerous longitudinal short rows of microscopic setulae; lateral parts of sternite with long black setae, as shown.

SUBFAMILY LIMONIINAE

TRIBE ERIOPTERINI

2. *Erioptera (Teleneura) acanthapophysis*, sp. nov. (Figs. 1, 9)

Similar to *annandaleana* in its general coloration of body and wings and in venation; head yellow; thoracic dorsum orange, pleura brown, patterned with yellow; legs with fore coxae, trochanters and basal half of femur blackened, remainder of legs yellow; wings light yellow, with conspicuous brown spots and dots along the veins; male hypopygium with a single pale dististyle; phallosome with conspicuous lateral blade-like apophyses, their apices with from two to four long spines.

Rostrum and palpi black. Antennae brownish-black, scape and pedicel enlarged, especially the latter; proximal two flagellar segments fused, remaining segments long-oval, shorter than their verticils. Eyes with very large ommatidia. Head yellow.

Pronotum and pretergites yellow. Mesonotum orange. Pleura chiefly brown, with a yellowed ventral stripe that includes the sternopleurite and ventral pteropleurite; meron darkened dorsally, broadly yellow beneath; dorso-pleural region clearer yellow. Halteres light yellow. Legs with fore coxae and trochanters brownish-black, middle and hind pairs yellow; fore femora with nearly the basal half blackened, remainder of legs light yellow, outer tarsal segments very slightly darker; legs with abundant linear scales additional to the long setae. Wings (Fig. 1) light yellow, with conspicuous brown spots, larger at cord and at both ends of stigma; longitudinal veins beyond cord with smaller paler brown spots, in some specimens these more abundant and tending to become confluent; cell *2nd A* slightly more infuscated than remainder of ground; veins light yellow in the ground, including the trichia; veins and trichia of patterned areas darker. Venation as in the subgenus, the cord at or before midlength of wing; *Rs* shorter than R_{2+3+4} ; R_{2+3} perpendicular or suberect at origin; *m-cu* shortly before fork of *M*; vein *2nd A* moderately sinuous, ending about opposite *m-cu*.

Abdomen of male uniformly yellow or brownish-yellow; hypopygium clear yellow, styli darkened. In female, abdominal tergites obscure yellow medially, sides brownish-black; sternites darkened basally, apices more yellowed, more extensively so on outer segments; genital segment yellow.

Male hypopygium (Fig. 9) with ninth tergite, *t*, semioval, outer end very shallowly emarginate, the lobes with dense microscopic setulae, some of the

laterals longer. Basistyle, *b*, projecting shortly beyond insertion of the dististyle, with unusually long setae. Dististyle, *d*, single, appearing as a narrow glabrous blade, lower margin of outer half slightly emarginate. Phallosome, *p*, very complex, the most conspicuous elements being large blade-like gonapophyses, *a*, their apices with long slender spines, varying in number from two to four, commonly three (as shown in the subfigures); a further noteworthy phallosomic element are triangular sclerotized plates, each produced caudad into a strongly recurved hook, as shown. Aedeagus at apex profoundly bifid into two long parallel tubes.

Length: ♂, about 4-4.2 mm; wing 4.5-5 mm; antenna about 0.9 mm; ♀, about 4.5 mm; wing 5 mm.

Holotype ♂, INDIA: KERALA: Munnar, 3500 feet, 15. xii. 1961, Coll. Schmid. Allotopotype ♀, with type. Paratopotypes 3 ♂♂, with types.

Other related regional species include *Erioptera (Teleneura) annandalei* Alexander (*punctipennis* Brunetti preoccupied), of the Eastern Himalaya, *E. (T.) lushaiensis* Alexander, Assam, and *E. (T.) nebulifera* Alexander, South India, all differing among themselves in coloration of the body, legs and wings, and, where known, in hypopygial structure. Brunetti described his *punctipennis* from two females taken at Kurseong on June 26-27, 1910, by Annandale. The legs of this fly are yellow with the apices of all segments very slightly darkened, very different from the coloration of the present fly.

