

## **HENOSEPILOACHNA SEPTIMA DIEKE (COCCINELLIDAE; COLEOPTERA); A NEW RECORD FOR PAKISTAN ALONG WITH NOTES ON ITS TAXONOMY, HOST PLANTS AND DISTRIBUTION**

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### **ABSTRACT**

*Henosepilachna septima*, an epilachnine ladybird beetle species, is here reported as new record for Pakistan. The species was collected as a serious pest of Bitter gourd *Momordica charantia* during 2008-2010 while studying epilachnine ladybird beetles of Pakistan. The species is widely distributed in the country, collected from all provinces including Azad Jammu and Kashmir. Notes are also provided on its genitalia morphology, host plants and seasonal occurrence. An identification key for the closely related species is given.

**Keywords:** *Henosepilachna septima*, Epilachninae, Coccinellidae

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### **INTRODUCTION**

Epilachnine ladybird beetles are phytophagous despite the fact that they belong to the well known, predominantly predacious family Coccinellidae. All these phytophagous ladybird beetles are grouped in a distinct sub-family Epilachninae. They are pests of plants belonging to family Cucurbitaceae and Solanaceae. *Henosepilachna septima* Dieke is one of these beetles which feed mostly on bitter gourd and sometime on ribbed gourd. According to Singh *et al.* (2010), this species feeds on leaves, stem and fruit of bitter gourd *Momordica charantia* and causes complete defoliation resulting in great economic loss.

Dieke, (1947), Kapur, (1967), Mahalya and Jesudasan (1996), Katakura *et al.* (2001), Dharmaretnam (2002), Jadwiszczak and Wegrzynowicz (2003) discuss the taxonomy of this species. CIBC (1982) report states that they have collected one *Epilachna* species from cucurbitaceous vegetables in Pakistan. But they could not identify the specimen to species level. In this study it was identified as *H. septima* by studying its male and female genitalia.

The species belong to the 28-punctata group of epilachnine ladybird beetles and are sometimes confused with other members of this group. In this manuscript, a key is provided for the separation of this species from other closely resembling species. The earlier identification of these species was mostly based on elytral spot pattern, due to which this species was misidentified frequently. The present article will briefly discuss its genitalia based identification in comparison with other resembling species.

### **MATERIALS AND METHODS**

The specimens of this species were collected from summer vegetables during the survey of epilachnine ladybird beetles throughout Pakistan in 2007-2010. Hand picking method is employed for collection. For killing, the specimens were put in small vials with a piece of cotton over it. The species was identified by studying its genitalia following the literature by Dieke (1947) and Katakura *et al.* (2001). The method of Majerus and Kearns (1989) was followed for genitalia extraction with some modification as given by Naz *et al.* (2012). The model of Dieke (1947) was followed while studying its pronotum and elytral spot pattern and its variation.

Stereoscope Labomed CZM 6 was used for studying minute structures especially genitalia and spot pattern. The host plants, on which both the adult and larvae of *H. septima* were found while feeding, were also collected and brought to laboratory for identification. Drawing of genitalia structures was made with free hand.

### **RESULTS AND DISCUSSIONS**

#### ***Henosepilachna septima* Dieke, 1947**

1947 *Epilachna septima* Dieke. Smithsonian Misc. Coll:106

- 1957 *Epilachna keiseri* Bielawski: Verhandlungen der Naturforschenden Gesellschaft Basel, 68 (1): 73-76 (Synonymised by Kapur, 1967).
- 1967 *Epilachna septima* (Dieke): Kapur, Proceedings of the National Institute of Sciences of India, 32 (3-4): 151.
- 1977 *Henosepilachna septima* (Dieke): Hoang, Revue d'Entomologie de l'URSS, 56 (1): 99; Katakura *et al*, 2001, Tropics, 10 (3): 333; Jadwiszczak & Wegrzynowicz, 2003, World Catalogue of Coccinellidae Part-1 Epilachninae: 170.

