

New or little-known species of exotic Tipulidae (Diptera). XV

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SYNOPSIS

Descriptions are given of three new species of Pediciine crane flies, two belonging to the genus *Ula* and one to *Dicranota*, all from Assam, and of five further species of Limoniini, all in the genus *Antocha*. The materials were collected in the Himalayan region from Kumaon in the west to Sikkim and Assam.

THE preceding part in this series of papers was published in 1967 (*Proc. R. ent. Soc. Lond. (B)* 36 (5-6): 61-68). At this time I am discussing three further species in the tribe Pediciini and am beginning the treatment of the genus *Antocha* Osten Sacken, vastly developed in the Himalayan region and throughout eastern Asia. The materials being considered are from the Himalayan region of India from Kumaon to Sikkim and Assam, where they were taken by Dr. Fernand Schmid. Through the appreciated interest of the collector, the types are preserved in my personal collection.

PEDICIINI

Ula (Ula) parabidens sp.n.

Male: length, about 6 mm.; wing, 6.5 mm.; antenna, about 2.7 mm.

Generally as in *bidens* Alexander and *subbidens* Alexander, differing in hypopygial characters. Male hypopygium (fig. 3) with the posterior border of tergite (*t*) truncate to feebly convex, the setae relatively sparse. Basistyle (*b*) without a setiferous tubercle at inner apical angle. Phallosome (*p*) with lateral arms divided into two slender slightly unequal points; inner apophysis lateral in position, appearing as a strong horn that narrows gradually, the apex directed mesad.

In *bidens* (fig. 2) the posterior border of tergite (*t*) is gently concave, the setae more numerous and conspicuous. Basistyle (*b*) with inner apical angle produced into a lobe with several long yellow setae. Phallosome (*p*) with lateral arms appearing as nearly straight blades, the apical spines small, inner apophysis placed far out on the phallosomic complex, directed mesad to appear virtually decussate across the mid-line.

Holotype ♂ on microscope slide, INDIA: Sirhoi Kashong, Manipur, Assam, 7500 feet, 13.vii.1960 (*F. Schmid*).

Ula (Ula) bidens Alexander is known to me only from the type locality in North-eastern Burma (Kambaiti, 2000 m., taken 16.v.1934, by Rene Malaise). *Ula (Ula) subbidens* Alexander is known from Nepal and Sikkim.

Ula (Ula) unidens sp.n.

Size small (wing of male 5.5 mm.); antennae relatively long, nearly one-half the wing; thorax dark chestnut-brown; wings tinged with brown, restrictedly patterned with darker brown; male hypopygium with lateral arm of phallosome a long flattened yellow blade, beyond mid-length bent and extended into a long straight spine, inner apophyses slender, strongly sinuous.

Male: length, about 5.5 mm.; wing, 5.5 mm.; antenna, about 2.5 mm.

Rostrum and palpi brown. Antennae 17-segmented, elongate, dark brown; flagellar segments long, subcylindrical, with short dense pubescence and with a single verticil on each, placed at near the basal third, shorter than segment; terminal segment about one-half longer than the penultimate. Head brown, paler anteriorly.