3. *Erioptera (Psiloconopa) epicharis* Alexander (Figs. 2, 10)

Erioptera (Ilisia) epicharis Alexander, 1966, *J. New York Ent. Soc.*, 74: 70.

Type ♀, SIKKIM: Yagtang. Specimen figured, Dakwani, Pauri Garhwal, Kumaon, 9300-11,000 feet, 5.viii.1959, Coll. Schmid. Venation (Fig. 2), male hypopygium (Fig. 10).

4. *Erioptera (Psiloconopa) sparsiguttula* Alexander (Figs. 3, 11)

Erioptera (Psiloconopa) sparsiguttula Alexander, 1966, *Bull. Brooklyn Ent. Soc.*, 59-60: 19.

Type ♀, Afghanistan: Chanlacha. Venation (Fig. 3), male hypopygium (Fig. 11).

5. *Erioptera (Erioptera) brahma* Alexander (Figs. 4, 12)

Erioptera (Erioptera) brahma Alexander, 1966, *Bull. Brooklyn Ent. Soc.*, 59-60: 14.

Type ♂, Sikkim: Zema. Venation (Fig. 4), male hypopygium (Fig. 12).

6. *Erioptera (Erioptera) litostyla* Alexander (Figs. 5, 13)

Erioptera (Erioptera) litostyla Alexander, 1966, *Bull. Brooklyn Ent. Soc.*, 59-60: 15.

Type ♂, Sikkim: Lachen. Venation (Fig. 5), male hypopygium (Fig. 13).

7. *Erioptera (Erioptera) pila* Alexander (Figs. 6, 14)

Erioptera (Erioptera) pila Alexander, 1966, *Bull. Brooklyn Ent. Soc.*, 59-60 : 16.

Type ♂, Sikkim : Yagtang. Venation (Fig. 6), male hypopygium (Fig. 14).

8. *Erioptera balioptera* Alexander (Subgenus uncertain) (Figs. 7, 15)

Erioptera (Erioptera) balioptera Alexander, 1966, *Bull. Brooklyn Ent. Soc.*, 59-60 : 13.

Type ♂, Assam : Serrarim. Venation (Fig. 7), male hypopygium (Fig. 15).

9. *Molophilus (Molophilus) hardyi*, sp. nov. (Fig. 16)

Belongs to the *gracilis* group; general coloration of body light brown; antennae of male elongate, nodulose, exceeding one-half the wing; male hypopygium with a single dististyle that appears as a blackened rod, apex shallowly forked, the axial branch pointed.

Rostrum and palpi brown. Antennae of male elongate, slightly exceeding one-half the body length; dark brown; flagellar segments long-oval, narrowed both ends, more strongly outwardly, the dilated central part with outspreading verticils, the longest exceeding the segments. Head brown.

Pronotum and pretergites light yellow. Mesonotum chiefly light brown, on prescutum appearing as vague broad stripes, scutellum slightly more yellowed. Pleura brownish-yellow. Halteres with knob and base of stem yellowed, the remainder slightly darker. Legs with coxae and trochanters yellow; remainder of legs brownish-yellow, tarsi passing into dark brown. Wings yellowed, proximal veins yellow, beyond cord more yellowish-brown; trichia brownish-black. Venation : R_2 in slightly oblique alignment with $r-m$; petiole of cell M_3 about four times $m-cu$; vein 2nd A relatively short.

Abdominal tergites brown, sternites somewhat paler. Male hypopygium (Fig. 16) with dorsal lobe of basistyle, b , very slender, tipped with two long setae, ventral lobe of style very extensive, its margin with scattered strong blackened setae, elsewhere on style setae short except on mesal face where there are several long delicate hairs. Dististyle, d , distinctive, appearing as a single black rod that forks at apex into a short blunt lobe and an inner or axial more acute blackened point. Proctiger unusually narrowed outwardly, near tip with delicate setulae. Aedeagus, a , very long and straight, the enclosed penis filament central in position.

Length : ♂, about 4.5 mm; wing 4.5 mm; antenna about 2.8 mm.

Holotype ♂, INDIA : KERALA : Munnar, 3500 feet, 15.xii.1961, Coll. Schmid.

