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Crotonothrips polyalthiae Mound & Nasruddin (Thysanoptera: Tubulifera) – a new record for India

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ABSTRACT: *Crotonothrips polyalthiae* Mound & Nasruddin (2012), a member of phlaeothripid (Insecta: Thysanoptera: Tubulifera) has been recorded for the first time from India, which was erstwhile known only from Malaysia and Indonesia. The diagnostic characters of this species are discussed along with the key to identify other known species of *Crotonothrips*.

KEY WORDS: *Crotonothrips polyalthiae*, new record, Thysanoptera, Tubulifera

The family Phlaeothripidae is the single family in the suborder Tubulifera with maximum number of taxons under the order Thysanoptera. It consists of two subfamilies, Idolothripinae and Phlaeothripinae which are distinguished on the basis of width of maxillary stylet that being broad (>5µm) and band like in the former and they feed exclusively on fungal spores. On the contrary, members of the subfamily Phlaeothripinae comprise a mixed group of individuals of both myco and phytophagous forms with maxillary stylets of 2 or 3µm broad for most of their length (Palmer *et al*., 1989). The family Phlaeothripidae currently includes about 3649 species worldwide (Thripswiki, accessed on 02.06.16), and about 12 per cent of them are known from India. So far 430 species in 143 genera have been reported from India (Tyagi and Kumar, 2016). In a recent survey carried out at Bhubaneshwar, Odisha, a species namely *Crotonothrips polyalthiae* Mound and Nasruddin (Phlaeothripidae: Phlaeothripinae) has been collected and its occurrence in India is reported here for the first time. The details of the collection and diagnostic features are discussed in this article along with the key to identify other known species of the genus *Crotonothrips*.

Diagnostic features of the genus *Crotonothrips* Ananthakrishnan

The genus *Crotonothrips* is characterized by reticulate head and pronotom, fore tarsus with a tooth in both sexes, much reduced mesopraesternum, S2 setae of tergite IX of both sexes about half as long as S1 and tube longer than head with short anal setae. Members of the genus *Crotonothrips* are known to induce plant galls and live within the leaf galls of a wide variety of plants. The genus *Crotonothrips* was erected by Ananthakrishnan in 1967 which comprised of 16

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species as per Thripswiki-accessed on 02.06.2016 (Table -1a and 1b). Among them, 14 species have been originally described from India, while *C. dentifer* from Japan and *C. polyalthiae* from Indonesia & Peninsular Malaysia.

The collected specimens were identified using appropriate keys (Mound & Nasruddin, 2012) and were confirmed by Dr.Mound as *C. polyalthiae* Mound &Nasruddin (2012).The image was photographed using the microscope (Leica stereo zoom Microscope, Leica M 205A).

Material Examined: 11 females, 01.i.2016, leaf galls of *Polyalthia longifolia,* (Family: Annonaceae), Bhubaneshwar (Latitude 20^0 0' 37.3'' N, Longitude $85^0$49' 59'' E), INDIA, Coll. R.R. Rachana. These specimens are deposited with ICAR - National Bureau of Agricultural Insect Resources (ICAR-NBAIR), Bangalore, Karnataka, India.

Diagnostic features of the species *Crotonothrips polyalthiaae* Mound and Nasruddin

Body and legs dark brown, fore tarsi and apex of fore tibia yellow; antennal segments I and VII-VIII brown, II yellow at apex, III almost clear yellow but weakly shaded at apex, IV-VI yellow on basal two-thirds, half or third respectively. Fore wing extensively shaded, paler at apex, clear near base around sub-basal setae and with a pale longitudinal line close to posterior margin. Mouth cone pointed,

Table -1a: Setae length of IX abdominal segment of different species of *Crotonothrips**

Thrips species	S1 (µm)	S2 (µm)	S3 (µm)
1. Crotonothrips coorgensis	153	112	153
2. Crotonothrips davidi	91	72	106
3. Crotonothrips dentifer	175	65	**
4. Crotonothrips dissimilis	126	64	126
5. Crotonothrips erraticus	172	148	256
6. Crotonothrips gallarum	160	80	175
7. Crotonothrips longirostris	140	80	148
8. Crotonothrips memecylonicus	143	61	153
9. Crotonothrips mimicus	106	60	160
10. Crotonothrips nagaensis	200	120	240
11. Crotonothrips nelliampathiensis	120	64	160
12. Crotonothrips parvus	107	31	122
13. Crotonothrips polyalthiae	240	60	265

**Data not available. *Data taken from respective species of thrips publication.
S1, S2 and S3 represent setae present on the IX abdominal segment

Table- 1b: Measurements of IX abdominal segment setae of three species

Thrips species	S1 (µm)	S2 (µm)	S3 (µm)
14. Crotonothrips cacharensis	144	140	200
15. Crotonothrips dantahastha	145	143	156
16. Crotonothrips maoensis	212	210	224

extending between fore coxae; mandible restricted to mouth cone. Fore tarsal tooth stout. Mesopraesternum incomplete medially. S2 setae of tergite IX shorter than S1 and S3 (Figure 1).

Fig 1. *Crotonothrips polyalthiae*

Distribution: India: Odisha (new record), Indonesia and Malaysia.

In addition to the above, the authors had the chance to study some of Prof. T. N Ananthakrishnan's collections of *Crotonothrips.* Comparative analysis of those species with our own collections and relevant literature, a detailed key to the species of *Crotonothrips* has been attempted here, as it was lacking as of now.