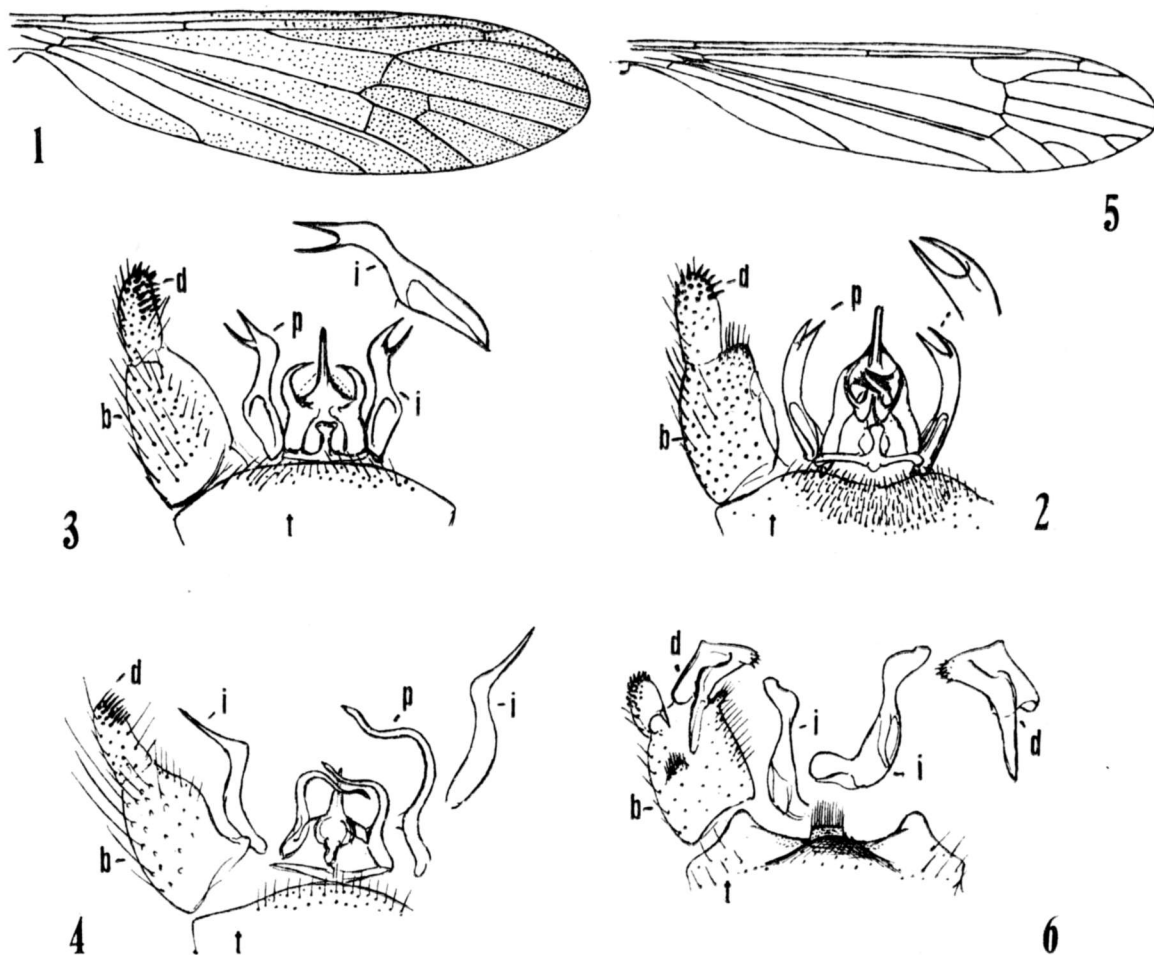
Thorax almost uniformly dark chestnut-brown; notal vestiture sparse, erect, dark coloured. Halteres with stem brown, knob brownish-black. Legs with coxae and trochanters obscure yellow; remainder of legs light brown, femoral bases yellowed. Wings (fig. 1) tinged with brown, restrictedly patterned with darker brown on anterior cord and more narrowly on remainder of cord, origin of *Rs*, and outer end of cell 1st *M*₂; veins pale brown, slightly darker in the patterned portions. Venation: basal section of *R*₅ lacking, *r-m* joining *Rs* at the fork; *m-cu* about one-third its length beyond fork of *M*.

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Abdominal tergites and hypopygium dark brown, sternites paler. Male hypopygium (fig. 4) with dististyle (*d*) with elongate black spinoid setae. Phallosome (*p*) with lateral apophysis or interbase a long flattened yellow blade, at near two-thirds its length bent at nearly a right angle and extended into a long slender spine; gonapophyses appear as slender strongly sinuous rods that narrow gradually to the subacute tip; aedeagus straight.

Holotype ♂, INDIA: Jhum La, Kameng, North East Frontier Agency, 7800 feet, 14.v.1961 (*F. Schmid*).

Ula (Ula) unidens is similar in general appearance to *U. (U.) bidens* Alexander and *U. (U.) subbidens* Alexander, all three differing among themselves in hypopygial characters, particularly of the phallosome.



