NEW OR LITTLE-KNOWN TIPULIDÆ FROM EASTERN ASIA (DIPTERA), XLIX

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SIX PLATES

In the present report I am considering a small part of the rich collections of crane flies that have been taken in various parts of India by Dr. Fernand Schmid. I am very deeply indebted to Dr. Schmid for his continued interest in collecting these fragile flies. His materials from various parts of the Himalaya, particularly from Kumaon and Sikkim, are very rich in species and have quite revolutionized our previous knowledge of the crane flies of India. In order to more properly introduce the subject I have provided a somewhat detailed preliminary statement discussing the collections that have been made in the past, together with some further correlated matters.

DEVELOPMENT OF OUR KNOWLEDGE OF INDIAN CRANE FLIES

In other papers in the Philippine Journal of Science I have presented accounts covering this same general heading for Japan [1] and for New Guinea.[2] In beginning a consideration of the crane flies found within the geographical limits of the former "British India" it seems desirable to furnish a somewhat comparable discussion covering this part of southern Asia. As now constituted, this area includes various independent

[1] Philip. Jour. Sci. 82 (1953) 21–33.
[2] *Ibid.* 89 (1960) 221–274.

nations and republics within the framework of the British Commonwealth—Pakistan, India, Ceylon and Burma, as well as the small Himalayan monarchy of Nepal. I am treating this subject under the following subheadings: (*1*) Geographical considerations, (*2*) Enrico Brunetti, and (*3*) Crane-fly collections.

GEOGRAPHICAL CONSIDERATIONS

In the vast area here considered particular interest applies to the great mountain system that forms the northern boundary, the Himalaya. A majority of the crane flies known from the entire region occur on the southern slopes of the Himalaya, representing the Oriental fauna at the lower levels, the Palæarctic at higher altitudes, as discussed later in this account. The isolated so-called "Hills" of the western Ghats in south India, chiefly in the states of Mysore, Madras and Kerala, support a most interesting fauna. Ceylon likewise has a rich crane-fly fauna, including in part certain widespread elements but with many endemic species at the higher levels. Assam, south of the Brahmaputra River, has several mountainous areas, including the Garo, Khasi, Naga and other hills, all with an exceedingly rich crane-fly fauna. To about 5,000 feet these hills in Assam are subtropical, with strong Malayan affinities, while above 6,000 feet the fauna is definitely Indo-Chinese. Burma, particularly in the high mountains of the north-east, is exceedingly rich in crane flies, including many Chinese elements.

The Himalaya.—This vast mountain system constitutes an effective barrier to the north-south distribution of many types of plants and animals. The exact limits of the Himalaya remain in question, not so much perhaps to the geographer or the geologist as to the biologist. Hingston (1920) considers the Himalaya as comprising a mountain system composed of many ranges whose terminations are unknown. The southern and northern boundaries, the plains of India on the one hand, the lofty Tibetan plateau and the Pamirs on the other, are more apparent but the east-west limits remain in question. Formerly it was believed that the Indus River on the west and the Brahmaputra on the east delimited the Himalaya but more recent knowledge shows that such a simple explanation is improbable. In the west the system merges with the high mountains north of Afghanistan while in the east it passes into the region of northern Burma and the borderland of China. The distinguished botanist and plant collector, the late F. Kingdon Ward, conducted several expeditions to this disputed area of

the eastern Himalaya and summarized his personal beliefs as they concerned the eastern extent of the system. Three works by Ward, cited in the list of "References" following this general account, are of particular interest in this connection. The eastern end of the Himalaya trends roughly east-northeast, culminating in the high peak, Namcha Barwa, altitude 25,445 feet. Beyond this point the mountains appear to trend southwestwards through Burma and thence eastward into Java, forming the loop known as the Malay Arc. Ward [(1934) 12] believes that insofar as distribution of plants and animals is concerned that the more ancient Altaid system of mountains carried the biota eastward across China. These latter mountains were in existence before the present Himalayan system came into being and it appears that the existing mountains are not primary ranges but merely southward projecting spurs from this more ancient system. The main axis of the Himalaya may be traced by the high peaks of these spurs. Ward calls attention to the fact that the relationship of the mountain flora of this part of Asia shows a preponderance of an east-and-west over a north-and-south relationship, despite the evident advantage of the latter during the periods of glaciation in recent geological times. He notes that the east and west continuity of the flora was scarcely impaired by this glaciation, seeming to indicate the presence of great mountain ranges trending east and west that permitted the flora to spread in either of these directions. He writes [(1934) 15] "Recent botanical exploration has shown the affinity of the eastern Himalaya flora lies mainly with western China, across the river gorge country, and not with the Indo-Malayan mountain system. This fact is most simply explained by the existence of a former Himalayan range stretching eastwards into China." From a long-time study of the crane flies of western China I subscribe to this explanation and belief. It would appear that many Himalayan elements have extended their range far to the east, even to Formosa, as was discussed in a significant paper by Gressitt (1936), explaining in part the striking differences in fauna and flora existing between Formosa and northern Luzon.

Limits of the Oriental Region.—The whole of lowland India, Ceylon and Burma is Oriental, with Palæarctic elements appearing only at relatively high altitudes in the Himalaya. In the northwestern section of the latter, as Pakistan and Kashmir,

the delimiting line between the two regions evidently lies much lower than is the case farther to the east, where the range has trended more to the south, reaching an approximate latitude of 27° north in West Bengal, Nepal, and Sikkim. Thus in Kashmir, Palæarctic elements are found even at 5,000 to 6,000 feet. Annandale [in Burnetti (1917) 59] placed the line at Simla in the western Himalaya at approximately 7,000 feet or even lower. Mani and Kapur (consult references) in the Panjab Himalaya found nearly the same figure. Edwards [(1928) 682] in Sikkim and adjoining Tibet found Oriental elements as high as 10,000 or even to 12,000 feet. Based on Schmid's extensive materials taken in 1959 in Sikkim, Palæarctic types of crane flies were common at about 9,000 feet and predominant at 10,000 feet and above. At approximately 12,000 feet, in the *Rhododendron* association, a characteristic crane fly fauna was found. It may be noted that here Schmid found a species of crane fly, a *Tipula* of the subgenus *Bellardina,* at 17,000 feet, representing the highest altitude in the Old World at which these flies have been taken.

Mani, Kapur and Santokh Singh (References, 1954–1958) call attention to the fact that in the Panjab Himalaya myriads of dead insects of small size may be found on the snows at about 14,000 to 16,000 feet, or even to 20,000 feet, having been carried upward from the lower plains by winds and convection currents. As regards living insects at high altitudes, Mani [(1955) 157, diagram 167] indicates that the abundance of insect life falls off rapidly beyond the limits of tree growth (between 10,000 and 12,000 feet) but that the zone of perpetual snows immediately above these limits is by no means barren of insect life. Kapur (1958), likewise in the Panjab Himalaya, notes that between 8,000 and 15,000 feet, the genera occurring mostly are of Palæarctic types, rarely showing Oriental affinities. He notes that above about 8,000 feet there is a progressive reduction in the number of species of insects, correlated with the reduction in vegetation and the increasing severity of climate but even at 15,000 feet or thereabouts there still is life in various ecological niches having a favorable microclimate.

ENRICO BRUNETTI

Of all early workers on the Indian crane flies, Enrico Brunetti described the largest number of species and exerted the greatest influence on the development of our knowledge of the

subject. Because of this importance a brief account of him and his work is provided.

Brunetti was born in London, England, May 21, 1862, his father being Italian, his mother English. He followed the profession of musician and orchestral leader, coming to India in 1904 as a band conductor, travelling not only in parts of India but in other sections of the Far East, including Java and the Treaty Ports of China. After 1906 he remained in India, chiefly in Calcutta, taking occasional short collecting trips into the hill stations, as discussed elsewhere in this account. On such excursions he collected many insects, stressing particularly the Diptera, in which order he seems to have become interested through his early association with George Henry Verrall (1848–1911) in England, and later with Thomas Nelson Annandale (1876–1924) in India.

Despite his lack of formal training and prior experience in the order he almost at once began the work of revising the Oriental Diptera. Doctor Annandale offered him the facilities of the Indian Museum and for part of the time he was a staff member while at other times his work was gratuitous and it was during these periods that he was able to build up his personal collection of Diptera. He became associated with the Zoological section of the Museum in 1904 and with the Zoological Survey of India at its founding in 1916. About 1920 it became advisable for him to visit England and the British Museum, primarily to compare certain of his Indian materials with the extensive collections in London. He left for England in May, 1921, originally intending to be away only for about a year but, as events transpired, he did not return to India during the remaining six years of his existence. For his studies in England he took with him not only his personal series of Diptera but also certain types from the Indian Museum collection. It was extremely fortunate that comparisons of specimens could be made with the constant advice and cooperation of Doctor Fred W. Edwards, then in charge of the Diptera collections of the Museum and one of the great students of the Nematocerous Diptera, including the Tipulidæ. The results of this survey by the two leading students of Indian crane flies has been summarized in an important paper by Edwards (1924). Brunetti died in London on January 21, 1927, bequeathing to the British Museum (Natural History) not only his library but also his personal collection of Diptera, totalling

some 80,000 specimens. The remainder of the Diptera that he described, including the majority of the type specimens in the Tipulidæ, are in the Indian Museum, Calcutta.

Biographical notices concerning Brunetti have been prepared by Prashad (1927), Senior-White (1927), Alexander (1942), and some others. There can be no question that when Brunetti began his studies on the Oriental Diptera in 1905 virtual chaos existed and that when he left India only sixteen years later a firm basis and approach to order had been effected, largely through his unaided efforts. When his work began, the collections of the Indian Museum entirely lacked type specimens or even authentically named material in most groups while the amount of available unnamed specimens in the order was very limited. Despite this discouraging prospect Brunetti undertook the task with optimism and enthusiasm. Revisions and eventually monographic treatments on various families or groups of Diptera appeared at frequent intervals, culminating in the three outstanding volumes of the "Fauna of British India" series, the first (1912) including the basic treatment of the Indian Tipulidæ.

From a detailed study of his papers it is readily apparent that some parts of his work, particularly those concerned with description and cataloguing, are of high caliber, in fact, are quite remarkable considering the handicaps of material and literature that he faced. His most serious defect was his demonstrated inability to place many of his species in its proper genus, this resulting in a confused and uncertain synonymy that holds in the Tipulidæ, Mycetophilidæ, and in various other families.

Brunetti published almost fifty papers and volumes on the Diptera. In these he described some 250 species of Tipulidæ and related groups commonly designated by the term "crane fly." A paper by the present writer, still in press (1960), has listed the Brunetti species, placed each in what appears to be its correct genus, and indicated the synonymy.

CRANE FLY COLLECTIONS

The Indian fauna and flora are vastly rich. As it concerns the insects, the number of described and possibly existing species has been variously estimated. The most exaggerated figure seems to have been that given by Mohamed Afzal Hussain, in his Presidential address to the entomological section

of the Science Congress meeting in Calcutta in 1938. It was his belief that while only about 40,000 species of insects actually had been identified and recorded from India that the number of existing forms could scarcely be fewer than 2,500,000, or approximately three times the number of described insects known at the present time in the entire world! This figure of possibilities seems vastly exaggerated but any further estimate would be guesswork only. To this date only about 600 species of crane flies have been described from the region, including a number still in the press but there is no question that this is only a fraction of the number of species actually occurring.

The earliest known species of Indian Tipulidæ were described by Fabricius, Wiedemann, Macquart, Walker, Westwood, and some others. A few scattered and desultory collections were made in the period before Brunetti, the more important being from Ceylon, taken by Humbert in 1859, Felder, 1861, Yerbury, 1890, and others. The distinguished student of the Coccidæ, Mr. E. E. Green, collected specimens of Tipulidæ as early as 1888. Between 1900 and 1910, Green, Mr. T. Bainbrigge Fletcher, and Nelson Annandale collected materials in many places in British India. With the arrival in India of Brunetti in 1904 there was a marked increase in interest and collecting activity in the Diptera.

The Brunettian period.—Brunetti collected chiefly at Darjeeling (Darjiling) in the eastern Himalaya, his first excursion being in 1905, with various later trips. Other collectors of Diptera in this period include Annandale (Himalaya, from 1906; Dawna Hills, Burma, 1908; South India, 1908, 1909); H. L. Andrewes (Nilgiri Hills, 1910, 1911); William Beebe in 1910; Lord Carmichael, Governor of Bengal, with his native assistants, 1912, 1913 (when he discovered one of the world's most beautiful and striking crane flies, *Ctenacroscelis carmichaeli* Brunetti); Fletcher in South India and the Himalaya; F. H. Gravely (Dawna Hills, 1911; Satara District, 1912; Cochin, South India, 1914; eastern Himalaya, 1914–1916); F. M. Howlett (Himalaya, 1908, 1909); A. D. Imms, while at Muir Central College, Allahabad (Garhwal, 1909, 1910); Stanley Kemp, with Mrs. Kemp (very important collections, Abor Hills, 1911, 1912; Khasi Hills, 1914, 1915; Goa and North Kanara Districts, south India, 1916; Garo Hills, 1917; Darjeeling District, 1917); C. Paiva (Darjeeling, 1909).

Post-Brunettian collections.—The materials described by Edwards for the most part had been collected incidentally by hunters and plant collectors or by scientists of the various Mount Everest expeditions. The chief of these were H. L. Walton, 1904; J. W. Gregory, 1922; A. E. Hobson; R. W. G. Hingston, 1924; F. Kingdon Ward, 1924 and later. Edwards honored all of these men by dedicating to them a species of *Tipula,* subgenus *Bellardina,* including five of the most striking crane flies in the Himalayan fauna. On later trips to northern Burma and adjoining parts of Tibet, Ward was accompanied by Lord Cranbrook (in 1931) and by Ronald Kaulback (in 1933 and later), who aided materially in insect collecting (Ward, 1934, 1937). F. M. Bailey secured some interesting species in Tibet in 1927.

Ronald Senior–White made collections in Ceylon over a period of years, with further materials in the Khasi Hills in October, 1920, in company with Fletcher. His collection of Diptera is in the British Museum. The largest and most important series of insects that have been taken in South India are by Mr. P. Susai Nathan, veteran entomologist and professional collector, who between 1928 and the present date has travelled widely in most of the mountain ranges in South India, including the Anaimalai (Anamalai), Bababuddin, Malabar, Nilgiri, Palni (Pulney) and Shevaroy Hills, as well as elsewhere in south and central India. His crane-fly materials are rich in species and of great importance. During the 1930's and 1940's desultory collecting was done in Assam, chiefly in the Khasi and Naga Hills, by Mr. S. Sircar and his assistants.

In 1934, a Swedish expedition conducted by Dr. René Malaise, with Mrs. Malaise, visited various parts of Burma and brought back very large collections, including Tipulidæ, the most interesting being from the Southern Shan States and especially from northern Burma, chiefly in the vicinity of Kambaiti at 7,000 feet. The collections are in the Naturhistoriska Riksmuseet, Stockholm. Also in 1934, Miss Vivien Hutchinson, of Elloughton, Yorkshire, England, made very interesting collections in various parts of Kashmir.

The Mani–Kapur–Santokh Singh expeditions to the Northwest Himalaya (Panjab Himalaya) in 1954, 1955, and 1956 brought back a considerable series of high altitude insects, including a small number of Tipulidæ. These expeditions are described in comprehensive accounts by Mani (1954, 1955a,

1955b, 1956), Mani and Santokh Singh (1955, 1957) and Kapur (1958), all cited under the References. These materials are preserved in the Indian Museum, Calcutta. An important collection of insects was made in Nepal by Dr. Edward I. Coher and assistants, while working with the World Health Organization, in 1956 and 1957. The crane flies are in my personal collection. The Reverend Aloysius Camilleri, S.J., secured a small number of Tipulidæ in the Darjeeling District in 1958, chiefly in the vicinity of Saint Mary's College, Kurseong.

The Swiss Zoological Expeditions to India, 1953–1954; 1958–1960. The largest and most representative collections in certain groups of insects, including the Tipulidæ, ever to be taken in India were secured by the entomologist, Dr. Fernand Schmid, of Lausanne, Switzerland. The materials in the Tipulidæ are so rich in species as to virtually have revolutionized our previous knowledge of the subject. Through the kindness of Dr. Schmid the crane flies are preserved in my personal collection. The various summers were spent in different sections of the Himalaya, the intervening winters in the south of India and in Ceylon. Chronologically, the sections where Dr. Schmid collected were Kashmir, Pakistan and Baluchistan, May 28 to November 28, 1953; Ceylon, January 7 to March 18, 1954; Kumaon, in the western Himalaya (Dehra Dun, Almora, Pauri Garhwal, Teri Garhwal), March 25 to October 13, 1958; South India (Madhya Pradesh, Bombay, Mysore, Madras, Kerala), November 3, 1958 to February 8, 1959; Sikkim and West Bengal, in the eastern Himalaya, March 11 to October 17, 1959; winter of 1959 to 1960, Assam (Khasia); summer of 1960, various parts of Assam. Dr. Fred Keiser, of the Natural History Museum, Basel, Switzerland, with Mrs. Keiser, made important collections in Ceylon in 1953 to 1954, the materials being preserved at Basel.

In concluding this account it seems appropriate to add two quotations from the works of outstanding botanists, Dr. Joseph Dalton Hooker and F. Kingdon Ward, as they concern the occurrence of crane flies in the Himalaya. The first is from Hooker's "Himalayan Journals," based on an observation made in May, 1849 in the Lachen–Lachoong valley, Chakoong, Sikkim. [Hooker 2 (1854) 18]. "As the rains advanced, insects seemed to be called into existence in countless swarms; large and small moths, cock-chafers, glow-worms, and cockroaches, made my tent a Noah's ark by night, when the candle was burning;

together with winged ants, May-flies, flying earwigs, and many beetles, while a very large species of *Tipula* (daddy-long-legs) swept its long legs across my face as I wrote my journal, or plotted off my map. After retiring to rest and putting out the light, they gradually departed, except a few which could not find the way out, and remained to disturb my slumbers."

The second observation is from Ward [(1937) 239, 240], made in the Adung Valley, northern Burma, in 1931. "We had better luck with a 'daddy-long-legs', which occurred in great numbers and extraordinary diversity, varying from gigantic insects, with a wing span of six inches, to a queer alpine insect, found in the scrub rhododendron at 14,000 feet, one sex of which flies, while its mate, having only rudimentary wings, has to crawl. We caught many of these Tipulidæ, nearly all of which proved to be previously unknown. They came into the hut after dark, attracted by the light, especially on rainy nights, which suggested a certain wisdom. It must have been miserable flitting about in the Adung valley at night when the air was thick with fine mist, as it so often was."

Parts of the above mentioned crane fly materials were studied by Edwards; following his death in November, 1940, the remainder were sent to me for further study and naming. Concerning the identity of the two species above mentioned, a paper by the writer may be consulted [Alexander (1951) 1073.]

TIPULINÆ

MACGREGOROMYIA SIKKIMENSIS sp. nov.

