

NEW GENERA AND SPECIES OF TUBULIFERA  
(THYSANOPTERA : PHLAEOTHRIPIDAE)  
FROM ASSAM AND MEGHALAYA

S. SEN & N. MURALEEDHARAN  
Zoological Survey of India, Calcutta, India 700012

(Received 11 October 1976)

Two new genera *Pegothrips*, *Neodixothrips* and three new species *Pegothrips meghalaya*, *Neodixothrips assamensis*, and *Tylothrips indicus* are described. The genus *Tylothrips* is recorded for the first time from the Oriental Region and a key is provided to separate the known species.

**Pegothrips** gen. nov.

Head longer than wide, cheeks parallel, slightly but distinctly indented behind eyes. Eyes slightly bulged behind forming an angular projection; postoculars longer than eyes, thin and pointed almost setaceous, placed well back. Antennae 8 segmented, segment 8 slender; areola of segment 2 at extreme apex. Mouthcone short and broad; maxillary stylets mesad, wide apart. Prothorax shorter than head; anteroangulars short, anteromarginals vestigial, other prothoracic setae well developed. Praepectus absent. Forefemora strongly enlarged in both sexes; foretibiae much shorter, with an inner tubercle at apex; foretarsi armed with a strong dagger-like tooth in both sexes. Forewings broad, phlaeothripine; double fringes sparse.  $B_2$  of segment IX of male short and exceptionally stout. All other setae thin and pointed. Tube shorter than head, anal setae shorter than tube.

**Type-species:** *Pegothrips meghalaya* sp. nov.

In general appearance the new genus comes close to *Arrhenothrips-Mallothrips* complex by the presence of stout forefemora in both sexes, foretibial tubercle at apex, strong dagger-like tooth in foretarsi of both sexes and absence of praepectus. While

*Arrhenothrips* has a pointed mouthcone, in *Mallothrips* it is broadly rounded; but in the new genus it is shorter and much broader with maxillary stylets placed mesad and wide apart. Further, *Mallothrips* has segment 8 of antennae very short, unusually small and closely united to segment 7. Another genus in the *Arrhenothrips-Mallothrips* complex is *Scelothrips* PRIESNER also with a short broadly rounded mouthcone, head slightly angularly produced behind eyes and cheeks rough. In *Scelothrips* the forefemora are very strongly incrassate, foretibiae without tubercle but strongly pointed at apex, midlaterals vestigial, anteroangulars and anteromarginals well developed, postangulars shorter than epimerals and  $B_2$  of IX in male weak.

However, the slight constriction of cheeks behind eyes, angular projection of eyes behind, areola of segment 2 of antennae at extreme apex, comparatively short foretibiae, lesser number of double fringes and short but exceptionally stout  $B_2$  of segment IX of male are some unique features to distinguish it as a distinct genus.