FIGS. 1-6.—(1) Venation of *Ula (Ula) unidens* sp.n. (2-4) Male hypopygium of: (2) *Ula (Ula) bidens* Alexander; (3) *Ula (Ula) paravidens* sp. n.; (4) *Ula (Ula) unidens* sp.n. (5) Venation of *Dicranota (Rhaphidolabis) subtumidosa* sp.n. (6) Male hypopygium of *Dicranota (Rhaphidolabis) subtumidosa* sp.n. (*b*, basistyle; *d*, dististyle; *i*, interbase; *p*, phallosome; *t*, tergite.)

Dicranota (Rhaphidolabis) subtumidosa sp.n.

General coloration dark brown; wings uniformly suffused with light brown, veins pale brown, R_{2+3+4} subequal to basal section of vein R_5 ; male hypopygium generally as in *tumidosa* but the shape and proportions of the marginal and subterminal lobes different.

Male: length about 5.5 mm.; wing, 5 mm.

Rostrum and palpi dark brown. Antennae dark brown; in unique type only 8 segments remain, proximal flagellar segments oval, longer than their very small verticils. Head dark brown.

Thorax uniformly dark brown, the usual praescutal stripes not differentiated. Halteres with stem light brown, base yellowed, knob dark brown. Legs with coxae and trochanters light brown, remainder darker brown. Wings (fig. 5) uniformly suffused with light brown, stigma only vaguely more darkened; veins pale brown. Veins beyond cord with abundant small trichia, basal veins behind R glabrous. Venation: R_{2+3+4} subequal to basal section of vein R_5 ; *m-cu* nearly one-half its length beyond the fork of *M*.

Abdomen dark brown. Male hypopygium (fig. 6) with posterior border of tergite (*t*) produced at mid-region into a transversely rectangular lobe that is broader than long, the margin with a continu-

ous row of long setae that are subequal in length to the lobes; lateral tergal lobes conspicuous, rounded; just cephalad of the mid-tergal lobe a low blackened transverse protuberance, more than twice as wide as marginal lobe. Other hypopygial details as shown. In *tumidosa* the median rectangular lobe is much broader, being more extensive than the compact subterminal darkened lobe.

Holotype ♂, INDIA: Kujjalong, Kameng, North East Frontier Agency, 4500 feet, 28.vi.1961 (*F. Schmid*).

Dicranota (Rhaphidolabis) subtumidosa is closely related to *D. (R.) tumidosa* Alexander, of Pakistan and Kashmir, differing in the hypopygial structure, particularly the tergite and interbase.

LIMONIINI

Antocha Osten Sacken

Antocha Osten Sacken, 1859, *Proc. Acad. Nat. Sci. Philad.* 1859: 219. Name in continuous use from 1859 to date.

Taphrophila Rondani, 1856, *Dipter. Italicae prodr.* 1: 185. A *nomen oblitum* between 1856 and 1938.

The genus *Antocha* is greatly developed throughout the Himalayan region and in eastern Asia, in contrast to the condition found in a corresponding area in western North America, where the single species so far discovered, *Antocha (Antocha) monticola* Alexander, ranges from the Yukon Territory (Whitehorse) south to Mexico (Morelos).

The characters to be found in the male hypopygium in this genus are of extreme importance in classification and have not been emphasised properly. The phallosomic region is very complex, including not only the aedeagus and gonapophyses but also the interbase, which is a direct outgrowth from the basistyle; all these structures are interconnected to form an intricate scaffolding, as shown in the various species here considered (figs. 8–13). Similarly, the dististyles vary greatly in conformation in the different species, as shown. It has been believed that the genital tube within the aedeagus possessed a single terminal opening, but in some species there are two closely approximated tubes, with separate openings (fig. 13).

In the present paper I am discussing six species and expect to treat many further species in succeeding reports.

Antocha (Antocha) biobtusa sp.n.

General coloration of mesonotum brownish-grey, the lateral and humeral regions of the praescutum yellowed; antennae with scape yellow, remainder black, flagellar segments oval; knobs of halteres infuscated; legs light brown; wings milky-grey, prearcular field whitened; male hypopygium with both dististyles yellowed, unusually broad, tips obtuse, outer gonapophyses long and slender, inner apophyses broader, especially basally.

