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New records of thrips (Thysanoptera) species associated with rice in Khasi Hills, Meghalaya

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ABSTRACT

Five species of thrips are recorded for the first time in Khasi Hills, the rice thrips *S. biformis* (Bagnall) earlier reported from Jaintia Hills and East Khasi Hills district is presently recorded from Ri-Bhoi District. *H. tenuipennis* (Bagnall), *B. indicus* (Ananthakrishnan) so far not yet reported from Khasi Hills are being reported from Khasi Hills, *H. ceylonicus* (Schmutz) earlier reported from West and East Garo Hills district is now reported from Khasi Hills, *A. sudanensis* (Trybom) reported from East Khasi Hills district and East Garo Hills is now being reported from Ri-Bhoi district of Meghalaya.

Keywords: Thrips, Rice crop, Recorded, Khasi Hills.

1. Introduction

The order Thysanoptera consists of nearly 6000 known species worldwide, but is poorly studied in Khasi Hills of Meghalaya. Thrips are placed in two sub-orders Terebrantia and Tubulifera^[1]. The sub-order Tubulifera comprises a single family, Phlaeothripidae which is the largest family of Thysanoptera^[2]. It includes around 3500 described species, whereas the sub-order Terebrantia comprises 2400 species with eight families^[3]. Pest thrips belong to the second major family, Thripidae they are known to be serious pests on a wide range of fruits, vegetables, flowers, and agronomic crops^[4]. From India approximately, 700 species of thrips are known and from North-east India 200 species are known of which 47 species of thrips are reported from Meghalaya by R.K. Varshney and others since 1967 to 1991^[5]. This low number from Meghalaya presumably reflects a lack of collecting activity, and systematic studies because the thrips fauna of Khasi Hills is expected to be highly diverse, considering the topographical and floristic diversity of the state.

In this present survey for Thysanoptera from rice fields from Khasi Hills of Meghalaya 5 species are being reported here for the first time from this region namely, *Haplothrips tenuipennis* (Bagnall), *Bolacothrips indicus* (Ananthakrishnan), *Haplothrips ceylonicus* (Schmutz) described by K.K. Ray and S. Sen from West and East Garo Hills district in 1998 and 1991 respectively is now reported from Khasi Hills. Although *Stenchaetothrips biformis* (Bagnall) and *Anaphothrips sudanensis* (Trybom) was already being described by S. Sen in 1991 from Jaintia Hills and East Khasi Hills district and from East Khasi Hills and East Garo Hills district respectively was now being reported from Ri-Bhoi district of Meghalaya^[5].

2. Materials and Methods:

2.1 Study area description:

The study site was carried out at Nongjri (25° 74' N 91° 90' E) and Mawlai (Near University Campus) (25°60' N 91°90' E) in Khasi Hills, Meghalaya Figure 1 and the collection was focused mainly on rice fields. Thrips specimen was collected from rice fields right from their nurseries, seedling and panicle stage in the month of June to November in the year 2009 and 2010.

2.2 Collecting Methods:

Samples were collected from 1sq meter quadrat from the four corners of the fields using camel brush collected specimens were preserved in collection fluid containing 60% ethanol, glycerine and acetic acid @ 9:1:1 with Triton-X (0.1 ml).

Permanent mounting of the specimens were being done following the standard protocol [6].

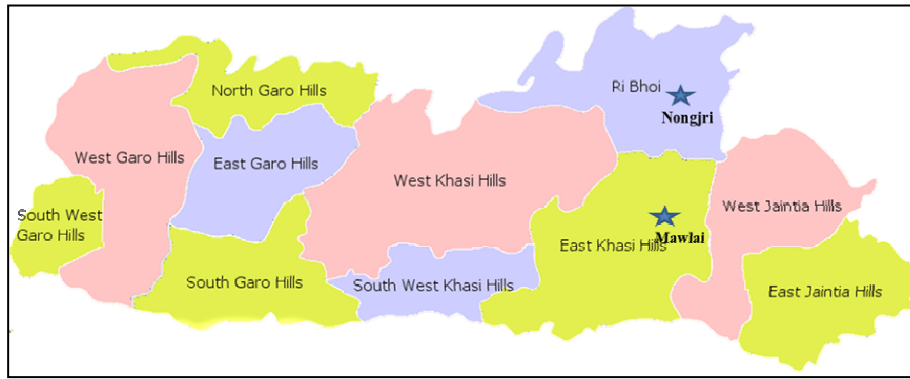


Fig 1: Collection sites of rice thrips in Khasi Hills

3. Results

3.1 Genus *Stenchaetothrips* Bagnall

1926. *Stenchaetothrips* Bagnall^[7]

1957. *Chloethrips* Preisner^[8]

1982. *Stenchaetothrips* Bhatti^[9]

The genus *Stenchaetothrips* was described in 1926 by Bagnall from a single female of the type species *melanurus* Bagnall from Sudan. It remained poorly understood and its relationships were never clarified until treated as a synonym of *Baliothrips*^[10]. Currently the genus includes 33 species^[11]. A full account of 15 *Stenchaetothrips* species known from India was provided by Bhatti, but Tyagi & Kumar subsequently described two further new species from India^[9, 12]. Wang provided a key to eight species of the genus from Taiwan; zur Strassen from Indonesia; Reyes from the Philippines and Mound from Australia^[13, 14, 15, 16].

Stenchaetothrips biformis Bhatti^[9]

Small, brown or bicoloured, head and thorax sometimes pale with darker margins, fore wing dark, antennae 7 segmented, very rarely 8 segmented due to secondary split in the style. Antherolateral adjacent to first ocellus longer than median pair setae. Spinula on meso and metasternum absent or weakly developed on mesosternum only. Abdominal tergites and sternites without large lobed caspida, rarely with a few short irregular teeth.

