NOTES ON INDIAN THYSANOPTERA WITH DESCRIPTIONS OF NEW SPECIES.

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(Plate IX.)

This paper is a supplement to the writer's last three papers[1] on Indian Thysanoptera; it includes notes on fifteen species of which five appear to be new to science and three other forms are new to the Indian region. The material includes collections made by the writer and his fellow workers at Coimbatore, Mr. T. B. Fletcher, till lately Imperial Entomologist, Pusa, Mr. C. C. Ghosh, the Burma Entomologist, Professor D. S. Chowdhry of Cawnpore and Professor Jhaveri of the Poona Agricultural College. The writer's thanks are hereby tendered to all these gentlemen for the help received. He is also thankful to Dr. Priesner for examining his specimens and offering suggestions and criticisms.

The following is a list of the species :—

1. *Hemianaphothrips palmae*, sp. nov.
2. *Pseudodendrothrips ornatissimus* Schm.
3. *Parthenothrips dracaenae* H.
4. *Heliothrips indicus* Bag.
5. *Thrips florum* Schm.
6. *Taeniothrips chaetogastra*, sp. nov.
7. *Panchaetothrips indicus* Bag.
8. *Ecacanthothrips fletcheri*, sp. nov.
9. *Liothrips dampfyi* Ky.
10. *Haplothrips inquilinus* Pr.
11. *Trybomiella ramakrishnae* Ky.
12. *Karnyothrips nigriflavus*, sp. nov.
13. *Androthrips coimbatorensis*, sp. nov.
14. *Mallothrips indica* Ramkr.
15. *Cercothrips* (*Gigantothrips*) *tibialis* Bag.

TEREBRANTIA.

1. **Hemianaphothrips palmae,** sp. nov.

Macropterous female.—Length 1·30 to 1·43 mm. Head yellowish brown, thorax brown with margins of pterothorax rather dark, prothorax light yellowish and the abdomen dark brown. Ocelli large and clear, with red pigment. Legs uniform pale yellow. Feelers pale yellow with the second joint lightly fuscuous and with a distinct brown patch on the distal portion of sixth joint; the following distal joints are also dark. Wings distinctly transparent at basal area, light greyish fuscuous

[1] *Journ. Bombay Nat. Hist. Soc.* XXXIV, pp. 1029-1040 (1931); *Rec. Ind. Mus.* XXXIV, pp. 277-279 (1932); *Indian Forest Records, Ent. Ser.*, XX (4), pp. 1-12 (1934).

beyond. Eyes large and bulging out. Head broader than long and shorter than prothorax, with no spines or bristles. Cheek distinctly arched and finely serrate but with no bristles; the front margin of vertex very broadly triangular. The vertex is finely transversely striated. Antennal joints: 1st cup-shaped and 2nd elongate oval, longer than first with a seta on it, 3rd and 4th subequal, narrow at base, 5th slightly shorter, all the three broader towards apex, 6th almost as long as 3rd, but broader than the latter, 7th and 8th very short, almost equal and of the same breadh throughout, 9th narrower and slightly longer than 7th or 8th. The partition between 6th and 7th not very clear in some specimens and it is possible that it is only a groove dividing the 6th into two parts. Mouth cone short and bluntly pointed extending just into the middle of prosternum. Prothorax large, as long as head, broader than long, the front margin straight, the sides sharply arched and the base at the junction of the pterothorax conspicuously rounded; it is unarmed. Legs comparatively short, stout and unarmed. Abdomen elongate, much longer than head and thorax together, bluntly pointed at apex. Basal segments with fine transverse striations, 7th and 8th with a sharp lateral spine on each posterior angle, 9th with a transverse row of six long and sharp bristles, the last segment with a similar row of four shorter bristles. Wings extending to 6th abdominal segment. Fore-wing with minute setae along both the veins and a conspicuous curved bristle at costal apex; first vein with five or six setae beyond the basal transparent portion and two distal ones, 2nd with a dozen setae. Fringes long and well developed.

