

Insect- pest complex of *Clerodendrum indicum* (L.) Kuntze in North-East India

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Abstract: *Clerodendrum indicum* (L.) Kuntze, a weed in the genus *Clerodendrum* is gaining worldwide recognition and importance because of its ethno-medical uses, anti-inflammatory, anti-rheumatism, anti-bronchitis and febrifuge properties. Perusal of literature revealed that no work has been done on insect pest complex of *C. indicum* from North East India. Therefore, an attempt was made to record different insect pest occurring on *Clerodendrum indicum*. Study on insect pest complex was done from August 2012 to February 2014 at the Instructional-Cum-Research (ICR) Farm and herbal garden of Assam Agricultural University, Jorhat. Observations revealed the occurrence of 8 species of phytophagous pests belonging to different orders. Out of 8 species, 6 were recorded as defoliators and 2 as sap suckers.

Key words: *Clerodendrum indicum*, defoliators, herbal garden, Instructional-Cum-Research (ICR) Farm, pest complex, sap suckers.

INTRODUCTION

Clerodendrum indicum (L.) Kuntze, a weed belonging to the family Lamiaceae and order Lamiales is a native to India. It belongs to the genus *Clerodendrum* which contains approximately 342 to 369 species. This particular weed is gaining importance as well as demand because of its ethno-medical uses and anti-inflammatory, anti-rheumatism, anti-bronchitis and febrifuge properties (Shrivastava and Patel, 2007). Apart from all these medicinal properties, new researches have considered *C. indicum* as an anti HIV-1 agent and showed an outstanding property of partially curing the Acquired Immuno-Deficiency Syndrome (AIDS) by using the whole plant (Bunluepuech and Tewtrakul, 2009). Out of several production constraints, insect pests are the major biotic factors causing severe damage to the crop. So it was felt essential to know the different insect pests attacking *C. indicum* plant to formulate suitable management practices. Observations made from August, 2012 to February, 2014 revealed the occurrence of 9 species

of phytophagous pests belonging to different orders viz., Lepidoptera (5 species), Coleoptera (2 species) and Hemiptera (2 species). These pests were categorized as defoliators (7 species) and sucking pests (2 species). The pests belonging to the order Lepidoptera were found in abundance (5 species) followed by Hemiptera (2 species) and Coleoptera (2 species).

MATERIALS AND METHOD

Method of survey

Fixed plot survey was carried out at the ICR Farm and herbal garden of Assam Agricultural University, Jorhat to record the insect pest associated with the selected medicinal plant *C. indicum* during August, 2012 to February, 2014. The observations were made at weekly interval. The observations were made either daily or at 2-3 days interval. For sampling, five plants were selected randomly in each plot of 2x2 sq. m from the selected surveyed areas of 80x40 sq. m and 20x10 sq. m. The

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samples were collected separately and brought to the laboratory, where these samples were observed under the stereo-binocular microscope. The immature stages were collected and reared under laboratory condition till the emergence of the adults. The collected adult insects were killed in ethyl acetate, mounted by pinning or paper for future taxonomic study. Soft body insects were preserved in 70% alcohol. The important taxonomic character of the collected specimen were identified by using dichotomous keys, visual observation and confirmed with the help of published nature guide. The specimen also sent to Indian Agricultural Research Institute, New Delhi for proper identification.

RESULTS AND DISCUSSION

Observations made during August, 2012 to February, 2014 revealed the occurrence of 9 species of phytophagous pests belonging to different orders viz., Lepidoptera (4 species), Coleoptera (2 species) and Hemiptera (2 species). These pests were categorized as defoliators (6 species) and sucking pests (2 species). The pests belonging to the order Lepidoptera were found in abundance (4 species) followed by Hemiptera (2 species) and Coleoptera (2 species) (Table 1 & 2). Major pests which caused significant damage were *Hyposidra talaca* Walker, *Aulacophora foveicollis* Lucas, *Aphis craccivora* Koch, *Euproctis fraterna* Moore. Details pertaining to insect pests, plant parts infested and period of activity are given as under.

1. *Hyposidra talaca* Walker

The larvae of *Hyposidra talaca* Walker, belonging to the order Lepidoptera and family Geometridae were found defoliating the leaves of *C. indicum* plants during August, 2012 to January, 2014. Sinu *et al.* (2011) and Chutia *et al.* (2012) reported the same pest on tea plantation from West Bengal and Jorhat. From the observations, it was found that the early instar larva cut small holes along the margin whereas the full grown larva fed voraciously on matured leaves, initially from the margin towards the mid rib, leaving the mid rib uneaten. Similar feeding pattern was observed by Uniyal and Singh (2010); Chutia *et al.* (2012) on *Perilla frutescens* and tea from

Dehradun and Jorhat. Earlier, the insect had been reported to feed on twenty five host plants including weeds (Browne, 1968) over the world.

2. *Aulacophora foveicollis* Lucas

Aulacophora foveicollis Lucas (Coleoptera: Chrysomelidae) was predominant from March to June, 2013 with maximum population of 2 beetles/plant recorded in the month of May, 2013. At mature stage of the crop the adults caused damage to the leaves and tender parts by scraping the epidermal layer in a very characteristic manner leaving a netted pattern. The incidence of *A. foveicollis* resulted in complete defoliation. The pest fed on the leaves from the margin, gradually moved towards the mid rib, giving a zig zag pattern. During heavy infestation no leaves could be seen and even the mid ribs of the leaves were eaten up by the pest. As a result of heavy infestation the plants dried and wither up. However, this particular pest is considered as a major pest of cucurbitaceous crops. Saljoqi and Khan (2007) and Hassan *et al.* (2012) reported this pest from Peshawar and Bangladesh as one of the most important constraints to cucurbit production capable of causing 30-100 per cent yield loss.