Mesonotal præscutum buffy yellow, the disk with three brown stripes; pleura yellow, patterned with brown; antennæ with basal three segments light yellow, remainder black; legs dark brown, femoral bases restrictedly yellow; wings weakly tinged with yellow, prearcular and costal fields darker; a restricted dark pattern, especially on anterior cord, outer end of cell R_2 and as narrower seams on certain veins; R_{1+2} atrophied or its base preserved; r-m about one-third its length before the fork of Rs; all cells beyond cord elongate; male hypopygium with posterior border of tergite emarginate, the lobes glabrous.

Male.—Length, about 8.5 to 9 millimeters; wing, 10.5 to 11.5; antenna, about 2 to 2.2.

Frontal prolongation of head yellow above, darkened on sides and beneath; nasus conspicuous, with long yellow setæ; palpi with basal two segments light brown, outer two obscure yellow.

Antennæ 12-segmented; proximal three segments light yellow, remainder black; flagellar segments cylindrical, without basal enlargements, longer than the verticils; terminal segment small, oval, about one-fourth the penultimate and much more slender. Head buffy yellow in front, the posterior vertex brownish gray, darker on the anterior vertex which is more or less furrowed longitudinally but without conspicuous tubercles.

Cervical region and propleura dark brown laterally, yellow above. Mesonotal præscutum buffy yellow, the disk with three brown stripes, the central one vaguely divided by a slightly darker brown vitta; scutum with the pale ground reduced, lobes extensively dark brown; scutellum dark brown; mediotergite light brown, with a vague paler central line, pleurotergite testaceous yellow, clearer yellow on the anterior ventral part. Pleura yellow, patterned with brown on the propleura and most of the anepisternum, with a narrower and paler stripe on the forecoxæ and dorsal sternopleurite, the ventral half of the latter light gray. Halteres yellow, knobs dark brown. Legs with forecoxæ weakly darkened, remaining coxæ and the trochanters yellow; remainder of legs very long and slender, dark brown, bases of femora restrictedly yellow; claws very small, simple. Wings (Plate 1, fig. 1) weakly tinged with yellow, prearcular and costal regions strongly brownish yellow; stigma and a cloud over Rs and adjoining veins dark brown; narrower dark brown seams over remainder of cord, along veins Cu and 2nd A, and as a narrow apical band from the wing tip basad; outer two-thirds of cell R_2 conspicuously clouded; veins dark brown, anterior cord still darker, posterior prearcular and costal fields paler. Macrotrichia on longitudinal veins beyond cord, basad of cord lacking on proximal ends of Sc, R and M, virtually lacking on basal section of Cu_1 and the anal veins. Venation: R_{1+2} atrophied or its base indicated by a spur; r-m about one-third its length before fork of Rs; cell M_1 about twice its petiole; cell 1st M_2 small; all cells beyond cord elongate.

Abdomen with basal segments yellow, the second and succeeding tergites brown, the outer ends paler, especially the borders; basal sternites more extensively yellowed, more or less pruinose; outer segments more darkened, hypopygial appendages brownish yellow. Male hypopygium (Plate 3, fig. 39) very simple in structure; posterior border of tergite, *t*, with a broad U-shaped emargination, this much larger than the

obtuse glabrous lateral lobes, remainder of tergite with small weak setæ, narrowly interrupted at the midline, lacking on almost the cephalic half. Outer dististyle, *d*, long and slender, about four times as long as the greatest width; setæ long but relatively sparse; inner style with the beak produced, pale, lower beak blackened, tip truncate. Phallosome, *p*, with low rounded cushionlike apophyses that are provided with short pale setulæ; ædægus broad on basal half, the narrowed outer part blackened.

Habitat.—Sikkim.

Holotype, male, Manu, altitude 4,920 feet, May 10, 1959 (*Schmid*). Paratopotypes, 2 males, one in poor condition.

Macgregoromyia sikkimensis is the most westerly member of the genus so far discovered. Originally described from the Philippines, there now are a dozen known species, all occurring in eastern and southeastern Asia, including four species in Japan, others in eastern and western China, and one in the Malay peninsula. The present fly is generally similar to species such as *M. brevicula* Alexander and *M. perpendicularis* Edwards, differing in coloration, slight details of venation, and in hypopygial structure.

DOLICHOPEZA (MITOPEZA) AMISCA sp. nov. **Plate 1, fig. 2; Plate 3, fig. 40.**

Size medium (wing of male 10 mm); thorax polished orange, virtually glabrous; antennæ of male long, about one-half the wing; wings tinged with brown, the costal border more heavily darkened; sparse macrotrichia in cells at wing tip; cell 1st M_2 small, cell M_1 broadly sessile, cell 2nd A very narrow; abdomen brownish orange, posterior margins of the segments darkened, eighth segment blackened; male hypopygium with dististyles large, pale, outer style unequally bilobed.

Male.—Length, about 8.5 millimeters; wing, 10; antenna, about 5.

Frontal prolongation of head dark brown above, with long black porrect setæ, yellowed beneath; palpi brown, the terminal segment darker at tip. Antennæ of male relatively long; scape, pedicel and base of first flagellar segment yellow, the pedicel with dense black setæ; remainder of organ brownish black; segments elongate, with scattered black verticils on upper aspect, surface with a short dense white pubescence. Head light gray in front, brownish black behind, surface sparsely pruinose.

Pronotum dark brown above, light yellow on sides. Thorax polished orange, scutum and scutellum slightly more brownish orange; mesonotum virtually glabrous, with a few scattered setæ on the scutellum; anterior dorsopleural membrane light yellow. Halteres with stem brownish yellow, knob blackened. Legs with coxæ and trochanters orange; remainder of legs broken. Wings (Plate 1, fig. 2) tinged with brown, the entire costal border to the wing tip strongly infuscated, the stigma a trifle darker; remainder of wing margin very narrowly to insensibly darkened; prearcular field and cell 2nd A slightly infuscated; veins dark brown, conspicuous. Macrotrichia in extreme outer ends of cells R_2 to 2nd M_2; veins with strong strichia basad almost to arculus, lacking on 2nd A and basal fourth of M, virtually lacking on Cu_1. Venation: Sc_2 ending opposite origin of the subtransverse Rs; R_{1+2} preserved as a strong spur that is longer than R_2, provided with trichia; cell 1st M_2 very small; cell M_1 broadly sessile; m-cu nearly one-half its length before the fork of M; cell 2nd A very narrow.

Abdomen brownish orange, polished, posterior borders of segments narrowly infuscated, eighth segment black; hypopygium yellow. Male hypopygium (Plate 3, fig. 40) with the tergite, *t*, glabrous on sides, the margins involuted; lobes on either side of midline with a compact group of about 15 blackened pegs, cephalad of which the disk is densely provided with strong yellow setæ directed chiefly mesad and slightly caudad, with a strong black seta on either side of midline. Dististyles, *d*, of unusual shape, the conformation about as figured, the outer style unequally bilobed; inner style densely setiferous, its apex farther produced into a glabrous blade.

Habitat.—South India (Kerala).

Holotype, male, Tenmalai, altitude 500 to 900 feet, November 26, 1958 (*Schmid*).

Dolichopeza (*Mitopeza*) *amisca* is most similar to the larger *D.* (*M.*) *kanagaraji* Alexander, which differs evidently in the coloration and in the wing venation. *D.* (*M.*) *flavicans* (Edwards) of Ceylon is distinct from the other Indian species of the subgenus in the petiolate cell M_1 of the wings.

DOLICHOPEZA (NESOPEZA) BALLATOR sp. nov. **Plate 1, fig. 3.**

Size medium (wing of female 9 millimeters); general coloration of thorax obscure yellow, abdomen darker; tarsi whitened; wings suffused with brownish yellow, prearcular and costal fields, stigma and outer radial field conspicuously darker brown;

narrow darker brown seams along cord; medial forks shallow; ovipositor with cerci black, relatively stout and flattened, tips slightly decurved.

Female.—Length, about 10 millimeters; wing, 9.

Frontal prolongation of head pale yellowish brown, with black setæ; palpi testaceous brown, terminal segment relatively short, subequal to the combined second and third. Antennæ with scape and pedicel yellow, flagellum brown; flagellar segments long-cylindrical, exceeding the verticils, the latter on segments beyond the first single, placed at near two-thirds the length of the segment; antenna broken beyond the sixth segment. Head light brown, paler on orbits; vestiture consisting of black setæ in a suborbital position, the disk of the vertex glabrous.

Thorax with the interior contents destroyed by insect pests, the color probably paler than in life; entire thorax brownish yellow, without evident pattern; præscutum glabrous, mediotergite with short retrorse setæ. Halteres with stem pale, knob infuscated. Legs with coxæ and trochanters yellow; a single leg (hind) remains, femora and tibiæ brownish yellow, tips of femora narrowly more darkened, of the tibiæ paling into whitish; tarsi white. Wings (Plate 1, fig. 3) suffused with brownish yellow; prearcular and costal fields conspicuously infuscated, paler along the cephalic border of cell R; stigma dark brown; outer ends of cells R_2 and R_3 extensively infuscated; further narrow brown seams along cord; veins light brown. Veins beyond cord with macrotrichia of moderate length, basad of cord lacking on M and 2nd A, a few near outer ends of Cu_1 and 1st A. Venation: Medial forks shallow, cell M_1 subequal to its petiole; cell 2nd A relatively broad.

Abdomen light brown; cerci black, relatively stout and flattened, their tips slightly decurved; hypovalvæ shorter, black at base, the acute tips pale.

Habitat.—Sikkim.

Holotype, female, Bichu, altitude 8,000 to 8,500 feet, July 14, 1959 (*Schmid*).

Dolichopeza (*Nesopeza*) *ballator* is quite distinct from all other described regional members of the subgenus in the pattern of the wings. The most similar species is *D.* (*N.*) *infuscata* Brunetti, which differs in the coloration of the body, legs and wings, and in the venation.

DOLICHOPEZA (NESOPEZA) PRAESUL sp. nov. **Plate 1, fig. 4; Plate 3, fig. 41.**

Size large (wing about 15 millimeters); general coloration of head and thorax dark brown; antennæ short; legs brown, outer tarsal segments white; wings strongly blackened; Rs long, medial forks deep; male hypopygium with the tergal plate blackened, posterior border emarginate; ninth sternite on either side swollen, with very long setæ; eighth sternite deeply emarginate, the lobes with abundant microscopic roughenings.

Male.—Length, about 11 to 12 millimeters; wing, 14 to 15; antenna, about 2.1 to 2.2.

Female.—Length, about 12 to 13 millimeters; wing, 15 to 16.

Rostrum brownish black; palpi elongate, black. Antennæ of male relatively short; scape and pedicel brownish yellow, flagellum black; proximal flagellar segments elongate, progressively shortened outwardly, with conspicuous verticils; outer segments and their verticils shorter, suboval to slightly produced beneath, the setæ of the tumid part very short and spinoid. Head with front obscure yellow, vertex dark brown, the low tubercle paler, its weakly emarginate apex more yellowed.

Pronotum brownish black. Mesonotum dark brown, the præscutum with vague indications of four slightly paler stripes; vestiture of præscutum short and sparse, of the scutellum longer, of mediotergite very long and delicate. Pleura brown, including the dorsopleural membrane. Halteres with stem brownish yellow, knob dark brown. Legs with coxæ brown, trochanters more brownish yellow; femora brown, slightly paler basally; tibiæ and basitarsi brownish black, remainder of tarsi white; claws small, simple. Wings (Plate 1, fig. 4) strongly blackened, especially cell Sc and the stigma; a darkened seam in cell M adjoining vein Cu; veins dark brown, R_1 and its outer veins, together with bullate areas on cord, pale. Macrotrichia present on veins beyond cord, lacking on basal section of Cu_1 and the anals, excepting one or two near outer ends of the latter veins; a few trichia at outer end of M. Venation: Sc_2 ending opposite or beyond the fork of Rs, the latter long, in alignment with the elongate R^{2+3}; medial forks deep, cell M_1 about three times its petiole; cell 2nd A moderately broad.

Abdominal tergites dark reddish brown, their posterior borders darker; sternites obscure brownish yellow, the apical margins slightly darkened; outer segments more uniformly blackened, the outer part of the eighth and ninth sternites

paling to brown. Male hypopygium (Plate 3, fig. 41) with the tergal plate, *t*, blackened, its posterior border broadly emarginate, the lateral parts produced cephalad. Ninth sternite, *s*, globose beneath on either side, provided with abundant very long setæ. Outer dististyle, *d*, elongate, darkened, slightly dilated on outer end, with long setæ; inner style obtuse at apex. Phallosome, *p*, in addition to the ædeagus, includes a large depressed-flattened plate, its apex biemarginate. Eighth sternite, *8s*, conspicuously emarginate medially, the lobes with abundant microscopic roughenings, on the sides with delicate setulæ.

Habitat.—South India (Madras).

Holotype, male, Senbaganur, altitude 5,500 to 6,500 feet, December 7, 1958 (*Schmid*). Allotopotype, female, pinned with type. Paratopotypes, 2 males, 1 female.

Dolichopeza (*Nesopeza*) *præsul* is the largest regional member of the genus so far discovered. It is most similar to species such as *D.* (*N.*) *compressior* Alexander, differing from all in the large size, venation, and especially in the structure of the male hypopygium, including the tergite, 8th and 9th sternites, and the phallosome.

TIPULA (BELLARDINA ARJUNA sp. nov. **Plate 3, fig. 42.**

Size medium (wing of male from 19 to 24 millimeters); general coloration of mesonotum almost uniformly chestnut brown, pleura conspicuously patterned, the dorsopleural membrane light yellow, beneath this with longitudinal stripes of blue gray and dark brown; legs yellow; wings almost uniformly light brown, restrictedly patterned with pale and darker areas; abdomen, including hypopygium, brownish yellow, tergites narrowly bordered by dark brown; male hypopygium with the outer tergal margin produced into two low glabrous lobes.

Male.—Length, about 17 to 21 millimeters; wing, 18 to 24; antenna, about 4.5 to 5.5.

Female.—Length, about 20 to 24 millimeters; wing, 23 to 28.

Frontal prolongation of head long, chestnut brown; nasus long, black; palpi with proximal three segments brownish yellow, terminal segment beyond its base blackened. Antennæ with scape light brown, succeeding segments yellow, slightly and vaguely darkened on the very small basal enlargements of the outer flagellar segments; verticils subequal to or slightly longer than the segments. Head chestnut brown, with a con-

spicuous blackened stripe extending from the summit of the entire vertical tubercle to the pronotum, posterior orbits and sides of the posterior vertex with a light gray shimmer.

Pronotum medially dark brown to brownish black, abruptly light yellow on side. Mesonotal præscutum almost uniformly dark chestnut brown, with faint indications of darker lines that represent the narrow borders of four stripes, lateral præscutal margin darker brown; scutum chestnut brown, vaguely patterned with darker brown; scutellum darker brown, with a faint still darker central vitta; mediotergite light blue gray, pleurotergite with the anapleurotergite brownish yellow, katapleurotergite blackened above, blue gray beneath; scutellum and mediotergite with long delicate erect setæ. Pleura conspicuously patterned, including the broad light yellow dorsopleural region, immediately beneath which is a blackened stripe, extending from the cervical region to the pleurotergite, somewhat paler and interrupted before the latter; a blue gray longitudinal band, narrowly bordered above by chestnut brown, beneath on the ventral sternopleurite by darker brown; meral region more pruinose, metapleura yellowed. Halteres with stem dusky, knob infuscated at base, apex obscure yellow. Legs with the coxæ blue gray; trochanters brownish yellow, darkened beneath; femora yellow, very weakly and narrowly darkened at tips; tibiæ yellow; tarsi light brown, outwardly passing into black; claws of male small, toothed. Wings chiefly and almost uniformly light brown, the anterior margin, with the outer radial cells, more yellowish brown, cell Sc yellow; stigma small, slightly darker than the ground; a major dusky cloud over outer end of cell 1st M_2 and fork of M_{1+2}; two white areas on basal half of wing in cell Cu, the larger outer one extending cephalad into cell M, the basal spot extended posteriorly across cell 1st A; small white marginal spots in centers of cells R_5 to M_4, inclusive, more extensively bordered at the veins by darker brown; in cases with very small pale spots before and beyond the origin of Rs; obliterative band at cord and into cell 1st M_2 variable, in cases conspicuous; veins yellow, somewhat darker in the prearcular field. Macrotrichia of veins well distributed over the wing, including some of the prearcular veins. Venation: Cell R_3 not constricted at midlength; petiole of cell M_1 about one-half m.

Abdomen chiefly brownish yellow, the lateral tergal borders dark brown, with a small light gray spot at posterior end;

hypopygium concolorous. Male hypopygium (Plate 3, fig. 42) with the tergite, *t*, transverse; posterior border slightly convex, with two submedian obtuse lobes that have about the same conformation as the median emargination; lobes glabrous, the surface behind with abundant setæ that are long and conspicuous on the sides, smaller on the disk, becoming exceedingly small but numerous immediately behind the lobes. Dististyles, *d*, about as shown, the outer one larger, its basal part produced outwardly into a point, the broader apex terminating in an obtuse lobe that is provided with abundant long setæ on upper surface and even more numerous shorter bristles beneath; inner style produced into a long arm, the obtuse outer end glabrous, the central part with relatively sparse coarse setæ.

Habitat.—Kumaon, Sikkim.

Holotype, male, Yangtang, Sikkim, altitude 11,200 feet, June 28, 1959 (*Schmid*). Allotype, female, Namnasa, Sikkim, altitude 9,500 feet, July 12, 1959 (*Schmid*). Paratypes, 1 male, 1 female, with the allotype, July 12 to 13, 1959; male, Chachu, Sikkim, altitude 11,500 feet, May 29, 1959; male, Shingba, Sikkim, altitude 10,400 feet, June 30, 1959; male, Yedang, Sikkim, altitude 10,600 feet, June 9, 1959; 2 males, Yoksam, Sikkim, altitude 5,600 feet, September 30, 1959; male, Dhur, Almora, Kumaon, altitude 7,400 feet, September 9, 1958; male, Kulara, Pauri Garhwal, Kumaon, altitude 12,000 feet, August 4, 1958 (all *Schmid*).

The name of this striking crane fly, *arjuna*, is that of the Prince of India in the Bhagavad-gita. In its thoracic coloration it most suggests the otherwise very different *Tipula* (*Bellardina*) *hobsoni* Edwards and *T.* (*B.*) *krishna* sp. nov. These species bear a superficial resemblance to certain tropical American species of the same subgenus and also to some members of the genus *Holorusia* Loew.

TIPULA (BELLARDINA) HYPSISTOS sp. nov. **Plate 3, fig. 43.**

Size medium (wing 16 to 21 millimeters); general coloration of thorax gray, præscutum with four faintly differentiated stripes; antennal pedicel light yellow, flagellum black; femora obscure yellow, tips narrowly black; wings grayish brown, tesselated with yellowish areas forming a zigzag pattern before the cord, cells C and Sc light yellow; basal abdominal segments yellowish brown, outer ones darkened; male hypopygium with the tergite terminating in a decurved broad simple lobe that

is densely provided with blackened spinoid setæ; outer dististyle unequally trilobed.

