

Integrated Approach for Management of Hadda/ Epilachna Beetle (*Henosepilachna vigintioctopunctata* Fabricius)

Arun Kumar^{1*}, Pawan Kumar², Pramod Kumar Mishra³, Pankaj
Kumar Rajpoot⁴ and Rishabh Mishra⁵

^{1*,3,4,5} Department of Entomology, Chandra Shekhar Azad University of Agriculture &
Technology, Kanpur (U.P)-208002

²Department of Entomology, Sardar Vallabhbhai Patel University of Agriculture &
Technology, Meerut (U.P)-250110

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Summary:

Hadda beetle, *Henosepilachna vigintioctopunctata* (Fabricius), also known as spotted/epilachna beetle. It is a polyphagous pest of various cultivated and wild vegetable crops in India. Among the various pests it is highly destructive and considered as a key pest damaging brinjal crop from seedling stage to maturity throughout country. It is a most serious pest of solanaceous and cucurbit crops, especially, Brinjal, Potato, Tomato, bitter gourd and melons. In the Asian countries, hadda/spotted beetle is the most harmful and the first ranked pest causing up to 60 per cent fruit yield loss and leaf damage upto 80 per cent in brinjal. A number of chemicals and botanicals have been found effective against insect-pests of brinjal crop.

Introduction:

Vegetable farming is an important part of Indian agriculture for their nutritional importance and livelihood security due to nutritional richness, economic viability and medicinal value. Globally, India is the second largest producer of vegetables with 199.88 million tonnes production during 2021-22 after China. Brinjal, *Solanum melongena* L., family *Solanaceae*. It is native to India in South Asia. It is also known as eggplant, aubergine or “King of vegetables”. Eggplant is grown as a vegetable throughout the tropical, sub-tropical and warm temperate climate of the world. The area under brinjal cultivation in India is 0.74 Million hectare with estimated annual production of 12.7 million tonnes with a productivity of 17.16 tonnes per hectare (MA & FW, 2022). Brinjal crop is susceptible to attack of various insect-pests from seedling to maturity. The brinjal crop is attacked by about

140 species of insect-pests in India and abroad, out of which, the Hadda/spotted beetle (*Henosepilachna vigintioctopunctata*) is considered as major insect-pest of Brinjal crop after shoot and fruit borer (*Leucinodes orbonalis*). It is an aggressive species of pest. Among the various pests it can cause up to 60 per cent yield loss and up to 80 per cent leaf damage in brinjal.

Hadda/Epilachna beetle:

(i) **Scientific name** – *Henosepilachna vigintioctopunctata* (Fabricius)

(ii) **Taxonomic position:**

- ❖ **Kingdom:** Animalia
- ❖ **Phylum:** Arthropoda
- ❖ **Class:** Insecta
- ❖ **Order:** Coleoptera
- ❖ **Family:** Coccinellidae
- ❖ **Genus:** *Henosepilachna*
- ❖ **Species:** *vigintioctopunctata*



(iii) **Host plants:** Hadda/Epilachna beetle (*H. vigintioctopunctata*) has been recorded as a serious pest of brinjal, potato, tomato cucumbers, melon, pumpkin, gourds and tobacco etc. in Uttar Pradesh and other parts of the country.

(iv) **Distribution:** Its harmful population distributed throughout South East Asia, South Canada, USA, Mexico and Africa.

(v) **Marks of identification:**

Newly laid eggs of hadda beetle are pale yellow to orange yellow in colour, elongated, usually in clusters of 5 to 45 eggs. An egg is approximately 1.4 mm in length and 0.5 mm in width, while, newly hatched larvae or grubs are approximately 1.5 mm in length and light yellow in color. Its larvae are soft bodied and covered with six longitudinal rows of stout branched spines on the back of body. At first the spines are yellow but after some time it's become darken on the tips and thus more conspicuous. Its grubs moult four times in entire larval stage during growth and development. Fully Matured larva is approximately 6.0-7.5 mm in length. Pupation occurs when the developed larvae congregate and attach themselves by the posterior end of the body to the underside of the leaves or stem. Fully grown 4th instar grubs successively stop feeding and spend about 1-3 days in pre-pupal stage. At pupation

period the larval skin is pushed backwards from the thorax towards the abdomen, where it remains as a whitish wrinkled mass. Its pupa is yellow, spineless and of the similar size and shape as of the adult beetle. The adult beetle is oval in outline shape about 6-7 mm in length.