3. *Myllocerus discolor* Fab.

The ash weevil, *Myllocerus discolor* Fab. (Coleoptera: Curculionidae) was also observed on *C. indicum* plant during the month of August, 2012. Hanumanthaswamy (1992) and Ramanna (2009) reported the same weevil on *Coleus* from GKVK Bangalore and Dharwad.

4. *Aphis craccivora* Koch

Among the sucking pests *Aphis craccivora* Koch (Hemiptera: Aphididae) was recorded as a major pest on *C. indicum* plants. Both nymph and adults were found to suck the sap from lower surface of the leaves and terminal portion of shoots during August, 2012 to February, 2014. The population of *A. craccivora* commenced from August, 2012 (0.68 aphid/10 cm terminal shoot) till February, 2013 (2.56 aphids/10 cm terminal shoot). The peak population was recorded during the month of November, 2012 with an average of 21.20 aphids/10 cm terminal shoot followed by December, 2012 (13.44 aphids/

10 cm terminal shoot). Similarly, highest population of *A. craccivora* was recorded during the month of November, 2013 with an average population of 15.77 aphids/10 cm terminal shoot followed by December, 2013 (11.45 aphids/10 cm terminal shoot). The incidence of aphids led to the development of sooty mould on infested parts. The aphids were noticed in association with ants. Sithanatham *et al.* (1984) reported the occurrence of *A. craccivora* Koch on chickpea from Hissar, India. Similar feeding pattern was reported by Ofuya (1997), Schreiner (2000) and Souleymane *et al.* (2013) on cowpea from Nigeria and Guam. Barman and Dutta (1995) reported the seasonal incidence of this aphid on summer green gram from Jorhat, Assam.

5. *Nezara viridula* Linn.

Both nymph and adults of Green stink bug, *Nezara viridula* Linn. (Hemiptera: Pentatomidae) were found sucking the sap from leaves and stems of *C. indicum* plants in the month of October, 2012. Kumar (2007) reported *Nezara viridula* Linn. on *Coleus* from Raichur. Souza *et al.* (2013) reported this pest on soybean from Brazil.

6. *Thysanoplusia orichalcea* Fab.

The larvae of *Thysanoplusia orichalcea* Fab. (Lepidoptera: Noctuidae) were also found feeding on *C. indicum* plants during the month of January, 2014. Sagar (1985 and 1988) reported this pest as a key pest of *Mentha arvensis* Linn. Kumar (2003) reported this pest as the major pest out of nine species of insect infesting *Bunium persicum*. Revannavar *et al.* (2004) and Nayaka *et al.* (2012) reported this pest on sunflower and soyabean crops from Karnataka

7. *Parasa lepida* Cramer

The larvae of *Parasa lepida* Cramer (Lepidoptera: Limacodidae) were found feeding on the same plant species during the month of August – September 2012. Kalshoven (1981) reported that *Parasa lepida* Cramer is a notorious pest of fruit trees, damaging coconuts, coffee, mango and cocoa from Indonesia. Kapoor *et al.* (1985); Jeyabalan and Murugan (1996) reported it on mango from India.

Table 1
Pest recorded on *Clerodendrum indicum* (L.) Kuntze at ICR Farm, AAU

Sl. No.	Pest species	Order/Family	Pest status
DEFOLIATORS			
1.	<i>Hyposidra talaca</i> (Walker, 1860)	Lepidoptera : Geometridae	Major, Phytophagous
2.	<i>Aulacophora foveicollis</i> (Lucas, 1849)	Coleoptera : Chrysomelidae	Major, Phytophagous
3.	<i>Euproctis fraterna</i> (Moore, 1883)	Lepidoptera : Lymentriidae	Major, Phytophagous
4.	<i>Thysanoplusia orichalcea</i> (Fabricius, 1775)	Lepidoptera : Noctuidae	Minor, Polyphagous
5.	<i>Myllocerus discolor</i> (Schoenherr, 1826)	Coleoptera : Curculionidae	Minor, Phytophagous
6.	<i>Parasa lepida</i> (Cramer, 1799)	Lepidoptera : Limacodidae	Minor, Phytophagous
SUCKING PESTS			
7.	<i>Aphis craccivora</i> (Koch, 1854)	Hemiptera : Aphididae	Major, Phytophagous
8.	<i>Nezara viridula</i> (Linnaeus, 1758)	Hemiptera : Pentatomidae	Minor, Phytophagous

Table 2
Pest recorded on *Clerodendrum indicum* (L.) Kuntze at Herbal garden, AAU

Sl. No.	Pest species	Order/Family	Pest status
DEFOLIATOR			
1.	<i>Aulacophora foveicollis</i> (Lucas, 1849)	Coleoptera : Chrysomelidae	Major, Phytophagous

8. *Euproctis fraterna* Moore

Another defoliator, *Euproctis fraterna* Moore (Lepidoptera: Lymentriidae) was found to cause serious damage during the month of April to July, 2013. From the observations, it was recorded that the early instar larvae were gregarious, fed voraciously on a single leaf. However the later instars fed solitarily on nearby leaves. The larvae fed on the leaves initially from the margin, gradually they moved towards the mid rib. Venkatesha *et al.* (1992) reported this pest as an important forest pest which feeds on the foliage of many dicotyledonous tree species. They also reported this pest defoliating the important forest tree *Terminalia arjuna*. Ram and Pathak (1987) reported this pest on Guava from Manipur.

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