**Pegothrips meghalaya** sp. nov. (Fig. 1)

Female (Macropterous): General body colour dark brown. All femora, mid and

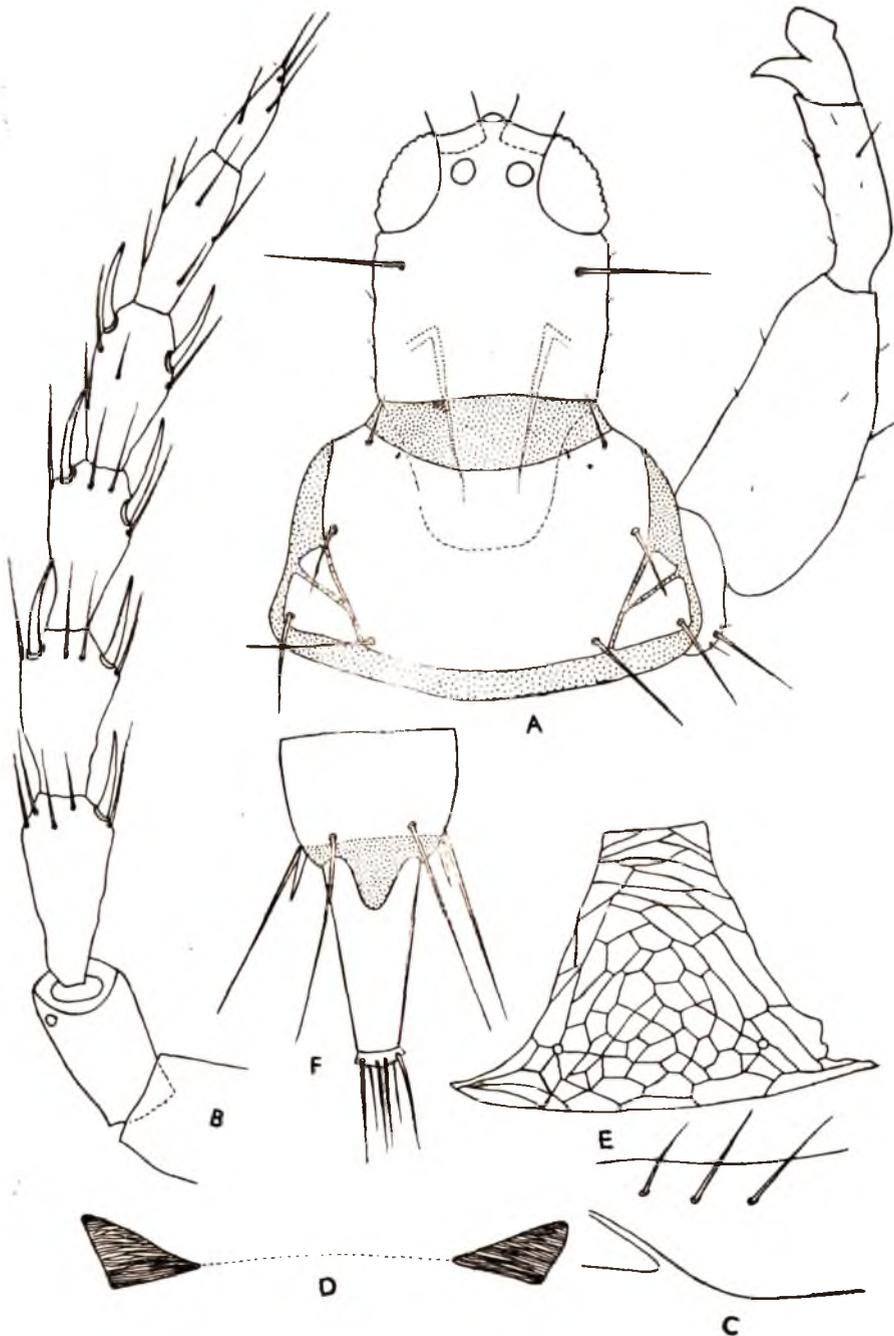


Fig. 1. *Pegothrips meghalaya* gen. et sp. nov. A. head and prothorax; B. antenna; C. basal wing bristles; D. mesopraesternum; E. pelta; F. segment IX of abdomen and tube of male.

hind tibiae dark brown; foretibiae yellow with a brownish tinge at basal half and margin, all tarsi yellow. Antennal segment 1 dark brown, 2 dark brown at basal half and margin, 3-8 yellow. Wings clear. All setae hyaline to light brown, thin and pointed.

Head longer than wide, 240\*-256 long, 188 wide across eyes, 192-208 across cheeks, 188-196 across base, sides finely crenulate with 2-5 very small spines. Eyes small with slight angular projection behind, 80-84 long, 56-60 wide; all ocelli 20-24 wide, median ocellus overhanging between antennae. Postoculars thin, pointed 96-104 long, placed 24 below posterior margin of eyes. Antennal segments 3-6 subpedicellate, 4-6 symmetrical, 8 slender; segments 1-8, length (width); 52-56 (40-48); 52-60 (36); 64-72 (32-36); 52-60 (36-40); 56-64 (32-36); 56-60 (28-32); 52-56(24-28); 44-48 (12-16); sense cones moderately thick, 24-36 long. Mouthcone short and broad 104-112 long, 120-128 wide at base, 104-112 at apex; maxillary stylets retracted mesad, wide apart, 'V' shaped.

