

## STUDIES ON INDIAN MYMARIDÆ—PART I

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THE family Mymaridæ comprises some of the smallest insects that are well distributed. The members of this small but interesting group are parasitic on the eggs of other insects, particularly that of Hemiptera. Several species of this group have been successfully utilized in the biological control of certain serious pests. A good deal of work has been done on the taxonomy of Mymaridæ by various workers in other parts of the world. In India, the work done on Mymaridæ almost amounts to nil. Mani (1938) included only 6 species in his catalogue of Indian Chalcidoidea. Later the same author (1942) described 3 species new to science. However, since then, not a single species has been added to our fauna, though we have several genera and a good number of species belonging to Mymaridæ. The authors have been collecting insects for sometime past and their taxonomic portion is being studied. It is intended to publish a series of papers on Indian Mymaridæ. The types have been deposited in the National Pusa Collection, Indian Agricultural Research Institute, New Delhi.

*Lymænon narayani* sp. nov.

### Female

*Length.*—0.975 mm. (inclusive of the ovipositor).

*Colour.*—General colour yellow with brown spots all over.

*Head.*—Slightly more than one and one-third times as wide as long. Vertex prominent like all other species. Eyes red, elongate. Genal space slightly more than half the length of eyes. Ocelli red and arranged in a low arc. Interocular space thrice the interocellar and four times the ocellocular; the latter thrice the frontocellar. Antennæ brown, situated slightly below the middle of the head; sockets thrice their own diameter apart. The relative lengths of the antennal segments from scape onwards as follows:

20, 8, 4, 3, 3.5, 4, 7, 7, 7, 7, 23.

Club solid, about three and one-thirds its own breadth, with five linear sensillæ.  $F_4$ – $F_8$  with one or more sensillæ in each [Fig. 3 (1)].

*Thorax.*—Very faintly reticulate; parapsidal furrows weakly defined, upper half of the scutellum brown, lower yellow. Scutum almost equal to

that of scutellum; metathorax narrow, propodeum brown, with a spiracular sulci at the sides.