Male: length, about 5.2 mm.; wing, 6.4 mm.; antenna, about 1.0 mm.

Rostrum yellow, palpi slightly darker. Antennae with scape yellow, remainder black; flagellar segments oval, slightly longer than their verticils. Head brownish-grey; anterior vertex broad, about three times the diameter of scape.

Pronotum obscure yellow, darkened medially. Mesonotal praescutum with lateral and humeral regions broadly yellow, disk with 3 brown stripes, the broad central area vaguely divided behind, the interspaces only a little paler than the stripes; remainder of notum brownish-grey. Pleura obscure yellow. Halteres with stem whitened, knob infuscated. Legs with coxae and trochanters yellowed, remainder of legs brownish-yellow to light brown. Wings (fig. 7) milky-grey, prearcular field whitened; veins dark yellow, poorly differentiated against the ground. Macrotrichia on distal sections of veins R_{4+5} , M_{1+2} and M_3 . Venation: *m-cu* about one-third its length before fork of *M*.

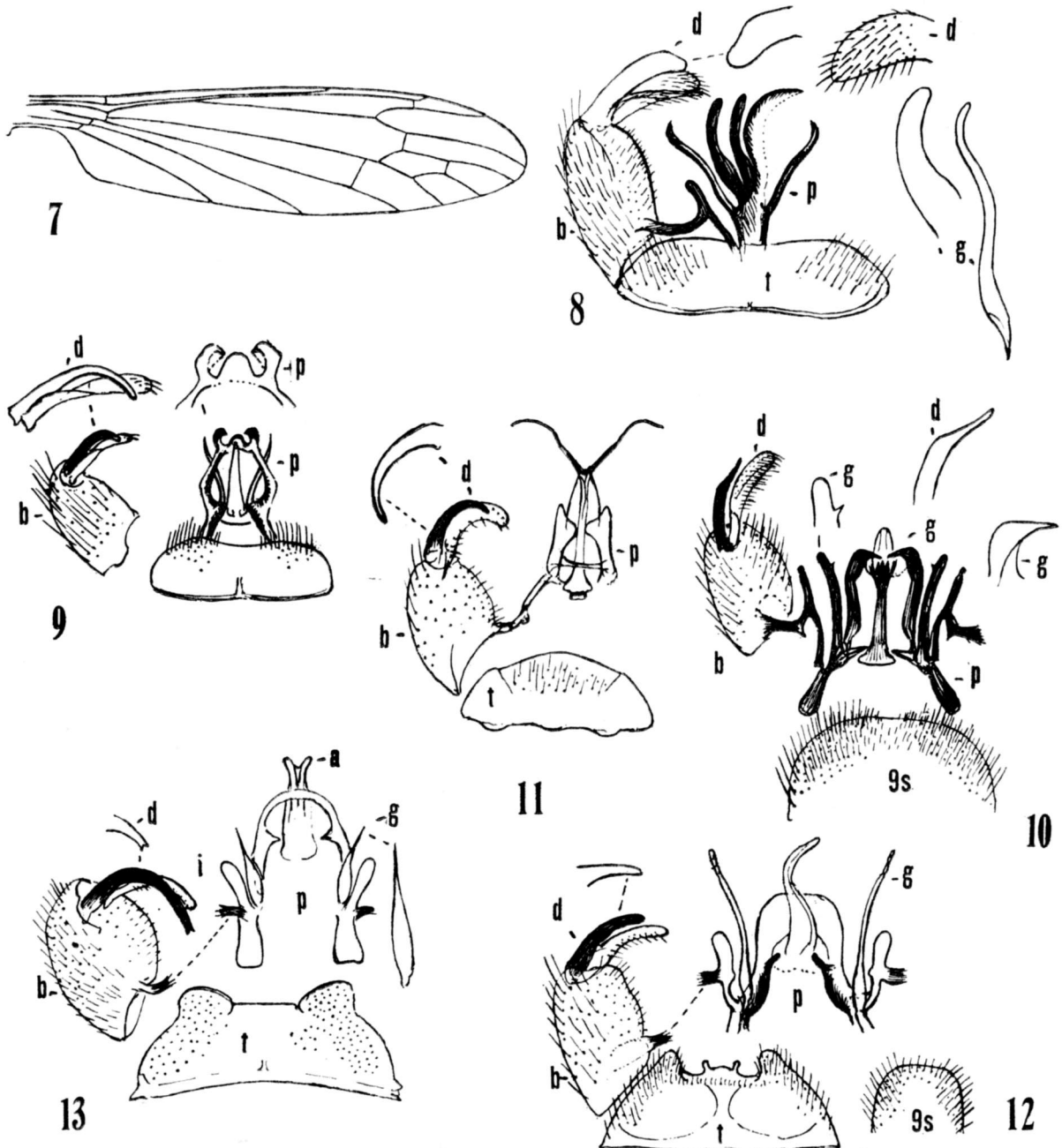
Abdominal tergites brown medially, paler on sides, subterminal segments more uniformly darkened; sternites obscure yellow, hypopygium clearer yellow. Male hypopygium (fig. 8) with the tergite (*t*) narrowly transverse, with both cephalic and posterior borders very shallowly emarginate. Both dististyles (*d*) yellowed, unusually broad, tips obtuse. Phallosome (*p*) with the interbase long-oval; outer gonapophysis long and slender, simple, much more slender than the inner apophysis, the latter with tip obtuse. Margins of both the inner apophyses and the aedeagus very pale and difficult to delimit.