The species is named for Dr. D. Elmo Hardy, outstanding student of the world Diptera and one of the principal workers on the Oriental Catalogue of Diptera, with Drs. Mercedes Delfinado and Alan Stone. From other regional species of the genus having elongate, nodulose antennae in the male and the hypopygium with a single dististyle, including *Molophilus (Molophilus) idiostylus*

Alexander, of Assam, and *M. (M.) peculiaris*, sp. nov., Madras, the present fly is readily told by the structure of the dististyle, as shown.

10. *Molophilus (Molophilus) neovaruna*, sp. nov.

Belongs to the *gracilis* group, *procericornis* subgroup, allied to *varuna*; antennae of male very long, subequal in length to the wing; flagellar segments with very long outspreading verticils; male hypopygium with dorsal lobe of basistyle terminating in an acute spine; outer dististyle long and slender, subequal in length to the intermediate style; inner style subrectangular, only slightly widened outwardly.

Rostrum and palpi dark brown. Antennae of male very long, subequal to the body or wing, brown throughout; flagellar segments with nearly the basal half oval, with very long outspreading verticils, the longest about one-half longer than the segment. Head medium brown.

Thorax medium brown throughout. Halteres and legs dark brown. Wings weakly suffused with brown, veins and the very long trichia darker brown.

Abdomen dark brown. Male hypopygium with the dorsal lobe of basistyle elongate, gradually enlarged outwardly, terminating in an acute spine; mesal face of style near base with a small setiferous long-oval lobe that is subequal in length to the inner dististyle. Outer and intermediate dististyles subequal in length and diameter, elongate, more dilated basally; outer style terminating in a long slender spine, inner margin of distal half with very small darkened denticles, intermediate style near apex twisted, terminating in a short point, margin shortly back from tip with rows of small black spines, remainder of style entirely smooth; inner dististyle much smaller, yellow, subrectangular, only slightly widened outwardly, apex obliquely truncated, with six or seven long setae.

Length : ♂, about 5 mm; wing 5 mm; antenna about 5 mm.

Holotype ♂, INDIA : ASSAM, Kameng, Arunachal Pradesh (NEFA), Chug, 6800-7300 feet, 30.vii.1961, Coll. Schmid.

There are several allied regional members of the *procericornis* subgroup, the most similar being *Molophilus (Molophilus) varuna* Alexander, likewise from Assam. This differs especially in the details of hypopygial structure, including most evidently the dorsal lobe of the basistyle, as described.

11. *Molophilus (Molophilus) peculiaris*, sp. nov. (Fig. 17)

Belongs to the *gracilis* group; general coloration of thorax brownish-yellow, variegated with brown; antennae of male elongate, exceeding one-half the body, flagellar segments strongly nodulose, with very long outspreading verticils; male hypopygium with a single dististyle of unique conformation, appearing as a slender curved rod, narrowed to an acute point, at near midlength with two small modified lobes.

Rostrum and palpi brown. Antennae of male elongate, brown; basal segments slightly paler; flagellar segments dilated on the proximal two-thirds and here provided with very long outspreading verticils, the longest exceeding the segments, outer third to fourth of segments narrowed, glabrous, outer two segments cylindrical, subequal; vestiture of terminal segments very reduced. Head brown.

Thorax, as appearing in balsam mount, almost uniformly brownish-yellow, variegated with darker brown, most conspicuous on the pleura. Halteres light brown. Legs with coxae and trochanters yellowed; remainder of legs broken. Wings yellowed to light brown, veins darker; trichia of veins, including the fringe of the entire wing, very long and abundant, the longest in the anal field. Venation: R_2 and r in approximate transverse alignment; petiole of cell M_4 nearly four times $m-cu$; vein $2nd A$ ending shortly before level of $m-cu$.

Abdomen brown. Male hypopygium (Fig. 17) with the dorsal lobe of basistyle, b , slender, with about three very long setae, the longest subequal to the lobe, ventral lobe of style, broad. A single dististyle, d , of peculiar conformation, appearing as a strongly curved rod, basal half stouter, at near midlength with a slender finger-like appressed lobe and at almost the same point with a small lobe that terminates in a small acute spine; apex of style beyond the lobes narrowed gradually to an acute point, appearing as a narrow blade with lateral folds or low ridges. Aedeagus, a , long and very slender.