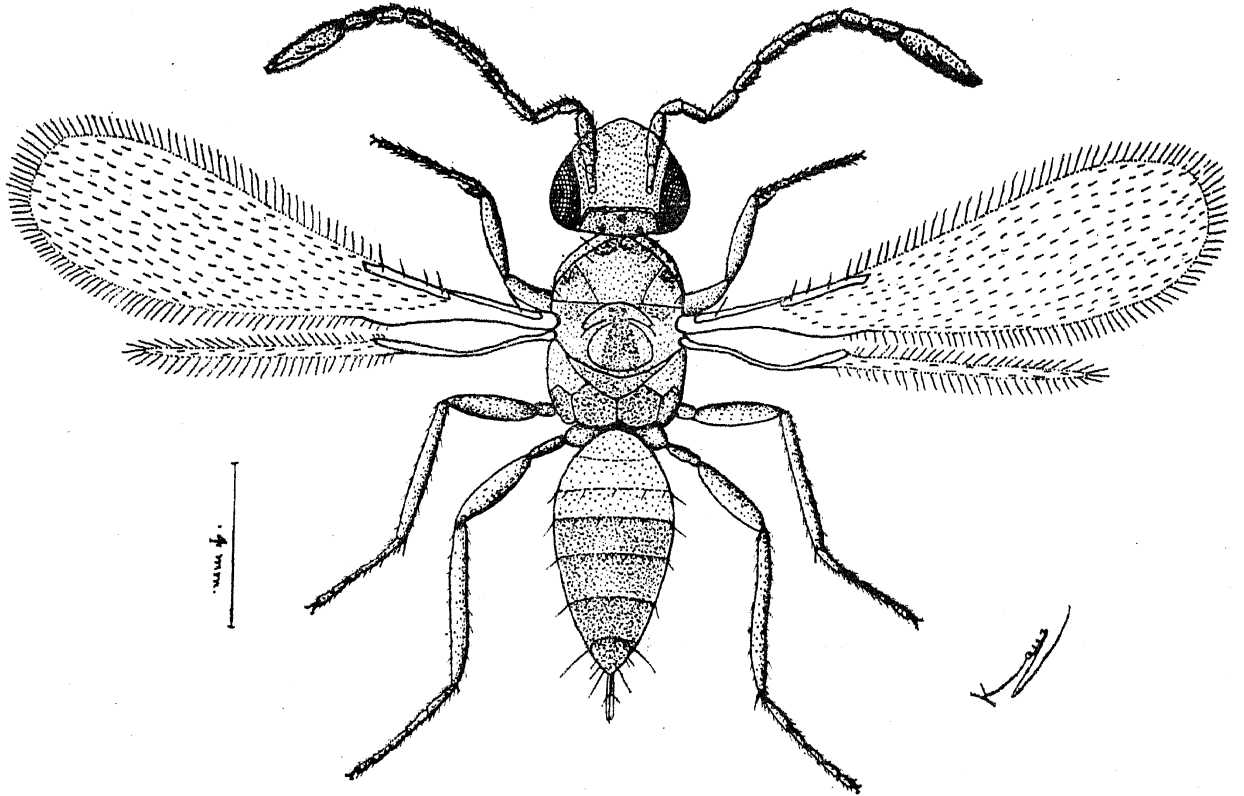


FIG. 1. *Lymænon shasthryi* sp. nov.

*Abdomen.*—Conicovate, faintly reticulate, upper half of the dorsum yellow, lower brown. A row of spines present in each segment. The first row consists of only two. Ovipositor slightly exserted and starts from behind the tip of the abdomen.

*Legs.*—Slender, coxæ and femurs yellow; tibia and tarsi somewhat brownish in shade. Hind tibia equal to the combined length of its femur and trochanter as well as equal to its tarsus.

*Wings.*—Forewing three and one-third times as long as broad, a little longer than the hind wing. Submarginal one and a half times the length of the marginal. Surface hair numerous, start from just below the proximal end of the marginal vein and are evenly distributed. Marginal cilia short; the longest being a little less than one-third the greatest wing width [Fig. 2 (1)].

Described from two females.

*Holo type.*—On slide.

*Host.*—Unknown (Sweeping lucerne fields).

Col.—R. B. Kaur; May 15, 1957.

Locality.—Delhi.

*Lymænon indicus* sp. nov.

Female

Length.—About 1.17 mm.

Colour.—Head, thorax, coxæ of the forelegs, tibia of the hind legs, distal eight segments of the antennæ brown; rest of the antenna and legs

