



ISSN (E): 2320-3862
ISSN (P): 2394-0530
NAAS Rating: 3.53
JMPS 2018; 6(1): 01-02
© 2018 JMPS
Received: 01-11-2017
Accepted: 02-12-2017

Suman Sanjta
Dr. YS Parmar,
University of Horticulture and
Forestry, Nauni, Solan,
Himachal Pradesh, India

Usha Chauhan
Dr. YS Parmar,
University of Horticulture and
Forestry, Nauni, Solan,
Himachal Pradesh, India

Incidence and diversity of thrips and its associated natural enemies in medicinal plants

Suman Sanjta and Usha Chauhan

Abstract

Eight species of thrips were identified from three medicinal plants viz. chandrashoor, patchouli and flax. The Phytophagous species were *Scirtothrips dorsalis*, *Bathrips melanicornis*, *Thrips carthami*, *T. flavus*, *T. kodaikanalensis*, *Anaphothrips sudanensis* and *Haplothrips* sp. There was only one predatory species, *Aeolothrips* sp. Out of these *Scirtothrips dorsalis* and *Thrips carthami* dominated all the species by contributing 27.45 and 13.73 per cent respectively. The former species has been reported as potential vector of virus. One species of natural enemy i.e. *Coccinella septempunctata* was also recorded on these medicinal plants. This is the first comprehensive report on the thrips and their natural enemies from this region which will help to update the list of present species associated with these medicinal plants.

Keywords: Thrips, natural enemies, diversity, medicinal plants, Himachal Pradesh

Introduction

Botanically, a herb is any plant that lacks the woody tissue which is characteristic of shrubs or trees and are used medicinally or for their flavour or scent. The herbal products are considered safe as compared to the synthetic foodstuffs that are considered as unsafe to human and environment. More than 30% of the entire plants species, at one time or other are used for medicinal purposes (Sarwar, 2013) ^[8]. It is estimated that world's market for plant derived drugs may accounts for about Rs. 200000 crores. The quality and quantity of raw materials obtained from the medicinal plants are adversely affected by the attack of number of insect pests in cultivated areas (Meshram, 2015) ^[4]. The medicinal plants studied in present investigation have enormous medicinal value and are used by general public in rural as well as urban areas for the remedy of various medicinal conditions. As cultivation of medicinal plants has become a highly commercial business, every effort is made to produce such crops free from any pest attack. Many insect pests invade the medicinal plants causing great losses in their quality and quantity (Murali Baskaran *et al.* 2007) ^[5]. Also, beneficial insects such as predators, parasitoids, pollinators and visitors could play an important role in improving the productivity of these plants. A number of investigations have surveyed the insects inhabiting different medicinal plants (Pobozniak and Sobolewska (2011) ^[7]; Shivaramu *et al.* 2013) ^[9] but there is paucity in the literature regarding the thrips species associated with the medicinal plants. Therefore, the present investigation was undertaken under the mid hills of Himachal Pradesh to study the thrips fauna and their associated natural enemies found on some of the commonly grown medicinal crop plants in the Nauni region.

Materials and methods

The study was carried out at Nauni, (1275 meters above mean sea level) and surrounding areas (near University campus of UHF, Nauni) in Solan district of Himachal Pradesh. Thrips and their natural enemies were collected from different medicinal plants. At each collection site, five plants were randomly selected for sampling. From each plant five leaves or flowers were selected randomly for collection and were beaten on white tray with a stick. The fallen thrips were collected in the collecting fluid containing 60% alcohol and glacial acetic acid (9:1) with Triton-X (1 mL/1000mL) and were mounted as prescribed by Bhatti (1999). The natural enemies were also collected and preserved by carding or pinning. The slides with mounted specimens were observed under phase contrast microscope. Thrips were identified using taxonomic keys, digital images and descriptions of Palmer (1992) ^[6], Bhatti (1980) ^[2], Ananthakrishnan and Sen (1980) ^[1] and Masumoto (2010) ^[3]. Some of the specimens were sent to Dr JS Bhatti (Retired Prof, Hans Raj college, Delhi), Dr Vikas Kumar (Scientist C, CDT,

Correspondence
Suman Sanjta
Dr. YS Parmar,
University of Horticulture and
Forestry, Nauni, Solan,
Himachal Pradesh, India

ZSI, Kolkata) and Dr Koumud Tyagi (PDF, CDT, ZSI, Kolkata) for identification or confirmation of identity. Natural enemies were identified with the identified reference specimens present in the laboratory.