Macropterous male.—1·100 mm. long. Body elongated and more slender than female. General colour similar but with the dark colour of abdomen and margins of thorax deeper in some specimens. Wings extend to tip of abdomen. Apex of abdomen with a pair of conspicuous curved bristles, one on each side. The penultimate segment with two long bristles on each side and a group of short spines at the central region. The four middle segments show a transparent naked transverse patch at the middle, characteristic of some male thrips.

Measurements of type female.—Head: length 0·132 mm., breadth 0·154 mm.; prothorax: length 0·132 mm., breadth 0·220 mm.; pterothorax: length 0·308 mm., breadth 0·297 mm.; abdomen: length 0·792 mm., broadest across 5th and 6th segments. Total length 1·364 mm.

Measurements of antenna.—1st joint 15μ, 2nd 40μ, 3rd 70μ, 4th 55μ, 5th 55μ, 6th 65μ, 7th 10μ, 8th 10μ, 9th 20μ.

Habitat and Locality.—Collected by the author on the flower heads of Date palm (*Phoenix dactylifera*); found in company with *Adiheterothrips jambudvipae*, Ram. on the banks of the Tungabhadra river at Tungabhadra and Siruguppa in the Bellary district.

Described from about ten females and three or four males.

This is the first Indian record of this genus erected by Priesner in 1925 as a subgenus of *Anaphothrips*, Uzel. The most important structural feature of the genus is its three jointed antennal style (antenna 9-jointed). This feature and the characteristic coloration mark it out as a distinct species.

2. **Pseudodendrothrips ornatissimus** Schmutz.

1913. *Pseudodendrothrips ornatissimus*, Schmutz, *Sitz. Akad. Wiss. Wien.* CXXII, p. 998.

Habitat and Locality.—Found as a pest on the shoots of mulberry (*Morus*), Mandalay, Burma (C. C. Ghosh Coll. T. V. R. No. 266). The insect in this material, though appearing at first glance like a *Sericothrips*, agrees in most respects with Schmutz's type described in 1913 from material collected from Ceylon on *Macrocarpus integrifolia*. The structure of the antennae in the present material is similar to the Ceylonese form with the peculiar division of the distal joints; the transverse groove in joint six is clearer than the partition between joints six and seven, and Schmutz appears evidently to have mistaken the boundaries of the joints. The insect is a small (about 1·000 mm. in length) golden yellow species with bright red ocelli, whip-like antennae, short and unarmed head and fairly long greyish wings.

3. **Parthenothrips dracaenae** Heeger.

1854. *Parthenothrips dracaenae*, Heeger, *Sitz. Akad. Wiss. Wien.* XIV, p. 365.
1902. *Parthenothrips dracaenae*, Hinds., *Proc. U. S. Nat. Mus.* XXVI, p. 176.

Habitat and Locality.—A dozen females (no males) collected by the writer on wild *Solanum* and *Tecoma jasminoides*, Nilgiris, 7,500 ft. (T. V. R. Nos. 290 and 316); this is the first record of this well known species in Asia. Differs from Schmutz's *P. octarticulata* recorded from Ceylon in the structure of the antennae and the colour of the fore-wings. This insect appears to enjoy a very wide distribution since it has been noted previously in different parts of Europe, North America and Australia. Dr. Priesner thinks that my specimens are somewhat paler than the European form. There is a detailed description of this insect in Hinds' paper referred to above.

4. **Heliothrips indicus** Bagnall.

1913. *Heliothrips indicus*, Bagnall, *Ann. Mag. Nat. Hist.* (8), XII, p. 291.
1928. *Heliothrips indicus*, Ramakrishna, *Ent. Mem. Dept. Agri. India* X, p. 254.

Habitat and Locality.—On ganja (*Cannabis sativa*), Coimbatore, (T. V. R. Coll.); on Sannhemp flowers, Pusa (P. V. Isaac Coll.). On Date flowers, Siruguppa, Bellary (T. V. R. Coll.). This is a common Indian black thrips found occasionally as a pest on groundnut and other field crops.