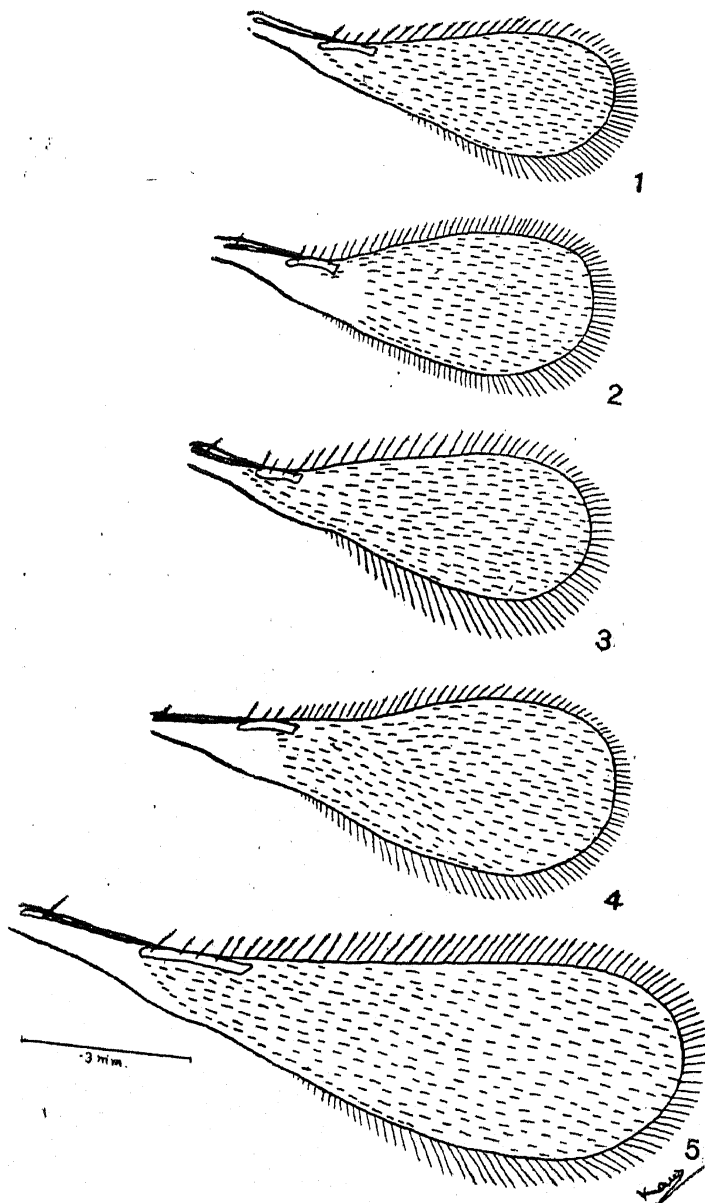


FIG. 2

FIGS. 2 and 3. Forewings and antennæ of *Lymænon* spp. (1) *L. narayani*; (2) *L. sahadeyani*; (3) *L. ramakrishnai*; (4) *L. indicus*; (5) *L. shasthryi*.

yellow. Abdomen gives a banded appearance. Dorsally, the upper half of each segment is lemon in shade whereas the rest of its is brown. Ventrally it is yellow. The proximal half of the abdomen lighter in shade as compared to the distal half.

*Head.*—Slightly wider than long and a little wider than thorax. Vertex broad as usual and very faintly reticulated. Eyes deep red ocelli very prominent and form an obtuse angled triangle. Interocular space about twice the interocellar; frontocellar space slightly less than ocellocular and almost half the interocellar. There are six prominent spines on the head; two between the ocelli, two above it; and two just below the eyes. Antennæ slightly hairy. Scape compressed laterally and from its lateral aspect thrice as long as thick. Relative lengths of the antennal segments from scape onwards as follows:

22, 8, 5, 5, 8, 7, 8, 7, 7, 6, 28.

Club solid, oblong, a little wider than the preceding segments, with four linear sensillæ. Each of the funicular segment except the first two with one such sensilla [Fig. 3 (4)].

*Thorax.*—Smooth, beset with a few spines on the pro- and meso-thoracic area as in all other species. Parapsidal furrows complete and weakly marked. Scutum almost equal to that of scutellum. Metathorax narrow.

*Abdomen.*—Subsessile, concovate. A row of seven spines present in each segment except the first where they are a few. Ovipositor slightly exerted and starts from behind the tip of the abdomen.

*Legs.*—Moderately developed. Hind tibia about one and a half times longer than its femora but almost equal to the combined length of femur plus trochanter; hind tarsus equal to its tibia.

*Wings.*—Forewings about two and three-fourth times longer than broad, a little longer than the hind wing, submarginal vein about one and a half times the length of marginal. Marginal cilia short, the longest being one-sixth the greatest wing width. Surface hair start from beyond the middle of the marginal and are evenly distributed over the rest of the surface [Fig. 2 (4)].

#### *Male*

Exactly similar to female except in antennæ and wing ratio. Scape and pedicel almost as long as wide, the former slightly longer than the latter. The rest of the segments are almost equal and with sensory lists. Forewings about thrice as long as wide.

Described from a single female and a single male.

Holo and Allo types on slides.

*Coll.*—R. B. Kaur; May 17, 1957.

*Host.*—Unknown (Sweeping lucerne).

*Locality.*—New Delhi.