Results and Discussion

In total eight species of thrips viz. *Scirtothrips dorsalis*, *Bathrips melanicornis*, *Thrips carthami*, *T. flavus*, *T. kodaikanalensis*, *Anaphothrips sudanensis*, *Aeolothrips* sp. and *Haplothrips* sp. were found in three medicinal plants viz. chandrashoor, flax and patchouli. Murali Baskaran *et al.* (2007)^[5] recorded *Scirtothrips dorsalis* on different medicinal plants in Andhra Pradesh. Poboziak and Sobolewska (2011)^[7], reported five species of thrips viz., *Thrips fuscipennis*, *T. flavus*, *T. albopilosus* *T. major* and *Frankliniella intonsa* on different medicinal crops in Iran. Shivaramu *et al.* (2013)^[9] recorded *Coryciodothrips inquilinus* on *Terminalia chebula* in

Karnataka. The difference in species composition might be due to difference in the crops and regions surveyed. Of all, *Scirtothrips dorsalis* and *Thrips flavus* were dominant species with 27.45 and 35.29 per cent relative proportion. Rest of the species i.e. *Bathrips sp.*, *Thrips carthami*, *T. kodaikanalensis*, *Anaphothrips sudanensis*, *Aeolothrips* sp., *Haplothrips* sp. and one species of natural enemy *Coccinella septempunctata* shared 3.92, 13.73, 1.96, 5.88, 3.92, 3.92 and 3.92 per cent respectively. Shanon index (H), H_{max} , evenness (J) and dominance (D) were 1.77, 2.2, 0.8 and 0.2 per cent respectively. This is the first comprehensive report on the thrips and their natural enemies from this region which will help to update the list of present species associated with these medicinal plants. This will also paves way for the future workers to work on the diversity of different pests and natural enemies associated with the medicinal plants and utilisation of associated natural enemies for the management of the pests.

Table 1: Distribution of Thrips and their natural enemies in different medicinal plants

Suborder	Family	Species	Crop	Location
Terebrantia	Thripidae	<i>Scirtothrips dorsalis</i>	Chandrashur	Nauni
		<i>Bathrips melanicornis</i>	Patchouli	Nauni
		<i>Thrips carthami</i>	Patchouli	Nauni
		<i>Thrips flavus</i>	Flax	Nauni
		<i>Thrips kodaikanalensis</i>	Flax	Nauni
	<i>Anaphothrips sudanensis</i>	Patchouli	Nauni	
	Aeolothripidae	<i>Aeolothrips</i> sp.	Patchouli	Nauni
Tubulifera	Phlaeothripidae	<i>Haplothrips</i> sp.	Patchouli	Nauni

Table 2: Diversity of Thrips species on medicinal plants

Species	Relative proportion (%)
A. Phytophagous species	
<i>Scirtothrips dorsalis</i>	27.45
<i>Bathrips melanicornis</i>	3.92
<i>Thrips carthami</i>	13.73
<i>Thrips flavus</i>	35.29
<i>Thrips kodaikanalensis</i>	1.96
<i>Anaphothrips sudanensis</i>	5.88
<i>Haplothrips</i> sp.	3.92
B. Predatory species	
<i>Aeolothrips</i> sp.	3.92
<i>Coccinella septempunctata</i>	3.92
Total	100
Shanon index (H)	1.77
H_{max}	2.2
Evenness (J)	0.8
Dominance (D)	0.2

References

- Ananthkrishnan TN, Sen S. Taxonomy of Indian Thysanoptera. Zoological Survey of India (Handbook Series). 1980; 1:1-234.
- Bhatti JS. Species of the genus Thrips from India (Thysanoptera). Systematic Entomology. 1980; 5:109-166.
- Masumoto M. Key to genera of the subfamily Thripinae (Thysanoptera: Thripidae) associated with Japanese plant quarantine. Research Bulletin of Plant Protection Station of Japan. 2010; 46:25-59.
- Meshram PB, Mawai NS, Malviya R. Biological Control of Insect Pests of Medicinal Plants - *Abelmoschus moschatus*, *Gloriosa superba* and *Withania somnifera* in forest nursery and plantation in Madhya Pradesh, India. American Journal of Agriculture and Forestry 2015; 3(2): 47-51
- Murali Baskaran, Rajavel RK, Shanthi DS, Suresh MK, Kumar S. Insect diversity and damage potential in medicinal plants ecosystem. Insect Environment, 2007; 13:76-79.
- Palmer JM. Thrips from Pakistan to the Pacific: a review. Bulletin of the British Museum Natural History (Entomology), 1992; 61:1-76.
- Poboziak Maria and Sobolewska Anna. Biodiversity of thrips species (*Thysanoptera*) on flowering herbs in Cracow, Poland. Journal of plant protection research. 2011; 53(4):393-398.
- Sarwar M. The theatrical usefulness of olive *Olea europaea* L. (Oleaceae Family) nutrition in human health: A Review. Sky Journal of Medicinal Plants Research. 2013; 2(1):1-4.
- Shivaramu K, Reddy PV, Suryanarayana MA. Infestation of gall thrips, *Coryciodothrips inquilinus* A. on *Terminalia chebula* Retz., a medicinally important plant. Pest management in Horticultural Ecosystem. 2013; 19(2):261-262.
- Tiwari KC, Joshi P. A record of some insect pests attacking medicinal plants at Ranikhet. Indian Journal of Pharmacy. 1974; 36:111-112