Holotype ♂, INDIA: Teng, Sikkim, 4600 feet, 1. viii. 1959 (*F. Schmid*).

Antocha (Antocha) biobtusa is most readily distinguished from other generally similar regional species by the structure of the male hypopygium, especially the pale dististyles with obtuse tips, and by the details of the phallosome. The pale yellow outer dististyle is broader than in other regional members of the genus.

Antocha (Antocha) hyperlata sp.n.

Size small (wing of male to about 4 mm.); antennae of male moderately long, about one-half the body or wing, scape yellowed, remainder dark brown; mesonotum yellowed, praescutum with 3 brown stripes, the central one long, pleura yellow, patterned with dark brown, especially on the ventral sternopleurite; knobs of halteres brown; legs light brown, femoral tips not darkened; wings greyish, veins R_{4+5} and M_3 with trichia; abdomen brown, posterior borders of segments more yellowed; male hypopygium with the phallosome distinctive, the apex of central region trilobed, gonapophyses slender, needle-like.



FIGS. 7-13.—(7) Venation of *Antocha (Antocha) biobtusa* sp.n. (8-13) Male hypopygium of: (8) *Antocha (Antocha) biobtusa* sp.n.; (9) *Antocha (Antocha) hyperlata* sp.n.; (10) *Antocha (Antocha) incurva* sp.n.; (11) *Antocha (Antocha) ophioglossodes* sp.n.; (12) *Antocha (Antocha) scapularis* sp.n.; (13) *Antocha (Antocha) turkestanica* de Meijere (*a*, aedeagus; *b*, basistyle; *d*, dististyle; *g*, gonapophysis; *i*, interbase; *p*, phallosome; *s*, ninth sternite; *t*, ninth tergite.)

Male: length, about 3.8–4 mm.; wing, 3.7–4 mm.; antenna, about 1.8–2.0 mm.

Rostrum yellow to brownish-yellow, palpi darker brown. Antennae of male moderately long, approximately one-half the body or wing; scape yellow, remainder dark brown; flagellar segments elongate, with dense erect setae, the sparse verticils shorter than the segments. Head brown, heavily grey pruinose, clearest on orbits and the broad anterior vertex.