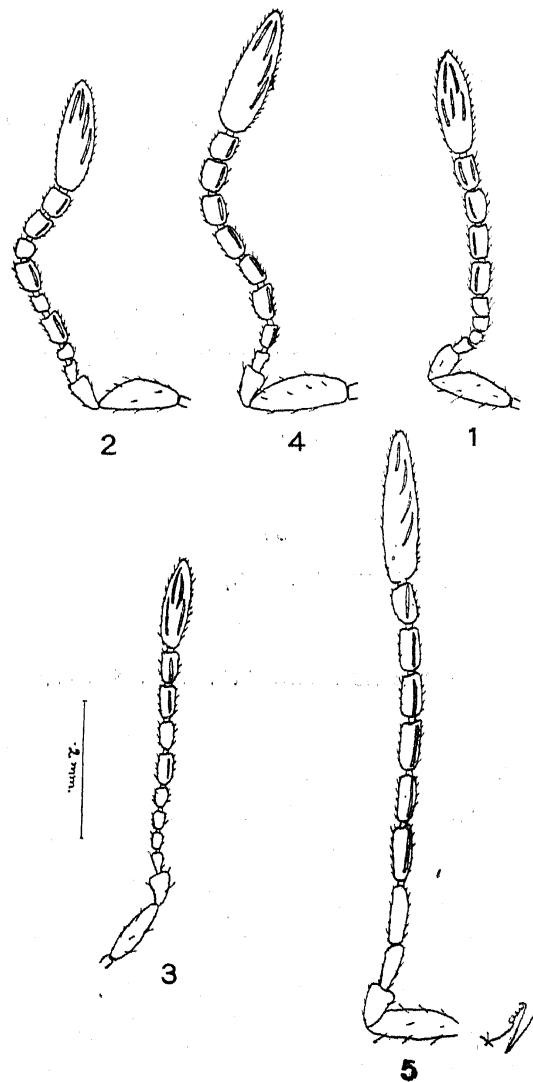


FIG. 3

FIGS 2. and 3. Forewings and antennæ of *Lymænon* spp. (1) *L. narayani*; (2) *L. sahadevani*; (3) *L. ramakrishnai*; (4) *L. indicus*; (5) *L. shasthryi*.

*Lymænon sahadevani* sp. nov.

This species comes very close to *L. indicus* except for some of the characters;

*Female*

*Length*.—1.04 mm.

*Colour*.—Similar to *L. indicus* except the abdomen and the pre-tarsi, which are darker in shade.

Antennæ scape and pedicel yellow, rest of the antennæ brown. It differs from *L. indicus* in the relative lengths of its segments which run as follows:

18, 8, 4, 3, 7, 4, 6.5, 4.5, 6, 5.5, 24.

Linear sensillæ are present in the club and F 3, 5, 7 and 8 [Fig. 3 (2)].

*Thorax*.—Similar to *L. indicus*.

*Abdomen*.—Brown both dorsally as well as ventrally. The upper one-third of each segment is lemon and the rest of it is perfect brown.

*Wings*.—Forewings three times as long as broad. A little shorter in length as well as in breadth than *L. indicus*. Surface hair start from beyond the marginal [Fig. 2 (2)].

Described from three females.

*Holotype*.—on slide.

*Coll*.—R. B. Kaur; July 5, 1957.

*Host*.—Unknown (Sweeping lucerne).

*Locality*.—Delhi.

*Lymænon ramakrishnai* sp. nov.*Female*

*Length*.—About 0.88 mm.

*Colour*.—Body brown with dark sutures, joints of the legs lighter in shade.

*Head*.—About one and one-third times wider than long. Eyes red, bare, elongate, slightly less than one and a half times the length of cheeks. Interocular space about twice the interocellar. The latter about twice the ocellocular. Antennæ brown, slightly pubescent, situated on the middle of the face close to the eye borders; sockets twice their own diameter apart. Scape cylindrical and from its lateral aspect four times longer than broad. The relative lengths of the antennal segments as below:

16, 7, 4.5, 3.5, 4, 4, 7, 6, 7, 6.5, 20.

