

18. Morphological Observations on Insect Thrips *Haplothrips driesseni* from Avenue Flora *Cassia* *Siamea* of Akola, Maharashtra

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Abstract

Thrips are distributed worldwide predominating in tropical, subtropical and temperate regions. They enjoy a wide range of distribution, habits and ecological habitat. Thrips belongs to Order Thysanoptera, are minute Insects only a few millimetres or less in length. There are approximately 7500 described species of thrips in the world. A large number of species are considered pest, because they feed on plant with commercial value, while some acts as a vectors of plants virus and bacterial diseases. Present paper is highlighted a preliminary work on thrips occur on avenue flora in Akola. *Cassia siamea* is a small to medium sized tree, up to 15-20 m tall, with a short bole and low branching high crown. Flowers yellow, up to 3.5 cm long, in dense racemes at the end of the shoot. This flower is pollinated by various avian birds and insects also. Thrips also observed on this flower, but particular thrips descriptions are not available or not explore properly. The study showed that the sample of thrips which were collected from the flower of *Cassia siamea* shows different species of thrips. The thrips founded in the flower is *Haplothrips driesseni*. The presence of this specie on the flowers surprising as they have been not recorded before and there is no record showing that this species host plant is *Cassia siamea*.

Key words: Thysanoptera, *Cassia siamea*, polyphagous, *Haplothrips driesseni*, host species

Introduction

Thrips are distributed worldwide predominating in tropical, subtropical and temperate regions. They enjoy a wide range of distribution, habits and ecological habitat. They occur on the tender, succulent parts of the plants, or under the barks of dead and drying twigs or among decaying leaves of grass, feeding on fungus spores and hyphae. Some of them produce and inhibit plant galls, while others are inquiline living inside the galls of thrips or other insects. A

large number of species are considered pest, because they feed on plant with commercial value, while some acts as a vectors of plants virus and bacterial diseases. While some act as predators of crop pests and also serve as weed control agents.

Thrips are extremely small, rasping and sucking type of insects feeding on variety of cells and on various plant parts. They are polyphagous infecting wide range of host species and are more abundant in the tropics.

Thrips are divided into two suborders, Terebrantia and Tubulifera, which differ in the shape of the last abdominal segment and the development of the ovipositor. The Terebrantia have the last abdominal segment more or less conical or rounded, and the female almost always has a well – developed, saw like ovipositor. The Tubulifera have the last abdominal segment tubular, and the females lack an ovipositor.

Cassia siamea is a small to medium sized tree, up to 15-20 m tall, with a short bole and low branching high crown. Flowers yellow, up to 3.5 cm long, in denseracemes at the end of the shoots, and in their axil. This flower is pollinated by various avion birds and insects also. Thrips also observed on this flower, but particular thrips descriptions are not available or not explore properly.

Aim of this project is to gain more knowledge about insects thrips found in the flower, identify the thrips and observe the morphological characters.

Review of Literature

Thrips is the general term of Thysanoptera. They are often considered as one of the most economically important insect pests in agroecosystems all over the world (Lewis, 1973; Riley et al. 2018). An important aspect of the biology of thrips is the identity of plants on which individual species can maintain populations, although this relationship can be difficult to establish (Mound, 2013). More than 7700 species were recorded, despite only about 1 % of the group could damage the various crops (Morse and Hoddle, 2006). For many flower thrips, pollen is their major food source (Kirk 1985, 2008). The importance is hard to overestimate, especially for vector thrips of plant viruses (Riley et al. 2011, Rotenberg et al. 2015). Thrips habitat range through forest, grassland, scrub, desert, most cultivated crops and garden, and they include phytophagous and carnivorous species (Lewis, 1973) of the approximately 5000 species known only a few hundred are crop pest. Thus, many species have now spread from their original natural habitats and hosts to favorable new environment where they often reproduce

rapidly to develop intense damaging or transmitting viruses to plants (Mount et Teulon, 1995). During the years 1925 -47, Ramakrishna Ayyar, Margabandhu and Shumsher Singh recorded several species from country. Ramakrishna and Margabandhu (1940) recorded 232 species of thrips belonging to four families from different crops in their catalogue of Indian Thysanoptera. Ananthakrishnan (1969) recorded 525 species of thrips under 213 genera from different parts of India

Material and Method

The Western Vidharbha region of Maharashtra is rich in flora and fauna. The studied insect Thrips, abundantly found in Akola. Insects Thrips feed on developing and expanded tissue generally occurs on the blooms of plants flower and leaves. Thrips are pollinator and non-pollinators, some are act as pest and very few are predators. Some species of thrips are widely occurs on flowers and feeds on pollen grains. Both Terebrantia and Tubulifera family thrips were inhabiting flowers, may or may not be act as pollinator. Comparison to other thrips, the size of adult is small and sexes easily differentiate as female is larger than male, and there are different families of thrips founded and showing different characteristics.