5. **Thrips florum** Schmutz.

1913. *Thrips florum*, Schmutz, *Sitz. Akad. Wiss. Wien.* CXXII, p. 1003.
1928. *Thrips florum*, Ramakrishna, *Ent. Mem. Dept. Agri. India*, X, p. 261.
1932. *Thrips florum*, Ramakrishna, *Rec. Ind. Mus.* XXXIV, p. 277.

Habitat and Locality.—On Rose flowers, Poona, (T. N. Jhaveri Coll.). This is one of the commonest of the Indian species of thrips (a reddish brown form) and is found on a variety of plants in S. India. Found often in company with different species of *Haplothrips*.

6. **Taeniothrips chaetogastra,** sp. nov.

Macropterous female. About 1·400 mm. long. General colour yellowish to yellowish brown. Head and thorax yellowish brown, abdomen and legs of a pale whitish yellow, legs with a slightly darker hue than abdomen. Fore-wings uniform grey, setae dark, fringes grey and hind wings of a lighter shade with the central longitudinal vein grey. Eyes black, ocelli with pinkish pigment. Antennal joints excepting the first which is pale whitish, are of a uniform dark grey colour. The prothoracic and abdominal bristles dark. Head broader than long, fore margin arched, surface of head near junction of prothorax with irregular transverse striae. A pair of conspicuous dark bristles in front of the posterior ocelli, genae slightly arched with two or three very short transparent setae along each. Antenna, first joint stout and cup-shaped with short seta towards apex, 2nd joint narrow at base and gradually widening towards apex with three or four sharp setae, 3rd joint narrow and more or less constricted at the base, widest at centre and then narrowing towards apex with two or three bristles and a forked trichome towards apex, the color is deeper at centre and lighter towards each apex, 4th joint similar in all respects to 3rd though slightly shorter and the bristles are conspicuous in both ; 5th joint narrow at base and widening towards apex, having a distinctly lighter colour at apex, 6th joint almost as long as 4th, elongate oval, broader at base and narrowing towards 7th joint but broadly connected with it, the extreme apex has a lighter hue, 7th very small, 8th an elongated cone longer than 7th and with two or three transparent setae at apex. Mouth cone broadly pointed and reaching middle of prosternum. Prothorax, somewhat broader than long, sides arched ; a pair of dark conspicuous bristles found at each posterior angle. In addition, the hinder margin has a row of four spines situated between the pair at each angle and of these the two in the middle are conspicuous and almost as long as the ones at each angle, the one at each side is smaller. The surface of the prothorax is also fringed with several small setae. Pterothorax almost as broad as long, very slightly arched at the sides ; on the median region there is a group of spines and of these, the middle two are conspicuous. The two hinder pairs of legs are slightly longer than the front pair and all the legs are profusely fringed with short bristles, especially the tibiae. The wings are well developed and reach the 8th abdominal segment, the setae along the veins and the costal margin are dark brown. The upper vein has a basal series of 7 or 8, then there is a long blank and then there are two towards the apex ; the lower vein has a regular series of 13 or 14 in an uninterrupted line ; the second of this series is opposite to the last of the basal series of the upper vein ; the costal margin has about 24 to 26 bristles, one long curved one at apex ; fringes rather scanty and found chiefly along hind border. The hind wing shows a distinct narrow grey longitudinal median vein. Abdomen elongate, very slightly longer than head and thorax together, broadest at base and gradually narrowing towards tail end ; the anal end is not sharply pointed. Each of the abdominal segments has a transverse row of 8-10 short setae on its ventral side. The dorso-lateral margins of the segments are finely transversely rugulose. Posterior margin of 9th segment with a transverse

row of six conspicuous long dark bristles, one pair towards each side and one on the median dorsal region ; the last segment has a transverse row of four long pre-apical bristles of the same type ; there are also two long bristles, one on each side of the median line anterior to the transverse row of bristles.