Club solid, conical, a little more than three and a half times longer than wide with four prominent sensillæ; Funicular segments 5, 7 and 9 also with one sensilla in each. [Fig. 3 (3)].

*Thorax*.—Completely brown, slightly convex; parapsidal furrows complete and well impressed. Scutum a little smaller in length to that of scutellum. Spiracular sulci prominent.

*Abdomen*.—Similar to that of *L. sahadevani*.

*Legs*.—Slender, hind tibia equal to the combined length of its femur plus trochanter and slightly less than its tarsus. Foretibia almost equal to its femur.

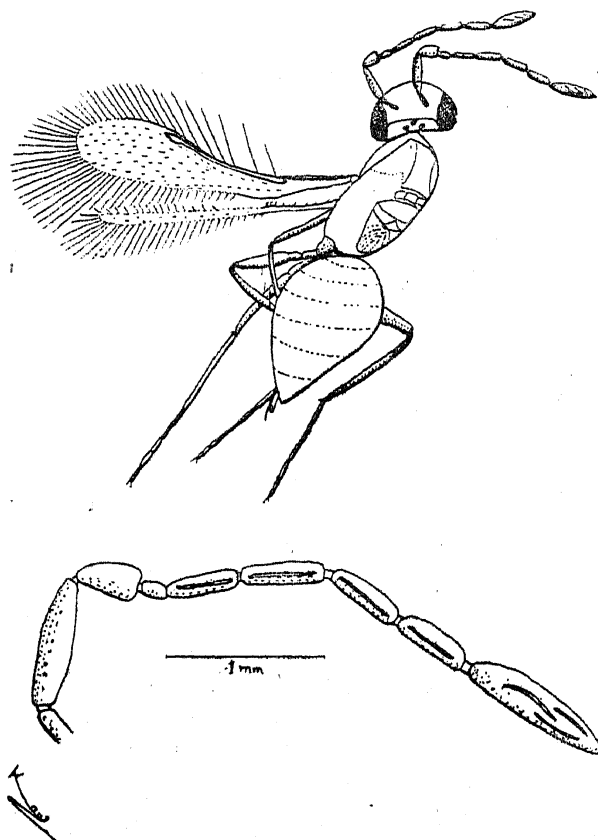


FIG. 4. *Neurotes enockii* sp. nov. showing also an enlarged antenna.

*Wings*.—Forewing about three times its own breadth and about one-thirds the length of hind wing. Submarginal weak and a little less than twice the length of the marginal, which is slightly thicker as compared to the marginal vein of *L. narayani*. Marginal fringe normal, the longest cilia a little less than one-half the greatest wing width. Surface hair start from just before the marginal and are equally distributed over the rest of the surface. [Fig. 2 (3)].

#### Male

*Length*.—0.87 mm. Exactly similar to female except for the antennæ. Scape a little longer than wide; pedicel almost as long as wide and slightly

less than the length of the scape. Eyes orange yellow in colour (probably due to long preservation).

Described from four females.

Holo and Allo types, on slides.

*Coll.*—R. B. Kaur; May 5, 1957.

*Locality.*—Delhi.

*Host.*—Unknown (Sweeping lucerne fields).

*Lymænon shasthryi* sp. nov. (Fig. 1)

*Female*

*Length.*—1.2–1.35 mm. This is the largest of the species collected so far.

*Colour.*—Body yellow with brown spots.

*Head.*—Slightly wider than thorax and a little broader than long. Brown with eyes and vertex dark in shade. Eyes longer than broad and bare. Genal space less than the length of the eyes. Interocular space a little more than three times the interocellar, the latter almost twice the frontocellar as well as ocellocular. Towards the proximad, there is a pair of stout spines on each side of the vertex. Antennæ long, slightly hairy and placed close to the mid inner border of the eyes. First three segments lighter in shade whereas the rest of the antenna dark brown. Scape cylindrical. Relative lengths of the segments from scape onwards as follows:

20, 9, 10, 13, 12, 11, 11, 10, 9, 34.