Male.—Length, about 15 to 17 millimeters; wing, 16 to 21; antenna, about 4 to 4.3.

Female.—Length, about 19 millimeters; wing, 19.

Frontal prolongation of head dark brown, relatively long, without nasus; palpi brown. Antennæ of moderate length; scape brownish yellow, pedicel clear yellow, flagellum black; flagellar segments with small basal enlargements, subequal in length to the longest verticils. Head gray; a central dark brown vitta extending from the summit of the low vertical tubercle backward almost to the occiput.

Pronotum brown, vaguely patterned with paler. Mesonotal præscutum gray, clearer laterally, with four faintly differentiated stripes that are best indicated by narrow blackish borders, the outer margins of the intermediate stripes especially distinct; median dark vitta divided before midlength, behind enclosing a gray line; lateral stripes bordered outwardly with blackish; scutal lobes each with two brown areas, the anterior one small; scutellum plumbeous gray; mediotergite gray, with a narrow central darkened line that is pointed behind. Pleura light gray, on ventral part vaguely patterned with darker; dorsopleural membrane infuscated. Halteres elongate, stem obscure yellow, knob more darkened basally, tip paler. Legs with coxæ and trochanters brownish gray; femora obscure yellow, tips narrowly black, the amount subequal on all legs; tibiæ light brown, tarsi passing into black; claws of male small, toothed. Wings grayish brown, variegated by yellowed areas, forming a tesselated or zigzag pattern in the cells before the cord; outer third of wing with a major brightening beyond stigma and in bases of the outer radial cells, with small pale brown; cells C and Sc light yellow. Veins with macrotrichia throughout their lengths or virtually so. Venation: Petiole of cell M_1 subequal to m.

Basal abdominal segments yellowish brown, the posterior borders of the tergites restrictedly pale; outer segments more uniformly darkened, more extensively so on the sternites. Male hypopygium (Plate 3, fig. 44) with the tergite, *t*, transverse, narrowed outwardly, posterior border truncate, the actual apex decurved and showing beneath, terminating in a simple low broad lobe that is densely provided with spinoid black bristles, the remaining upper surface with abundant longer

setæ. Dististyles, *d*, distinctive, short and compact; outer style trilobed, including a larger outer lobe, very obtuse at apex, surface with long pale setæ; inner lobe a little smaller, obtuse, the vestiture more sparse, chiefly at and near apex subtruncate, surface sparsely setiferous, the bristles more numerous at the outer angles; inner style about as long but slender, broadest on basal half, constricted at midlength, the outer end expanded, very obtuse, almost glabrous, with a few microscopic bristles on the disk.

Habitat.—Sikkim.

Holotype, male, Gurudongmar Cho, altitude 17,000 feet, June 23, 1959 (*Schmid*). Allotopotype, female, pinned with the type. Paratopotypes, 4 males, with the types; paratype, male, Donkung, Sikkim, altitude 15,750 feet, June 22, 1959 (*Schmid*).

The types were collected at light, near a mountain torrent. This is the highest altitude at which crane flies have been taken in the Himalaya, but it may be indicated that in the Bolivian Andes a species of *Limonia* has been taken at even higher altitudes.

Tipula (*Bellardina*) *hypsistos* is most similar to species such as *T.* (*B.*) *trilobata* Edwards, of Yunnan, differing especially in the coloration of the body, toothed claws, and structure of the hypopygium, particularly of the tergite.

TIPULA (BALLARDINA) KRISHNA sp. nov. **Plate 3, fig. 43.**

Allied to *hobsoni;* size very large (wing of male to 28 millimeters); head and pronotum darkened medially above; mesonotum chestnut brown, pleura brown, conspicuously pattered with darker brown and yellow; legs chestnut brown, outer tarsal segments black; wings light brown, patterned with two major cream-colored areas before the cord, with further light and darker markings; abdomen very stout, orange; hypopygium very large, darker brown; posterior border of tergite produced into two fingerlike lobes; both dististyles heavily sclerotized and blackened, produced into spines.

Male.—Length, about 24 to 25 millimeters; wing, 26.5 to 28; antenna, about 6.

Frontal prolongation of head long, dark chestnut brown above, dark brown on sides and beneath; nasus elongate; proximal two segments of palpi brown, the third more reddened, terminal segment brownish black. Antennæ with scape light brown, gray pruinose; remainder of organ orange, the bases

of the flagellar segments darkened at point of insertion of the long verticils. Head reddish brown, sides of posterior vertex gray pruinose; a very broad dark brown longitudinal stripe extends from the summit of the entire vertical tubercle backward, on the cervical region passing into black.

Pronotum above dark chestnut brown, abruptly light yellow on sides. Mesonotum almost uniformly chestnut brown, contrasting abruptly with a light yellow area that extends from the head to the wing root over the dorsopleural region. Pleura light brown above, its superior border narrowly more darkened; dorsal sternopleurite with a large silvery area that crosses the pteropleurite onto the katapleurotergite, ventral sternopleurite yellow; meron and metapleura with silvery sheen. Halteres yellow. Legs with the fore- and middle coxæ chestnut, posterior pair more yellowed, all with long pale setæ; trochanters chestnut brown; remainder of legs chestnut brown, the tips of the basitarsi and remainder of tarsi black; claws with an obtuse tooth. Wings strongly suffused with light brown, cell Sc more yellowish brown; two major cream-colored areas before cord, one crossing cells Cu and 1st A before midlength, the second at the outer two-thirds of cell M; a series of small pale marginal spots in centers of cells R_5 to 1st A, the alternating tips of the veins dark; a narrow and inconspicuous yellow subbasal band in cells R_2 to R_5, inclusive; somewhat darker areas at midlength of cell Cu, cord and outer end of cell 1st M_2; small obliterative areas before stigma, in outer end of cell R and in base of cell 1st M_2; veins brownish yellow, Sc, R and M more orange, C and prearcular veins darker. Venation: Cell R_3 slightly constricted before midlength; petiole of cell M_1 shorter than m.

Abdomen very stout, bright orange, the massive hypopygium more chestnut brown. Male hypopygium (Plate 3, fig. 43) described and figured from the dried type so the internal structures are incomplete and possibly not entirely accurate. Ninth tergite, *t*, large and tumid, its posterior border produced into two long fingerlike compressed-flattened lobes that are directed caudad and ventrad, tips obtuse, surface with setæ. Basistyle and sternite chiefly fused, the suture indicated beneath, outer lobe of the former densely silvery pruinose. Dististyles, *d*, heavily blackened and sclerotized; outer style appearing as two flattened outer blades, their tips narrowly obtuse, lower plate with long pale setæ, on margin at near midlength with an

acute tooth; it appears that the style is farther produced inwardly into a yellow plate that is again armed with a spine; inner style a long slender blackened spine from a small dilated base, curved outwardly, tip pale, apex acute. Lobes of ninth sternite oval, polished, almost contiguous at the midline.

Habitat.—Sikkim.

Holotype, male, Namnasa, altitude 9,500 feet, July 12, 1959 (*Schmid*). Paratype, 1 male, Karponang, altitude 8,100 feet, August 22, 1959 (*Schmid*).

The specific name, *krishna,* is that of the Hindu deity who communicated with Arjuna, the Prince of India, in the Bhagavad-gita. This magnificent fly is related to *Tipula* (*Bellardina*) *arjuna* sp. nov. and *T.* (*B*) *hobsoni* Edwards, differing in details of coloration of the body but especially in the very distinctive structure of the hypopygium. In its general appearance, especially the coloration of the body and wings, it strongly suggests an unusually large specimen of *arjuna.*

LIMONIINÆ

LIMONIINI

PROTOHELIUS NILGIRICUS Alexander. **Plate 1, fig. 5; Plate 3, fig. 45.**

Protohelius nilgiricus ALEXANDER, Ent. News 71 (1960) in press.

Type, male, Cherangode, Nilgiri Hills, Madras, altitude 3,500 feet, November, 1950 (*Susai Nathan*).

Male.—Length, about 6 millimeters; wing, 6.5; antenna, about 1.8.

General coloration of thorax brownish yellow, with large and conspicuous blackened areas on sides of præscutum, scutal lobes and pleurotergite; legs yellow; wings (Plate 1, fig. 5) subhyaline, stigma short-oval, dark brown.

Male hypopygium (Plate 3, fig. 45) with the outer dististyle, *d,* blackened except at base, the termination elongate, more than three times the lateral lobe; inner style a little longer, pale, the terminal portion about twice its lower lobe, the latter with conspicuous setæ.

This is the first record of occurrence of the genus in India.

LECHRIINI

LECHRIA COORGENSIS Alexander. **Plate 1, fig. 6.**

Lechria coorgensis ALEXANDER, Ent. News 71 (1960) in press.

Type, male, Ammatti, South Coorg, India, altitude 3,100 feet, May, 1951 (*Susai Nathan*).

Male.—Length, about 5 millimeters; wing, 5.7; antena, about 1.1.

Female.—Length, about 6.5 millimeters; wing, 5.3.

Size small; general coloration of pronotum and mesonotum orange, posterior sclerites of latter darker, pleura dull orange; wings (Plate 1, fig. 6) weakly tinged with brown, prearcular and costal fields more yellowed; tip of R_{1+2} atrophied, R_2 before the radial fork, cell 1st M_2 long, m-cu at or before the fork of M; abdomen of male black, hypopygium dull orange.

PEDICIINI

NASITERNELLA GRALLATOR sp. nov. **Plate 3, fig. 46.**

Subapterous in both sexes; size medium (length of male about 8 millimeters, wing, 1.5); general coloration brown; legs long and slender in both sexes.

Male.—Length, about 7.5 to 8.5 millimeters; wing, 1.5 to 1.6; antenna, about 1.2 to 1.3. Foreleg, femur 7; tibia, 7; tarsus, 10. Hind leg, femur 6.7; tibia, 8; tarsus 10.5.

Female.—Length, about 9 to 9.5 millimeters; wing, 1.4 to 1.5.

Rostrum and palpi short, dark brown. Antennæ (Plate 3, fig. 46) short, dark brown, 13 to 15-segmented; flagellar segments beyond the first very short and crowded, transverse; certain segments, both at base and near tip of flagellum more or less fused; verticils very small. Head brownish gray, the center of the anterior vertex more darkened.

Pronotum yellowish brown to light brown. Mesonotum brownish gray, præscutum with a slightly darker central stripe, the anterior and lateral borders more blackened; vestiture short. Pleura grayish brown, the dorsal sternopleurite blackened. Halteres elongate, stem yellowed, knob darkened, the tip paler. Legs long and slender in both sexes, as shown by the measurements; coxæ and trochanters brownish gray; remainder of legs black, the extreme bases of fore-femora yellowed. Subapterous in both sexes, wings, reduced to straplike structures that are subequal to or slightly longer than the halteres, light brown basally, passing into brownish black; venation entirely distorted.

Abdomen dark brown, the basal segments somewhat lighter in color, in the female the abdomen paler brown, the posterior borders of the segments narrowly pale. Ovipositor with the cerci appearing as broad flattened blades, the tips obtuse. Male hypopygium (Plate 3, fig. 46) with the basistyle, *b*, nar-

rowed outwardly, apex obtuse, with a concentration of black spinoid setæ, with a row of similar bristles down the face of style; outer face of style at midlength with many long yellow bristles; mesal face before apex with a small curved lobe that is densely provided with long yellow setæ, forming a terminal brush. Interbase a weak slender rod, gradually narrowed to the obtuse tip. Dististyle, *d*, single, a large powerful structure, stout at base, at near midlength bent at more than a right angle into a straight blade, its tip acute. Ædeagus, *a*, slender, the apex a small head.

Habitat.—Sikkina.

Holotype, male, Gey, altitude 12,000 feet, in *Rhododendron* association, May 20, 1959 (*Schmid*). Allotopotype, female, pinned with type. Paratopotypes, 8 of both sexes, May 18 to 20, 1959 (*Schmid*).

This unusually interesting crane fly is told from all regional Pediciine crane flies by the nearly apterous condition in both sexes. I am referring it to the genus *Nasiternella* rather than to *Pedicia* (*Tricyphona*) because of the structure of the male hypopygium. The specific name refers to the very long stilt-like legs.

NASITERNELLA TJEDERI sp. nov. **Plate 1, fig. 7; Plate 5, fig. 47.**

Size small (wing less than 10 millimeters); general coloration of thorax yellow, præscutum with a faint central darkening; femora blackened, with a broad obscure yellow subterminal ring; wings yellow, with four more or less complete transverse brown crossbands; vein Sc_2 very far retracted, the basal section of R shorter than the second; abdomen dark brown, patterned with yellow; male hypopygium with the spine of the dististyle relatively short, outer setiferous brush with abundant long setæ.

Male.—Length, about 8 millimeters; wing, 9.5 to 9.7; antenna, about 1.2.

Rostrum very short, light yellow; palpi reduced to two segments, the first yellow, the second brown. Antennæ 14-segmented; scape and pedicel light yellow, flagellum brownish black; first flagellar segment about one-third to one-half longer than the second; intermediate segments suboval, with short verticils; terminal segment a little longer than the penultimate. Head brownish gray, posteriorly with long setæ.

Pronotum light yellow. Mesonotum pale yellow, with two very pale-brown central stripes that are barely indicated on their inner edge by slightly darker lines; præscutal vestiture reduced to a few small setæ on the interspaces; scutellum with longer pale setæ. Pleura pale yellow; ventral sternopleurite slightly darker. Halteres yellow. Legs with the coxæ and trochanters yellow; femora brownish black with a broad but diffuse yellow ring before the blackened tips; tibiæ yellowish brown, tips narrowly blackened; tarsi yellowish brown, the outer segments slightly darker. Wings (Plate 1, fig. 7) with the ground yellow, with four more or less complete brown crossbands, placed beyond arculus, at level of origin of Rs, cord and across the outer forks, the first two narrowly interrupted in cell 1st A and interconnected along vein Cu, the outer band more extensively broken in cells R_5 and M_3; in the costal field the areas are heavier, subequal to or exceeding the interspaces which are clearer yellow; additional small marks at h, tip of vein 2nd A, and end of R_3; still less evident marginal seams at ends of veins M_3 and 1st A; veins light yellow in the ground, darkened in the patterned areas. In both available specimens there is a dusky line delimiting the stigma behind, extending from the outer end of cell C, almost reaching vein R_{s+z}, beyond vein R_2 paralleling vein R_{1+2} to the margin. Venation: Sc_1 ending some distance beyond end of Rs, Sc_2 very retracted, the first section of vein R shorter than the second; cell R_4 subequal to its petiole; r-m variable in position, from before the fork of Rs (as shown) to shortly beyond the fork; cell 1st M_2 long, m connecting veins M_2 and M_3; m-cu at or shortly beyond fork of M; supernumerary crossvein in cell M just before the level of origin of Rs, the latter strongly arcuated to square and short-spurred near origin.

Abdomen dark brown, the posterior borders of the tergites yellowed, the amount decreasing on the outer segments; sternites brown, their bases extensively obscure yellow, the tips more narrowly so; hypopygium yellowish brown. Male hypopygium (Plate 3, fig. 47) with the basistyle, *b*, narrowed at apex, with relatively sparse blackened spinoid setæ and interpolated very long setæ; accessory subterminal lobe with similar spinoid setæ; interbase an oval blade with sclerotized borders. Dististyle, *d*, a powerful arm, bent and narrowed at a right angle into an acute spine, much shorter than in other members of the genus; at its base on outer margin with a second arm that is densely setiferous to form a brush.

Habitat.—Sikkim.

Holotype, male, Chateng, altitude 8,000 feet, July 28, 1959 (*Schmid*). Paratopotype, male.

I take great pleasure in dedicating this conspicuous fly to Dr. Bo Tjeder, of Falun, Sweden, critical student of the Tipulidæ and other groups of Diptera. It is quite distinct from the northern and subarctic species that center around *Nasiternella hyperborea* (Osten Sacken) and *N. variinervis* (Zetterstedt), the latter being the genotype. It is even more removed from the only other known fully winged regional species *N. ignara* (Alexander), of northern Burma.

PEDICIA (TRICYPHONA) SAKKYA sp. nov. **Plate 1, fig. 8; Plate 3, fig. 48**

Size medium (wing of male 11 millimeters); general coloration of thorax brownish yellow, præscutum with four dark brown stripes; legs black; wings fulvous brown, the base more yelowed; vein R_{4+5} subequal to r-m, cell M_1 present, cell 1st M_2 small; male hypopygium with the tergite transverse, posterior border broadly emarginate; interbase appearing as a small flattened yellow blade.

Male.—Length, about 9.5 millimeters; wing, 11; antenna, about 1.4.

Rostrum and palpi brownish black. Antennæ 16-segmented, brownish black; flagellar segments subcylindrical, the more proximal ones more crowded and closely applied to one another; segments longer than the appressed vestiture. Head dark gray.

Pronotum grayish brown. Mesonotal præscutum brown, yellow pollinose, with four distinct dark-brown stripes, the median interspace dusky; posterior sclerites of notum brown, yellow pollinose, each scutal lobe with two dark-brown areas, the anterior one very scall; posterior part of mediotergite more darkened. Pleura brownish gray. Halteres obscure yellow, knobs large. Legs with forecoxæ brown, remaining covæ and all trochanters more yellowed; remainder of legs black. Wings (Plate 1, fig. 8) fulvous brown, the base more yellowed; veins pale brown, those in the costal region yellowed. Abundant long macrotrichia on veins excepting near wing base, including numerous trichia on r-m in the holotype but not in the paratype. Venation: Sc_2 not evident in the available material; cell R_3 sessile, vein R_{4+5} subequal to r-m; cel M_1 long, three to four times its petiole; cell 1st M_2 small, more so in the type; m-cu at near one-third the length of M_{3+4}.

Abdomen with proximal five segments light brown, the remainder dark brown. Male hypopygium (Plate 3, fig. 48) with the tergite, *t*, transverse, very narrow at midwidth, posterior border broadly emarginate to form large obtuse lobes, surface with abundant setæ; tergal arms ventral, appearing as stout sclerotized rods, at apex bent laterad into an acute point. Basistyle, *b*, with the interbase a small flattened yellow blade, apex obtuse; basistyle with two apical lobes, subequal in size, the outer with sparse spinoid setæ near apex and with very long yellow setæ; inner lobe more narrowed basally to appear clavate, its outer half with very numerous black spinoid setæ, longer and more slender than those of the outer lobe. Dististyle, *d*, a simple flattened obscure yellow blade, gently curved to the obtuse tip, lower margin of outer half with numerous small setæ. Phallosome with gonapophyses appearing as small oval lobes, directed inwardly.

Habitat.—Sikkim.

Holotype, male, Tung, altitude 4,500 feet, August 2, 1959 (*Schmid*). Paratopotype, male.

The specific name, *sakkya*, is that of the Tibetan deity responsible for the common prayer, "Om mani padmi om." *Pedicia* (*Tricyphona*) *sakkya* is very distinct from all others so far discovered in the Himalayan region. It is most similar to certain Nearctic species that are allied to *P.* (*T.*) *diaphana* (Doane), differing in all details of structure of the hypopygium.

