



OCCURRENCE OF *THOSEA SINENSIS* WALKER, COCONUT CUP MOTH, (LEPIDOPTERA: LIMACODIDAE) ON APPLE PLANTATIONS (*MALUS DOMESTICA* BORKH.) FOR THE FIRST TIME IN JAMMU PROVINCE OF J&K STATE

Ruchie Gupta¹ Ravinder Sharma² & Sheetal Rani²

¹Department of Zoology, University of Jammu, Jammu-180 006, J&K, India

²Temperate Sericulture Research Institute, Mirgund SKUAST-K

ABSTRACT

Thosea sinensis Walker has been recorded for the first time on apple plantations in various areas of Jammu province, Jammu and Kashmir. Caterpillars cause extensive damage to the apple plantations by feeding extensively on the leaves of the plants of all ages, especially damages young apple trees in nurseries and new leaves of apple trees. Information regarding host plants, distribution, morphology and some biological aspects of the insect has been worked out by the present author. Detailed investigations with regards to their bio-ecological studies and control measures are immediately warranted as they are likely to become potential danger to apple industry in future.

KEY WORDS: *Thosea sinensis* Walker, occurrence, Lepidoptera, voracious, Limacodidae.

INTRODUCTION

Thosea sinensis Walker (Lepidoptera: Limacodidae), also known as coconut cup moth has been recorded as an important emerging insect pest which though causes considerable damage to the apple plantations in the apple growing areas *i.e.* Bhaderwah, Batote and Kishtwar of Jammu province during the period from March, 2009 to Feb, 2012. Information regarding host plants, distribution, morphology and some biological aspects of the insect has been worked out by the present author. Considerable interest should be given for the detailed study of this insect pest as a minor pest of today may become major tomorrow.

MATERIALS & METHODS

Field studies were conducted in all the apple growing areas of Jammu province for detailed investigations of *Thosea sinensis* Walker. Regular visits are made to stations *viz.* Bhaderwah, Batote, Kishtwar, Mandi, Budhal and Kud areas of Jammu province during 2009-2012 to record the distribution, extent of damage, biological and ecological observations regarding *Thosea sinensis*. The insect was collected by traditional methods of handpicking and by using nets. Larvae were collected from the field and reared under laboratory conditions.

OBSERVATIONS

Distribution

The pest is worldwide in distribution and the genus *Thosea* has South East Asian distribution occurring in Peninsular Malaysia, Java, Sumatra, Borneo, Sulawesi (Cock *et al.*, 1987), Central Province (French, 2003), Indonesia

(Kalshoven, 1981), Singapore (Leong and D'Rozario, 2010), Korea, China (Leech, 1889; Seitz, 1912, Zhonguan *et al.*, 2000; Solovyev and Witt, 2009), Thailand (Leksawasdi *et al.*, 2003), Malaysia (Wood, 1968; Ariffin and Barsi, 2000; Xue *et al.*, 2000; Wood and Neskit, 1969), Vietnam (Niguyenhai *et al.*, 1998) and Taiwan (Hu and Wang, 1969). In India the pest has been recorded from Tamil Nadu (Ponnamma and Babjan, 1997 and Subbarao *et al.*, 1976), Jodhpur (Sundararaj and Murugesan, 1997), Kerala (Dhileepan, 1992), Himachal Pradesh (Chander, 1983) and Jammu and Kashmir

Host plant

The pest is polyphagous and has been recorded from a variety of trees and plantations. It has been recorded from *Bhesa Paniculata* (Leong and D' Rozario, 2010), pomegranate, coffee, tea (French, 2003), coconut (Yueguan & Yangkun, 2002), Palms (French, 2003 and Ariffin and Barsi, 2000), Cowpea, *Calotropis*, *zizyphus*, *Azazia rubicans* and *Dolichos lablab* (Subbarao *et al.*, 1976), tea (Hu and Wang, 1969), oil palm (Sundararaj and Murugesan, 1997; Dhileepan, 1992; Wood and Nesbit, 1969), *Havea brassiliensis* (Niguyenhai *et al.*, 1998) and apple (Chander, 1983; Gupta, 2013).

Diagnostic features

Larvae are called as slug caterpillars because they are short, fleshy and slug like with small thoracic legs and no prolegs. Dorsal surface terminates just below the spiracles in a slight flange that is usually maintained in close contact with the substrate, larvae move with creeping motion, curiously shaped and conspicuously marked, broad oval and has a grey or green stripe along the back with coloured spots along the side. Larva apple green with

striking mid-dorsal patterns, exhibited rows of sub-dorsal and lateral scoli. Larvae are best characterised by the absence of prolegs and the presence of adhesive, sucker-like zones on the abdomen which sometimes secrete a viscous, slug-like trail on the host-plant foliage. The sub-dorsal scoli consisted of short spines radiating outwards, while the lateral scoli were more elongated, conical and elaborate. Locomotion peristaltic, thoracic legs minute and the head small, retracted beneath thoracic segments except when extended during feeding. Larva possesses two complete rows of spined scoli or tubercles on each side, one sub-dorsal (dorso lateral) and the other lateral, just above the row of spiracles. The lateral row never includes a full scolus on first abdominal segment, where the spiracle is displaced dorsally from the line of the rest; the scolus is sometimes visible as a small scobinate patch between the spiracle and the scolus of T₃; modifications include reduction or enlargement of scoli, differential loss, particularly of the sub-dorsals the scoli having developed from typical zygaenoid verrucae, there is an additional sub-spiracular row of tubercles. The spines of the tubercles or scoli also have urticating qualities; larva measured 31 mm in length and 21 mm in width (including lateral scoli). Pupation is in a hard, spherical, almost nut-like cocoon that is often anchored to the substrate by an irregular arrangement of silken threads. The moth emerges by cutting out a circular lid at one end.

