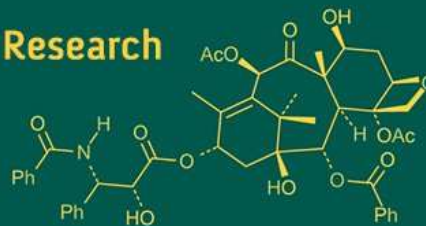
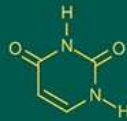
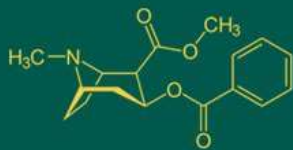


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## Succession of onion insects and pests complex on onion (*Allium cepa*) at Raisen (M.P)

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### Abstract

This research is about onion (*Allium cepa* L.) which is an important commonly grown vegetable in kitchen gardens and for commercial purposes throughout the globe its crucial. A field experiment was conducted at Entomology farm, Faculty of Agriculture RNTU, Raisen M.P. during rabi, 2021-22, to investigate the succession of onion insect pest complex in onion crop. Observation was taken immediately after transplanting. For observation a sample of 25 plants was randomly selected for observation of various pest complex as well as natural enemies. The first appearance of the thrips was observed when the crop age was about 18-22 days i.e. vegetative stage. It is evident that the pest was present on the crop during the vegetative stage and remained available up to the second week of January i.e. reproductive stage of the crop (25.29 days). Appearance of spider (39-43 days) & red spider (32-36 days) was observed when the crop age i.e. maturity Stage & Reproductive Stage (Flowering / Fruiting Stage).

**Keywords:** *Allium cepa*, *Thrips tabaci*, vegetative stage, flowering stage, natural enemies, pest, red spider

### Introduction

Onion, *Allium cepa* L. (Family: Alliaceae) is an important bulb, vegetable and spice crop of India. They are known for their pungent flavor and aroma, which are caused by sulfur-containing compounds. It can be consumed raw, cooked, fried, dried or roasted. It is cultivated in almost all parts of the country mainly for culinary purpose and also have medicinal value (Singh *et al.*, 2017) [8]. Onion is also possessing antioxidant, hypoglycemic, anti-inflammatory, anticancer and antimicrobial properties (Bora and Sharma 2009) [9]. Onion also contains protein, vitamin C and minerals like phosphorus, calcium and carbohydrates. India is the second-largest onion-producing nation in the world (Anonymous, 2022). Bihar, Gujarat, Madhya Pradesh, Karnataka, and Maharashtra are the principal onion-growing states in the nation. Onion cultivation covered 85000 acres in Madhya Pradesh, with an annual production of 13.50 lakh tone (Anonymous, 2021-22). Globally, onion crop is infested by different insect and mite pests of which thrips *Thrips tabaci* Lindeman, onion maggot *Delia antiqua* (Meign), Leek moth *Acrolepiopsis assectella* armyworm *Spodoptera exigua* (Hubner), head borer *Helicoverpa armigera* Hubner ect. The first appearance of the thrips was observed when the crop age was about 18-22 days i.e. vegetative stage. It is evident that the pest was present on the crop during the vegetative stage and remained available up to the second week of January i.e. reproductive stage of the crop (25.29 days). Appearance of spider (39-43 days) & red spider (32-36 days) was observed when the crop age i.e. maturity Stage & Reproductive Stage (Flowering / Fruiting Stage).

### Materials and Methods

The experiment will be conducted at Agriculture research farm, Rabindranath Tagore University, Raisen Bhopal (MP) during Rabi season 2020 and 2021. Onion variety Prasadhi Will be obtained from the Kalash seeds pvt Ltd. Onion seeds will be in the nursery beds from the level of ground (15cm) with one meter width and five-meter length. 30 days old seedling will be transplanted in well pulverized main field with a plant spacing of 15x10cm. Before transplanting the seedling of onion will be treated with fungicide solution to stop the early

infestation of fungal disease to the onion. All horticultural practices will be adopted during experiment. The experiment will be laid out in Randomized Block Design. Observation was taken immediately after transplanting. For observation a sample of 25 plants was randomly selected for observation of various pest complex as well as natural enemies. The onion crop was unprotected for this experiment. The sequence in which the insect complex appeared was noted. The status of different insect pests was recorded. Observation on different insect were recorded on 25 randomly selected plants twice in a standard week. It was initiated after transplanting and taken up to the maturity of the crop. Observation of thrips (nymph, adult), Onion maggot, spider, predatory thrips and other relative insects.

