

## OCCURRENCE OF INSECTS- PESTS AND NATURAL ENEMIES ON NIGER IN NORTHERN HILLS OF CHHATTISGARH

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**Abstract:** The present experiment was conducted at experimental area of Research-cum-Instructional Farm at Raj Mohini Devi College of Agriculture and Research Station, Ambikapur (C.G.), during the period of study from 27<sup>th</sup> August 2021 to 2<sup>nd</sup> December 2021 at different stages of crop. The niger variety JNC-9 was sown and investigation revealed that nine species of insect-pests and three species of natural enemies. The crop was infested by leaf hopper, green stink bug, red pumpkin beetle, flea beetle, bihar hairy caterpillar, green semilooper, tobacco caterpillar, niger caterpillar and semilooper at the different crop growth stages and lady bird beetle, dragonfly and spider were recorded as a natural enemies.

**Keywords:** Insect-pests, Natural enemies, Niger, Occurrence

### INTRODUCTION

Niger, *Guizotia abyssinica* (L.f.) Cass. is an oil bearing crop and belonging to the Compositae family. It is commonly known as ramtil in Hindi. It is originated from Ethiopia and spread to other countries. It's is highly ubiquitous in distribution, mostly India and Ethiopia. Niger seed is mainly used for the extraction of edible oil and contains a proportion of edible oil (38 to 40%), protein (18 to 24%), sugar (12%) and minerals essential for human and animal consumption (Getinet and Teklewold 1995).

In Chhattisgarh, Niger is cultivated over 0.36 lakh ha area with a production of 0.069 lakh tonnes and productivity of 190 kg ha<sup>-1</sup>. Seed yield of niger crop is lower, causes of many factors including that the cultivation by resource, poor farmer on marginal soils and under grown were rainfed conditions as well as also damages causing by insect pests, diseases and weeds in the lack of appropriate management and low yielding capacities of the cultivars.

Niger is a wild-growing, ecofriendly as well as less labour needed crops but seed yield of niger crop is lower, causes of various biotic factors including many insect pests are harshly decrease the growth and production of niger crop. Here, the concern a brief introduction to the biotic condition and their preventive measure for the maximum productivity (Goyal *et al.* 2022).

So one of the major limitation in the niger production of can be assigned to many insect pests causing damage at time of different stages of crop growth. Among the insect pest *Condica conducta*, *Taylorilygus pallidulus*, *Thysanoplusia orichalcea*,

*Helicoverpa armigera*, *D. sororcula* and *S. litura* and recorded of miner pests are *Spodoptera exigua*, *Pyrgomorpha bispinosa-conica*, *Uroleucon carthami*, *Bemisia tabaci*, *Nezara viridula*, *Chrotogonus trachypterus*, *Amrasca biguttula* and *Odontotermes obesus* and also caused crop damage were *Agrotis* sp. and *Spilosoma obliqua* on the niger. (Basappa and Singh 1990). Jacob *et al.* (2000) recorded of *Amrasca devastans* in oilseed crops included niger (*Guizotia abyssinica*) crop in different areas of Andhra Pradesh in India.

### MATERIALS AND METHODS

A field experiment was carried out at experimental area of Research-cum-Instructional Farm at Raj Mohini Devi College of Agriculture and Research Station, Ambikapur (C.G.), during *Kharif* 2021. JNC-9 variety of niger was sown and following the standard package and practices of the crop. Observation on the occurrence of various insect-pests and natural enemies were recorded on ten plants randomly selected from three locations of the experimental area. It is started after sowing and continued up to the harvesting of the crop. The plot was kept free from insecticidal treatments.

### RESULTS AND DISCUSSION

The observation presented in Table 1. that occurrence of insect- pests and natural enemies, recorded of the nine species of insect - pests were found belonging to order Hemiptera, Coleoptera and Lepidoptera and three species of natural enemies were found belonging to order Coleoptera, Odonata and Araneae, during the period of study from 27<sup>th</sup>

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August 2021 to 1<sup>st</sup> December 2021 at different stages of niger crop in Ambikapur, Surguja district, Chhattisgarh.

The scenario with respect to insect pests of this crop has been changed in the recent past. The present findings, leaf hopper, green stink bug, red pumpkin beetle, flea beetle, bihar hairy caterpillar, green semilooper, tobacco caterpillar, niger caterpillar and semilooper were insect pests. Lady bird beetle, dragonfly and spider were natural enemies.

**Occurrence of leaf hopper**

Leaf hoppers were observed on the crop when it was 11 days after sowing and it remained upto 16<sup>th</sup> November 2021. They are suck the cell sap from foliage of the crop.