Freshly emerged adult of hadda beetle is straw or cream yellow in color and shortly after emergence, 28 black spots with variable size appear on the dorsal elytra. The whole body of *H. vigintioctopunctata* is covered with short fine hairs. Adults become more darkened with older age and finally attain orange brown color with a bronze hue. Adult females of hadda beetles are slightly larger than adult males.

(vi) Nature of damage

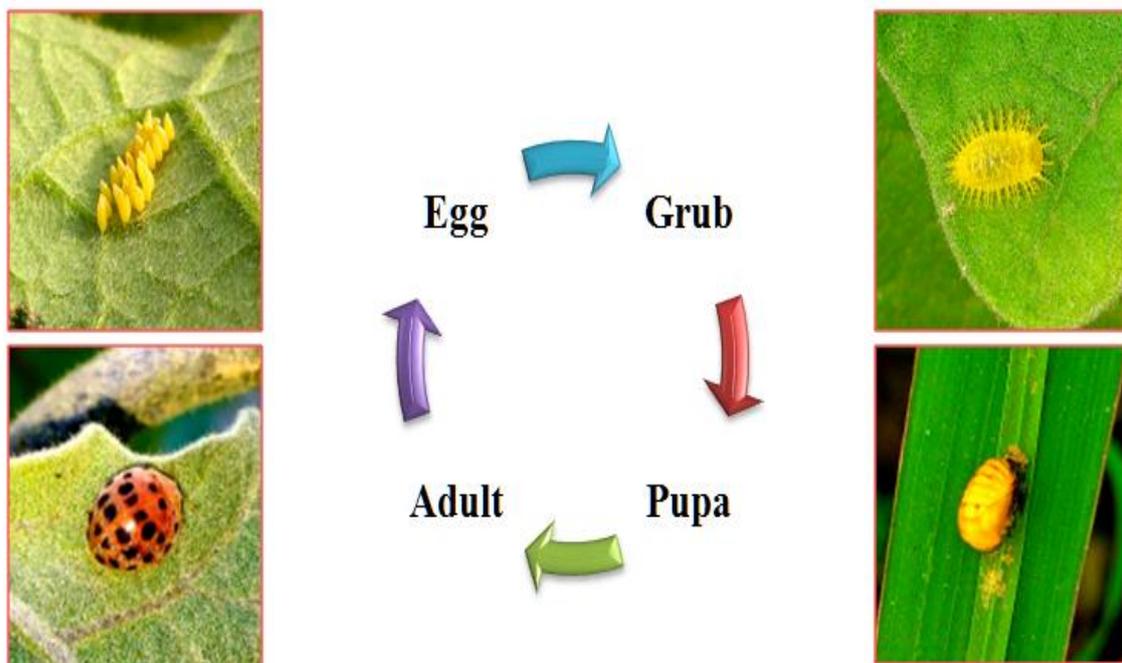
Its adults and grubs have biting and chewing mouth parts, which scrap the chlorophyll of leaves. Skeletonization of leaves is a major damaging symptom of hadda/spotted beetles on brinjal plants. Its harmful population actively occurred from April to middle of the October and next highest population found during second week of September.



(vii) Life cycle (Bionomics):

The grubs of hadda/spotted beetle is yellowish-red in colour with bearing six rows of longitudinal spines. It lays cigar shaped eggs in 6-7 clusters of about 120-460 eggs/female on lower surface of leaf and its complete their egg incubation, grub and pupal period in 2-4, 10-35 and 5-6 days, respectively. Its grubs are elongate, elliptical with moderately long legs and a well developed head and mandibles, body covered with long branched processes (Scoli) bearing spines. It pupates on the stem or leaves. The adults of *E. dodecastigma* are copper coloured with six spots on elytra. While, *E. vigintioctopunctata* have 14 spots on each elytra with deep red pigmentation. Adults 5-8 mm long, dorsally convex and flattened ventrally. Its head partly hidden beneath pronotum. Its brownish-yellow to dark brown colouration with 6-14 black spots on each elytron and 7 on the pronotum. Both adult and grubs of hadda/spotted beetle scrap the lower epidermis of leaves in characteristic manner leaving behind stripes of uneaten areas. The leaves give a stifled appearance. The adult male and female survived for

an average period of 21-25 days and 28-32 days, respectively with 7 generations per year. The whole body of the adults is covered with fine short hairs.