Measurements of type.—Head : length 0·121 mm., breadth 0·154 mm. ; prothorax : length 0·165 mm., breadth 0·198 mm. ; pterothorax : length 0·286 mm., breadth 0·275 mm. ; abdomen 0·704 mm. Total length 1·342 mm.

Measurements of antenna.—1st joint 35μ, 2nd 45μ, 3rd 65μ, 4th 60μ, 5th 43μ, 6th 58μ, 7th 10μ, 8th 20μ.

Described from a unique female specimen collected by the author on flowers of Persian Nim, Coimbatore, in company with *Dolichothrips indicus*, Hood-Pr. T. V R. No. 29 x, September 1923.

The insect is well provided with bristles and setae all over the body, near the ocelli, on the prothorax, and especially on the abdominal segments ; and it is, therefore, named *T. chaetogastra.* It does not appear to be any of the species described till now.

7. **Panchaetothrips indicus** Bagnall.

1912. *Panchaetothrips indicus*, Bagnall, *Rec. Ind. Mus.* VII, p. 257.
1928. *Panchaetothrips indicus*, Ramakrishna, *Ent. Mem. Dept. Agri. India* X, p. 273.

Habitat and Locality.—One solitary female from cotton flower collected by the writer's brother T. V. Subramania Ayyar, Mysore Entomologist, from Bobbur, Mysore, (T. V. R. No. 370). The well known hosts of this insect noted so far have been Turmeric and Arrow-root plants in S. India and Banana in N. India. It was also found once on *Haemelia patens* in Coimbatore. This genus with its only known species is unique and confined to India as far as we know.

TUBULIFERA.

8. **Ecacanthothrips fletcheri,** sp. nov.

Macropterous female.—Length 2·75 mm. General colour dark greyish brown. Fore tarsi, fore tibiae, the tip of the fore femoral spine yellowish, the middle and hinder tibiae at base and apex and their tarsi yellowish tinged with grey brown. Antennal joints 1 and 2 of same colour as head ; third along the outer margin and the basal portion of 4th, 5th and 6th yellowish, 7th and 8th dark grey. Head longer than broad and longer than prothorax ; cheeks sub-parallel with three strong tubercles each giving rise to a short sharp bristle along each cheek ; the postocular bristle on each side very long projecting forwards beyond the eye. Third antennal joint with double row of sense cones. Ocelli with reddish pigment. Eyes large, oval, placed almost near the anterior margin of vertex. Prothorax rhomboidal with one forwardly directed transparent bristle at each anterior angle and one at each posterior angle. Front legs strongly developed ; femur stout with a strong straight tooth at middle of inner margin, tibia narrow at base and curved along inner margin, the latter with three short but conspicuous tubercular

projections towards the apex; tarsus with one strong tooth at base. There are a few short and strong bristles at the basal region of outer margin of femur and coxa. Hind legs normal with a few small bristles on outer margin of femora. Pterothorax stout, longer and broader than prothorax. Wings extending to 7th abdominal segment; fore-wing with the basal spines long, transparent and knobbed, its apex with 22 duplicate hairs. Abdomen elongate, oval, longer than head and thorax together, the segments with spines at posterior lateral angles. Tube rather stout and shorter than head or prothorax with very short and feeble bristles at tip.

Measurements of type.—Head length 0·374 mm.; prothorax length 0·264 mm.; tube length 0·242 mm.; pterothorax length 0·440 mm.; abdomen length 1·650 mm. Total length 2·75 mm.

Measurements of antenna.—1st joint 1·75μ, 2nd 2·75μ, 3rd 3·145μ, 4th 4·170μ, 5th 5·160μ, 6th 6·125μ, 7th 7·85μ, 8th 8·65μ.

In Priesner's recent synopsis of the species of this genus the insect comes near *Bryanti obscurata*, from Borneo, but differs from it chiefly in the colouring and length of antennal joints.