DICIANOTA (RHAPHIDOLABINA) MAGRA sp. nov. Plate 1, fig. 9; Plate 4, fig. 49.

Size small (wing of male about 6 millimeters); general coloration yellow, præscutum with four brown stripes; thoracic pleura with a large dark-brown area on mesepisternum; knobs of halteres darkened; legs yellow; wings weakly yellowed, restrictedly patterned with brown; R $_{4+5}$ elongate, with r-m before midlength; male hypopygium with a single appendage at apex of basistyle interpreted as being the dististyle; gonapophysis elongate, before apex on outer margin with a compact group of four strong spines.

Male.—Length, about 5 to 5.5 millimeters; wing, 5.8 to 6; antenna, about 0.9.

Female.—Length, about 6.5 to 7 millimeters: wing 6.5 to 8.

Rostrum and palpi light yellow. Antennæ yellow, 15-segmented; proximal two or three flagellar segments enlarged and

more or less fused; succeeding segments elongate, with very long verticils that exceed the segments. Head yellow.

Pronotum yellow. Mesonotum yellow, the præscutum with four brown stripes; each scutal lobe with a major darkened area; mediotergite darkened posteriorly. Pleura yellow, the anepisternum and sternopleurite dark-brown, forming a conspicuous transverse stripe. Halteres with stem yellow, knob dark brown. Legs with forecoxæ yellow, middle and hind pairs darkened; trochanters yellow, middle and hind pairs darkened, especially beneath; remainder of legs light yellow, the terminal tarsal segments weakly infuscated. Wings (Plate 1, fig. 9) weakly yellowed, slightly patterned with darker, including small brown spots at arculus, Sc_2, origin of Rs, cord, outer end of cell 1st M_2, R_2, and forks of R_{4+5} and M_{1+2}; stigma yellowed, narrowly ringed with pale brown; outer radial cells washed with pale brown, cell R_2 more whitened; very small to scarcely evident brown marginal spots on veins R_3 to 2nd A, inclusive; veins yellow, darker in the patterned areas. Macrotrichia on veins beyond cord, basad of this with sparse trichia on Rs and on outer half of 2nd A. Wings of male more dilated, widest opposite termination of vein 2nd A. Venation: Rs long, angulated at origin; R_{1+2} very short, vein R_3 arcuated, R_{4+5} long, with r-m before midlength; cell M_1 subequal to its petiole; cell 1st M_2 strongly widened outwardly; m-cu close to the fork of M.

Abdominal tergites brown, sternites more bicolored, darkened basally, more broadly obscure yellow on outer part. In the female, abdomen more yellowed, basal rings darkened. Male hypopygium (Plate 4, fig. 49) with the tergite, *t*, transverse, posterior border produced into a broad obtuse central lobe and lateral flattened blades. Basistyle, *b*, with a single terminal structure that is interpreted as being the dististyle, *d*, smaller than the basistyle, produced into a broad beak, with spinoid setæ, chiefly concentrated into two groups, one at summit of style, the second at outer end of beak; setæ of body of style very long, especially on mesal aspect. Gonapophyses, *g*, appearing as paired straight rods, the tip of each produced into a hyaline point, at base of latter with an erect compact group of strong spines.

Habitat.—Sikkim.

Holotype, male, Chumtang, altitude 5,120 feet, July 18, 1959 (*Schmid*). Allotype, female, Tung, altitude 4,500 feet, August

2, 1959 (*Schmid*). Paratypes, a fragmentary female on slide with the allotype; 1 male, Nanga, altitude 5,000 feet, August 4, 1959; 1 female, Teng, altitude 4,600 feet, August 1, 1959 (all *Schmid*).

Dicranota (*Rhaphidolabina*) *magra* is named for an aboriginal Sikkimese tribe discussed by Hooker in his "Himalayan Journals." It is readily distinguished from other regional members of the subgenus, including *D.* (*R.*) *reticularis* Alexander and *D.* (*R.*) *trichoneura* Alexander, by the coloration of the body and wings, venation, especially of the radial field, and the structure of the male hypopygium.

DICRANOTA (RHAPHIDOLABINA) MEGOMMA sp. nov.
Plate 1, fig. 10; Plate 4, fig. 50.

General coloration of body black, including the abdomen; eyes of male very large; wings broad, weakly tinged with brown, restrictedly patterned with still darker brown; cell M_1 lacking, cell 1st M_2 long, closed.

Male.—Length, about 5 millimeters; wing, 6; antenna, about 1.2.

Rostrum reduced, brown; palpi short, apparently 3-segmented. Antenna dark brown, tip broken, with 13 segments preserved; basal three or four flagellar segments crowded, short suboval, the outer ones passing into suboval; verticils short. Head large, comprised chiefly of the compound eyes which are broadly contiguous beneath, narrowly separated above by the vertex.

Thorax uniformly black, surface subnitidous by a very sparse pruinosity; præscutum with a poorly defined broad central more blackened stripe; dorsopleural membrane dark brown. Halteres with stem brown, apex of knob brownish black. Legs with coxæ dark brown, paler beneath; trochanters brownish yellow; remainder of legs brownish black, femoral bases slightly more yellowed; claws long, unusually straight. Wings (Plate 1, fig. 10) broad, weakly tinged with brown, prearcular and costal fields slightly more yellowed; stigmal region vaguely brownish yellow; faint darker clouds at origin of Rs, cord, R_2, and outer end of cell 1st M_2; veins light brown, darker in the clouded parts, Cu_2 and a faint line behind vein 2nd A more yellowed. Macrotrichia of veins small and sparse, beyond cord with a few on R_3, tip of R_4, outer two-thirds of distal section of R_5, distal sections of M_{1+2} and M_3, and a very few on M_4; none

on veins before cord, Sc, or about the proximal half of R. Venation: Sc_1 ending beyond fork of R_{2+3+4}, Sc_2 far before origin of Rs, the latter long; R_{2+3+4} short, suberect, less than r-m, subequal to R_2; r-m on R_5; cell M_1 lacking, cell 1st M_2 closed, long, gradually widened outwardly, m-cu more than one-half its length beyond the fork of M.

Abdomen brownish black, hypopygium black. Male hypopygium (Plate 4, fig. 50) with the tergite, *t*, extensive, central region of posterior border very slightly convex; lateral arms very long, broad and darker at base, before tip arcuated and thence narrowed into a spine. Basistyle, *b*, with a stout lateral densely setiferous cushion, apex narrowed into an unusually slender lobe that is provided with a few spinoid setæ, its tip farther extended into a still more slender lobule; body a basistyle with unusually long setæ; interbase a long yellow spine from an expanded base, gradually narrowed to the acute tip. Phallosome, *p*, including slender apophyses.

Habitat.—Sikkim.

Holotype, male, Gey, altitude 11,650 feet, in Rhododendron association, May 18, 1959 (*Schmid*).

Dicranota (*Rhaphidolabina*) *megomma*, while very different in its general appearance from *D.* (*R.*) *niphas* sp. nov., is closely related, as shown by the structure of the head and hypopygium, and the venation. The two flies are very distinct in the coloration of the body and wings.

DICRANOTA (RHAPHIDOLABINA) NIPHAS sp. nov. **Plate 1, fig. 11; Plate 4, fig. 51.**

Size small (wing about 4.5 millimeters); head and thorax black, head and eyes very large; abdomen whitened, base of hypopygium black, styli yellow; halteres and legs white; wings milky white, veins pale, virtually glabrous; cell M_1 lacking, cell 1st M_2 elongate; male hypopygium with the tergal arms and interbase subequal in size, slender; dististyle single, with a slender outer lobe that is provided with small spinules.

Male.—Length, about 4 millimeters; wing, about 4.5.

Rostrum and mouth-parts brownish black. Antennæ darkened, short. Head dull black, very large, holoptic, eyes very large.

Thorax black, dorsum subnitidous, præscutum with sparse erect pale setæ; pleura more opaque. Halteres white. Legs with fore-coxæ blackened, remaining coxæ and trochanters testaceous to white; remainder of legs white, the outer tarsal

segments infuscated. Wings (Plate 1, fig. 11) milky white, including the veins. Veins nearly glabrous; vein R_5 with about two macrotrichia near outer end; costal fringe long but very sparse. Venation: R_{1+2} subequal to R_2; cell 1st M_2 closed, subequal to or longer than distal section of vein M_{1+2}; cell M_1 lacking; m-cu beyond fork of M, in cases to two-thirds its length.

Abdomen whitened, hypopygium black, with whitened styli. Male hypopygium (Plate 4, fig. 51) with the tergite, *t*, extensive, posterior border broadly convex medially, with sparse long setæ; lateral arms long, twisted before the acute terminal spine. Basistyle, *b*, with the interbase subequal in length to the tergal arm, broad-based, narrowed into a long slender spine; outer lobe of basistyle oval, with dense setæ, squamules and pale spinules. Dististyle, *d*, single, including a slender posterior lobe with small spinules and a large flattened blade. Phallosome with the gonapophyses small, darkened, tips obtuse.

Habitat.—Sikkim.

Holotype, male, Chamiteng, altitude 9,900 feet, August 24, 1959 (*Schmid*). Paratopotypes, 13 males, mostly damaged by insect pests. The types were found while flying singly in sunlight near a mountain torrent.

The specific name, *niphas*, a snow-flake, is in reference to the milky white wings. By my key to the subgenera of *Dicranota* [Arkiv f. Zool. (2) 42 A (1949) 17–18], the fly runs to *Rhaphidolabina* Alexander but disagrees with all species, with the exception of *Dicranota* (*Rhaphidolabina*) *megomma* sp. nov., in the lack of cell M_1 of the wings. In its general appearance, especially in the large eyes of the male, it suggests species of the subgenus *Polyangæus* Doane in western North America.

DICRANOTA (AMALOPINA) ELEGANTULA (Brunetti).

Plate 1, fig. 12; Plate 4, fig. 52.

Amalopina elegantula BRUNETTI, Fauna Brit. India, Diptera Nematocera (1912) 517.

The fly was described from an imperfect male taken in the Darjeeling district, West Bengal, May 26, 1910 by Brunetti.

Sikkim: Lingdok, altitude 4,600 feet, May 7, 1959 (*Schmid*).

Manu, altitude 4,920 feet, May 10, 1959 (*Schmid*).

The species has remained unknown since its description. Further notes and figures of essential structures are provided.

Antennæ with scape and pedicel darkened, flagellum yellowish; proximal flagellar segments very crowded and fused,

outer ones elongate, subequal to their verticils. Legs uniformly whitened excepting the entirely brownish-black fore- and middle femora. Wings (Plate 1, fig. 12) broad, widest opposite termination of vein 2nd A, subhyaline, with a restricted brown pattern, appearing as narrow seams at origin of Rs, cord, R_2, the supernumerary crossvein in cell R_4, and outer medial forks; tips of all longitudinal veins with paler brown spots, most extensive on the anal veins. Venation: R_{2+3+4} longer than R_2; r-m connecting vein R_5 with M_{1+2}; cell M_2 open by atrophy of m. The supernumerary crossvein in cell R_4 is normally present, lacking in abnormal specimens. Male hypopygium (Plate 4, fig. 52) much as in other members of the genus. Ninth tergite, *t*, with posterior border low convex medially, with few very long setæ; lateral tergal arms powerful, broad-based, narrowed before the apex which is extended into a slender spine. Basistyle, *b*, with apex trilobed, all lobes with microscopic blackened spicules, the lateral and central ones slender, the mesal lobe extensive; interbase broad at proximal end, its outer half a straight blade, the tip acute. Dististyle, *d*, a simple flattened blade, the tip obtuse. Phallosome with the gonapophyses divaricate, each terminating in a short finger-like lobe, the tip obtuse.

Brunetti describes the venation as having the anterior crossvein (r-m) "uniting the second and third longitudinal veins," which is an impossibility in the order since this crossvein must connect posteriorly with vein M, the fourth longitudinal vein. It is presumed that Brunetti meant that the crossvein connected the third and fourth veins (R_5 with M_{1+2}) and not the second and fourth, which it does in rare cases. In the available material, r-m connects veins R_5 and M_{1+2}.

The present material shows that the nearest ally is the Japanese *Dicranota* (*Amalopina*) *gibbera* (Alexander), hitherto referred tentatively to the subgenus *Rhaphidolabina*. The two species have the same peculiar leg coloration, differing evidently in the hypopygial structure.

HEXATOMINI

LIMNOPHILA (ELÆOPHILA) DELICOLA sp. nov. **Plate 1, fig. 13.**

Size large (wing of female 9.5 millimeters); general coloration of mesonotum buffy, patterned with brown; pleura dark brown, with yellowish gray areas; scape and pedicel black, basal flagellar segments light yellow; femora yellow, each with

a broad black subterminal ring; wings bright yellow, with a conspicuous dark-brown pattern, consisting in part of cross-bands, without dots or spots in the cells.

Female.—Length, about 10 millimeters; wing, 9.5.

Rostrum and palpi black. Antennæ with scape and pedicel black, flagellum light yellow, the outer four or five segments slightly infuscated; basal flagellar segments oval, the outer ones elongate, with long verticils. Head gray, center of the posterior vertex and the occiput broadly brownish black.

Pronotum dark brown. Mesonotal præscutum light brown or buffy, with an intricate dark brown pattern, including the lateral borders, sublateral stripes and narrow intermediate lines on anterior half, interconnected or virtually so; posterior interspace with three small brown spots; a more intensely blackened median vitta on anterior third; pseudo-sutural foveæ and a connected darkening brown; scutum buffy, the lobes patterned with brown; scutellum testaceous yellow, with a darkened spot on either side at base; postnotum dark brown, mediotergite more pruinose. Pleura dark brown, vaguely patterned with areas of yellowish gray pruinosity. Halteres yellow, apical half of knob brownish black. Legs with coxæ dark brown, trochanters slightly paler; femora light yellow, with a black subterminal ring, the narrower apex more reddened; tibiæ yellow, tips narrowly brownish black; tarsi with proximal three segments yellow, tips narrowly darkened, remainder of tarsi brownish black. Wings (Plate 1, fig. 13) bright yellow, more saturated yellow in the prearcular and costal interspaces and along the veins; a conspicuous dark-brown pattern, in part cross-banded as follows: A U-shaped area near wing base, extending to vein 1st A; a narrow parallel-sided band entirely crossing the wing at the level of the supernumerary crossvein; a Y-shaped band at cord, one arm reaching costa at tip of Sc, the other at R_{1+2}; beyond cord an interrupted band extends from outer end of cell R_3 obliquely backward to vein M_3, the apices of the cells broadly yellow; additional brown marks at tip of vein R_3, outer end of cell 1st M_2, fork of M_{1+2}; tips of Cu_1 and 2nd A with very small marginal spots, still smaller on medial veins; no spots or dots in the cell interspaces; veins brown, clear yellow in the ground areas. Wings broadest opposite termination of vein 2nd A. Venation: Cell M_1 about three times its petiole; m-cu shortly beyond fork of M.

Abdominal tergites dark brown, still darker laterally; sternites light yellow, lateral and posterior borders of segments dark brown. Ovipositor with cerci long and slender, basal shield obscure yellow.

Habitat.—Sikkim.

Holotype, female, Karponang, altitude 9,900 feet, August 23, 1959 (*Schmid*).

Limnophila (*Elæophila*) *delicola* is the most distinct member of the subgenus so far discovered in the Himalayan region, being readily told by the large size and striking pattern of the wing. All other regional species have abundant dark spots and lots in the ground interspaces of the wing.

EUPILARIA UMA sp. nov. **Plate 1, fig. 14.**

Size large (wing of female 8.5 millimeters); general coloration dull black, the anepisternum chiefly velvety black; legs with all coxæ uniformly dark brown; wings strongly infuscated, stigma still darker brown, most cells basad of cord with paler centers; Rs long, R_{2+3+4} only about one-third the basal section of R_5; m-cu a short distance beyond fork of M; abdomen uniformly dull black, genital segment obscure orange.

Female.—Length, about 8.5 millimeters; wing, 8.5; antenna, about 1.3.

Rostrum dull brownish black; palpi black. Antennæ with scape and pedicel black, flagellum brownish black; basal flagellar segments short-oval, crowded, outer segments more elongate, with longer verticils. Head dull black.

Pronotum and mesonotum almost uniformly dull black, very sparsely pruinose to appear dark plumbeous. Pleura somewhat paler, the anepisternum velvety black; dorsopleural membrane light brown. Halteres black. Legs with all coxæ uniformly dark brown, trochanters still darker; femora dark brown, bases slightly paler; tibiæ and basitarsi more yellowish brown, tips very narrowly darker; remainder of tarsi brown, passing into black. Wings (Plate 1, fig. 14) strongly infuscated, the stigma still darker brown; most cells before cord with paler centers; veins medium brown. Macrotrichia on most veins beyond cord, including R_3, R_4, distal section of R_5 and outer branches of M; basad of cord lacking on Sc, R_{2+3+4}, M and the anals; Rs with a very few trichia over most of the length; Cu_1 with few trichia on outer end of basal section, with more on the outer section. Venation: Rs longer than in *varaha;* R_{2+3+4} only about one-

third the long nearly straight basal section of R_5; m-cu only a short distance beyond the fork of M.

Abdomen uniformly dull black, genital segment obscure orange. Ovipositor with cerci slender, brownish horn color.

Habitat.—Sikkim.

Holotype, female, Manu, altitude 4,920 feet, May 10, 1959 (*Schmid*).

Eupilaria uma is most similar to *E. varaha* Alexander, of Khasia, differing in the larger size and in the details of coloration and venation.

HEXATOMA (ERIOCERA) GLOMEROSA Alexander. **Plate 1, fig. 15.**

Hexatoma (Eriocera) glomerosa ALEXANDER, Ent. News 71 (1960) in press.

Type, female, Kollar, Nilgiri Hills, Madras, South India, altitude 1,250 feet, November, 1958 (*Susai Nathan*).

Female.—Length, about 16 millimeters; wing, 15; antenna, about 2.8.

Size medium (wing of female 15 millimeters); antennæ of female 11-segmented; general coloration of thorax light gray, præscutum with four conspicuous dark-brown stripes; dorsopleural membrane of thorax with a conspicuous blackened area; femora and tibiæ obscure yellow, tips very narrowly blackened; wings (Plate 1, fig. 15) tinged with brown, cell C and the small stigma darker; veins of outer radial field stout; R_{2+3} short, about one-half R_{1+2}; abdomen light brown, extreme posterior borders of tergites blackened; ovipositor with long very slender cerci.

ERIOPTERINI

CRYPTERIA (CRYPTERIA) BASISTYLATA Alexander. **Plate 1, fig. 16; Plate 4, fig. 53.**

Crypteria basistylata ALEXANDER, Journ. N. Y. Ent. Soc. (in press, 1960).

Type, male, Tapoban, Pauri Garhwal, India, altitude 7,300 feet, August 2, 1958 (*Schmid*).