Length: ♂, about 4.5-4.6 mm; wing 5-5.4 mm; antenna about 3-3.2 mm.

Holotype ♂, INDIA: MADRAS, Bodi Mettu, 2000-3000 feet, 24.i.1962, Coll. Schmid.

In the long nodulose antennae of the male the present fly suggests members of the *procericornis* subgroup of the *gracilis* group but the hypopygial structure is distinct from other species of this subgroup. The most similar species as regards hypopygial structure is *Molophilus (Molophilus) idiostylus* Alexander, of Assam, that is referred to the *gracilis* group, as mentioned under *Molophilus (Molophilus) hardyi*, earlier in this paper. In this latter fly the hypopygium is generally similar to that of the present species but the conformation of the dististyle is entirely different.

12. *Molophilus (Molophilus) sublancifer*, sp. nov. (Fig. 18)

Belongs to the *gracilis* group and subgroup, allied to *lancifer*; general coloration of head and thorax brown, abdomen darker brown; wings with vein M_{3+4} long, slightly less than M_4 ; male hypopygium with mesal lobe of basistyle broadly flattened, apex obliquely truncate and coarsely toothed; both dististyles generally similar, long and slender, virtually glabrous.

Head brown. Antennae of male elongate, nodulose, about five-sixths the length of wing, dark brown; flagellar segments with basal half oval, with very long outspreading verticils, the longest about one and one-half times the segment.

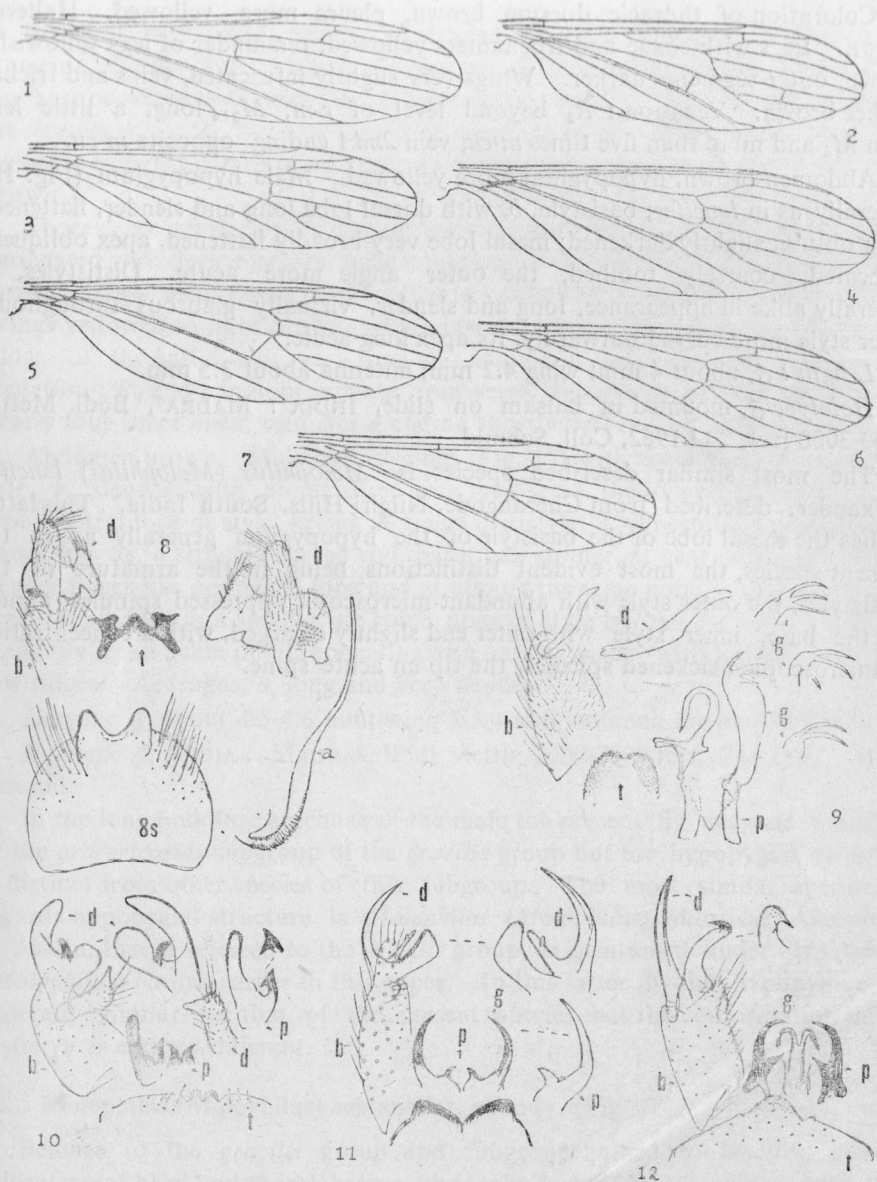
Coloration of thoracic dorsum brown, pleura more yellowed. Halteres brown. Legs with coxae and trochanters yellowed; remainder of legs yellowish-brown, outer segments darker. Wings very slightly infuscated, veins and trichia darker brown. Venation: R_2 beyond level of $r-m$; M_{3+4} long, a little less than M_4 and more than five times $m-cu$; vein $2nd A$ ending opposite $m-cu$.