### Results and Discussion

A compilation of information on insect succession on onions showed that at various stages of crop growth, one species of Thysanoptera and two unidentified species of the Arachnida order representing one insect pest, one species of non-insect pest, and one species of natural enemy appeared. First appearance of the thrips was observed when the crop age

was about 18-22 days i.e. vegetative stage. It is evident that the pest was present on the crop during the vegetative stage and remained available up to the second week of January i.e. reproductive stage of the crop (25-29 days). Appearance of spider (39-43 days) & red spider (32-36 days) was observed when the crop age i.e. maturity Stage & Reproductive Stage (Flowering / Fruiting Stage). It is evident that the pest was present on the crop during the vegetative stage and remained available up to the second week of January i.e. reproductive stage of the crop (27-31 days). Appearance of spider (41-45 days) & red spider (34-38 days) was observed when the crop age i.e. maturity Stage & Reproductive Stage (Flowering / Fruiting Stage). It is evident that the pest was present on the crop during the vegetative stage and remained available upto the first week of February i.e. reproductive stage of the crop stage.

**Table 1:** Succession of onion insect pest complex 2020-21

SW	Date of observation	Onion insect pest complex				Crop age (DAT)	Crop stage
		Name		Order	Family		
		Common	Scientific				
Seedling-3	15 <sup>th</sup> to 21 <sup>th</sup> Jan 2021	Thrips	<i>Thrips tabaci</i>	Thysanoptera	Thripidae	18-22	VS
4	23 <sup>th</sup> to 29 <sup>th</sup> Jan 2021	Thrips	<i>Thrips tabaci</i>	Thysanoptera	Thripidae	25-29	VS
5	31 <sup>th</sup> Jan to 5 <sup>th</sup> Feb 2021	Red Spider	<i>Tetranychus Spp.</i>	Arachnida	Unidentified	32-36	VS
6	6 <sup>th</sup> to 10 <sup>th</sup> Feb 2021	Spider	Unidentified	Arachnida	Unidentified	39-43	VS
7	12 <sup>th</sup> to 17 <sup>th</sup> Feb 2021	Thrips	<i>Thrips tabaci</i>	Thysanoptera	Thripidae	46-50	VS
8	19 <sup>th</sup> to 25 <sup>th</sup> Feb 2021	Spider	Unidentified	Arachnida	Unidentified	53-57	VS
9	27 <sup>th</sup> Feb to 4 <sup>th</sup> Mar. 2021	Spider	Unidentified	Arachnida	Unidentified	60-64	VS
10	6 <sup>th</sup> to 10 <sup>th</sup> Mar. 2021	Spider	Unidentified	Arachnida	Unidentified	66-70	VS
11	12 <sup>th</sup> to 19 <sup>th</sup> Mar. 2021	Red Spider	<i>Tetranychus Spp.</i>	Arachnida	Unidentified	70-76	VS
12	21 <sup>th</sup> to 26 <sup>th</sup> Mar. 2021	Red Spider	<i>Tetranychus Spp.</i>	Arachnida	Unidentified	80-82	RS
13	28 <sup>th</sup> to 3 <sup>th</sup> Apri. 2021	Spider	Unidentified	Arachnida	Unidentified	85-90	RS
14	5 <sup>th</sup> to 11 <sup>th</sup> Apri. 2021	Spider	Unidentified	Arachnida	Unidentified	92-98	RS
15	13 <sup>th</sup> to 20 <sup>th</sup> Apri. 2021	Spider	Unidentified	Arachnida	Unidentified	100-105	MS
16	22 <sup>th</sup> to 25 <sup>th</sup> Apri. 2021	Thrips	<i>Thrips tabaci</i>	Thysanoptera	Thripidae	108-110	MS
17	26 <sup>th</sup> to 30 <sup>th</sup> Apri. 2021	Thrips	<i>Thrips tabaci</i>	Thysanoptera	Thripidae	112-116	MS

VS = Vegetative Stage RS= Reproductive Stage (Flowering /Fruiting Stage), MS = Maturity Stage, DAS (Days after Spray)

A collection of data on the succession of insects on onions revealed that one Thysanoptera species and two unidentifiable Arachnida species, which corresponded to one insect pest, one non-insect pest, and one natural enemy species, emerged at different stages of crop growth. Bele *et al.*, (2021) <sup>[10]</sup> the experiment entitled qualitative and quantitative Succession of insect pests and their natural enemies on onion crop were observed. Quantitative Estimation of insect pest the mean population of onion thrips maximum population 4.74 N & A/ plant and minimum population 2.68 N & A / plant was noted. Pod borer (*H. armigera*) peak infestation 0.64 larva/pant. The lowest population (0.06 larva/ plant) was noted.

### Conclusion

This study provides valuable insights into the succession of insect pests affecting onion crops, particularly highlighting the presence of thrips and various spider species throughout different growth stages. Understanding these dynamics is crucial for implementing effective pest management strategies to mitigate potential yield losses in onion

cultivation. Further research focusing on integrated pest management could enhance sustainable production practices for this important vegetable crop globally.

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