Male.—Length, about 3 to 3.5 millimeters; wing, 5 to 5.5.

Size small (wing, 5.5 millimeters or less); thorax uniformly light yellow, abdomen brownish black, basal sternites obscure yellow; halteres and legs white or pale yellow; wings (Plate 1, fig. 16) milky white, veins basad of cord very pale; male hypopygium (Plate 4, fig. 53) with the basistyle, *b*, very long, arcuated or bent at near midlength, dististyles, *d*, terminal,

very small, the outer with appressed teeth on margin before the long terminal spine.

CRYPTERIA (CRYPTERIA) HAPLOA Alexander. **Plate 1, fig. 17; Plate 4, fig. 54.**

Crypteria haploa ALEXANDER, Journ. N. Y. Ent. Soc. (in press, 1960).

Type, male, Kulara, Pauri Garhwal, India, altitude 12,000 feet, August 3, 1958 (*Schmid*).

Male.—Length, about 4.5 to 5 millimeters; wing, 6.5 to 7.

Female.—Length, about 6 millimeters; wing, 6.

Size medium (wing of male to 7 millimeters), general coloration of thorax yellow, præscutum with ill-defined slightly darker stripes; antennæ brownish black; wings (Plate 1, fig. 17) whitish subhyaline, the veins comprising the cord slightly darker; male hypopygium (Plate 4, fig. 54) with the basistyle, *b*, relatively short and stout, bearing strong apical and basal lobes, the latter with three powerful bristles; two dististyles, *d*, the outer blackened, scabrous; gonapophyses appearing as smooth blackened horns.

CRYPTERIA (FRANCKOMYIA) STYLOPHORA sp. nov. **Plate 1, fig. 16; Plate 4, fig. 55.**

Size relatively large (wing of male 7.5 millimeters); general coloration of thorax buffy yellow; halteres and legs yellow, outer tarsal segments brownish black; wings tinged with yellow, veins chiefly yellow, in part blackened; supernumerary crossvein in cell R_3 just distad of R_2; male hypopygium with dististyles subterminal; basistyle with a powerful rod at proximal end of mesal face.

Male.—Length, about 6.5 millimeters; wing, 7.5; antenna, about 1.2.

Rostrum and palpi obscure yellow. Antennæ with scape obscure yellow, pedicel dark brown, flagellum black; flagellar segments elongate, the basal fusion segment comprised of five segments without constrictions or subsegments; free outer segments oval, slightly longer than their verticils, with a short dense white pubescence; terminal segment longer than the penultimate. Front and anterior vertex yellow, remainder of vertex light gray, with long yellow setæ.

Thorax buffy yellow, without distinct pattern. Halteres pale yellow. Legs yellow, the outer tarsal segments brownish black; claws small. Wings (Plate 1, fig. 16) tinged with yellow, the prearcular and costal fields more saturated yellow; veins yellow,

especially in the brightened fields and on proximal third of wing, other veins brownish black, including R, cord, outer end of cell 1st M_2, R_{2+3+4}, base of R_{2+3}, supernumerary crossvein in cell R_3, fork of M_{1+2}, distal section of M_3 and vein 2nd A. Macrotrichia of veins short, occurring on most veins beyond cord, lacking on R_{2+3+4}, basal third of R_{2+3}, proximal end of first section of R_4; basad of cord with trichia on about the outer half of vein 2nd A, lacking on all but outer end of Sc; costal fringe relatively long, especially basally, where some longer yellow setæ are interspersed with the ones. Venation: Sc_1 ending shortly beyond the fork of R_{2+3+4}, Sc_2 about opposite this fork; R_2 short and pale, lying just basad of the supernumerary crossvein in cell R_3, this at about midlength of vein R_4; cell M_1 subequal to its petiole; cell 1st M_2 subequal to or shorter than the distal section of vein M_3; m-cu shortly beyond the fork of M; vein 2nd A of moderate length, arcuated beyond base, thence extended straight to shortly beyond the level of origin of Rs.

Abdomen obscure yellow, hypopygium more intensely yellowed. Male hypopygium (Plate 4, fig. 55) large; basistyle, *b*, long, bent, constricted at near midlength, at apex produced into a large pale flattened lobe that is about equal in length to but broader than the outer dististyle, densely setiferous; at proximal end of basistyle on mesal face with a powerful erect lobe that is tipped with a brush of long yellow setæ; extreme base of style with two separate groups of three or four very long bristles. Dististyles, *d*, subterminal, outer style narrowed at base, much expanded outwardly beneath, the outer angle farther produced into a curved black spine, its surface microscopically scabrous and with tiny setulæ; inner style larger, produced into a dilated outer part that narrows to a point, tipped with two long setæ. Phallosome, *p*, including powerful black gonapophyses, their surface scabrous, and the small simple pale ædeagus.

Habitat.—Sikkim.

Holotype, male, Thomphyak, altitude 12,800 feet, in *Rhododendron* association, May 29, 1959 (*Schmid*).

The only previously described Indian species of the subgenus is *Crypteria* (*Franckomyia*) *recessiva* Alexander (*gracilis* Brunetti, preoccupied), well distinguished from the present fly by the body coloration and more heavily patterned wings. The basic plan of the male hypopygium of the present fly is quite

as in the subgenotype, *Crypteria* (*Franckomyia*) *discalis* Alexander), of western China.

GONOMYIA (PROTOGONOMYIA) AITHOLODES Alexander.
Plate 2, fig. 19; Plate 4, fig. 56.

Gonomyia (*Protogonomyia*) *aitholodes* ALEXANDER, Journ. N. Y. Ent. Soc. 69 (1961) in press.

Type, female, Lingari, Pauri Garhwal, Kumaon, India, altitude 4,400 feet, September 1, 1958 (*Schmid*).

Female.—Length, about 4.5 millimeters; wing, 4.6; antenna, about 1.5.

Size small (wing of female about 4.5 millimeters); general coloration dull brownish black; antennæ, halteres and legs black; wings (Plate 2, fig. 19) tinged with blackish, the prearcular and costal fields slightly more yellowed; veins R_3 and R_4 divergent, narrowing cell R_1 at the margin, cell 2nd M_2 unusually deep; ovipositor (Plate 4, fig. 56) with the cerci narrowly produced at tips.

GONOMYIA (PROTOGONOMYIA) NIGRIPES (Brunetti).

Mesocyphona nigripes BRUNETTI, Fauna Brit. India, Dipt. Nematocera (1912) 458.

Limnophila incompleta BRUNETTI, Rec. Indian Mus. 15 (1918) 326.

The types of the above are from the Darjiling District, North India. The species has been badly confused with several other regional members and is re-described and figured herewith.

Male.—Length, about 5 to 5.5 millimeters; wing, 6 to 6.5.

General coloration black, including the antennæ, halteres and legs; wings (Plate 2, fig. 20) weakly darkened; vein Sc long.

Male hypopygium (Plate 4, fig. 58) with the outer lobe of basistyle, *b*, stout, with a relatively small glabrous apical flange. Three dististyles, *d*, the outer slightly expanded and very obtuse at tip; second style blackened, unequally bifid, its shorter arm an obtuse blade; inner style an elongate blade, the tip obtuse; setæ numerous but small and weak. Ædeagus with a stout apical hook, the expanded central part with numerous long pale setæ.

GONOMYIA (ELLIPTEROIDES) MEOINEURA sp. nov. Plate 2, fig. 21; Plate 4, fig. 57.

Size small (wing of female to 5 millimeters); general coloration black, mesonotal scutellum and dorsopleural region yellow; antennæ, halteres and legs black; wings weakly infuscated, Sc unusually short, Sc_1 ending about opposite one-third the length of Rs; ovipositor with cerci very long and slender; male hypopygium with the outer dististyle terminating in an acute spine;

intermediate style trifid, its longest arm a slender gently curved rod.

Male.—Length, about 3.5 to 3.8 millimeters; wing, 3.8 to 4.2; antenna, about 1.3 to 1.4.

Female.—Length, about 4.8 to 5 millimeters; wing, 4.8 to 5; antenna, about 1.4 to 1.5.

Rostrum and palpi black. Antennæ unusually long, black; flagellar segments long-oval with verticils that exceed the segments. Head black.

Thorax dull black; mesonotal scutellum yellow; dorsopleural membrane obscure yellow, region of the metapleura obscure brownish yellow. Halteres blackened. Legs black. Wings (Plate 2, fig. 21) weakly infuscated; veins darker brown. Macrotrichia on longitudinal veins beyond the general level of origin of Rs, lacking on much of veins Sc, basal section of Cu_1 and the anals. Venation: Sc unusually short, Sc_1 ending about opposite one-third the length of Rs, Sc_2 some distance from its tip; R_{2+3+4} from one-third to one-fourth longer than the basal section of R_5 and about one-half to one-third R_3; outer radial forks only moderately divergent, cell R_2 at margin about one-half as extensive as cell R_3; cell 2nd M_2 about two and one-half to three times its petiole; m-cu at or close to fork of M.

Abdomen brownish black. Ovipositor with valves elongate, especially the very long slender cerci which are acutely pointed at tips. Male hypopygium (Plate 4, fig. 57) with the outer lobe of basistyle, *b*, low and obtuse, with long setæ. Outer dististyle, *d*, expanded on outer half, terminating in an acute spine; intermediate style trifid, the longest arm a slender gently curved rod, its tip acute, axial arm pointed, with long setæ on basal two-thirds, inner arm short, blackened; inner style long-oval, tip obtuse, surface with numerous erect but relatively short setæ, two at apex much longer. Ædeagus, *a*, moderately expanded before the curved apex, the dilated part with long slender setæ.

Habitat.—Sikkim.

Holotype, male, Mangalbarey, altitude 2,800 feet, April 30, 1959 (*Schmid*). Allotopotype, female. Paratopotypes, 4 males and females, one pair still in copula; paratypes, both sexes, Sirwani, altitude 1,150 feet, May 1, 1959 (*Schmid*); 1 male, Dikchu, altitude 2,300 feet, May 9, 1959 (*Schmid*).

Gonomyia (*Ellipteroides*) *meioneura* is told from other regional members of the subgenus having black body coloration and unpatterned wings by the unusually short Sc. The most similar to such species is *G.* (*E.*) *ebenomyia* Alexander, of Nepal, which differs further in the venation, especially of the radial and medial fields.

GONOMYIA (EUPTILOSTENA) MOGHALICA Alexander. Plate, fig. 22; Plate 5, fig. 59.

Gonomyia (*Euptilostena*) *moghalica* ALEXANDER, Journ. N. Y. Ent. Soc. 69 (1961) in press.

Type, male, Chhana, Almora, Kumaon, India, altitude 3,500 feet, September 22, 1958 (*Schmid*).

Size medium (wing of male to 6 millimeters); general coloration of head and mesonotum gray, pleura striped with whitish; antennal flagellum dark brown to black; wings (Plate 2, fig. 22) strongly yellowed, restrictedly patterned with brown; male hypopygium (Plate 5, fig. 59) with three dististyles, *d*, the inner one small and slender; ædeagus, *a*, before apex with two small recurved points.

GONOMYIA (IDIOCERA) INVOLUTA Alexander. Plate 2, fig. 23; Plate 5, fig. 60.

Gonomyia (*Idiocera*) *involuta* ALEXANDER, Journ. N. Y. Ent. Soc. 69 (1961) in press.

Type, male, Yagtang, Sikkim, altitude 11,650 feet, in *Rhododendron* association, June 17, 1959 (*Schmid*).

Size relatively large (wing of male 7.5 millimeters); mesonotum brown, the præscutum with a central darkening; pleura pale brown with a broad pale-yellow longitudinal stripe; legs light brown; wings (Plate 2, fig. 23) faintly tinged with brown, prearcular and costal fields more yellowed, stigmal darkening small; Sc long, veins R_{1+2} and R_3 nearly contiguous at margin, cell R_3 large; male hypopygium (Plate 5, fig. 60) with apical lobe of basistyle short; three dististyles, the inner and outer ones short, bispinous, blackened, intermediate style longer, including an outer flattened blade and a short black inner basal spine.

GONOMYIA (IDIOCERA) MAGRA sp. nov. Plate 2, fig. 24; Plate 5, fig. 61.

Size medium (wing of male to 5.5 millimeters); general coloration of thorax gray, præscutum with two intermediate darker stripes; pleura with a conspicuous light yellow longitudinal stripe; legs brown, outwardly passing into black; wings brownish yellow, prearcular and costal regions clearer yellow, restrictedly patterned with brown; male hypopygium with the intermediate and inner dististyles conspicuously bifid, the outer

style forked shallowly at tip; ædeagus slender, the narrowed tip bent at a right angle.

Male.—Length, about 4.5 to 5 millimeters; wing, 5 to 5.5; antenna, about 1.1 to 1.2.

Female.—Length, about 7 millimeters; wing, 6.

Rostrum and palpi black. Antennæ with proximal three segments yellow, scape more infuscated beneath, remainder of flagellum brownish black to black; flagellar segments oval, shorter than the longest verticils. Head gray, anterior vertex and orbits light yellow.

Pronotum light yellow, brownish gray medially above, pretergites light yellow. Mesonotal præscutum gray with two intermediate brown stripes, widened and slightly divergent behind, pseudosutural foveæ reddish brown; scutum gray, lobes patterned with brown, posterior callosity obscure yellow; scutellum brownish yellow, darker brown at base; postnotum gray, the anterolateral part of mediotergite and dorsal pleurotergite more yellowed. Pleura purplish gray, with a conspicuous light yellow longitudinal stripe extending from behind the fore coxæ to base of abdomen, widened behind; dorsopleural membrane pale yellow. Halteres infuscated. Legs with fore and hind coxæ extensively darkened basally, tips yellow, the middle coxæ more extensively so; trochanters yellow; remainder of legs brown, outer tarsal segments black. Wings (Plate 2, fig. 24) brownish yellow, clearer yellow in prearcular and costal fields; stigma dark brown; a further restricted brown pattern, including small clouds at origin of Rs, cord and m-cu; wing tip in outer ends of cells R_3 and R_5 narrowly darkened; veins brownish yellow, clear yellow in the brightened fields. Macrotrichia on longitudinal veins beyond the general level of origin of Rs, lacking on all but the outer ends of basal sections of M and Cu_1, and on veins 1st A and 2nd A. Venation: Sc moderately long, Sc_1 ending about opposite one-third to one-fifth the length of Rs, Sc_2 before origin of Rs; vein R_3 oblique to suberect, cell R_1 at margin narrow; cell 2nd M_2 nearly twice its petiole; m-cu more than one and one-half times its length before fork of M.

Abdominal tergites dark brown, somewhat paler laterally, posterior borders of segments very narrowly yellow in male, slightly more extensively so in female; hypopygium brownish yellow. Male hypopygium (Plate 5, fig. 61) with apical lobe of basistyle, *b*, slender, with strong setæ. Three dististyles, *d*,

the outer a nearly simple black rod, split at apex into two short unequal spines, surface of basal half scabrous, the outer spine largest; intermediate style unequally bifid, the long very slender outer arm gently sinuous, subequal in length to the base of style, tip narrowly obtuse, inner spine more than half as long, narrowed to the acute tip; inner style very conspicuously bifid, outer arm a long curved spine, exceeding the base in length, narrowed to an acute point, inner spine shorter, straight, with three long setæ at and beyond midlength, with a further concentration of conspicuous bristles on margin near base of spines. Ædeagus, *a*, slender, the narrowed tip bent at about a right angle.

Habitat.—Sikkim.

Holotype, male, Rapham, altitude 5,250 feet, April 2, 1959 (*Schmid*). Allotype, female, Singbeng, altitude 4,920 feet, April 26, 1959 (*Schmid*). Paratype, 1 female, pinned with the allotype.

The specific name, *magra,* is that of an aboriginal tribe in Sikkim. *Gonomyia* (*Idiocera*) *magra* is still another of the regional members of the subgenus having the inner dististyle of the male hypopygium conspicuously bifid. All such species, including also *G.* (*I.*) *maharaja* Alexander, *G.* (*I.*) *myriacantha* Alexander, and *G.* (*I.*) *paleuma* sp. nov., show unusually strong characters in the structure of the hypopygium.

GONOMYIA (IDIOCERA) MAHARAJA Alexander. **Plate 2, fig. 25; Plate 5, fig. 62.**

Gonomyia (*Idiocera*) *maharaja* ALEXANDER, Journ. N. Y. Ent. Soc. 69 (1961) in press.

Type, male, Lata, Pauri Garhwal, Kumaon, India, altitude 7,500 feet, July 6, 1958 (*Schmid*).

General coloration gray, præscutum with two brownish gray intermediate stripes; antennæ with proximal three segments yellow, the remainder darkened; legs obscure yellow, outer tarsal segments black; wings (Plate 2, fig. 25) weakly tinged with yellow, restrictedly patterned with brown; veins R_{1+2} and R_3 narrowly separated at margin; male hypopygium (Plate 5, fig. 62) large and conspicuous; basistyle with apical lobe elongate; three dististyles, all more or less bifid.

GONOMYIA (IDIOCERA) PALEUMA sp. nov. **Plate 2, fig. 26; Plate 5, fig. 63.**

Size medium (wing of male 6 millimeters); mesonotal præscutum with the disk grayish brown, margins broadly yellow; pleura blackened, with a broad yellow longitudinal stripe; legs

yellow, the outer tarsal segments black; wings tinged with yellow, especially the basal and costal regions, with a restricted dark pattern; veins R_{1+2} and R_3 contiguous at margin; male hypopygium with the outer lobe of basistyle relatively long; three dististyles, all bispinous.

Male.—Length, about 5.5 to 5.8 millimeters; wing, 6 to 7.

Rostrum and palpi black. Antennæ with scape and pedicel light yellow, flagellum black; flagellar segments oval, the outer ones more elongate, subequal to the verticils. Head above light yellow on front and orbits, the center of posterior vertex dark brown; vertex with strong black setæ on posterior part.

Pronotum yellow. Mesonotal præscutum with disk almost covered by three confluent grayish brown stripes, the humeral and lateral parts broadly light yellow, pseudosutural foveæ chestnut; scutum brownish gray; scutellum darkened basally, the posterior margin extensively obscure yellow; mediotergite brownish black, pruinose, the anterolateral part yellow, pleurotergite extensively yellowed, darkened on less than the lower half. Pleura blackened, with a broad yellow longitudinal stripe extending from behind the forecoxæ to the abdomen. Halteres pale (apex of knob destroyed). Legs with coxæ light yellow, fore pair slightly darkened at base; trochanters deeper yellow; femora yellow, tips weakly darkened on outer face; tibiæ and tarsi yellowish brown, outer tarsal segments black. Wings (Plate 2, fig. 26) tinged with yellow, the prearcular and costal fields more saturated yellow; stigma small, dark brown; dark brown clouds at origin of Rs, cord and m-cu, darkening the veins, remaining veins yellowed, especially in the brightened fields. Veins beyond cord with strong macrotrichia, with others on Rs and outer ends of Sc, M. Cu_1 and the anals. Venation: Sc moderately long, Sc_1 ending about opposite one-fourth the length of the long Rs, Sc_2 before the origin of the latter; veins R_{1+2} and R_3 contiguous at margin, closing the cell; cell 2nd M_2 about one-half longer than its petiole; m-cu about one and one-half times its length before the fork of M.