Adult

Ochraceous, relatively stout usually invested with a dense pile of scales, and the forewings are also coarsely scaled, the scales arranged haphazardly rather than in rows; antennae bipectinate, wings well developed, fore wings and hind wings are dissimilar in venation and usually also in shape. The forewings are triangular as a rule, with the stem of vein M bisecting the cell on both fore and hind wings with modifications to the course of R₁ and of the cubital and anal vein; Rs in hindwing unbranched, no jugum or fibula, front and hind wings united by frenulum or by an expanded humeral angle of the hindwing, mouthparts usually in the form of a long proboscis; antennae knobbed at the tip, ocelli absent, front wings only slightly cleft, wings scaled throughout with some clear areas; tibial spurs short, hind wing with three anal veins, S_c and R_s widely separate beyond discal cell and base of R usually well developed; S_c and R_s in hind wings separate from base or fused for a short distance along basal half of cell.

Damage

Thosea sinensis Walker has been recorded for the first time on apple plantations in various areas of Jammu province, Jammu and Kashmir. Caterpillars are voracious feeders and cause extensive damage to the apple plantations. They extensively feed on the leaves of the plants of all ages, especially damages young apple trees in nurseries and new leaves of apple trees. The caterpillar feed voraciously on the leaves and eat away whole of the leaves leaving behind only the midribs.

REFERENCES

Ariffin, D. & Basri, M.W. (2000) Intensive IPM for management of oil palm pests. *Oil Palm Bulletin*, 52 (41): 1-14.

Chander, R. (1983) Green slug caterpillar, *Thosea cana* Walker, a new record on apple. *Bulletin of Entomology*, 24(2): 136-138.

Cock, M.J.W., Godfray, H.C.J. & Holloway, J.D. (1987) Slug and Nettle Caterpillars-The Biology, Taxonomy and Control of the Limacodidae of Economic Importance on Palms in South-east Asia. CAB International, Wallingford, UK: 270.

Dhileepan, K. (1992) Insect pests of oil palm (*Elaeis guineensis*) in India. *Planter*, 68(793): 183-191.

French, B.R. (2003) Insect pests of food plants of Papua, New Guinea. A compendium: 27-28.

Hu, C.C. & Wang, L.C. (1969) Study on *Thosea sinensis* Walker. *Taiwan Agricultural Quarterly*, 5(4): 107-115.

Leech, J.H. (1889) On the Lepidoptera of Japan and Corea.11. Heterocera, I. *Proceedings of Zoological Society of London*, 1888: 609-611.

Leksawadi, P., Thanyakam, A. & Duangsupa, C. (2003) Longan leaf eater. *Proceedings of 41st Kasetsart University Annual Conference, 3-7-February*: 326-334.

Leong, T.M. & D'Rozario, V. (2010) Final instar caterpillar and metamorphosis of *Thosea vetusta* (Walker, 1862) in Singapore (Lepidoptera: Limacodidae). *Nature in Singapore*, 3: 305-310.

Ponnamma, K.N. & Babjan, B. (1997) Addition to the insect fauna associated with oil palm in India. *Planter*, 73(856): 347-349.

Seitz, A. (1912) Macrolepidoptera of the World, 2: 339-347

Solovyev, A.V. & Witt, T.J. (2009) The Limacodidae of Vietnam. *Entomofauna*, 16: 33-229.

Subba Rao, P.V., Rangarajan, A.V. & Azeez Basha, A. (1976) Record of new host plants for some important crop pests in Tamil Nadu. *Indian Journal of Entomology*, 36(3): 227-228

Sundararaj, R. & Murugesan, S. (1997) Record of *Thosea bipartita* (Limacodidae: Lepidoptera) on *Azadirachta indica* (neem) from Jodhpur, India. *Indian-Forester*, 123(3): 261

Wood, B.J. (1968) *Pests of oil palms in Malaysia and their control*. Kuala Lumpur: Incorporated Society of Planters.

Wood, B.J. and Neskit, D.P. (1969) Caterpillar outbreaks on oil palms in eastern Sabah. *Planter, Kuala Lumpur*, 45(518): 285-299.

Xue, Z., Wang, Y. & Zhang, Y. (2000) Study on the spatial pattern of the larva of *Thosea sinensis* surviving in winter. *Journal of Jiangsu Forestry Science and technology*, 27 (4), 43-45.

Yueguan, F. & Yankun, X. (2002) Occurrence and control of coconut leaf beetle in China.

Zhong Guan, X., Yong Chang, W. & Yong Zhong, Z. (2000) A study on the spatial pattern of the larva of *Thosea sinensis* surviving in winter. *Journal of Jiangsu Forestry Science and Technology*: 27(4): 43-45.