**Occurrence of green stink bug**

Green stink bug were observed on the crop when it was 39 days after sowing and it remained upto 23<sup>th</sup> November 2021. The nymph and adult suck the cell sap from the foliage.

**Occurrence of Flea beetle**

Flea beetle bug were observed on the crop when it was 46 days after sowing and it remained upto 23<sup>th</sup> November 2021. They are feed on surface on the leaves.

**Occurrence of Red pumpkin beetle**

Red pumpkin beetle were observed on the crop when it was 46 days after sowing and it remained upto 23<sup>th</sup> November 2021. They are feed on surface on the leaves and flowers.

**Occurrence of Bihar hairy caterpillar**

Bihar hairy caterpillar was observed on the crop when it was 25 days after sowing and it remained upto 30<sup>th</sup> November 2021. The early stages larvae gregariously feed underneath leaves and final instar larvae start feeds on the leaves margins.

**Occurrence of Green semilooper**

Green semilooper was observed on the crop when it was 32 days after sowing and it remained upto 9<sup>th</sup> November 2021. The larvae feed on the leaves and defoliate the plant.

**Occurrence of Tobacco caterpillar**

Tobacco caterpillar was observed on the crop when it was 18 days after sowing and it remained upto 26<sup>th</sup> October 2021. It's caterpillars feed on the leaves and defoliate the plant.

**Occurrence of Semilooper**

Semilooper was observed on the crop when it was 46 days after sowing and it remained upto 30<sup>th</sup> November 2021. Semiloopers feed on the leaves and defoliate the plant.

**Table 1.** Insect pests and natural enemies on niger crop during *Kharif 2021*.

S. No.	Common name of insect pests/ Natural enemies	Scientific name	Order	Family	Crop age (DAS)	Period of activity	Crop stage
1.	Leaf hopper	<i>Amrasca</i> sp.	Hemiptera	Jassidae	11	7 <sup>th</sup> Sep. to 16 <sup>th</sup> Nov.	SS
2.	Green stink bug	<i>Nezara viridula</i>	Hemiptera	Pentatomidae	39	5 <sup>th</sup> Oct. to 23 <sup>th</sup> Nov.	VS/MS
3.	Flea beetle	<i>Altica</i> sp.	Coleoptera	Chrysomelidae	46	12 <sup>th</sup> Oct. to 23 <sup>th</sup> Nov.	FS
4.	Red pumpkin beetle	<i>Aulacophora foveicollis</i>	Coleoptera	Chrysomelidae	46	12 <sup>th</sup> Oct. to 23 <sup>th</sup> Nov.	FS/MS
5.	Bihar hairy caterpillar	<i>Spilosoma obliqua</i>	Lepidoptera	Arctiidae	25	21 <sup>th</sup> Sep. to 30 <sup>th</sup> Nov.	VS/MS
6.	Green semilooper	<i>Thysanoplusia orichalcia</i>	Lepidoptera	Noctuidae	32	28 <sup>th</sup> Sep. to 9 <sup>th</sup> Nov.	VS
7.	Tobacco caterpillar	<i>Spodoptera litura</i>	Lepidoptera	Noctuidae	18	14 <sup>th</sup> Sep. to 26 <sup>th</sup> Oct.	VS
8.	Niger caterpillar	<i>Condica conducta</i>	Lepidoptera	Noctuidae	39	5 <sup>th</sup> Oct. to 9 <sup>th</sup> Nov.	VS
9.	Semilooper	<i>Achea janata</i>	Lepidoptera	Noctuidae	46	12 <sup>th</sup> Oct. to 30 <sup>th</sup> Nov.	FS
(Natural enemies)							
10.	Lady bird beetle	<i>Coccinella</i> sp.	Coleoptera	Coccinellidae	18	14 <sup>th</sup> Sep. to 30 <sup>th</sup> Nov.	VS/MS
11.	Dragon fly	<i>Crocotrhemis</i> sp.	Odonata	Libellulidae	25	28 <sup>th</sup> Sept. to 19 <sup>th</sup> Oct.	VS
12.	Spider	<i>Clubiona</i> sp.	Araneae	Clubionidae	39	5 <sup>th</sup> Oct. to 2 <sup>nd</sup> Nov.	VS
SS= Seedling stage, VS= Vegetative stage, FS= Flowering stage and MS= Maturity stage.							

**Plate: 1** Occurrence of insect pest in niger crop during *Kharif* 2021



Fig.(a) Adult of *Amrasca* sp.