Funicular segments slender and almost of equal thickness. Club solid and just four and a half times longer than wide [Fig. 3 (5)].

*Thorax.*—Elongate, moderately convex and with a faint median groove. Prothorax light brown and with a pair of spines on each side of it. Pleuron brown. Parapsidal furrows distinct, axillæ brown and separated. Scutum with a big brown spot in its anterior region. Scutellum also with a big oval brown spot in its middle and slightly less than scutum in its median length. Metathorax slightly curved into the region of the propodeum. Propodeum brown with four carinæ, the two middle ones are hexagonal in shape and the side ones, which are comparatively smaller, are subrectangular.

*Abdomen.*—Elongate, broad in the centre, gradually and uniformly tapering to a point distally. First three tergites are brownish yellow whereas the last four are dark brown in colour except the anal extremity which again is lighter in shade. A row of spines is present on each segment except the



first one. A pair of spines present on the sheath of ovipositor, one on each half. Ovipositor exerted to about one-sixth the length of abdomen.

*Legs.*—Brownish yellow, coxæ comparatively darker in shade. Hind femora slightly more than half the length of its tibia, the latter one and one-fifth times longer than its tarsus.

*Wings.*—Forewing varies from being three and one-third times longer than broad and one and one-third times longer than the hind wing. Submarginal a little longer than the marginal. Marginal cilia short but uniformly distributed, the longest being a little more than one-fourth the greatest wing width. Surface hair numerous and uniformly distributed all over. [Fig. 2 (5)].

#### Male

Length varies from .9 to 1.17 mm.

Coloration similar to that of female. Antenna longer than the body and measures to about 1.4 mm. in length. Pedicel half the length of the first funicular segment; except these two the rest of the antennal segments are almost equal. Segments beyond the pedicel with linear parallel sensillæ. Club solid and oblong.

*Thorax.*—Like that of female but no carinæ are seen on the propodeum.

*Abdomen.*—Oblong and almost equal to the length of the thorax. Arrangement of spines as in female.

*Wings.*—Similar to that of female.

*Legs.*—Long and slender. Hind tibia equal in length to that of its tarsus.

Described from six females and two males.

Holo and Allotypes on slides.

*Coll.*—B. R. Subba Rao.

*Locality.*—Mandya (Mysore State).

*Host.*—*Tettigonella spectra* (Dist.) (Fulgoridæ: Hemiptera).

It gives us great pleasure to name the species after Mr. Shivashankar Shasthry, who first studied the biology of the host and recorded the parasite.

*Neurotes enocki* sp. nov. (Fig. 4)

#### Female

*Length.*—0.676 mm.

*Colour.*—Brownish yellow.

*Head*.—Viewed from above subcomplanate, almost one and a half times broader than long and about as broad as thorax. Eyes bare, red (dark in old mounts) and elongate. Genal space about half the eye length. Ocelli red and lie in a low arc. Interocular space three times the interocellar, the latter slightly over the ocellocular, vertex brown. Antenna eight-jointed, brownish yellow and uniformly coloured, non-hairy shorter than the length of the body. The relative lengths of the antennal segments as below:

12, 6, 2.5, 7, 8, 8, 7, 28.

Scape cylindrical; pedicel one and a half times longer than broad;  $F_1$  slightly longer than broad; the following four about thrice their own breadth. Club solid, rounded at the tip where there are a few very minute hair; four times longer than broad. Sensory ridges present on the distal four funicular segments as well as on the club but the exact number cannot be made out as they are very faint.

*Thorax*.—Oblong, faintly striated longitudinally. Anterior tip of the mesothorax brown; a brown spot in the region of parapsids. Parapsidal furrows not deeply impressed. Just at the base of scutum, in front of the anterior border of the scutellum, there is a belt of three rectangular carinae with the largest in the middle. Scutellum smooth and smaller than scutum. Metathorax with one median diamond-shaped carina. Propodeum somewhat brownish and feebly sculptured; from the lower tip of the metathoracic carina 12–16 faint longitudinal lines radiate towards the base of the propodeum (shown in Fig. 4).