Pronotum buffy-yellow, clearer yellow on sides. Mesonotal praescutum yellowed, with 3 brown stripes, the central one long and more conspicuous; posterior sclerites of notum testaceous yellow. Pleura obscure yellow, conspicuously patterned with dark brown on the anepisternum and extensively on the ventral sternopleurite. Halteres with stem yellow, knob brown. Legs with coxae and trochanters yellow, fore coxae darker; remainder of legs light brown, femoral tips and tarsi not darker. Wings greyish, prearcular and costal fields more yellowed; veins light brown. Macrotrichia on veins R_{4+5} , M_{1+2} and M_3 , rarely at tip of R_3 . Venation: vein R_2 very faint, opposite to shortly beyond level of $r-m$; cell 1st M_2 normally closed, rarely open by atrophy of m ; $m-cu$ a short distance before fork of M , in cases nearly at the fork.

Abdominal tergites brown, their posterior borders more yellowed, sternites less evidently bi-colored; hypopygium yellow to brownish-yellow. Male hypopygium (fig. 9) with tergite (t) transverse, central third of posterior border truncate. Dististyles (d) subterminal, outer style shaped like a boomerang, smaller and more slender than the inner style. Phallosomic scaffolding large and conspicuous, at outer end the parts united and appearing trilobed, the central lobe obtusely rounded, the lateral blades more produced; the scaffolding that surrounds the central area includes the slender needle-like outer gonapophyses and the shorter interbase.

Holotype ♂, INDIA: Luanglong Khunou, Manipur, Assam, 2500 feet, 28.v.1960 (*F. Schmid*). *Paratypes*: 1 ♂ (*paratopotype*), with the type; several ♂, Apong, Manipur, 2430 feet, 1.viii.1960; 2 ♂, Bongba Khulen, Manipur, 2500 feet, 28.vii.1960; 1 ♂, Huiahu, Manipur, 5000 feet, 3.vii.1960; 1 ♂, Mapum, Manipur, 5000 feet, 12.vi.1960; several ♂, Ninghti, Manipur, 2500 feet, 30.vii.1960; 1 ♂, Sihai Khulen, Manipur, 4700 feet, 25.vi.1960; 2 ♂, Srinagi, Sikkim, 4920 feet, 6.iv.1959; 1 ♂, Dulahar, Pauri Garhwal, Kumaon, 4500 feet, 2.vi.1958; 1 ♂, Pulwara, Pauri Garhwal, 4300 feet, 31.viii.1958 (all *F. Schmid*).

In its general appearance, especially the pattern of the praescutum, the present fly agrees with the description of *Antocha* (*Antocha*) *triangularis* (Brunetti), differing in the darkened knobs of the halteres and the femoral tips, and in the conspicuous darkened pattern of the thoracic pleura. The types of *triangularis* and its apparent synonym, *A. (A.) unilineata* Brunetti, both from the western Himalaya, are females.

Antocha (*Antocha*) *incurva* sp.n.

General coloration of mesonotum and pleura plumbeous; antennae black throughout; halteres infuscated; legs dark brown; wings brownish-grey, unpatterned; male hypopygium with ninth sternite broad, its posterior border rounded; phallosome with inner gonapophyses appearing as short sclerotised hooks, the tip incurved into a strong point.

Male: length, about 5 mm.; wing, 5.7 mm.; antenna, about 1.4 mm.

Rostrum yellowish-brown; palpi brownish-black. Antennae black throughout, relatively long; flagellar segments oval, with dense erect dark setae that are somewhat shorter than the verticils. Head brown; anterior vertex very broad, exceeding 5 times the diameter of scape.

Pronotum light brown. Mesonotum dark plumbeous grey, praescutum of the unique type discoloured and it is uncertain as to whether there are differentiated markings. Pleura dark plumbeous, dorsopleural membrane obscure yellow. Halteres infuscated. Legs with coxae and trochanters brownish-yellow; remainder of legs dark brown; claws of male relatively short for members of the subgenus. Wings brownish-grey, unpatterned; veins light brown. Macrotrichia on distal section of vein R_{4+5} , more sparse on M_{1+2} , M_3 and M_4 . Venation: $m-cu$ about three-fourths its length before fork of M .