Abdomen brown, hypopygium more yellowed. Male hypopygium (Fig. 18) generally as in *lancifer*; basistyle, b , with dorsal lobe long and slender, flattened, apex obtuse, slightly darkened; mesal lobe very broadly flattened, apex obliquely truncated, coarsely toothed, the outer angle more acute. Dististyles, d , generally alike in appearance, long and slender, virtually glabrous throughout, inner style more curved outwardly, its apex long-acute.

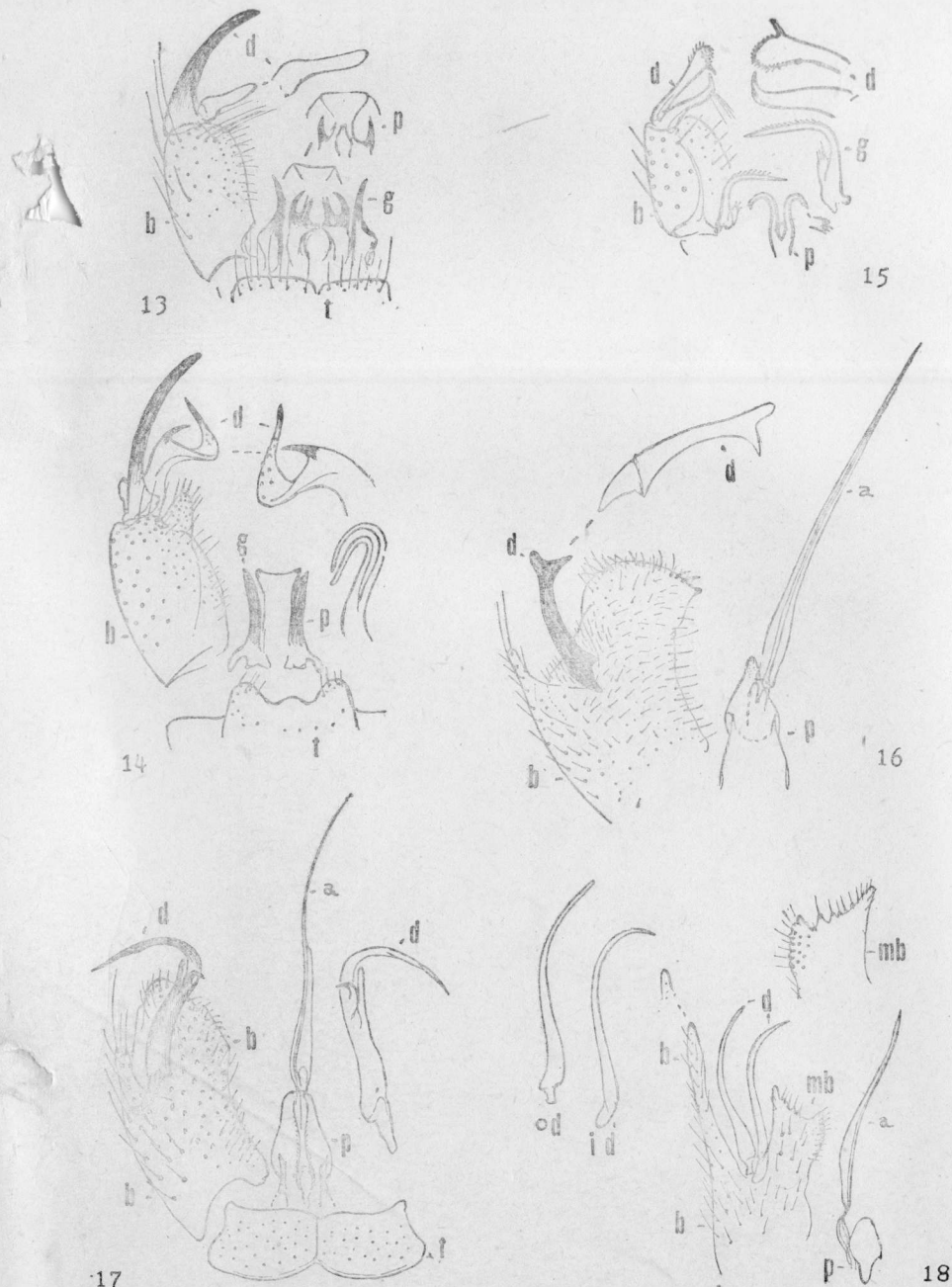
Length: ♂, about 4 mm; wing 4.2 mm; antenna about 3.5 mm.