Described from one specimen caught at light in Pusa (T. B. Fletcher Coll.—T. V R. No. 267).

9. **Liothrips dampfyi** Karny.

1914. *Liothrips dampfyi*, Karny, *Verh. Zool. Bot. Ges. Wien.* LXIV, p. 58.

Habitat and Locality.—On *Tamarix gallica*, Cawnpore, (D. S. Chowdhry Coll.—T. V R. No. 264). This insect was first described by Karny from the same host plant in Egypt and is a new record for India. In general form the insect appears more like a *Gynaikothrips* than a *Liothrips* and Dr. Priesner who examined the specimens is also of that opinion.

10. **Haplothrips inquilinus** Priesner.

1921. *Haplothrips inquilinus*, Priesner, *Treub.* II, p. 4.
1928. *Haplothrips inquilinus*, Ramakrishna, *Mem. Dept. Agri. India* X, p. 292.

Habitat and Locality.—On *Mallotus philippinensis*, Taliparamba, Malabar (T. V R. Coll.) with a *Liothrips* sp. Originally described from Java, and there are previous records on *Mimusops elengi* and *Eugenia jambolana* in South India.

11. **Trybomiella ramakrishnai** Karny.

1926. *Trybomiella ramakrishnai*, Karny, *Mem. Dept. Agri. India* IX, p. 218.

Habitat and Locality.—In flowers of Lupin and other hill plants, Ketti, Nilgiris, 5,000 ft. (T. V R. No. 391). Previously collected from Chrysanthemum flowers in Coimbatore, and Sandal in Salem District.

12. **Karnyothrips nigriflavus,** sp. nov.

Macropterous female.—Length 1·75 to 2·0 mm. General colour bright yellow and dark brown. Head, prothorax, the first antennal joint, base and inner margin of 2nd joint and the tube dark brown; ocelli with

some red pigment. The legs and rest of the body bright yellow except the ventral tips of the legs and the 7th and 8th joints which are lightly tinged with dark brown; the abdomen in some specimens shows irregular darkish diffused pigment. Wings light flavous almost transparent. Head longer than broad, fore-margin broadly triangular. Sides subparallel, slightly corrugated but not armed. Postocular bristle small and inconspicuous. Antennal joints 1 and 2 short and cup-shaped, 2nd longer than 1st and constricted at base, 3-5 subequal narrow at base and broadening towards apex, 6th broadest at apex and slightly shorter, 7th elongate and of same breadth throughout and 8th a long cone with an apical bristle. Mouth cone broadly rounded reaching just the middle of the prosternum. Prothorax as long as head but broader, the postero-lateral bristles medium sized and knobbed. Fore femur short and stout. Tarsal tooth curved and small; wings extending to 5th abdominal segment and the fore-wings with 2 to 5 duplicate hairs at apex. Abdomen elongated and much longer than head and thorax together. The wing retaining spines well developed in each of the proximal segments and the posterior pair curved and approximating each other at the median line. The spines at the posterior angles of the segments well developed, especially those on the 9th segment; and the bristles at the tip of tube longer than the tube. Tube short with slender long setae at apex which are longer than it.

Measurements of type female.—Head: length 0·187 mm., breadth 0·132 mm.; prothorax: length 0·154 mm., breadth 0·242 mm.; pterothorax length 0·308 mm.; tube length 0·132 mm. Total length 1·848 mm.

Measurements of antenna.—1st joint 30μ, 2nd 40μ, 3rd 50μ, 4th 55μ, 5th 50μ, 6th 40μ, 7th 45μ, 8th 30μ.

Macropterous male.—Length 1 to 1·25 mm. Shorter than female but similar in color and all other features.

Described from numerous specimens (T. V. R. No. 269a) collected on Bamboo in Coimbatore with *Veerabahuthrips bambusae*, Ramkr., and *Androthrips coimbatorensis* described below. Closely allied to *Karnyothrips melaleucus* Bagnall but differs in the colour of the different parts.