Abdomen dark brown, posterior borders of segments obscure yellow, outer segments more uniformly darkened; hypopygium brownish yellow. Male hypopygium (Plate 5, fig. 63) with the apical lobe of basistyle, *b*, relatively slender, narrowed to the subacute tip, with numerous long setæ, especially on lower margin of outer half. Three dististyles, *d*, all bispinous; outer style with spines unequal, the outer long and straight, both

glabrous; intermediate style with the more slender spine gently curved to the acute tip, heavily blackened, outer blade paler, tip obtuse, both arms glabrous; inner style smallest, the spines subequal in length but the outer more slender, inner spine with five strong setæ on margin. Ædeagus, *a*, decurved at tip, the apex produced into a sharp point on lower edge, ventral margin of organ dilated at near two-thirds the length.

Habitat.—Sikkim.

Holotype, male, Lachung, altitude 8,610 feet, July 5, 1959 (*Schmid*). Paratopotype, male, July 9, 1959. Paratype, male, Namnasa, altitude 9,500 feet, July 13, 1959 (*Schmid*).

Readily told from other species of *Idiocera* having all dististyles of the hypopygium bispinous by the structure of the hypopygium.

GONOMYIA (LIPOPHLEPS) DISSIMILIS Alexander. **Plate 2, fig. 27; Plate 5, fig. 64.**

Gonomyia (*Lipophleps*) *dissimilis* ALEXANDER, Journ. N. Y. Ent. Soc. 69 (1961). In press.

Type, male, Perumalmalai, Madras, South India, altitude 4,000 to 4,500 feet, December 6, 1958 (*Schmid*).

General coloration of mesonotum brownish gray, scutellum broadly light yellow; pleura darkened, with a very conspicuous whitened longitudinal stripe; femora yellow with a broad black subterminal ring, posterior pair in male with a series of long erect bristles; wings (Plate 2, fig. 27) marbled with light gray and whitish subhyaline, stigma darker; abdominal tergites dark, the posterior borders broadly yellow; male hypopygium (Plate 5, fig. 64) with two dististyles, the outer very unequally bifid; phallosome with the gonapophyses long and conspicuous, black, dissimilar in form.

GONOMYIA (LIPOPHLEPS) TREPIDA sp. nov. **Plate 5, fig. 65.**

Male.—Length, about 5 millimeters; wing, 4.8.

Very similar to *Gonomyia* (*Lipophleps*) *xanthophleps* sp. nov., differing in the structure of the male hypopygium, particularly the phallosome. Male hypopygium (Plate 5, fig. 65) with the outer dististyle, *d*, long and narrow, slightly longer than the basistyle, at widest part of dilation less than twice the subbasal diameter; inner dististyle very small. Phallosome, *p*, with the gonapophyses dissimilar, subequal in length, one expanded at tip, the outer angle rounded, the inner produced into a short black spine; second apophysis a slender sinuous rod, the apical fourth gradually narrowed to the acute tip.

Habitat.—Sikkim.

Holotype, male, Gangtok, altitude 5,570 feet, May 3, 1959 (*Schmid*).

GONOMYIA (LIPOPHLEPS) XANTHOPHLEPS sp. nov. **Plate 2, fig. 28; Plate 5, fig. 66.**

Belongs to the *nubeculosa* group; general coloration of thorax dark brown, pretergal region, mesonotal scutellum and a pleural stripe conspicuously yellow; femora obscure yellow, with a brownish black subterminal ring preceded and followed by narrow clear yellow annuli; wings with ground darkened, base, costal region and wing apex pale yellow; a restricted darker brown pattern at tip of Sc, stigma, ends of outer radial veins and the cord, cell R_3 present; abdomen brownish black, posterior borders of tergites narrowly obscure yellow; male hypopygium with two dististyles, the outer a broad blackened blade; gonapophyses blackened, dissimilar in form.

Male.—Length, about 4.5 millimeters; wing, 4.8; antenna, about 0.9.

Rostrum and palpi black. Antennæ with scape and pedicel brownish black beneath, conspicuously yellowed above, flagellum black; flagellar segments elongate, with very long verticils, as in the subgenus. Head light-yellow, center of posterior vertex darkened.

Pronotum, extreme lateral margin of præscutum and pretergites light yellow. Mesonotal præscutum and scutum dark brown, scutellum bright yellow, darkened medially at base; postnotum darkened, sparsely pruinose, paling to light brown on pleurotergite and adjoining part of mediotergite. Pleura dark brown, with a very conspicuous longitudinal light yellow stripe extending from and including the forecoxæ, reaching the abdomen; dorsal pleurites, especially the pteropleurite, paler. Halteres with stem light yellow, including the apex of knob, the remainder of latter infuscated. Legs with forecoxæ yellow, remaining coxæ darkened basally, the tips paling to obscure yellow; trochanters yellow; femora obscure yellow with a brownish black subterminal ring that is preceded and followed by a slightly narrower clear yellow annulus; tibiæ obscure yellow; basitarsi brownish yellow, remainder of tarsi black. Wings (Plate 2, fig. 28) with the ground darkened, the prearcular and costal regions pale yellow, interrupted by darkened areas at tip of Sc, stigma and ends of veins R_3 and R_4; other small darkenings at cord and outer end of cell 1st M_2; wing tip in cells R_4 to 2nd M_2 conspicuously yellowish white;

veins light brown, darker in the clouded parts, clear light yellow in the prearcular field and interspaces of veins C, Sc and R. Macrotrichia on most longitudinal veins beyond cord, lacking on second section of M_{1+2} and Cu_1; basad of cord lacking on all veins excepting the extreme outer end of Rs; costal fringe long and conspicuous. Venation: Sc short, Sc_1 ending opposite origin of Rs; vein R_3 very short, suberect; m-cu close to fork of M.

Abdomen brownish black, posterior borders of tergites narrowly obscure yellow; hypopygium with parts of basistyle pale. Male hypopygium (Plate 5, fig. 66) with the tergal lobes low, with long setæ. Dististyles, *d*, two, terminal, the outer a blackened glabrous blade, with less than the outer half narrowed, tip subacute; inner style pale, narrowed outwardly, tipped with two modified setæ. Phallosome with the ædeagus (not figured) depressed-flattened, terminating in a lobe that is fringed with setæ. Gonapophyses asymmetrical, appearing as simple blackened rods, one terminating in a short spine, the other with this much longer and stouter.

Habitat.—West Bengal.

Holotype, male, Pul Bazar, altitude 2,400 feet, March 12, 1959 (*Schmid*).

Other regional members of the *nubeculosa* group include besides *Gonomyia* (*Lipophleps*) *nubeculosa* de Meijere, also *G.* (*L.*) *conjugens* Senior-White, *G.* (*L.*) *pallidosignata* Alexander, and *G.* (*L.*) *trepida* sp. nov., all differing particularly in the structure of the male hypopygium. The male sex of *conjugens* is not known to me but Senior-White's brief statement of "three black linear chitinous processes, one directed posteriorly, two laterally" scarcely appears to pertain to the present fly.

GONOMYIA (GONOMYIA) EMPHYSEMA sp. nov. **Plate 2, fig. 29; Plate 6, fig. 67.**

Size medium (wing of male 5.3 millimeters); mesonotum grayish brown, scutellum yellow; head posteriorly, pronotum and pretergites light yellow; legs black; wings tinged with gray, stigma pale brown; Sc_1 ending about opposite one-third Rs, Sc_2 removed from tip; male hypopygium with outer lobe of basistyle long and slender; both dististyles elongate, the outer with a darkened expansion near midlength; inner style subequal in length, terminating in a black spine; phallosome with two subequal gonapophyses; ædeagus narrowly obtuse at tip, with a further black subtending spine.

Male.—Length, about 5 millimeters; wing, 5.2; antenna, about 1.

Rostrum and palpi black. Antennæ black; proximal flagellar segments oval, beyond the fifth or sixth becoming long-cylindrical, with verticils that are much longer than the segments. Head dark gray, with a light yellow triangle on the posterior vertex.

Pronotum light yellow, vaguely infuscated above, more extensively so on sides; pretergites narrowly light yellow. Mesonotal præscutum and scutal lobes dark grayish brown, central region of scutum restrictedly brightened; scutellum yellow, darkened at base; mediotergite gray, the lateral border narrowly yellow, pleurotergite brownish yellow, slightly darkened on posterior border. Pleura chiefly dark brown, the dorsal sternopleurite and dorsopleural membrane yellowed; posterior pleurites extensively light yellow. Halteres with stem obscure yellow, knob infuscated. Legs with coxæ brown, the posterior pair paler; trochanters yellowish brown; remainder of legs black. Wings (Plate 2, fig. 29) tinged with gray, prearcular and costal fields light yellow; stigma long, pale brown; veins brown, paler brown in the brightened fields. Long macrotrichia on veins beyond the general level of origin of Rs; Sc virtually glabrous, with a few trichia near outer end; approximately the basal third of veins M and 1st A and the basal two-thirds of Cu_1 and 2nd A glabrous. Venation: Sc relatively long, Sc_1 ending about opposite one-third the length of Rs, Sc_2 removed from tip; m-cu about one-fourth its length beyond the fork of M.

Abdomen dark brown, hypopygium more yellowish brown. Male hypopygium (Plate 6, fig. 67) with the outer lobe of basistyle, *b*, long and slender, subequal in length to the body of style, setæ shorter than the lobe. Outer dististyle, *d*, slender on basal half, stouter and with abundant setæ on outer part, at near midlength on inner margin with a conspicuous darkened swelling or extension, its tip obtuse; inner style subequal in length, the outer third narrowed into a black spine, at its base on inner margin dilated, with a concentration of strong setæ, on outer margin at base of spine with a single powerful bristle from a raised tubercle. Phallosome, *p*, including two brown gonapophyses, of approximately equal length, one narrower and extended into a long apical spine, the other broader, its lower margin pale and membranous, tip obtuse; tip of ædeagus darkened, relatively small, apex broadly obtuse, subtended by an outer slender black spine.

Habitat.—Sikkim.

Holotype, male, Lingdok, altitude 4,600 feet, May 7, 1959 (*Schmid*).

Gonomyia (*Gonomyia*) *emphysema* is generally similar to *G.* (*G.*) *affinis* Brunetti and other allied species, differing from all in the structure of the male hypopygium, particularly the dististyles and phallosome.

GONOMYIA (GONOMYIA) ISHANA Alexander. **Plate 2, fig. 30; Plate 6, fig. 68.**

Gonomyia (*Gonomyia*) *ishana* ALEXANDER, Journ. N. Y. Ent. Soc. 69 (1961). In press.

Type, male, Trijugi, Pauri Garhwal, Kumaon, India, altitude 7,000 feet, May 26, 1958 (*Schmid*).

Size large (wing of male 6.5 millimeters); mesonotal præscutum reddish brown with three darker brown stripes, scutellum obscure yellow; pleura reddish brown, striped longitudinally with light yellow; wings (Plate 2, fig. 30) strongly tinged with yellowish brown, the prearcular and costal fields clear yellow; male hypopygium (Plate 6, fig. 68) with the apical lobe of basistyle, *b*, long and slender, with relatively few setæ; outer dististyle, *d*, slender, dilated at apex into a triangle, the angles produced into points; inner style with a strong basal spine; phallosome, *p*, with the apophyses long and slender, acutely pointed and blackened at tips.

GONOMYIA (GONOMYIA) RAVANA sp. nov. **Plate 2, fig. 31; Plate 6, fig. 69.**

Size medium (wing of male under 6 millimeters); general coloration of mesonotal præscutum dark brown, scutellum light yellow; pleura and pleurotergite clear light yellow, restrictedly patterned with brown on propleura and anepisternum; wings strongly suffused with brownish yellow, prearcular and costal regions clearer yellow; Sc relatively short; male hypopygium with three dististyles, the inner bearing a black outer spine and a longer needlelike basal one; phallosome with two blackened apophyses, outer crest relatively small, oval; a recurved black spine beyond the apophyses.

Male.—Length, about 5 millimeters; wing, 5.8.

Rostrum light yellow, palpi black. Antennæ with scape brown, remainder of organ black; basal flagellar segments oval, the outer ones becoming elongate, with long conspicuous verticils. Front and anterior vertex yellow, posterior vertex dark gray.

Pronotum and pretergites clear light yellow. Mesonotal præscutum with disk dark brown, the three usual stripes vir-

tually confluent, humeral and lateral regions light yellow, pseudosutural foveæ chestnut brown; scutal lobes dark brown, central area broadly obscure yellow; scutellum light yellow, the extreme base darkened; mediotergite brownish gray, the anterolateral angles, with the pleurotergite, light yellow. Pleura clear light yellow, the propleura and a major area on anepisternum brown, ventral sternopleurite slightly reddened. Halteres pale yellow. Legs with coxæ clear yellow, trochanters slightly darker yellow; remainder of legs brown, femoral tips infuscated, outer tarsal segments black. Wings (Plate 2, fig. 31) strongly suffused with brownish yellow, prearcular and costal fields, together with basal part of cell Cu, clear yellow; stigma pale brown. Relatively short macrotrichia on veins beyond cord, basad of this with trichia on Rs, more than outer half of M and 1st A, with shorter apical series on Cu_1 and 2nd A; vein Sc glabrous except for a few scattered trichia near outer end. Venation: Sc relatively short, Sc_1 ending about opposite one-fifth the length of Rs, Sc_2 at extreme tip; basal section of R_5 short; cell 1st M_2 subequal in length to vein M_4; m-cu about one-half its length beyond the fork of M.

Abdominal tergites dark brown, sternites and hypopygium yellow. Male hypopygium (Plate 6, fig. 69) with the outer lobe of basistyle, *b*, long and conspicuous, a little larger outwardly, with very abundant setæ, those of outer face longer, of inner margin unusually stout; near base with a compact group of about five stouter pale bristles. Three dististyles, *d*, or branches; outer style longest, very unequally bifid at tip; intermediate style a long slender spine, narrowed to the needlelike tip, beyond midlength with a single powerful bristle; inner style large, at base of outer margin with two spines, the shorter outer one black, the more proximal inner spine longer and pale, subequal in size and shape to the intermediate style; body of style short and stout, terminating in a single powerful bristle, with other more normal setæ on margin and surface. Phallosome, *p*, about as figured, including the crested outer part which bears a strong black spine near its base; two blackened apophyses that are shorter than in decacantha, one more flattened and ribbonlike.

Habitat.—India (Kumaon).

Holotype, male, Gangrea, Pauri Garhwal, altitude 7,500 to 10,000 feet, June 13, 1958 (*Schmid*).

Gonomyia (*Gonomyia*) *ravana* is allied to *G.* (*G.*) *decacantha* Alexander, differing in all details of the male hypopygium, especially the dististyles and phallosome. The blackened spine on the phallosome distal to the apophyses is lacking in *decacantha* but is found in the otherwise quite distinct *G.* (*G.*) *periploca* Alexander.

GONOMYIA (GONOMYIA) SIBYNA sp. nov. **Plate 2, fig. 32; Plate 6, fig. 70.**

Size medium (wing of male about 5.5 millimeters); general coloration of mesonotum dark brown, scutellum yellow; pleura and pleurotergite chiefly yellow; legs brownish black; wings tinged with gray, stigma pale brown, inconspicuous; Sc moderately long, Sc_1 ending opposite or beyond one-third the length of Rs; male hypopygium with the outer dististyle a simple blade, its tip narrowly obtuse; inner style with a single very powerful spine; phallosome with the two gonapophyses unequal, apex of ædeagus pale, obtuse.

Male.—Length, about 5 to 5.2 millimeters; wing, 5.5 to 5.6; antenna, about 0.85 to 0.9.

Rostrum and palpi black. Antennæ black; basal flagellar segments oval, outer ones slender, with long verticils. Head dark brown, restrictedly patterned with obscure yellow.

Pronotum and pretergites light yellow, lateral præscutal margins broadly more obscure yellow. Mesonotal præscutum with disk almost uniformly dark brown; pseudosutural foveæ black; scutal lobes dark brown, the median region yellow; scutellum yellow, darkened medially at base; mediotergite brownish gray, the anterolateral angles light yellow; pleurotergite light yellow, ventral fourth infuscated. Pleura almost uniformly light yellow, the propleura and a weak cloud on anepisternum pale brown; ventral sternopleurite extensively infuscated. Halteres with stem pale, base narrowly yellowed, knob infuscated. Legs with forecoxæ and trochanters brown, of the other legs paler; remainder of legs brownish black. Wings (Plate 2, fig. 32) tinged with gray, the prearcular and costal fields light yellow; stigma pale brown, inconspicuous; veins light brown, those in the brightened areas still paler. Veins of outer two-thirds of wing with conspicuous macrotrichia, lacking on bases of Sc, M, Cu_1 and the anals. Venation: Sc long, Sc_1 ending about opposite one-third to two-fifths Rs, vein R_4 long, deflected caudad, cell R_3 at margin extensive; m-cu at fork of M.

Abdominal tergites dark brown, sternites paler. Male hypopygium (Plate 6, fig. 70) with apical lobe of basistyle, *b*, of moderate length, with long setæ, some nearly as long as the lobe itself. Outer dististyle, *d*, a straight simple rod, slightly widened outwardly, tip narrowly obtuse, the lower outer third glabrous; inner style with a single very powerful spine, gradually curved to the acute tip, outer beak small, with two unequal fasciculate setæ, the lower about twice the size of the upper. Phallosome, *p*, with the two gonapophyses unequal, one long and sinuous; apex of ædeagus pale, obtuse.

Habitat.—Sikkim.

Holotype, male, Dethang, altitude 4,000 feet, April 1, 1959 (*Schmid*). Paratopotype, male.

Gonomyia (*Gonomyia*) *sibyna* is generally similar to other regional species, including *G.* (*G.*) *chalaza* Alexander, differing especially in the structure of the male hypopygium.

GONOMYIA (GONOMYIA) YAMA sp. nov. **Plate 2, fig. 33; Plate 6, fig. 71.**

Size medium (wing over 5 millimeters); general coloration of mesonotal præscutum dark brown, humeral and lateral regions whitish yellow; pleura light yellow, with reddish brown areas on anepisternum and ventral sternopleurite; legs brown, tarsi blackened; wings weakly tinged with brown; macrotrichia of veins long; m-cu close to fork of M; basistyle of male hypopygium with but few setæ; two dististyles, the outer a simple rod, the inner bidentate at apex; phallosome with two blackened unequal apophyses, apex of ædeagal portion obtusely rounded.

Male.—Length, about 4.6 to 4.7 millimeters; wing, 5.2 to 5.4.

Rostrum clear light yellow; palpi black. Antennæ black throughout; outer flagellar segments elongate, shorter than the longest verticils. Head gray.