Holotype ♂, mounted in balsam on slide, INDIA: MADRAS, Bodi Mettu, 2000-3000 feet, 24.i.1962, Coll. Schmid.

The most similar described species is *Molophilus (Molophilus) lancifer* Alexander, described from Cherangode, Nilgiri Hills, South India. This latter fly has the mesal lobe of the basistyle of the hypopygium generally as in the present species, the most evident distinctions being in the armature of the dististyles, the outer style with abundant microscopic appressed spinules almost to the base, inner style with outer end slightly enlarged, with a concentration of microscopic blackened spinules, the tip an acute spine.



Figs. 1-12. Venation of: 1, *Erioptera (Teleneura) acanthapophysis*, sp. nov.; 2, *Erioptera (Psiloconopa) epicharis* Alexander; 3, *Erioptera (Psiloconopa) sparsiguttula* Alexander; 4, *Erioptera (Erioptera) brahma* Alexander; 5, *Erioptera (Erioptera) litostyla* Alexander; 6, *Erioptera (Erioptera) pila* Alexander; 7, *Erioptera balioptera* Alexander. Male hypopygium of: 8, *Dolichozeza (Nesopeza) himalayae* Alexander; 9, *Erioptera (Teleneura) acanthapophysis* Alexander; 10, *Erioptera (Psiloconopa) epicharis* Alexander; 11, *Erioptera (Psiloconopa) sparsiguttula* Alexander; 12, *Erioptera (Erioptera) brahma* Alexander. (Symbols: a, aedeagus; b, basistyle; d, dististyle; g, gonapophysis; p, phallosome; s, 8th sternite; t, 9th tergite).



Figs. 13-18. Male hypopygium of: 13, *Erioptera (Erioptera) litostyla* Alexander; 14, *Erioptera (Erioptera) pila* Alexander; 15, *Erioptera balioptera* Alexander; 16, *Molophilus (Molophilus) hardyi*, sp. nov.; 17, *Molophilus (Molophilus) peculiaris*, sp. nov.; 18, *Molophilus (Molophilus) sublancifer*, sp. nov. (Symbols: i, interbase; a, aedeagus; b, basistyle; d, dististyle; id, inner dististyle; mb, mesal lobe of basistyle; od, outer dististyle; p, phallosome; t, 9th tergite).