Prothorax 208 long, 240 wide at anterior margin, 380 wide at posterior. Anteroangulars short, placed away from the lateral margin, 56-60 long, anteromarginals vestigial, midlaterals 80, posteroangulars 100-120, epimerals 88-100. Epimeral suture complete. Forefemora 260-300 long, 128 wide; foretibiae 160-172 long, 60 wide with a tubercle at the apex; foretarsi with a dagger-like tooth, curved downwards, 36-40 long. Pterothorax 440-460 long, 460-480 wide across meso and 420-440 across metathorax. Forewings broad, parallel 884-918 long with 2-4 double fringes; basal wing bristles  $B_1$ - $B_3$  44-48, 80-84 and 80-88

long. Mesopraesternum reduced, restricted as two very small triangular sclerites.

Abdomen 432 wide at base, 420-432 at middle, 320 across segment VIII, 192-200 across segment IX. Pelta roughly triangular with apex flat.  $B_1$ - $B_3$  of segment IX 184-200, 168-180, 184-200 long respectively. Tube 200-208 long, anal setae 164-172 long. Total body length 2.31-2.35 mm.

**Male:** Macropterous: Colouration as in female.

Head 200 long, 168 wide across eyes, 172-176 across cheeks, 164-168 across base. Eyes 64-68 long, 44-48 wide; postoculars 64-72. Antennal segments 1-8, length (width) - 40-44 (36-40); 44-48 (28-32); 52-56 (28-32); 48-52 (28-36); 52-56 (32-36); 48-56 (28-32); 40-48 (24-28); 36-40 (16), sense cones 16-20 long. Mouthcone 80-88 long, 108-116 wide at base, 84-92 at apex.

Prothorax 184-196 long, 208-228 wide at anterior margin, 328-340 wide at posterior margin. Anteroangulars 24-36, anteromarginals vestigial, midlaterals 36-40, posteroangulars 78-84, epimerals 60-72 long. Forefemora 228-240 long, 108-116 wide; foretibiae 140-152 long, 52 wide; foretarsi with a dagger-like tooth 32 long, curved downwards. Pterothorax 380-400 long, 400-420 wide across meso, 380-400 across metathorax. Forewings 782-816 long, 68-84 wide, basal wing bristles 44-48, 52-60, 56-68 long.

Abdomen 372-392 wide at base, 352-360 at middle, 268-280 across segment VIII, 168-180 across segment IX;  $B_1$ - $B_3$  of segment IX 160-168, 36-40, 168-180 long respectively,  $B_2$  exceptionally stout. Tube 164 long, anal setae 140 long.

Total body length 1.99-2.04 mm.

**Holotype:** female (Z.S.I. Reg. No. 474/H<sub>12</sub>), **allotype** male (Z.S.I. No. 475/H<sub>12</sub>), paratypes

\*All measurements in microns unless otherwise specified.

12 females, 5 males (Z.S.I. Reg. Nos. 476-492/H<sub>12</sub>), India: Meghalaya, Garo Hills, Songaak, from leaf gall of wild plant, 22.ix.75 (Dr. N. MURALEEDHARAN & Party Coll.) deposited in the National Zoological Collections of Zoological Survey of India, Calcutta.