Collection and Rearing of Thrips

The thrips were collected from flowers of the host plant *Cassia siamea* (L). Flower and insect samples are collected by hand picking method and then with the help of a fine camel hair brush transferred to Vial for laboratory work. They were collected by direct picking the insects with a fine camel hair brush and transferred to Vial containing 60 % ethyl alcohol with 0.5 % ethyl acetate to prevent stiffness of limbs. The eggs, larvae, pupae. The thrips were also collected and carried to the laboratory along with flowers of *Cassia siamea* for rearing.

In the lab, the thrips collected in the field were extracted by gently shaking the flowers on white paper, the insects then separated by their morphological characteristics (Cavalleri and mound, 2012).

For longer storage the thrips were transferred to freshly prepared 70 % ethyl alcohol and kept in dark to prevent loss of colour of larvae and pupae.

Microscopic Preparation.

Small size of thrips requires examination under a compound microscope at higher magnification. Such specimens must be specially prepared and placed temporarily or permanently on microscope slides). (Schaeff 2009).

For the microscopic examination, adults mounted on microscope slides. For routine identifications, a water-soluble mountant or glycerol is used.

The thrips is preserved in AGA solution (60% ethanol, 10 % glycerol, acetic acid). The preserved thrips were used for microscopic preparation. They were dehydrated with ethanol grades (30 %, 50 %, 70 %, 90 % and absolute alcohol) then, embedded in DPX on slide. Before mounting the thrip on slide, attempt to open the wings and straighten the antennae.

Identification

The identification of thrips is based on the adults, since there are no adequate keys for separation of species based on the characteristics of eggs, larva or pupae.

The species identified by the key referred from literature and reference book. **Priesner (1935)**, **Ananthakrishnan (1973)**, **Ananthakrishnan and Sen (1980)** published good and reliable keys for the identification of species occurring in the Asian tropics. **Stannard (1957)** provides a key on thrips suborder Tubulifera from North America. **Chiasson (1985)** provide a computer-compatible key to the Tubulifera (Thysanoptera) of Canada. **Mound and Walker (1986)** provides a key for Tubuliferan species from New Zealand. **Mound and Kibby (1998)** provides an identification guide on order Thysanoptera. **Mound & Minae (2007)** provides key of Haplothrips lineage (Thysanoptera-Phlaeothripidae). **Ananthakrishnan (1973)** gives some major diagnostic characters to distinguish Thrips from the other known species of India. Insect thrips also identified by using website of **thrip.net** (weblink:[https:// thripsnet. zoologie. uni-halle.de/](https://thripsnet.zoologie.uni-halle.de/).)

Observation and Result

Collected insect thrips thoroughly observed under laboratory conditions and identified by using referred keys and books and also cross referred by using online data and thrips identification websites.

One thrips specie is identified on the basis of morphological observation belongs to Order Tubulifera.

Sub-Order: Tubulifera (Family - Phlaeothripidae) *Haplothrips driesseni*

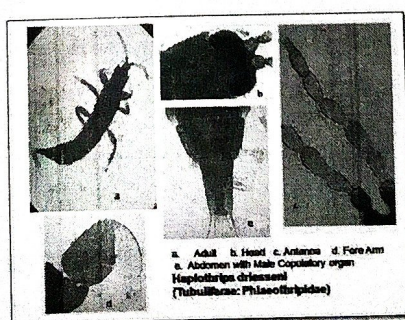
Classification

- Kingdom – Animalia
- Phylum – Arthropoda
- Class – Insecta

- Order – Thysanoptera
- Sub-Order – Tubulifera
- Family – Phlaeothripidae
- Sub- family – Phlaeothripinae
- Genus – Haplothrips
- Species – driesseni

Characteristics

- i. Body colour brown to dark brown
- ii. Tarsi and base of antennal segment 3rd yellowish brown
- iii. Fore wing shaded medially and with no duplicate cilia, sub- basal setae capitate
- iv. Head longer than wide
- v. Maxillary stylet less than one – fifth of head width apart, retracted anterior to postocular setae, maxillary bridge complete; postocular setae capitate, extending to posterior margin of compound eyes.
- vi. Antennal segment 3rd with two slender sensoria, 4th with four sensoria.
- vii. Metanotum without sculpture medially, median setae arise medially on sclerite, Meso-presternum transverse.
- viii. Fore tarsal tooth small, at inner apex of tarsus.
- ix. Tergites 2nd – 3rd with neither sculpture not discal setae lateral to wing – retaining setae



Discussion and Conclusion

The study showed that the sample of thrips which were collected from the flower of *Cassia siamea* shows different species of thrips. The thrips founded in the flower is *Haplothrips*

driesseni The presence of this species on the flowers surprising as they have been not recorded before and there is no record showing that this species host plant is *Cassia siamea*.

The host plant of this *Haplothrips* species remain unknown, although it is likely to be a special of Juncaceae or Cyperaceae but in present observation this species also found in the *Cassia siamea* flowers. There is one record showing *Megalurothrips distalis* (Karny) founded in drumstick plants flower and no other record showing *Cassia siamea* as a host thrips. May be the host plant of this species is *Cassia siamea*, for knowing its proper host plant and its habitat, a detailed study is needed. The present study highlights the new host of the thrips.

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