Abdomen dark brown. Male hypopygium (fig. 10) with tergite (t) narrowly transverse, the breadth about 4 times the length; posterior border nearly truncate, with abundant setae over much of the surface. Ninth sternite (s) broad, posterior margin gently rounded, nearly the outer half with abundant setae, those near mid-line smaller. Basistyle (b) with unusually long coarse setae. Outer dististyle (d) blackened, outer third narrowed, tip obtuse; inner style longer, setae conspicuous. Phallosome (p) with interbase and outer gonapophysis yellowed, the latter longer, with a small marginal point before apex. Inner apophysis subtending the long-oval aedeagus, each appearing as a short sclerotised hook, its apex incurved at a right angle into a strong point.

Holotype ♂, INDIA: Tsomgo, Sikkim, 12,500 feet, in *Rhododendron* association, 26.viii.1959 (F. Schmid).

In its general appearance the present fly resembles *Antocha* (*Antocha*) *amblystyla* Alexander, differing conspicuously in the hypopygial structure, including virtually all parts.

***Antocha* (*Antocha*) *ophioglossodes* sp.n.**

General coloration of thorax dark grey, praescutum with a very broad brown central stripe; antennae of male relatively long; legs brownish-yellow, claws with a single long nearly basal spine; wings greyish-white, unpatterned, prearcular field whitened; male hypopygium with outer dististyle blackened; terminal filaments of aedeagus long, only slightly shorter than the base.

Male: length, about 5.5 mm.; wing, 6 mm.; antenna, about 2 mm.

Rostrum obscure yellow; palpi black. Antennae of male relatively long, about one-third the wing, black throughout; flagellar segments long-cylindrical, with dense erect whitened setae; terminal segment about one-half the penultimate. Head dark brown.

Thoracic dorsum dark grey, the praescutum with a very broad median stripe that ends abruptly some distance before the suture, lateral stripes more greyish, crossing the suture on to the scutal lobes. Pleura dark grey, the ventral sternopleurite more blackened; dorsopleural membrane dusky. Halteres yellow, apex of knob more darkened. Legs with coxae and trochanters obscure yellow; remainder of legs brownish-yellow, terminal tarsal segments slightly darker; terminal tarsal segment sinuous, lower face with a tubercle near outer end; claw with a very long nearly basal spine. Wings greyish-white, unpatterned, prearcular field whitened, bases of both anal cells weakly darkened; veins pale. Numerous macrotrichia on distal sections of veins R_{4+5} and M_{1+2} , with fewer on M_3 . Venation: *m-cu* before fork of *M*.

Abdomen, including hypopygium, dark brown. Male hypopygium (fig. 11) generally as in *ophioglossa*. Ninth tergite (*t*) transverse, median region of posterior border slightly convex. Dististyles (*d*) terminal, outer style blackened, curved on distal half to the subacute tip, inner style slightly longer and stouter, tip obtuse. Phallosome (*p*) generally as in *ophioglossa* but with the terminal filaments much longer, sinuous, only slightly shorter than the base.

Holotype ♂, INDIA: Yagtang, Sikkim, 11,650 feet, in *Rhododendron* association, 17.vi.1959 (F. Schmid).

Antocha (*Antocha*) *ophioglossodes* is related to *A.* (*A.*) *ophioglossa* Alexander, of northeastern Burma, differing evidently in the male hypopygium, particularly the blackened outer dististyle and the elongate snake-tongue-like filaments of the aedeagus.

***Antocha* (*Antocha*) *scapularis* sp.n.**

General coloration of thorax grey; antennae black, scape paler; legs brown; wings brownish-grey, prearcular field whitened, the small stigma pale brown; male hypopygium with tergite transverse, the outer lateral angles produced, conspicuously setiferous, median area with two slender lobules, interbase a small pale blade, apex obtuse; outer gonapophyses long and very slender, about twice the interbase; aedeagus outwardly relatively long and slender.

Male: length, about 5-6.5 mm.; wing, 6.5-8 mm.; antenna, about 1.4-1.8 mm.

Rostrum obscure yellow; palpi dark brown. Antennae with scape yellowish-brown, clearer yellow beneath, remainder of organ brownish-black to black; flagellar segments oval, exceeding their verticils. Head brownish-grey.