3.1.1 Material examined:

2♀, 1♂, collected from Nongiri and Mawlai, dated 14. 8. 09, 25.74095 N 91.90942 E and dated 09.7.09, 25.60761 N and 91.90353 E respectively.

Host plant: Rice (*Oryza Sativa* Linn)

3.1.2 Distribution

A genus of 20 grass-leaf feeding species found throughout the tropics; the majority of species are oriental^[9]. *Stenchaetothrips* species are found predominantly in Asia, but a few have become distributed worldwide^[17].

3.1.3 Remarks

Previously reported by S.Sen from Jowai and Elephant Falls of Meghalaya in 1991 from rice crop is now reported from Ri-Bhoi district of Khasi Hills.

3.2 Genus *Haplothrips* Amyot and Serville

1843. *Haplothrips* Amyot and Serville^[18]

1976. *Haplothrips* Pitkin^[19]

The genus *Haplothrips* is the third largest genus in the Thysanoptera and includes about 230 species worldwide^[20]. These species breed almost exclusively in flowers, with many considered to be host specific^[21]. They are particularly associated with the flower of Asteraceae, but considerable numbers are found in the flowers of Poaceae, Juncaceae or Cyperaceae^[3, 22].

Haplothrips ceylonicus Pitkin^[19]

Mid and hind tibiae proximally brown, distal half to one-third and all tarsi yellow; antennal segments 3-6 yellow, 7-8 brown. Forewings with 6-9 double fringes.

Haplothrips tenuipennis Bagnall^[23]

Brown species with antennal segments 3-6 yellow, segments 4-6 slightly tinged with brown at apex, fore tibiae and all tarsi yellow.

3.2.1 Material examined: 1 specimen each collected from Nongiri and Mawlai site

Host plant: Rice (*Oryza Sativa* Linn)

3.2.2 Distribution

A large genus of perhaps 300 species or more found worldwide and exhibiting a wide diversity of living and feeding habits^[19, 24], but most are Eurasian with very few from the Neotropics^[25].

3.2.3 Remarks

H.tenuipennis and *H.ceylonicus* is recorded for the first time from Khasi Hills although; *H.ceylonicus* was previously reported by K.K.Ray in 1998 and S. Sen in 1991 from Garo Hills of Meghalaya.

3.3 Genus *Anaphothrips* Uzel

1895. *Anaphothrips* Uzel^[26]

Members of the *Anaphothrips* are normally found on plants of the grass family, Poaceae. About

80 species are listed under several subgenera in Thysanoptera catalog of the World, and are reported from all continents except Antarctica^[27]. *Anaphothrips* was formerly a paraphyletic group until critically reviewed by Bhatti who elevated subgenera *Agalmothrips*, *Anaphothrips*, *Dictyothrips*, *Hyalopterhrips*, *Proscirtothrips* and *Tamaricothrips* to generic status, synonymized subgenus *Neophysopus* with *Anaphothrips*, described seven new genera to accommodate species excluded from *Anaphothrips*, and retained eight Nearctic species in *Anaphothrips*^[28].

Anaphothrips sudanensis Bhatti^[28]

Body distinctly bicoloured, mostly brown, abdominal tergites 3-7

yellow, VIII-X dark brown, antenna 8 segmented, forewing not very broad.

3.3.1 Material examined: 1 specimen each collected from Nongjri and Mawlai site

Host plant: Rice (*Oryza Sativa* Linn)

3.3.2 Distribution

The genus includes at least 79 species worldwide. Several are associated with grasses and grain crops^[29].

3.3.3 Remarks

This species is recorded for the first time from Ri-Bhoi district of Khasi Hills and it was previously reported by S.Sen in 1991 from East Khasi Hills and East Garo Hills district of Meghalaya.

3.4. Genus *Bolacothrips* Uzel

1895. *Bolacothrips* Uzel^[30]

1930. *Bolacidothrips* Priesner^[31]

A genus of about ten worlds species living on grasses occur on economic crops such as corn, rice, sugarcane and wheat^[32].

Bolacothrips originally described as *Thrips striatopennata*^[33] has

been known under the following synonyms: *Bolacothrips orientalis*^[34], *Bolacidothrips orizae*^[35] and *B. oryzae*^[36].

Bolacothrips (= *Bolacidothrips* *graminis*) *indicus* Ananthakrishnan^[37]

Antennae 7 segmented, segment 3 and 4 with simple sense cones, ocellar setae III and 1 pair of postocular setae long.

3.4.1 Material examined: 1 specimen each collected from Nongjri and Mawlai site

Host plant: Rice (*Oryza Sativa* Linn)

3.4.2 Distribution

First described from Sri Lanka^[33] is now also known from Cambodia, Guam, Hawaii, India, Indonesia, Malaysia, Philippines, Taiwan and Florida^[38, 35, 36].

3.4.3 Remarks

This species is recorded for the first time from Khasi Hills of Meghalaya.



A) *S. biformis* Bagnall

B) *H. ceylonicus* Schmutz



C) *H. tenuipennis* Bagnall

A. *sudanensis* Tryborn

B. *indicus* Ananthakrishnan

Fig 2: Photo plates of rice thrips

4. Conclusion

Knowledge on host plants of thrips is important, since many polyphagous species and viruses they transmit can survive on different wild-growing plants also out of growing season of the plants, in which this pest caused the highest damage^[39]. Directly sampling in crop of interest is the only sure way to know what thrips species are present and causing damage. Thrips appear to be a constant early season agricultural pest in Meghalaya.

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