Integrated Pest Management:

- Collect and destroy the egg clusters, grubs, pupa and adult beetles to prevent population buildup.
- Shake plants to dislodge the grubs, pupa and adult beetles in a pot of kerosenated water at early in the morning.
- Avoid mono cropping of brinjal or cucurbits.
- Conserve natural enemies (Predators- *Rhynocoris fuscipes*, *Rhynococoris fuscipes*, *Uga colliscutellum* and *U. menoni*) in brinjal ecosystem.
- Remove the alternate hosts of the hadda beetle from brinjal field.
- Grow the resistant cultivars.
- Use light traps @ 1/ha to attract and kill the beetles.
- Bird perches @ 10/ acre should be erected for facilitating field visits of predatory birds.
- Avoid using insecticides at the time of fruit maturation and harvest because the synthetic pyrethroids cause resistance and resurgence in insects.

- Encourage the activity of parasitoid *Pediobius foveolatus*.
- Use of Entomopathogenic microbes (*Aspergillus flavus* and *Bacillus thuringiensis*) to suppress pest population.
- In case of heavy infestations, spray any one of the insecticide starting from one month after planting at 15 days interval, Neem oil 1500 ppm @ 1-1.5 ml/lit. or NSKE 5% @ 50 gm./lit. or *Beauveria bassiana*, *Metarhizium anisopliae* @ 5-10 ml/lit or *Bacillus thuringiensis* Var. Kurstaki @ 3-5 ml/lit. of water.

Conclusions:

Spotted/Hadda/Epilachna beetle belongs to the family Coccinellidae of order Coleoptera. It is a polyphagous, multivoltine, coccinellid beetle, infesting crops in mid-hills to plains of India. It's both grubs as well as adult beetles feed voraciously on the green matter of the leaf and skeletonize it leaving the upper epidermal tissue intact. Integrated Pest Management method has proved to be effective for proper management of hadda beetle of brinjal. By this, there is no adverse effect on our environment as well as pest management is done in less cost, which increases the income of the farmer. IPM is a system that utilizes all suitable techniques and methods in a compatible manner as possible and maintains pest populations at levels below those causing economic injury. Intelligent selection and use of pest control tactics will ensure favorable economic, ecological and sociological consequences.

References:

- APEDA (2022). Annual report of Other Fresh Vegetables export details. Retrieved from https://apeda.gov.in/apedawebsite/SubHead_Products/Other_Fresh_Vegetables.html.
- MA&FW. (2021). Area and Production of Horticulture crops for 2020-21 (Final Estimates). Retrieved from <https://agricoop.nic.in/en/statistics/state-level>.
- MA&FW. (2022). Area and Production of Horticulture crops for 2021-22 (1st Adv. Estimates). Retrieved from <https://agricoop.nic.in/en/statistics/state-level>.
- Nithish, A. (2020). Study on management of damage caused by *Henosepilachna vigintioctopunctata* in brinjal. *Journal of Pharmacognosy and Phytochemistry*, **9** (5): 2874-2881.
- Taraa, J. S. and Sharma, S. (2017). Biology and Life Cycle of *Henosepilachna vigintioctopunctata* Fabricius, A Serious Defoliator of Bitter Gourd (*Momordica*



charantia) in Jammu Region (Jammu & Kashmir) India. *Indian J. Sci. Res.*, **13** (1): 199-203.

Tayde, A. R. & Simon, S. (2013). Studies on Biology and Morphometris of Hadda Beetle, *Epilachna Vigintioctopunctata* (Coleoptera: Coccinellidae) A Serious Pest of Bitter Gourd, *Momordica Charantia*, In Eastern Uttar Pradesh, India. *International Journal of Agricultural Science and Research*, **3** (4): 133-138.