13. **Androthrips coimbatorensis,** sp. nov.

Macropterous female.—Length 1·5 to 1·7 mm. General colour uniform pale to dark greyish brown with parts of head, thorax and legs suffused with very pale yellowish tinge, head, post abdominal segments and tube of a slightly darker tinge. First two joints of antenna of a slightly deeper grey than other joints, the middle ones, 3-5 of a lighter hue than the apical joints 7 and 8. Ocelli with red pigment. Wings with very light grey infumation. The fore femora have the outer margin broadly dark grey with the rest of it pale yellowish, fore tibia also of a lighter pale yellowish colour. Middle and hind legs pale greyish. Head longer than broad, broadest just behind eyes, the front margin slightly drawn forwards into a broad triangular process, ocelli with red pigment, clear and well placed forwards; postocular bristle half as long as eye and projecting over eye, cheeks sub-parallel and not armed; mouth cone

broadly pointed, reaching middle of prosternum. Antenna, 1st joint short and stout, 2nd longer and cup-shaped, 3 to 7 subequal, narrow at base and broadening towards apex, 6 and 7 almost of same breadth throughout, 8th a broad cone. Prothorax shorter than head with medium sized bristles at post lateral angles and a row of 5 or 6 long ones at its base where it joins pterothorax. In the fore legs the femur is very stout and incrassated with a conspicuous conical tubercle at base of inner margin, the tibia with a broad projection at apex of its inner margin and the tarsus with a long curved tooth at base. Wings slightly narrow at middle and extending to 6th abdominal segment. Fore-wing with 5 duplicate hairs at apex. 3 basal spines clear. Abdomen elongate with sides always parallel, not broader than pterothorax, the wing retaining spines, well developed. Tube shorter than head or prothorax, with long cilia at apex. 9th segment with 4 long bristles at post margin, 2 on each side ; there are small ones between these two.

Measurement of type.—Length 1·628 mm.

Male.—Length 1·232 mm.; shorter than female ; similar in other respects.

Described from a few specimens collected on bamboo in Coimbatore with *Karnyothrips nigriflavus*, n. sp., and *Veerabahuthrips bambusae*, Ramkr. ; appears different from the species noted before from India, *viz.*, *A. flavipes*, Schm. and *A. ramachandrai*, Ky., especially in the colour of the fore femora, wing hairs and armature of fore femora.

14. **Mallothrips indica** Ramakrishna.

1928. *Mallothrips indica*, Ramakrishna, *Ent. Mem. Dept. Agri. India* X, p. 308.

Habitat and Locality.—In *Eugenia jambolana* fruits, Cawnpore (D. S. Chowdhry Coll.—T. V. R. No. 263). The species was first described as the type species of a new genus by the writer from material collected in leaf galls of the same plant (*Eugenia*), in Marudamalai hills, Coimbatore, 1,500 ft.

15. **Cercothrips (Gigantothrips) tibialis** Bagnall.

1921. *Gigantothrips tibialis*, Bagnall, *Ann. Mag. Nat. Hist.* (9) VII, p. 364.
1926. *Gigantothrips tibialis*, Karny, *Ent. Mem. Dept. Agri. India* IX, p. 239.
1929. *Gigantothrips tibialis*, Ramakrishna, *Ent. Mem. Dept. Agri. India* X, p, 311.

Habitat and Locality.—This giant thrips was recently found in numbers on a wild shrub near the Tungabhadra river Siruguppa (C. S. Balasubramaniam Coll.—T. V R. No. 388.) The species was originally described from Ceylon by Bagnall and later collected from South India on the same plant (*Careya arborea*) as in Ceylon and noted in the writer's memoir on Indian Thysanoptera. This species, according to the characters given by Hood and in the opinion of Karny and Priesner has to come under Hood's genus *Cercothrips* (p. 73, *Insec. inscit. Washington*, VII, 1919) and is different in generic characters from *Gigantothrips* Z.

MGPIC—III-8-10—11-12-34—440.