Pronotum and pretergites clear light yellow. Mesonotal præscutum with disk almost uniformly dark brown, humeral and lateral portions whitish yellow; scutal lobes dark brown, median area and the scutellum obscure yellow, the base of latter restrictedly more darkened; mediotergite brownish gray, the anterolateral border and pleurotergite yellow, the latter more reddened ventrally. Pleura light yellow, variegated on anepisternum and ventral sternopleurite with reddish brown areas. Halteres with stem yellowed, knob moderately infuscated. Legs with coxæ reddened, yellowed at tips; trochanters

obscure yellow; remainder of legs brown, femoral bases more yellowed, tarsi passing into black. Wings (Plate 2, fig. 33) weakly tinged with brown, prearcular and costal fields more yellowed; stigma very faintly darkened; veins dark brown, lighter in the brightened fields. Macrotrichia of veins long, on most longitudinal veins of outer four-fifths of wing, including all of Sc; on M and 1st A narrowly lacking, on Cu_1 and 2nd A more extensively so. Venation: Sc_1 ending about opposite one-fourth to one-fifth the length of Rs, Sc_2 near tip of Sc_1; vein R_4 deflected strongly toward the wing tip, widening cell R_3 at margin; cell 1st M_2 shorter than vein M_4; m-cu at or just before the fork of M.

Abdominal tergites dark brown, sternites yellowed; hypopygium brownish yellow. Male hypopygium (Plate 6, fig. 71) with apical lobe of basistyle, *b*, relatively slender, with few setæ. Two dististyles, *d*, the outer a simple rod with long coarse setæ, on mesal face at midlength with a long glabrous flange; inner style shorter, near apex with two nearly equal points or teeth, at their base with the long apical setæ. Phallosome, *p*, with two blackened unequal apophyses, ædeagus dilated and obtusely rounded at apex.

Habitat.—Kumaon.

Holotype, male, Gangrea, Pauri Garhwal, altitude 7,500 to 10,000 feet, June 15, 1958 (*Schmid*). Paratype, male, Khati, Almora, altitude 7,700 to 8,000 feet, September 10, 1958 (*Schmid*).

Gonomyia (*Gonomyia*) *yama* is quite distinct from all of the now numerous regional species of the subgenus in the structure of the male hypopygium, particularly the dististyles. The hypopygium is much simpler than that of various species allied to *G.* (*G.*) *decacantha* Alexander, especially in the structure of the inner dististyle and phallosome.

LIPSOTHRIX MIRIFICA sp. nov. **Plate 2, fig. 34; Plate 6, fig. 72.**

General coloration black; antennæ of male elongate; wings brownish yellow, patterned with pale brown, especially over the cord; R_{2+3+4} short, only about one-third longer than the basal section of R_5; cell 1st M_2 very large, rectangular, subequal in length to distal section of M_{1+2}; male hypopygium with the interbase long and slender, strongly bent beyond midlength.

Male.—Length, about 8 to 8.2 millimeters; wing, 9 to 9.5; antenna, about 3 to 3.1.

Rostrum and palpi dark brown. Antennæ of male elongate, about one-third the wing, dark brown; flagellar segments with a short dense pale pubescence, additional to the sparse verticils, the latter shorter than the segments; terminal segment oval, only about one-third as long as the penultimate. Head black.

Thorax black, præscutum with sparse erect setæ. Halteres obscure brownish yellow. Legs with coxæ black; trochanters yellow; femora brown, the bases yellowed; tibiæ and tarsi brown; each claw with two conspicuous spines, the outer one longer. Wings (Plate 2, fig. 34) brownish yellow, the prearcular field yellow, costal region less evidently so; broad pale brown seams over cord and outer end of cell 1st M_2, much narrower at fork of Sc and on R_2; a darkened cloud in cell Cu_1 between the cubital branches; veins brown, yellowed in the brightened fields. Macrotrichia on longitudinal veins beyond cord, outer half of Sc and outer ends of anal veins, the latter very sparse, including a single trichia on 1st A and about four on 2nd A. Venation: Sc_1 ending about opposite two-thirds the length of R_{2+3+4}, the latter short, only about one-third longer than basal section of R_5; cell 1st M_2 very large, rectangular, subequal in length to distal section of M_{1+2}; m-cu shortly beyond fork of M.

Abdomen, including hypopygium, black. Male hypopygium (Plate 6, fig. 72) with the outer dististyle, *d*, shorter than the inner; interbase, *i*, with proximal end dilated, thence unusually long and slender, beyond midlength bent at nearly a right angle, outwardly slightly expanded into a narrow blade, the tip acute.

Habitat.—Sikkim.

Holotype, male, Chachu, altitude 9,950 feet, in *Rhododendron* association, May 17, 1959 (*Schmid*). Paratype, male, Gey, altitude 11,650 feet, in *Rhododendron* association, May 18, 1959 (*Schmid*).

Lipsothrix mirifica is quite distinct from all other regional species in its black coloration, patterned wings and venation. It is most like *L. mirabilis* Alexander, of western China, differing conspicuously in the pattern and venation of the wings.

HESPEROCONOPA SIKKIMENSIS sp. nov. **Plate 2, fig. 35; Plate 6, fig. 73.**

General coloration dark gray, præscutum with a darker central stripe that is narrowly bordered by blackish; antennæ and

legs black; wings strongly blackened; male hypopygium with mesal face of basistyle with abundant setæ, the outer ones more spinoid; both the interbase and gonapophysis blackened and pointed at tips.

Male.—Length, about 4.2 to 5 millimeters; wing, 4.6 to 5.8; antenna, about 1.2 to 1.4.

Female.—Length, about 4.8 to 5.2 millimeters; wing, 5.5 to 6.2.

Rostrum and palpi black. Antennæ black throughout; first flagellar segment oval, the succeeding ones short-oval, becoming progressively smaller outwardly; segments with a dense pale pubescence, the sparse verticils shorter than the segments. Head dark gray; anterior vertex broad.

Pronotum brownish gray. Mesonotal præscutum gray, with a darker gray central stripe that is narrowly bordered by blackish, præscutal borders narrowly darkened, the interspaces with conspicuous erect black setæ; posterior sclerites of notum blackened, sparsely pruinose; scutal lobes and scutellum with black setæ. Pleura and pleurotergite clear light gray, glabrous. Halteres with stem light brown, especially at base, knob dark brown. Legs with coxæ and trochanters blackened; remainder of legs black, femoral bases narrowly obscure yellow; vestiture short. Wings (Plate 2, fig. 35) strongly blackened; veins black. Veins with strong macrotrichia, lacking at bases of M, Cu_1 and the anals. Venation: Sc_1 ending about opposite one-half to nearly two-thirds the length of R_{2+3+4}, Sc_2 about opposite or before the fork of Rs; R_2 shorter than R_{2+3}; m-cu at or close to fork of M.

Abdomen blackened, pruinose to appear dark gray. Ovipositor with cerci long, blackened basally, upcurved to the acute tips. Male hypopygium (Plate 6, fig. 73) with basistyle, *b*, stout, its mesal face with abundant setæ, the more cephalic ones very long and delicate, outer ones becoming strong and spinoid; outer face of style with fewer normal setæ. Outer dististyle, *d*, with microscopic setulæ only, to appear nearly glabrous; apex obtuse, the lateral spine at near midlength blackened, relatively weak; inner style shorter, tip obtuse, outer surface with strong erect to slightly retrorse setæ. Interbasal rods enlarged basally, the outer half narrowed into a black spine, its tip acute. Phallosome, *p*, with the ædeagus slender, small, pale yellow; apophyses appearing as slender black spines.

Habitat.—Sikkim.

Holotype, male, Zema, altitude 8,900 feet, May 24, 1959 (*Schmid*). Allotopotype, female, pinned with type. Paratopotypes, males and females, with types; paratypes, males and females, Yedang, altitude 9,680 feet, June 10, 1959 (*Schmid*).

The discovery of a species of the genus *Hesperoconopa* Alexander in Asia is of unusual interest, all other known species being from western North America. In its general appearance the fly suggests a large species of *Bæoura* from which it readily is told by the very different genitalia of both sexes.

CHEILOTRICHIA (CHEILOTRICHIA) GLORIOLA sp. nov. Plate 2, fig. 36; Plate 6, fig. 74.

Size medium (wing of male 5 millimeters); general coloration polished black, head more pruinose; antennæ and legs black, femoral bases restrictedly yellow; halteres yellow; wings tinged with yellow, the base and costal region strongly so, with a restricted brown pattern; cell 1st M_2 closed; male hypopygium with the outer dististyle bifid, its inner arm shallowly notched at tip.

Male.—Length, about 4.5 millimeters; wing, 5.

Female.—Length, about 5.5 millimeters; wing, 5.6.

Rostrum, palpi and antennæ black; flagellar segments of male oval, with very long verticils. Head dark gray.

Pronotum dull black, sides obscure yellow, the pretergites narrowly of the same color, more conspicuously so before the wing root. Mesonotum black, surface shiny, with a very faint gray pruinosity; a few long yellow bristles. Pleura more pruinose, especially ventrally. Halteres pale yellow. Legs with the coxæ black; trochanters yellowish brown; remainder of legs black, femoral bases yellowed, narrowly so on forelegs, more evident on posterior pair where, in cases, about the proximal seventh is included; legs without scales. Wings (Plate 2, fig. 36) tinged with yellow, more saturated and conspicuous at base, including veins Sc, R, and all but the tips of the anals; a restricted but conspicuous brown pattern, including seams at cord and outer end of cell 1st M_2, R_2 and R_{1+2}, and outer two-thirds of vein Cu, best evidenced by a deepening in color of the veins. Veins of outer two-thirds of wings with macrotrichia, lacking on base of Sc, most of M, and the very restricted bases of anal veins. Venation: Sc very long, Sc_1 ending shortly before level of fork of the long Rs, Sc_1 about twice R_2; R_{2+3+4} subequal to R_{3+4}; cell 1st M_2 closed, a little

shorter than distal section of vein M_3; m-cu at or close to fork of M.

Abdomen black. Ovipositor with valves horn yellow, long and very slender, nearly straight. Male hypopygium (Plate 6, fig. 74) with basistyle, *b*, short and compact, without apical lobes. Dististyles, *d*, terminal, both blackened; outer style deeply bifid, the arms nearly parallel to one another, outer arm simple, subequal in length to the base, inner arm shorter and more slender, shallowly and unequally bidentate at tip; inner style a simple flattened blade, tip obtuse, lower margin with a flange. Ædeagus, *a*, slender, from a rectangular basal plate.

Habitat.—Sikkim.

Holotype, male, Talam, altitude 11,300 feet, in *Rhododendron* association, June 16, 1959 (*Schmid*). Allotype, female, Chachu, altitude 9,500 feet, in *Rhododendron* association, May 21, 1959 (*Schmid*).

Cheilotrichia (*Cheilotrichia*) *gloriola* is the first representative of the typical subgenus to be found in India. It is readily told from the now numerous species of the subgenus *Empeda* Osten Sacken by the polished black coloration, wing pattern, and closed cell 1st M_2.

RHABDOMASTIX (RHABDOMASTIX) HIMALAYENSIS Alexander.
Plate 2, fig. 37; Plate 6, fig. 75.

Rhabdomastix (*Rhabdomastix*) *himalayensis* ALEXANDER, Journ. N. Y. Ent. Soc. 68 (1960) in press.

Type, male, Salkhola, Pauri Garhwal, Kumaon, altitude 4,240 feet, August 22, 1958 (*Schmid*).

Male.—Length, about 7 millimeters; wing, 7.2; antenna, about 26.

Size large (wing of male about 7 millimeters); antennæ of male very long, exceeding three times the body or wing; general coloration of thorax dark grayish brown; femora obscure yellow, narrowly darkened at tips; wings (Plate 2, fig. 37) very weakly darkened, unpatterned except for the darker brown stigma; veins unusually glabrous; Sc long, anal cells very broad; male hypopygium (Plate 6, fig. 75) with the interbase, *i*, elongate, narrowed very gradually into a hairlike point.

RHABDOMASTIX (SACANDAGA) ALMORÆ Alexander. Plate 2, fig. 38; Plate 6, fig. 76.

Rhabdomastix (*Sacandaga*) *almoræ* ALEXANDER, Journ. N. Y. Ent. Soc. 68 (1960) in press.

Type, male, Bagheswar, Almora, Kumaon, altitude 3,200 feet, September 23, 1958 (*Schmid*).

Size small (wing, 4 millimeters or less); general coloration of head and thorax gray, the præscutum with indications of a pair of pale brown stripes; legs brownish black; wings (Plate 2, fig. 38) relatively narrow, membrane weakly darkened; macrotrichia of veins reduced in number; Sc relatively long, cell 2nd A narrow; male hypopygium (Plate 6, fig. 76) with the outer half of the interbase, *i*, a long pale blade.

(In an earlier part of this series of papers an error was made that should be corrected. In Part XLV [Philip. Journ. Sci. 86 (1957) 429] two species with the identical name, *Eupilaria singhalica,* were described. The second of these actually was named *Eupilaria taprobanica* Alexander, as is evident elsewhere in the same report.)

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ILLUSTRATIONS

[Legend: *a*, ædeagus; *b*, basistyle; *g*, gonapophysis; *i*, interbase; *p*, phallosome; *s*, sternite; *t*, tergites.]

PLATE 1

FIG. 1. *Macgregoromyia sikkimensis* sp. nov.; venation.
2. *Dolichopeza* (*Mitopeza*) *amisca* sp. nov.; venation.
3. *Dolichopeza* (*Nesopeza*) *ballator* sp. nov.; venation.
4. *Dolichopeza* (*Nesopeza*) *præsul* sp. nov.; venation.
5. *Protohelius nilgiricus* Alexander; venation.
6. *Lechria coorgensis* Alexander; venation.
7. *Nasiternella tjederi* sp. nov.; venation.
8. *Pedicia* (*Tricyphona*) *sakkya* sp. nov.; venation.
9. *Dicranota* (*Rhaphidolabina*) *magra* sp. nov.; venation.
10. *Dicranota* (*Rhaphidolabina*) *megomma* sp. nov.; venation.
11. *Dicranota* (*Rhaphidolabina*) *niphas* sp. nov.; venation.
12. *Dicranota* (*Amalopina*) *elegantula* (Brunetti); venation.
13. *Limnophila* (*Elæophila*) *delicola* sp. nov.; venation.
14. *Eupilaria uma* sp. nov.; venation.
15. *Hexatoma* (*Eriocera*) *glomerosa* Alexander; venation.
16. *Crypteria* (*Crypteria*) *basistylata* Alexander; venation.
17. *Crypteria* (*Crypteria*) *haploa* Alexander; venation.
18. *Crypteria* (*Franckomyia*) *stylophora* sp. nov.; venation.

PLATE 2

FIG. 19. *Gonomyia* (*Protogonomyia*) *aitholodes* Alexander; venation.
20. *Gonomyia* (*Protogonomyia*) *nigripes* (Brunetti); venation.
21. *Gonomyia* (*Ellipteroides*) *meioneura* sp. nov.; venation.
22. *Gonomyia* (*Euptilostena*) *moghalica* Alexander; venation.
23. *Gonomyia* (*Idiocera*) *involuta* Alexander; venation.
24. *Gonomyia* (*Idiocera*) *magra* sp. nov.; venation.
25. *Gonomyia* (*Idiocera*) *maharaja* Alexander; venation.
26. *Gonomyia* (*Idiocera*) *paleuma* sp. nov.; venation.
27. *Gonomyia* (*Lipophleps*) *dissimilis* Alexander; venation.
28. *Gonomyia* (*Lipophleps*) *xanthophleps* sp. nov.; venation.
29. *Gonomyia* (*Gonomyia*) *emphysema* sp. nov.; venation.
30. *Gonomyia* (*Gonomyia*) *ishana* Alexander; venation.
31. *Gonomyia* (*Gonomyia*) *ravana* sp. nov.; venation.
32. *Gonomyia* (*Gonomyia*) *sibyna* sp. nov.; venation.
33. *Gonomyia* (*Gonomyia*) *yama* sp. nov.; venation.
34. *Lipsothrix mirifica* sp. nov.; venation.
35. *Hesperoconopa sikkimensis* sp. nov.; venation.
36. *Cheilotrichia* (*Cheilotrichia*) *gloriola* sp. nov.; venation.
37. *Rhabdomastix* (*Rhabdomastix*) *himalayensis* Alexander; venation.
38. *Rhabdomastix* (*Sacandaga*) *almoræ* Alexander; venation.

PLATE 3

FIG. 39. *Macgregoromyia sikkimensis* sp. nov.; male hypopygium.
40. *Dolichopeza* (*Mitopeza*) *amisca* sp. nov.; male hypopygium.
41. *Dolichopeza* (*Nesopeza*) *præsul* sp. nov.; male hypopygium.
42. *Tipula* (*Bellardina*) *arjuna* sp. nov.; male hypopygium.
43. *Tipula* (*Bellardina*) *krishna* sp. nov.; male hypopygium.
44. *Tipula* (*Bellardina*) *hypsistos* sp. nov.; male hypopygium.
45. *Protohelius nilgiricus* Alexander; male hypopygium.
46. *Nasiternella grallator* sp. nov.; antenna, male hypopygium.
47. *Nasiternella tjederi* sp. nov.; male hypopygium.
48. *Pedicia* (*Tricyphona*) *sakkya* sp. nov.; male hypopygium.