**Neodixothrips** Gen. Nov.

Head as long as broad to slightly broader, constricted at base, surface strongly reticulate. Eyes large; postoculars very weak, about half the length of eyes and placed much below eyes. Antennae 8

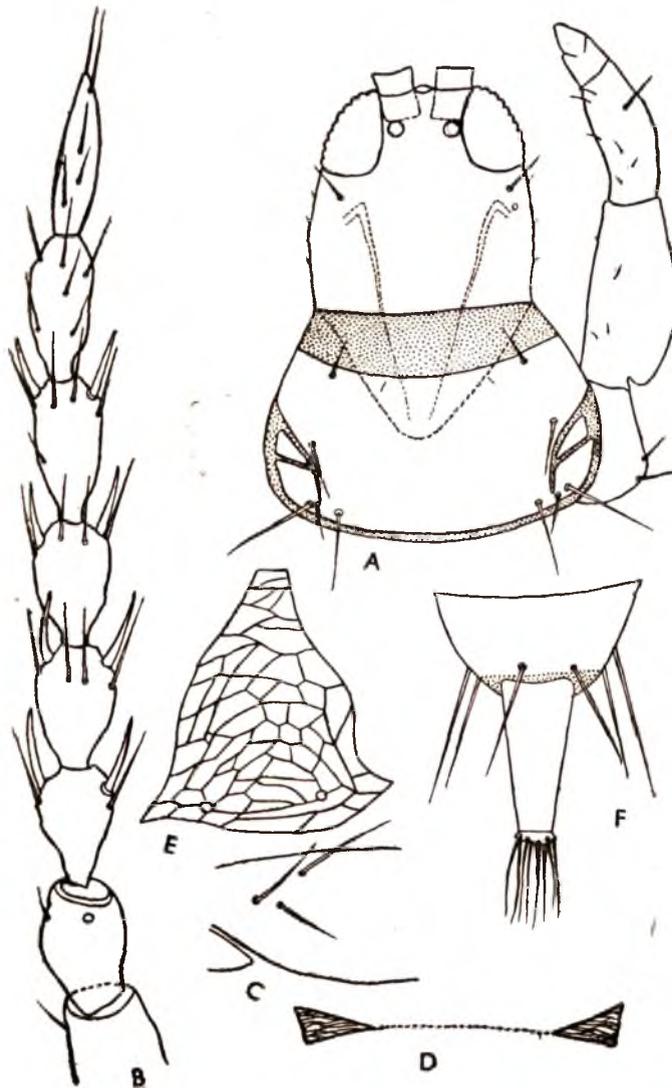


Fig. 2. *Neodixothrips assamensis* gen. et sp. nov. A. head and prothorax; B. antenna; C. basal wing bristles; D. mesopraesternum; E. pelta; F. segment IX of abdomen and tube.

segmented, 4-5 small, globular; 8 constricted at base, slender, subequal to slightly longer than 7. Maxillary stylets oculad, wide apart. Mouthcone short and broadly pointed. Prothoracic anteroangulars weak, anteromarginals vestigial, other setae moderately developed. Praepectus absent. Legs short; forefemora slightly enlarged and foretarsi unarmed in both sexes. Forewings broad, phlaeothripine: all basal wing bristles well developed, arranged not in the same line. Mesopraesternum very much reduced. Body sculptured, all setae hyaline, pointed. Tube shorter than head.

**Type-species** *Neodixothrips assamensis* sp. nov.

The new genus is closely allied to the monotypic genus *Dixothrips* ANANTHAKRISHNAM (1969 a, b) but it is a distinct genus and can easily be distinguished by the constriction of head at base, much shorter postoculars, shape of three terminal segments of antennae, nature of basal wing bristles and tube shorter than head.

***Neodixothrips assamensis* sp. nov.** (Fig. 2)

**Female: Macropterous:** General body colour brown; head, prothorax and terminal segments of abdomen and tube darker. Antennal segment 1 brown, 2 and 8 golden yellow with brownish tinge, rest golden yellow. Forefemora yellow with brownish tinge in basal three-fourth, rest yellow, mid- and hind- femora brown; mid- and hind- tibiae brown in the basal three-fourth, rest yellow; foretibiae and all tarsi yellow. Forewings light grey. All setae hyaline and pointed.

Head about as long as broad to slightly broader 188-200 long, 168-180 wide across eyes, 192-220 across cheeks, 188-216 across base, constricted at base; cheeks smooth, convex; surface strongly reticulate.

