RESEARCH NOTE

Infestation of tortoise beetle, *Cassida exilis* Bohemian (Coleoptera: Cassidinae) on Kinnow mandarin in India

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**ABSTRACT**: Kinnow Mandarin is an important citrus fruit crop of Punjab. Forty insect and mite pests have been recorded infesting different parts of Kinnow tree. During surveys for insect-pests of Kinnow Mandarin, adults of tortoise beetle, *Cassida exilis* Bohemian were observed for the first time in 2009 in the orchards of Punjab Agricultural University, and in farmers’ orchards in Ludhiana, Punjab, India during end June-September i.e. rainy reason. The adult cause damage to the leaves of Kinnow trees by scrapping and biting the green tissue, making small holes. As many as 23 holes were observed per leaf. Infested plants are easily recognizable because of typical feeding pattern of making small holes. The perusal of the literatures revealed that there is no record of incidence of *C. exilis* on Kinnow in India. So, it is concluded that Kinnow Mandarin is a new host plant for adult beetle, *C. exilis* from Punjab, India.

**Keywords**: Kinnow mandarin, Punjab, tortoise beetle

Kinnow Mandarin, a hybrid between King (*Citrus nobilis*) and Willow leaf (*Citrus deliciosa*) mandarins, is an important citrus fruit crop of Punjab. Forty insect and mite pests have been recorded infesting different parts of Kinnow tree (Singh *et al.*, 2013). Tortoise beetles belong to subfamily Cassidinae of the family Chrysomelidae (leaf beetles). The body of these beetles resemble like tortoise because of the forward and sideways extensions of the body, hence commonly called as tortoise beetles (Ghate *et al.*, 2003; Kalaichelvan *et al.*, 2004). Most of cassidine species feed on obnoxious weeds and serve as important biological control agents against weeds, while some are important pests (Maulik, 1919). World catalogue of the Cassidinae (Borowiec and Ewiètojañska, 2008) lists 2760 species and is also available in the form of an interactive manual on the web giving the synonymies, distribution, host plants, published literature and colour photographs for most of the species. *Cassida exilis* Bohemian is distributed in Bengal, Maharashtra and Tamil Nadu in India (Ghate *et al.*, 2003; Kalaichelvan *et al.*, 2004).

*Cassida exilis* Bohemian is one of the small Cassidinae (length about 4mm). It is quite common and easily recognized by elytra that are testaceous or light brown (golden in life) without any markings and with prothorax that is elliptical and slightly drawn forward in the middle. The disc of prothorax is smooth and glossy and slightly convex. Scutellum is triangular and smooth. Elytra are as broad at the base as prothorax, convex and with 9 rows fine rows of fine punctures but without any costae. There is a depression behind the scutellum on each side of the suture. Underside is pale shining. For other detailed characters, see Maulik (1919).

Regular surveys were conducted since 2004 in the three zones of Punjab *i.e.* South western arid zone, central plain zone and sub-montaneous zone along with fixed plot surveys in college orchard and new orchard of Punjab Agricultural University (PAU), Ludhiana for different insect-pests and natural enemies in Kinnow Mandarin. Different life stages of the insect-pests were collected and reared in Fruit Entomology Laboratory, Department of Fruit Science, PAU, Ludhiana. Samples of insect-pests and natural enemies were sent to concerned taxonomists at Division of Entomology, New Delhi, National Bureau of Agriculturally Important Insects, Bengaluru and other laboratories for identification.

During surveys for insect-pests of Kinnow Mandarin, adults of *C. exilis* were observed in Punjab for the first time in 2009 in the orchards of Punjab Agricultural University, and in farmers’ orchards in Ludhiana, Punjab, India during end June-September *i.e.*, rainy reason. The adults cause damage to the leaves of Kinnow by scrapping and biting the green tissue, making small holes. As many as 23 holes were observed per leaf. Infested plants are easily recognizable because of typical feeding pattern of making small holes. The adults which were very active and shiny were observed mostly on the underside of the leaves and they flew away on slight
disturbance. Not more than one beetle was observed per leaf at any of the location. This is the first record of adult of C. exilis on leaves of Kinnow Mandarin in India.

In India, Ghate et al., (2003) reported C. exilis on Alternanthera sessilis, Amaranthus paniculatus and Achyranthes aspera (family Amaranthaceae). Kalaichelvan et al. (2004) observed A. sessilis, A. tenella, Amaranthus blitum, A. philoxeroides, A. simplex and Celosia argentea (family Amaranthaceae) and Milingtonia hortensis (family Meliaceae) as host plants while Leucas lanata (family Lamiaceae) was also reported as host plant from India (Takizawa, 1980). Kalaichelvan and Verma (2005) revealed eighteen species belonging to Cassidinae including C. exilis from Bhilai-Durg in Chhattisgarh (Central India) from different host plant, mostly weeds. Alam et al., (1969) reported C. exilis from a Citrus spp. in Pakistan, apart from different weeds as hosts. Sultan et al., (2008) observed C. exilis from Rawalpindi-Islamabad of Pakistan on different weeds. Only one adult was collected by them from the foliage of poor man’s fruit, i.e., Ziziphus mauritiana Lam. (family Rhamnaceae). So far, none of the Citrus spp. is recorded as host of this beetle (adult) from India. Records from families other than Chenopodiaceae and Amaranthaceae are based probably on additional host for adults (Sultan et al., 2008). The perusal of the literatures revealed that there is no record of incidence of C. exilis on Kinnow in India. So, it is concluded that Kinnow Mandarin is a new host plant for adult beetle, C. exilis from Punjab, India.

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