Pronotal scutum brownish-grey, scutellum and pretergites yellowish-brown. Mesonotal praescutum light grey with 3 dark brown stripes, the broad median area ending some distance before suture, lateral stripes obscured by pruinosity; scutal lobes dark brown, median area and base of scutellum light grey, remainder of the latter, with the postnotum, darker grey. Pleura grey, dorsopleural membrane more yellowed. Halteres with stem yellow, knob brown. Legs with coxae brownish-grey, trochanters yellow; remainder of legs brown; claws long, near base with a single major spine. Wings brownish-grey, prearcular field whitened; stigma small, pale brown; veins brown. Sparse macrotrichia on outer ends of distal sections of veins R_{4+5} and M_{1+2} , and usually with a few on M_3 . Venation: R_2 distinct, opposite or slightly before level of *r-m*; *m-cu* before fork of *M*, in cases about to one-half its length.

Abdomen dark brown. Male hypopygium (fig. 12) with tergite (*t*) transverse, outer lateral angles of posterior border produced into subtriangular lobes that are provided with long conspicuous setae; central emargination broad, near the mid-region further produced into 2 slender lobules, the space between these more or less convexly rounded; thickening of cephalic border of tergite and central area conspicuous. Ninth sternite large, with abundant long coarse setae, apex truncate or virtually so. Outer dististyle (*d*) blackened, apex narrowly obtuse; inner style slightly longer, with long conspicuous setae, apex obtuse. Phallosomic scaffolding (*p*) with the interbase a short flattened

pale blade, its length about 3 times the diameter, occasionally only about twice this length, tip obtuse; outer gonapophysis dilated at base, long and very slender, about twice the interbase, the narrowed outer end paler; central area of phallosome a flattened plate, aedeagus relatively long and slender.

Holotype ♂, INDIA: Dhar, Pauri Garhwal, Kumaon, 7220 feet, 17.viii.1958 (*F. Schmid*). *Paratypes*: 2 ♂, Kanol, Pauri Garhwal, 8530 feet, 19.viii.1958; 1 ♂, Kulara, Pauri Garhwal, 12,000 feet, 4.viii.1958; 1 ♂, Pana, Pauri Garhwal, 8200 feet, 10.viii.1958; 2 ♂, Sutol, Pauri Garhwal, 7250 feet, 18.viii.1958 (all *F. Schmid*).

The most similar regional species is *Antocha (Antocha) turkestanica* de Meijere, the hypopygium of which is shown for comparison (fig. 13); there are conspicuous differences in the ninth tergite and outer gonapophysis.

Antocha (Antocha) turkestanica de Meijere

Antocha turkestanica de Meijere, 1921, *Tijdschr. Ent.* **64** : 107, fig. 147 (♂ hypopygium). Fergana, Turkestan = Kirghiz S.S.R.

Antocha (Antocha) libitina Alexander, 1959, *Philipp. J. Sci.* **88** : 159–160; *syn. n.* Afghanistan.

Taphrophila afghana Nielsen, 1962, *Vidensk. Meddr. dansk. naturh. Foren.* **124** : 167–169, fig. 3 (♀), fig. 4 (♂ hypopygium); 1963, *Stuttg. Beitr. Naturk. no.* 118 : 1–2; *syn. n.* Afghanistan.

Male hypopygium (fig. 13) with outer lateral angles of tergite (*t*) produced into low obtuse lobes provided with pale inconspicuous setae, median region of emargination truncate, not produced as in *scapularis*. Ninth sternite small and inconspicuous, appearing as a whitened membranous plate with abundant microscopic setulae that are arranged in small groups and lines. Both dististyles (*d*) long, outer style slender, microscopically notched at apex to appear bidentate; inner style shorter, its setae small and inconspicuous. Phallosomic scaffolding (*p*) with the interbase a flattened oval blade. Outer gonapophysis only a little longer than the interbase, the proximal two-thirds dilated, thence narrowed into a spine. Aedeagus (*a*) terminating in two divergent lobes that bear the paired genital orifices.

Antocha (Antocha) turkestanica differs from *scapularis* in the male hypopygium, particularly in the tergite, outer dististyle, outer gonapophysis, and apex of aedeagus (figs. 12, 13).

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