Eyes moderately large 76-84 long, 44-52 wide, all ocelli 20-24 wide, median ocellus overhanging, placed 20-24 away from paired ones, the latter 28 apart. Postoculars weak, pointed 32-40 long, placed 32-40 below posterior margin of eyes. Antennal segments 3-6 pedicellate, 4-5 globular, 8 long, slender and constricted at base, areola of 2 at extreme apex; segments 1-8, length (width): 40-48 (32-36), 48-56 (32-40), 40-44 (28-32), 40-48 (32-36), 44-52 (32-36), 48-56 (32-36), 52-56 (24-28), 56-60 (16), sense cones on 3-6 moderately thick 20-24 long. Mouthcone short, broadly pointed 96-108 long, 116-132 wide at base, 44-56 at apex; maxillary stylets retracted oculad, wide apart.

Prothorax slightly sculptured, about as long as head 188-192 long, 220-240 wide at anterior margin, 328-340 wide at posterior margin. Anteroangulars short 36 long placed away from the lateral margin, midlaterals 40-52, posteroangulars 76-80, epimerals 92-112. Forefemora 164-172 long, 84-100 wide. Pterothorax 360-400 long, 348-360 wide across meso- and 340-348 across metathorax. Forewings broad 697-731 long, 80-100 wide with 8-11 double fringes. Basal wing bristles well developed, pointed, arranged not in the same line 40-48, 48-60, 56-84 long. Mesopraesternum very much reduced, restricted to two very small triangular sclerites.

Abdomen 300-320 wide at base, 300-328 at middle, 272-280 across segment VIII, 180-188 across segment IX. Pelta roughly triangular  $B_1$ - $B_3$  of segment IX, 80-100, 80-112, 112-140 long respectively. Tube 140-148 long, anal setae 100-112 long. Total body length 1.77-1.82 mm.

**Male: Macropterous:** Colouration as in female. Head 172 long, 152 wide across eyes, 168 wide across cheeks, 160 wide across base. Eyes 72 long, 40-44 wide;

postoculars 24–32 long. Antennal segments 1–8, length (width): 40–44 (36–40), 44–46 (32–36), 40–44 (28–32), 36–40 (28–32), 40–44 (28–32), 44–48 (28–32), 48–56 (20–24), 48–56 (12–16), sense cones 20–24 long. Mouthcone 88–100 long, 120 wide at base, 72–80 at apex.

Prothorax 160–172 long, 180 wide at anterior margin, 280 at posterior margin. Anteroangulars 20–28 long, anteromarginals vestigial, midlaterals 40–44, posteroangulars 20–28, epimerals 60–76. Forefemora 140–152 long, 72–84 wide. Pterothorax 360 long, 320 wide at meso and 308 at metathorax. Forewings 646–663 long, 64–88 wide with 4–7 double fringes; basal wing bristles 40–44, 44–52, 55–64 long.

Abdomen 268–272 wide at base, 260 at middle, 206 across segment VIII, 128 across segment IX. B<sub>1</sub>–B<sub>3</sub> of segment IX, 56–88, 48–56, 120–140 long respectively. Tube 128–132 long, anal setae 100 long. Total body length 1.36–1.65 mm.

#### Holotype

Female (Z. S. I. Reg. No. 403/H<sub>12</sub>), **paratypes** 5 females, 1 male (Z.S.I. Reg. No. 495–500/H<sub>12</sub>) India : Assam, Cachar District, Loharband 3–x–75 from tubular leaf galls (Dr. N. MURALEEDHARAN and party Coll.) and **allotype** male (Z.S.I. Reg. No. 494/H<sub>12</sub>), **paratypes** 5 females, 3 males (Z. S. I. Reg. No. 501–508/H<sub>12</sub>) same locality as holotype, 4. x. 75, from leaf galls of wild plant, deposited in the National Zoological Collections of Zoological Survey of India, Calcutta.

#### Genus *Tylothrips* HOOD

*Tylothrips* HOOD, 1937, *Revta. Ent. Rie de J.*, 7 (4), 494.