PLATE 4

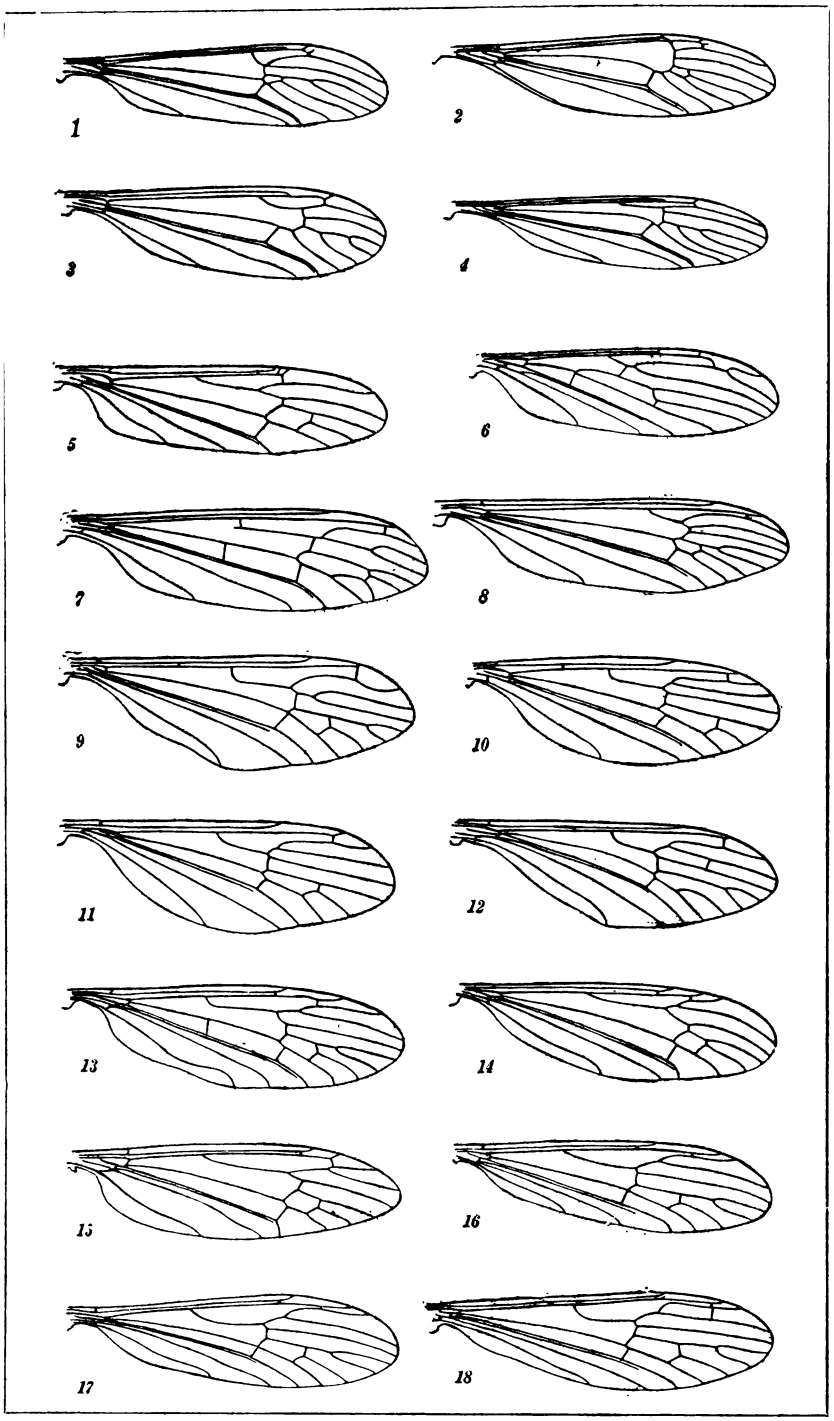
FIG. 49. *Dicranota* (*Rhaphidolabina*) *magra* sp. nov.; male hypopygium.
50. *Dicranota* (*Rhaphidolabina*) *megomma* sp. nov.; male hypopygium.
51. *Dicranota* (*Rhaphidolabina*) *niphas* sp. nov.; male hypopygium.
52. *Dicranota* (*Amalopina*) *elagantula* (Brunetti); male hypopygium.
53. *Crypteria* (*Crypteria*) *basistylata* Alexander; male hypopygium.
54. *Crypteria* (*Crypteria*) *haploa* Alexander; male hypopygium.
55. *Crypteria* (*Franckomyia*) *stylophora* sp. nov.; male hypopygium.
56. *Gonomyia* (*Protogonomyia*) *aitholodes* Alexander; ovipositor.
57. *Gonomyia* (*Ellipteroides*) *meioneura* sp. nov.; male hypopygium.
58. *Gonomyia* (*Photogonomyia*) *nigripes* (Brunetti); male hypopygium.

PLATE 5

FIG. 59. *Gonomyia* (*Euptilostena*) *moghalica* Alexander; male hypopygium.
60. *Gonomyia* (*Idiocera*) *involuta* Alexander; male hypopygium.
61. *Gonomyia* (*Idiocera*) *magra* sp. nov.; male hypopygium.
62. *Gonomyia* (*Idiocera*) *maharaja* Alexander; male hypopygium.
63. *Gonomyia* (*Idiocera*) *paleuma* sp. nov.; male hypopygium.
64. *Gonomyia* (*Lipophleps*) *dissimilis* Alexander; male hypopygium.
65. *Gonomyia* (*Lipophleps*) *trepida* sp. nov.; male hypopygium.
66. *Gonomyia* (*Lipophleps*) *xanthophleps* sp. nov.; male hypopygium.

PLATE 6

FIG. 67. *Gonomyia* (*Gonomyia*) *emphysema* sp. nov.; male hypopygium.
68. *Gonomyia* (*Gonomyia*) *ishana* Alexander; male hypopygium.
69. *Gonomyia* (*Gonomyia*) *ravana* sp. nov.; male hypopygium.
70. *Gonomyia* (*Gonomyia*) *sibyna* sp. nov.; male hypopygium.
71. *Gonomyia* (*Gonomyia*) *yama* sp. nov.; male hypopygium.
72. *Lipsothrix mirifica* sp. nov.; male hypopygium.
73. *Hesperoconopa sikkimensis* sp. nov.; male hypopygium.
74. *Cheilotrichia* (*Cheilotrichia*) *gloriola* sp. nov.; male hypopygium.
75. *Rhabdomastix* (*Rhabdomastix*) *himalayensis* Alexander; male hypopygium.
76. *Rhabdomastix* (*Sacandaga*) *almoræ* Alexander; male hypopygium.



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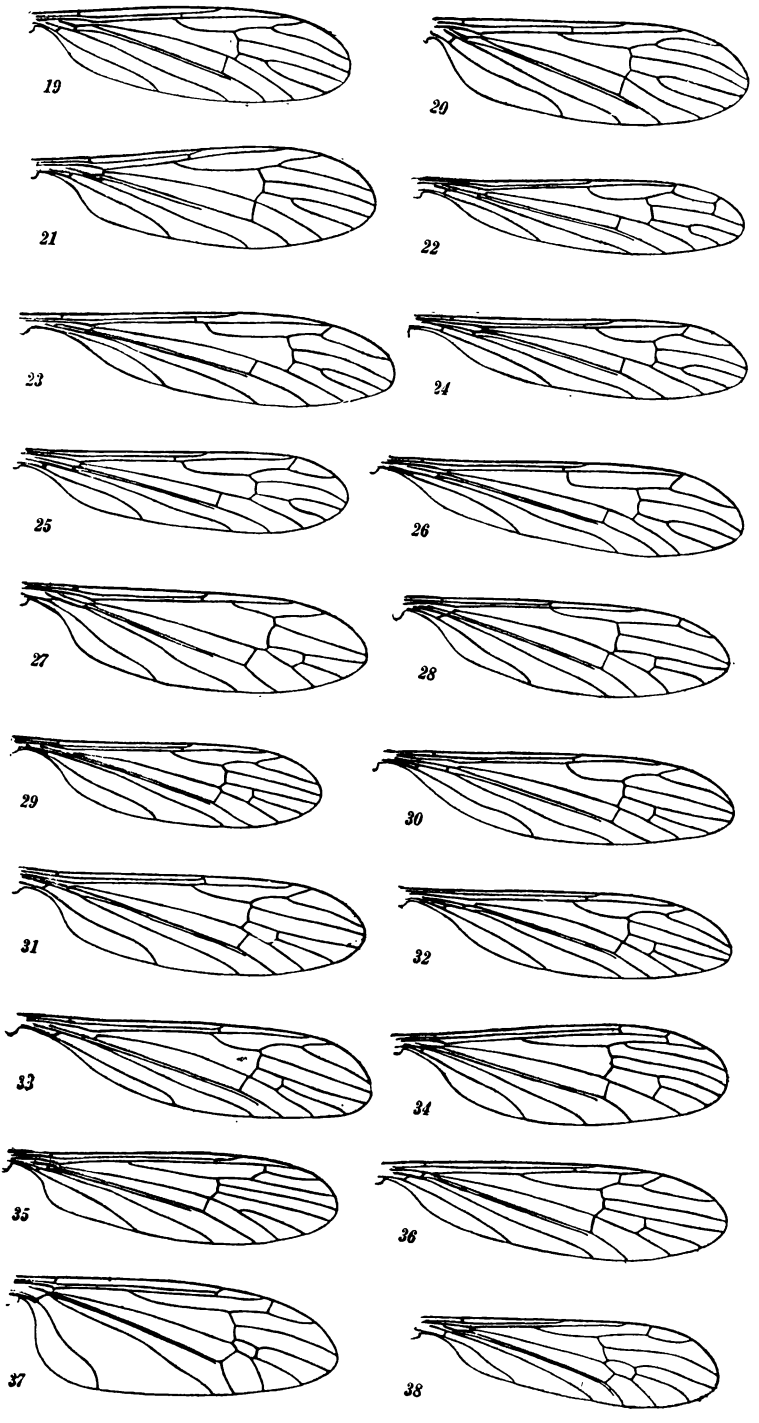

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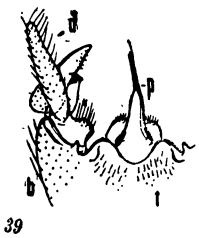

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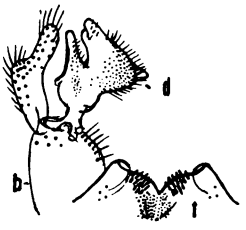

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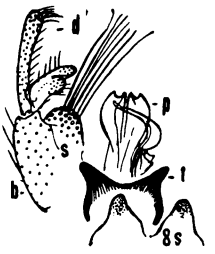

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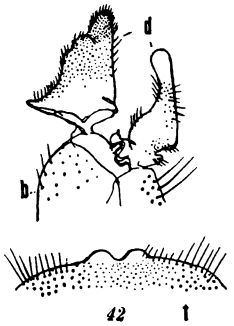

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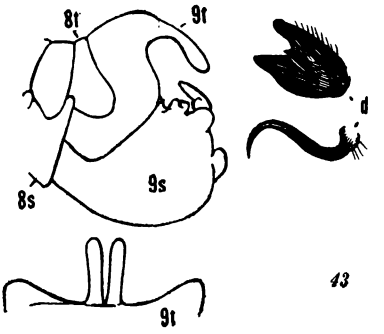

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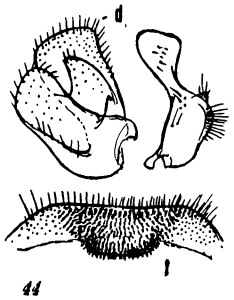

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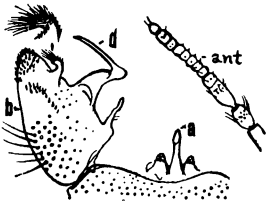

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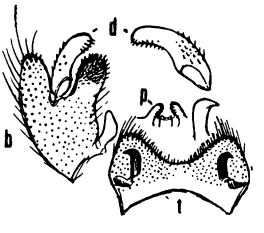

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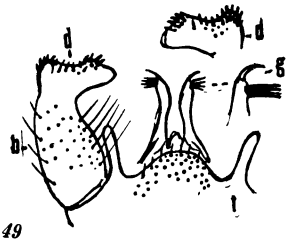
PLATE 3.



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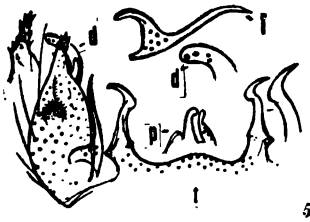

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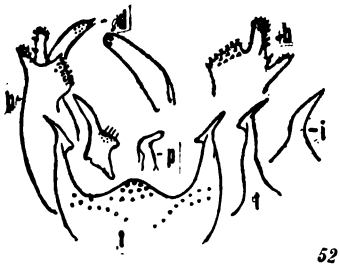

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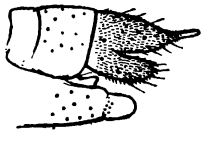

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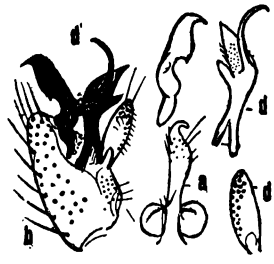

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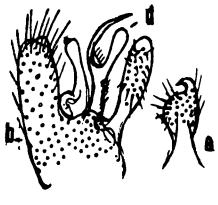

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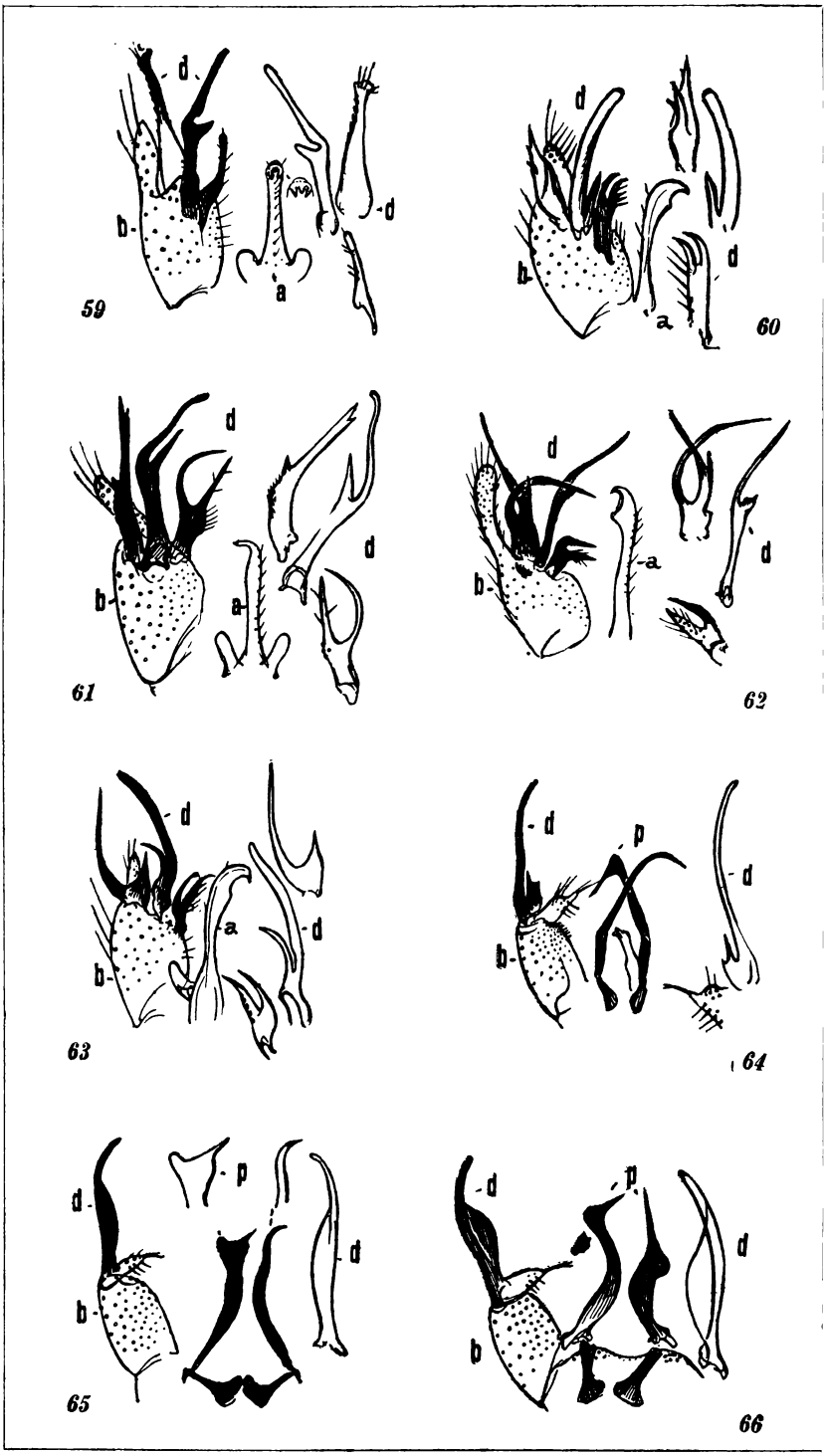
PLATE 4.



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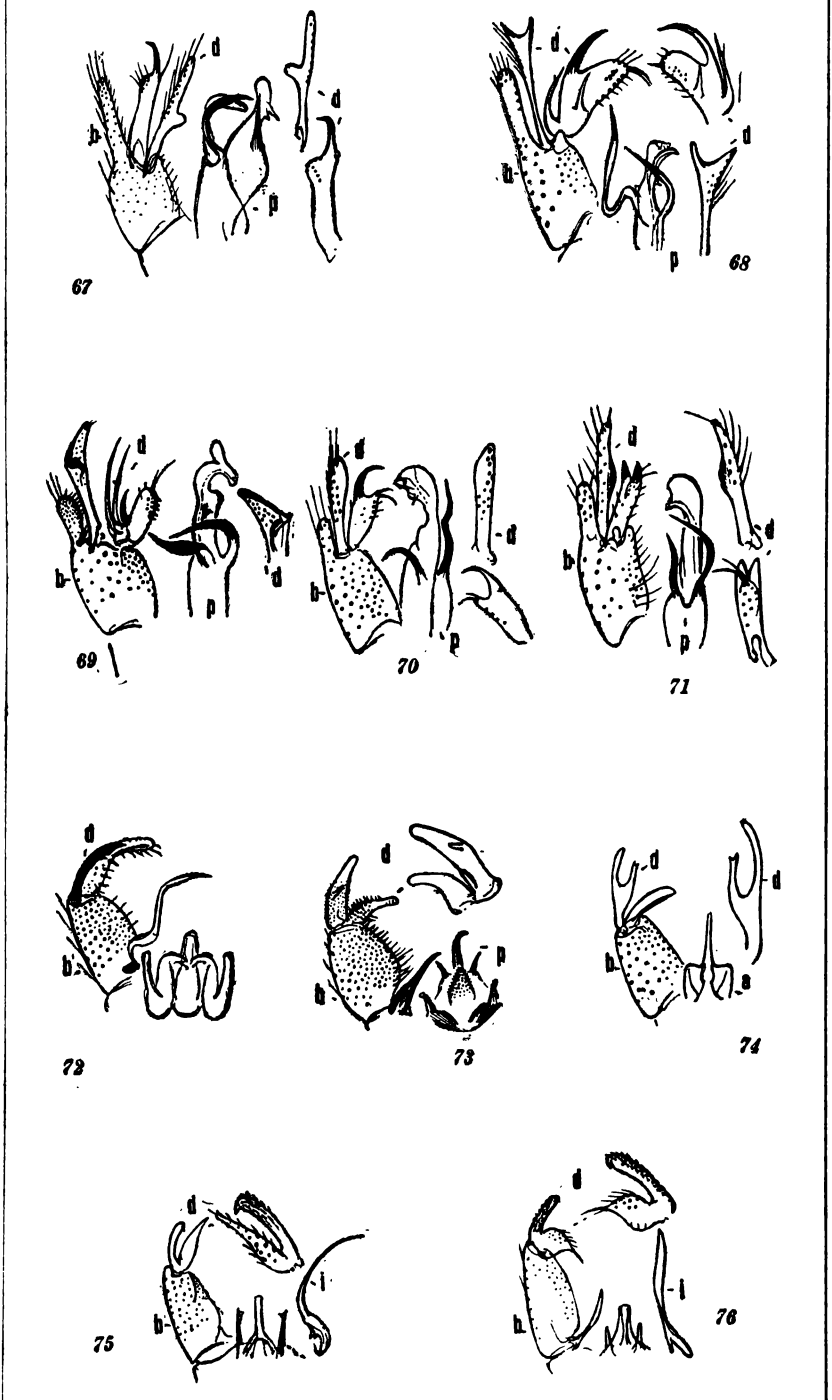

PLATE 6.