*Abdomen*.—Subpetiolate, smooth and conical; slightly longer than thorax. First tergite the smallest and then the size increases gradually up to sixth, which is the largest; seventh is a small triangular piece. Ovipositor slightly exserted and starts from behind the tip of the abdomen.

*Legs*.—Lemon yellow, long and slender; coxae moderately developed; trochanters two-jointed. Foretibia comparatively thicker and shorter. Hind tibia slender and slightly more than one and a half times the length of its femur. Tarsi pentamerous, segments equal, hind tarsus of the length of its own tibia, foretarsus longer than its tibia and almost equal to its femur.

*Wings*.—Forewings long and narrow with the costal edge a little convex; four and a half times longer than wide. Marginal cilia long, dense and cover the whole wing margin except some basal portion; the longest is a little over the greatest wing width. Surface hair start from just below the proximal end of the marginal. Submarginal thin and short. Marginal very long, reaching to beyond the middle of the wing, the tip slightly

enlarged. Post-marginal and stigmal absent. Hind wings narrow and linear; a little smaller than the forewings densely ciliated but cilia not longer than those of the forewing.

Described from a single female on slide.

Coll.—R. B. Kaur; June 20, 1957.

Locality.—I.A.R.I., New Delhi.

Host.—Unknown (Sweeping lucerne and mulberry).

Key to Females of Indian Species of *Lymænon Haliday*

1. Thorax evenly brown 2  
    Thorax yellow with brown patches 4
2. Second antennal segment almost equal to  
    that of fifth 3  
    Second antennal segment appreciably larger  
    than the fifth; surface hair of the fore-  
    wing start from just before the marginal  
    vein *L. ramakrishnai* sp. nov.
3.  $F_5$  to  $F_9$  of antenna almost equal, and pro-  
    vided with sensory lists; surface hair of  
    forewing start from beyond the middle of  
    the marginal vein *L. indicus* sp. nov.
- $F_5$  to  $F_9$  of antenna unequal;  $F_6$  and  $F_8$   
    without sensory lists; surface hair of fore-  
    wing start from beyond the marginal vein *L. sahaddevani* sp. nov.
4. Funicular segments almost equal in lengths 5  
    Funicular segments unequal in lengths:  
    First four funicular segments appreciably  
    smaller than the last four; surface hair of  
    the forewing start from just below the mar-  
    ginal vein *L. narayani* sp. nov.
5. Funicular segments almost equal in width;  
    surface hair of forewing start from just  
    below the marginal vein *L. shasthryi* sp. nov.  
    Last two funicular segments appreciably wider  
    than the rest. *L. longicrus* (Kieffer).

*Key to the Species of Neurotes Enock.**Females*

1. Head and thorax dark brown or smoky brown; wing surface not hyaline 2

Head and thorax brownish yellow; wing surface hyaline; hind tarsus over one and a half times as long as its femora; first funicular segment one-fifth of scape.

*N. enocki* sp. nov.

2. Head and thorax dark brown; surface hair most numerous at the base and margins of the wing leaving an almost clear area in the centre; second funicular segment the longest.

*N. iridescens* Enock

Head and thorax smoky brown; pilosity of the wing infumate; hind tarsus as long as its femora; first funicular segment one-third of scape.

*N. flaviventris* Ryland

*Note.*—It is rather difficult to draw a key to species without well differentiated specific characters of the described species. In the case of *N. iridescens* Enock, description of the female is not much detailed and the ratio of various components of the legs have been neglected altogether; whereas, in the case of *N. flaviventris* Ryland, legs have been fully described but the ratio of various components of female antenna is not given because of the breakage of antenna, above second funicular joint. In the absence of characters made out by examining the type specimens and with the available original description a key, more or less practicable, has been drawn.

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\* The original not seen.