*Tylothrips* PRIESNER, 1949, *Bull. Soc. Found I Ent.*, 33, 89, 91.

The collection of a new species of *Tylothrips* HOOD a rare genus from Megha-

laya is an interesting and valuable addition to Indian Tubulifera. HOOD (1937) described the new genus and species *T. concolor* from Peru and subsequently (1955) he described *T. bruesi* from Florida. Unfortunately both the species are based on a single specimen each and the availability of more material of *T. indicus* nov species undoubtedly adds considerably to a better understanding of the genus *Tylothrips*. It is worthy to note that the two hitherto known species are reported to be mycophagous forms whereas the present species has been taken from wild plants.

#### KEY TO THE SPECIES OF *TYLOTHRIPS* HOOD

1. Head 1.2 times as long as wide across eyes, terminal segments of antennae forming a club, segment 3 of antennae shorter than 4, all tibiae tuberculate along inner margin..... *concolor* HOOD.
- Head much longer (1 : 4–1.5), terminal segments of antennae not forming club, segment 3 of antennae subequal to longer than 4, only foretibiae tuberculate along inner margin .. 2.
2. Segment 6 of antennae longer than 7 and 8, postoculars shorter than eyes, anteroangulars, well developed, basal wing bristles asymmetrically disposed, body setae blunt to very little dilated at tip..... *bruesi* HOOD.
- Segment 6 of antennae shorter than 7 and 8, postoculars longer than eyes, anteroangulars wanting, basal wing bristles symmetrically disposed, body setae expanded at tip..... *indicus* sp. nov.

#### *Tylothrips indicus* sp. nov. (Fig. 3)

Female: Macropterous : General body colour inclusive of antennae and legs dark brown with a blackish shade along the outer margin of antennae, cheeks and legs. Forewings grey with a median streak. All setae dark brown, lighter at tip, long, stout and knobbed at tip.

Head a little produced in front of eyes, with a notch behind eyes, about 1.3 times longer than wide across cheeks 248–280



Fig. 3. *Tylothrips indicus* sp. nov. Female; A. head and prothorax; B. antenna; C. basal wing bristles; D. mesopraesternum; E. pelta; F. segment IX of abdomen and tube.

long, 172–180 wide across eyes, 200 across cheeks, 192–196 across base, cheeks warty with 3 moderately strong spines, sides convex, converging at base, surface strongly reticulate. Eyes bulged, one third the length of head, 76–80 long, 48–56 wide; all ocelli 20–24 wide, median ocellus on elevation, placed 20 away from the paired ones, the

lateral 20–24 wide. Postoculars 1.5 times longer than eyes, stout expanded at tip 120–136 long, placed 34–38 below the posterior margin of eyes. Antennae very long, 2.5 times longer than head, segment 3–6 pedicellate, 7 subpedicellate, almost rectangular, 8 constricted at base; terminal segments not forming a club, pedicel of 3

crenulate; segments 1-8 length (width) : 52-60 (44-48); 60-64 (32-36); 100-108 (32-36); 96-104 (36-40); 88-96 (28-32); 64-76 (28-32); 84-92 (24-28); 76-84 (24-28); sense cones on 3 to 7 40-52 long. Mouthcone very short and broad 80-92 long, 120-132 wide at base, 72-80 at apex; maxillary stylets retracted mesad, wide apart.

Prothorax about 0.7 the length of head, 140-180 long, 234-240 wide at anterior margin, 300-340 at posterior margin. Anteroangulars wanting, anteromarginals very weak 16-20 long, midlaterals 123-136, posteroangulars 140-148, epimerals 140-156; all setae arise from cone-like tuberculate projection, the cone of epimerals more prominent. Praepectus absent, probasisternum well developed. Forefemora very slightly enlarged, inner margin straight with minute tubercles 200-220 long, 30-38 wide; foretibiae armed with 10-11 prominent teeth like tubercles bearing setae along inner margin, foretarsi with a prominent incurved tooth 20 long. Pterothorax 460-529 long, 420-500 wide across meso- and 400-520 across metathorax. Forewings broad at base, narrow beyond middle 1.037-1.105 mm long, 88 wide at base, 60 at middle and 28-40 at apex; basal wing bristles, arranged in the same line, long, stout and expanded at tip 38-100, 116-120, 96-100 long respectively; double fringes absent. Mesopraesternum complete, very well developed with a median crest.