Fig.(b) Adult of *Nezara viridula*



Fig.(c) Adult of *Altica* sp.



Fig.(d) Adult of *Aulacophora foveicollis*



Fig.(e) Caterpillar of *Spodoptera litura*



Fig.(f) Caterpillar of *Condica conducta*



Fig.(g) Caterpillar of *Thysanoplusia orichalcia*



Fig.(h) Caterpillar of *Achea* sp.

**Plate: 2** Occurrence of natural enemies in niger crop during *Kharif* 2021Fig.(i) Different stage larvae of *Spilosoma obliqua* on niger crop

Fig.(a) Dragonfly



Fig.(b) Spider



Fig.(c) Lady bird beetle

#### Occurrence of Lady Bird beetle

Lady bird beetle were observed on the crop when it was 18 days after sowing and it remained upto 30<sup>th</sup> November 2021.

#### Occurrence of Dragon fly

Dragon fly were observed on the crop when it was 25 days after sowing and it remained upto 19<sup>th</sup> October 2021.

#### Occurrence of Spider

Spider was observed on the crop when it was 39 days after sowing and it remained upto 2<sup>nd</sup> November 2021.

Among the insect pests, two species were recorded from Hemiptera, two species from Coleoptera and five species from Lepidoptera order. Although natural enemies Lady bird beetle, dragonfly and spider from the order Coleoptera, Odonata and Araneae, respectively. Sandipan *et al.* (2016) was survey on the niger crop, that infested by the pests .Apart from that, in pest incidence hairy caterpillars was observed in scattered in uniform population. whereas, the population of whiteflies and aphids was not recorded in the niger crop during the experiment. Biswas and Das (2011) observed insects and mite diversity in the oil bearing crops in Bangladesh, including niger crop and found hairy caterpillar, niger caterpillar, common cutworm, black cutworm, leaf hoppers, aphid, green grasshopper and leaf beetle. Observed insect- pests on the niger *i.e.* aphids (*Dactynotus carthami*), capsule fly (*Dioxya sororcula* Wied.), leaf hopper (*Amrasca biguttula*), white fly (*Bemisia tabaci*), green bug (*Nezara viridula*), green semilooper (*Thysanoplusia orichalcea*) and mirid bug (*Taylorilygus pallidulus*). Painkra, *et al.* (2015). Who recorded various insect pollinators/visitors visiting on niger crop (*Guizotia abyssinica* cass.).

#### CONCLUSION

From the present study it can be concluded that a many species of insect pests infested niger crop. Hence, overall 9 insect pests (2 sap feeders, 2 foliage

feeders and 5 defoliators) and 3 natural enemies were observed on the niger crop, during *Kharif* 2021.

#### REFERENCES

**Basappa, H. and Singh, V.** (1990). Record of insect pests on niger. *Journal of Oilseed Research*, 7(2): 86-87.

[Google Scholar](#)

**Biswas, G. C. and Das, G. P.** (2011). Insect and mite pests diversity in the oilseed crops ecosystems in Bangladesh. *Bangladesh Journal of Zoology*, 39(2): 235-244.

[Google Scholar](#)

**Getinet, A. and Teklewold, A.** (1995). An agronomic and seed-quality evaluation of niger (*Guizotia abyssinica* Cass.) germplasm grown in Ethiopia. *Plant Breeding*. 114: 375-376.

[Google Scholar](#)

**Goyal, V. K., Agrawal, N., Jain, M., Bisen, R. and Tripathi, R.**, (2022). Niger (*Guizotia abyssinica* (L. f.) Cass.) an Oilseed Crop under Biotic Stress. In *Managing Plant Production Under Changing Environment* (pp. 135-149). Springer, Singapore.

[Google Scholar](#)

**Jacob, P.S., Ramasubbarao, V. and Punnaiah, K.C.** (2000). Leafhopper fauna associated with oilseed crops in Andhra Pradesh, India. *Pest Management and Economic Zoology*, 8(1): 11-27.

[Google Scholar](#)

**Painkra, G. P., Shrivastava, Shiv K., Shaw, S. S. and Gupta, R.** (2015). Succession of various insect pollinators/visitors visiting on niger crop (*Guizotia abyssinica* cass.). *Internat. J. Plant Protec.*, 8(1): 93-98.

[Google Scholar](#)

**Sandipan, P. B., Jagtap, P. K., Rathod, N.K. and Patel, M. C.** (2016). Survey of various pests and diseases of niger (*Guizotia abyssinica* Cass) crop under tribal belts of south Gujrat. *Journal of Plant Development Sciences*, 8(5): 227-230.

[Google Scholar](#)

