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Pests Associated with Orchid *Dendrobium nobile* under Mid-Altitude of Sikkim

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Abstract

Plants of *Dendrobium nobile* were infested by the different pest during the year. Biosdual scale *Diaspis boisduvali* suck the sap round the year from leaves and cane and weaken the plant. Shoot borer *Peridaedala* sp. observed to cause damage during June—September by boring into the shoots. Aphid *Macrosiphum luteum* such the sap from new shoot, bud and flower during March–June. Thrips *Dichromothrips nakahari* puncture flowers and suck up the exuding sap causes them flecked and deformed. False spider mite *Brevipalpus essigi* suck out plant juices from leaves and flowers and make them abortive. Snails *Cryptaustenia verrucosa* and *C. heteroconcha* damage the plants by gnawing cane, leaves, stem and inflorescence. Most of the pests observed in the present investigation have been seen to damage orchid *D. nobile* for the first time.

Key words : Pests, *Dendrobium nobile,* Sikkim.

Orchid *Dendrobium nobile* a lovely plant known for its beautiful flowers is highly ornamental in full bloom flowered during March to May. They are known as one of the most colorful species in the orchid world and most commonly grown among *Dendrobium* species. It is widespread throughout parts of India, China and southeast Asia where it grows in deciduous forests at an elevation of 200 to 2,000 meters. Indeed *D. nobile* with in its many forms and varieties is a grand species and is probably one of the most popular orchids in cultivation. *D. nobile* has been the parent in extensive breeding programs to the degree where these hybrids are known as Nobile Dendrobiums. *D. nobile* has also been the basis of a colorful line hybrids known as Yamamoto Dendrobiums. Besides ornamental use the plant have many medicinal uses and this species is cultivated as a medicinal plant in China. The whole plant contains mucilage and the alkaloid dendrobine. It is antiphlogistic, pectoral, stomachic and as a tonic used in Vietnam for the treatment of pulmonary tuberculosis, general debility, flatulence, dyspepsia, reduced salivation, parched and thirsty mouth, night sweats, fever and anorexia (1). Several sesquiterpene alkaloids, sesquiterpene glycosides, sesquiterpenoids, dendrbine type alkaloid, phenanthrenoids bibenzyles, coumarins have been reported from *D. nobile* up till now (2). Knowing the immense potential in *D. nobile,* plants have been collected and have been conserved, characterized and multiplied for further commercial utilization. Observations showed that pest invasion is known to significantly impair the production of *D. nobile.* In this communication a compressive report on insects associated with *D. nobile* and damage caused by them under mid-altitude of Sikkim is presented.

Methods

Plants of *D. nobile* collected from Northeastern Himalayan region have been conserved at National Research Center for Orchids, Pakyong, Sikkim which is situated at the elevation of 1,300 m between $27^0 4'$—$28^0 7' 48''$ N and $88^0 58''$—$88^0 5' 25''$ E longitude experiences average maximum temperature 17—28 C and minimum 6—20 C, maximum relative humidity of 81—95% and minimum 43—73%. Pakyong receives an average annual rainfall about 300 cm. In total 216 Dendrobium nobile plants grown in pot under open polyhouse have been taken for observations. Visual observations have been recorded during 2004–06 on pests association ; damage caused by them and stays on the host plants during the year.

Table 1. Extent of damage caused by the pests associated with orchid *Dendrobium nobile.*

	Name of pest	Plant portion affected	Duration of occurrence	Extent of damage to plants and flowers (%)
1	Boisduval scale *Diaspis boisduvali*	Leaf, cane	Round the year	44
2	Yellow aphids *Macrosiphum luteum*	New shoot, bud and flower	Feb–Jun	32
3	Shoot borer *Peridaedala* sp.	Shoot	Jun–Oct	37
4	Thrips *Dichromothrips nakahari*	Flowers	Apr–May	45
5	Yellow beetle *Anomala* sp.	Flower	Apr–May	10
6	False spider *Brevipalpus essig*i	Leaf, flower	Round the year	25
7	Snails *Cryptaustenia verrucosa* and *C. heteroconcha*	Cane, leaf flower	May–Sep	23

Results and Discussion

The pest associated with the *D. nobile* that cause damage is summarized in Table 1. All the pests are described and discussed as follows. Boisduval scale *Diaspis boisduvali* suck plant juices from leaves, canes, roots and flower and cause loss of vigor, deformation of infested plant parts, yellowish spots on leaves, loss of leaves, and even death of the plant. Toxic saliva injected by these scale while feeding causes necrosis of tissue at the feeding site and even small infestation cause extensive discoloration and large populations usually kill the host (3). These scales are widely distributed throughout the tropics and subtropics and occur under glass in temperate areas (4, 5), have been recorded from hosts belonging to 44 genera in 15 plant families (6). There are reports of orchids like *Cattleya, Dendrobium, Epidendrum, Oncidium* and *Vanda,*as the chief host of boisduval scale (7, 8).

Nymph and adults of yellow aphids *Macrosiphum luteum* suck the sap from new shoot, flower bud and opened flower. Due to sap extraction flower turned to malformed or even failed to open. Affected plants retard growth and flower quality affected. They excrete honeydew on which sooty mold attracted. High humidity and cloudy weather fasten the population build up. Present literature revealed that this aphid have been reported to infest orchids of the genera *Oncidium, Cattleya, Lycaste, Brassia, Epidendrum, Laelia* and *Castsetum* (9).

Shoot borer *Peridaedala* sp. observed to cause damage during rainy season and disappear at the end of the season. Adult moth is black in color and larvae, greenish yellow. Eggs are laid on new shoot and emerging larvae bore downward, feeding on stem/cane. Larval excreta can be seen coming out from the hole made by larvae. Pupation takes place inside the tunnel. Further growth of plant arrested and flower production gets affected. Dead shoots or yellow shoots flag on the stem observed. The pest was observed to cause significant damage on many species of orchids including *D. nobile* (10).

Thrips *Dichromothrips nakahari* puncture flowers with their mouth parts and suck up the exuding sap causes them flecked and deformed. Thrips can be found in greatest numbers between floral sheaths.

Yellow beetle *Anomala* sp. feed on petals of *D. nobile* during May when these orchids comes to flower. Beetle pest appears on the onset of and disappeared after rainy season is over. The group of scarabaeid beetles is widespread and found to damage many crops all over world like sugarcane, sweet potato, potato,brinjal and so on.

False spider mite *Brevipalpus essigi* has been discovered in large numbers, feed first along midribs of leaves and then disperse outward. They puncture epidermis of the leaf and suck out plant juices. The damaged leaves were severely discolored with large necrotic areas either side of midrib. Closer observations determined these to be individual sunken spots caused by the mites feeding which had coalesced into a fine red/brownish speckling over the leaf surface. On several leaves these speckling formed a distinctive diamond pattern increasing in intensity from the center outwards. Remaining portions of the leaf surfaces were distinctively chlorotic. These mites also infest flowers and make them abortive. False spider mites do not produce webbing.

Snail *Cryptaustenia verrucosa* and *C. heteroconcha* have been found to damage the plants by gnawing cane/stem, and inflorescence (spike) dur-

ing night hours and hide under dark during day light and thereby destroy the crop. Snails are more prevalent in moist and moderate temperature of rainy season.

Conclusion

Plants of *D. nobile* were infested by different pests during the year. All plant parts viz. leaves, stem, bud, flowers and inflorescence suffered damage in different degrees. Most of the pests observed in the present investigations have been seen to damage orchids for the first time. Therefore damage by serious pests receives importance in orchid cultivation and paved way for crop protection.

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