Abdomen 460-500 wide at base, 440-560 at middle, 288-320 across segment VIII, 180-196 across segment IX. Pelta roughly triangular with apex flat.  $B_1$ - $B_3$  of segment IX knobbed 160-168, 160-176, 164-172 long respectively. Tube 200 long, anal setae short, 100-120 long. Total body length 2.5-2.7 mm.

Male : Macropterous : Colouration as in

female, Head 228 long, 160 wide across eyes, 168 across checks, 152 across base. Eyes 80 long, 44-48 wide; postoculars 104-112 long. Antennal segments 1-8 length (width) : 52 (40), 56 (32), 92 (28), 96 (28), 88 (28), 68 (24), 72 (24); 76 (24); sense cones 48-55 long. Mouthcone 80 long, 116 broad at base, 80 at apex.

Prothorax 136 long, 180 wide at anterior margin, 260 at posterior margin. Anteroangulars wanting, anteromarginals very weak 20 long, midlaterals 112, posteroangulars 104-112, epimerals 120-128. Forefemora 300 long, 80 wide, foretibiae armed with teeth-like tubercles along inner margin, foretarsi provided with a tooth 24 long. Pterothorax 400 long, 355 wide across meso- and 360 across metathorax. Forewings 918 long, 76 wide at base, 56 at middle and 48 at apex, basal wing bristles 80, 72-80 long respectively.

Abdomen 364 wide at base, 300 at middle, 216 across segment VIII, 132 across segment IX.  $B_1$ - $B_3$  of segment IX-136-140, 44-48, 160 long respectively. Tube 160 long, anal setae 100 long. Total body length 1.94 mm.

**Holotype** female (Z. S. I. Reg. No. 509/H<sub>12</sub>), **allotype** male (Z. S. I. Reg. No. 510/H<sub>19</sub>), paratypes 2 females (Z. S. I. Reg. Nos. 511-512/H<sub>12</sub>), India: Meghalaya. Shillong. Mawphlang, 6. ix. 75, from wild plant Dr. N. MURALEEDHARAN & party Coll.), deposited in the National Zoological Collections of the Zoological Survey of India, Calcutta.

The new species comes close to *T. bruesi* HOOD by the nature of the terminal segments of antennae and presence of tubercles only in the foretibiae. It, however, differs from *T. bruesi* HOOD by longer postoculars, absence of anteroangulars, symmetrical disposition of basal wing bristles and the nature of the major body setae.

*Acknowledgements:-* We thank Dr. S. KHERA, Joint Director-in-Charge, for providing necessary facilities to work; Dr. O.B. CHHOTANI, and Dr. S.K. TANDON, Superintending Zoologists and to Shri K. RAI, and Dr.B. DUTTA, Zoologists for their help and encouragement and Prof. T. N. ANANTHAKRISHNAN, Entomology Research Unit, Loyola College Madras for kindly confirming the identity of new taxa, going through the manuscript and for offering valuable suggestions.

#### REFERENCES

- ANANTHAKRISHNAN, T. N (1969a) Indian Thysanoptera. *C. S. I. R. Zoological Monograph* No. 1 : 1-171.
- ANANTHAKRISHNAN, T. N. (1969b) Mycophagous Thysanoptera. II. *Oriental Ins.*, 3 : 294.
- HOOD, J. D. (1937) Studies in Neotropical Thysanoptera *V. Rev. Ent., Rio de J.*, 7 : 494-495
- HOOD, J. D. (1955) *Tylothrips bruesi* a new Thysanopteron from Florida. *Psyche*, 62 : 35-38.