Key to identify species of the genus *Crotonothrips* Ananthakrishnan (except *C. dantahastha*)

1. Fore-tarsi with well developed tooth in both the sexes. S2 setae of abdominal segment IX always shorter than both S1 and S3 2

   - Fore-tarsi of both sexes without tooth. S2 setae of abdominal segment IX almost subequal to S1 but shorter than S3.....14

2. Mouthcone not broad but slightly narrow and pointed …….....3

   — Mouthcone broadly rounded …… 4

3. Mesopraesternum in complete medially. Antennal segments I, VII, VIII brown, II yellow at apex, III yellow, IV –VIyellow on basal two thirds, half or third respectively..... *polyalthiae* Mound & Nasruddin, 2012

   — Mesopraesternum boat shaped. Antennal segments I – VI golden yellow, VII & VIII brown.....*longirostris* Muraleedharan & Sen, 1981

4. Body distinctly bicolorous; head, all legs yellow; thorax and abdomen brown ..... *memecylonicus* Ananthakrishnan, 1976

   - Body almost unicolorous brown with an admixture of yellow in certain areas 5

5. Anteromarginal vestigial 6

   — Antermarginals short (10–20µm) 7

   — Anteromarginals long (> 25µm) 9

6. Antennal segments I & II brown, III – VIII golden yellow, III – VII pedicellate. Epimerals 150 µ long. Forewings with 17-20 double fringes

   ..... *nagaensis* Muraleedharan, 1982

7. Antennal segments IV–VI more rounded & pedicellate. S2 setae of tergum IX short but more than half as long as S1 & S3 …….. 8

   - Antennal segments IV–VI elongate not pedicellate. S2 setae very short, less than half the length of S1 & S3 ..... *parvus* Ananthakrishnan, 1976

8. Femora and tibia brown, apices yellow, all tarsi yellow. Body uniformly brown. Mesopraesternum more parallel sided .....*mimicus* (Ananthakrishnan, 1969)

   — Femora brown with apices yellowish; fore tibia yellow, mid and hind tibia pale brown with apices yellowish, tarsi largely yellow.

Mesopraestrnum boat shaped ..... *dentifer* (Priesner, 1935)

9. Mesopraesternum without median crest.....10

—Mesopraesternum with a median crest..... 13

10. Postocular short (<45µm) 11

— Postocular long (>45µm) 12

11. Anteroangulars and anteromarginals 20-25µm. S2 of tergite IX: 65, S1& S3 122-130µm long. Forefemora, mid and hind tibiae brown, mid and hind femora yellow at apex, fore tibiae yellowish brown, tarsi .....*dissimilis* Ananthakrishnan, 1976

— Anteroangulars and anteromarginals 30-40µm. S2 of tergite IX: 102-112, S1 & S3 140-155µm long. All femora and tibiae brown, tarsi yellow ..... *coorgensis* Ananthakrishnan, 1976

12. Postangulars short (60µm), S1, S2, S3 of tergiteIX respectively144-160, 64-80, 144-175µm. All legs uniformly yellow suffused with brown. Fore-wings with 9-10 double fringes .....*gallarum*Ananthakrishnan, 1967

- Postangular long (96µm), S1, S2, S3 of tergite IX respectively 172, 148, 256µ. All femora, mid and hind tibiae brown with golden yellow tinge, fore tibiae goldenyellow. Fore wings with 16-18 double fringes ..... *erraticus* Muraleedharan & Sen, 1981

13. Mouth cone broadly rounded.Antennal segments 1, 2, 7, 8 brown, 3-5 yellow, 6 basal yellow, apex brown. Fore wings with 12 - 14 double fringes. Fore tibia & all tarsi yellow, all femora & mid & hind tibia brown. Setae of tergite IX -S2: 72-85, S1 & S3: 91 - 106 µm ..... *davidi* Ananthakrishnan, 1976

— Mouth cone broad at base but slightly pointed at apex. Antennal segments 1, 2, 6 - 8 brown, 4 & 5 base yellow and proximal 2/3 brownish, 3 more yellow. Fore wings with 8-10 double fringes. All femora & tibiae yellowish brown,all tarsi yellow. S1, S2 & S3 of tergite IX respectively120-128, 64-72, 160-184 µm..... *nelliampathiensis* Varatharajan & Chochong, 2000

14. Post angular long (>40µm). Forewings with 6-7 doublefringes. Fore femora yellow, brown at base, mid and hind femora brown, distal tip yellow, fore tibia yellow, mid & hind tibiae and all tarsi brown..... *cacharensis* Muraleedhran & Sen, 1978

- Post angular short (<40µm). Fore wings with 12-15 double fringes. All femora brown, fore tibiae yellow, mid and hind tibiae brown with yellow apex..... *maoensis* Neelamani & Prasad, 1990

In all the 13 species listed in the table -1a, the length of S2 setae of abdominal segment IX was shorter than S1 and S3, whereas in the following three species such as *C. cacharensis, C. dantahastha* and *C. maoensis*, S1 and S2 are almost sub-equal and S3 is longer than S1 & S2. Absence of fore-tarsal tooth and equal length of S1 and S2 setae of tergite-IX in *C. cacharensis* resulted in naming it as *Inermothrips cacharensis*, i.e., *Inermothrips* as a sub genus of *Crotonothrips* (Muraleedhran & Sen, 1978). Since the above three species exhibit characters contrary to the definition of *Crotonothrips*, it is possible that they may come under the group of the genus *Liothrips.* As the data being not fully available for *C. dantahastha*, the key to identify this species is not provided here. However, an in-depth study is required on *C. cacharensis, C. dantahastha* and *C. maoensis* to consider them under any other genera, but as of now, the above three species are retained in the genus *Crotonothrips* (Thripswiki, accessed on 02.06.16).

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