**Material Examined:** 4 ♂ 4 ♀ Pak., Islamabad, Chak Shehzad 11. ix. 2008 (Falak Naz) (NIM); 2 ♀ Pak., Islamabad, Chak Shehzad 11. ix. 2008 (Falak Naz) (UAP); 1 ♂ 1 ♀ Pak., Islamabad, NARC 20. viii. 2010 (Falak Naz) (UAP); 1 ♂ 1 ♀ Pak., NWFP, Peshawar, 16. ix. 2005 (Falak Naz) (NIM); 1 ♀ Pak., KP, D.I. Khan 14. xii. 2005 (Falak Naz) (NIM); 1 ♂ 1 ♀ Pak., Islamabad, Chak Shahzad, 11. ix. 2007 (Falak Naz) (NIM); 2 ♂ 4 ♀ Pak., Punjab, Norwal, Zafarwal, Karyal, 11. viii. 2010 (Waqas) (NIM); 2 ♂ 3 ♀ Pak., Punjab, Norwal, Zafarwal, Chicharwali, 16. viii. 2010 Leg: Waqas (NIM); 1 ♀ Pak., Punjab, Norwal, Sanyari, 20. viii. 2010 Leg: Waqas; 2 ♀ Pak., Punjab, Norwal, Zafarwal, Lessar, 13. viii. 2010 (Talha) (UAP); 5 ♂ 4 ♀ Pak., Punjab, Norwal, Zafarwal, Lessar Koard, 20. viii. 2010 (Talha) (NIM); 7 ♂ Pak., Punjab, Norwal, Zafarwal, Lohara, 20. viii. 2010 (Talha) (NIM); 1 ♂ Pak., Punjab, Norwal, Zafarwal, Lohara, 20. viii. 2010 (Talha) (UAP); 4 ♂ Pak., AJK, Kotli, Hollar, 15. x. 2010 (Aalia) (UP); 1 ♂ Pak., AJK, Poonch, Abbaspur, 23. x. 2010 (Aalia) (UP); 1 ♂ 1 ♀ Pak., KP, Buner, Karapa, 17. ix. 2011 (Falak Naz) (NIM); 1 ♂ 1 ♀ Pak., KP, Buner, Karapa, 17. ix. 2011 (Falak Naz) (UAP); 4 (♂) Pak, KP, Peshawar, 1.x. 2011 (Falak Naz) (NIM).

### Taxonomy

**Diagnosis:** Body highly convex, ground colour yellowish red, elytra mostly with 28 spots. Postcoxal line complete and subterminal (Fig.3). Compressed siphonal tip and thick basal knife edge of the median lobe in male genitalia are the distinguishing characters of this species.

**Size:** Male (n=8), 6.62± 0.12 mm; Female (n=9), 7.44± 0.10mm.

**Maculation:** Head without spots. Pronotum mostly 2 and 6 spotted (sometimes 4 and 7 spotted), spot 7 being hazy. Elytral spot pattern variable, however not so complicated like that of *H. vigintioctopunctata*. Mostly 14, 13 or 12 spotted, respectively. In 13 spotted, spot *a* or *b* is missing. The persistent spots are bigger than non-persistent ones. All the spots are away from suture and margin.

### Male Genitalia (Fig. 1)

Phalobase; Trabe and basal piece normal; median lobe with distinct basal knife edge, then straight for most of its length except apex, which gently bent in a hook, parameres long, thick with no distinct apical thorn, with short hairs on apex.. Siphon; normal but siphonal tip compressed on one side, tapering like nib.

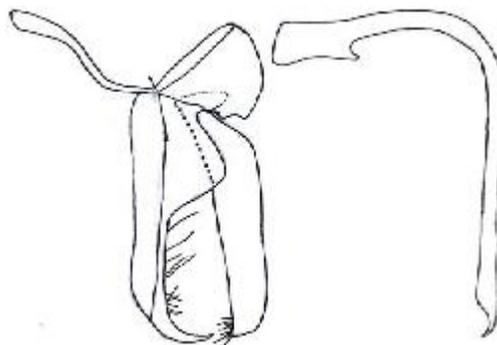


Fig. 1 Male genitalia of *H. septima*

### Female Genitalia (Fig. 2)

Genital plates have deep notch on inner side and overlap each other on notched portion. Plates sparsely pubescent on lower half. Sternite visible.

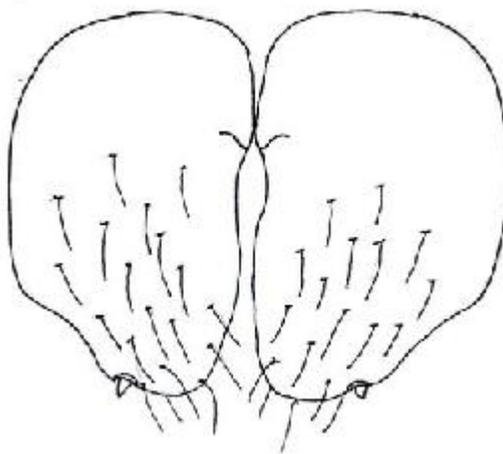


Fig 2. Female genitalia of *H. septima*

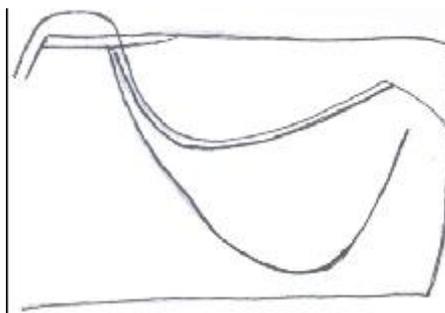


Fig 3. Post coxal line of *H. septima*

**Key for the separation of *H. septima* from other 28-punctata species of Pakistan.**

1. Elytral tips angular; male genitalia with basal knife edge of the median lobe half the length of the latter, siphon slightly bent at the apex.....*H. vignitioctopunctata*
- 1'. Elytral tips rounded, male genitalia not as above.....2
2. The persistent spot No. 4 of the elytra generally touching the external margin of the elytra; male genitalia with median lobe dentulate dorsally; siphon nearly straight at the apex.....*H. dodecastigma*
- 2'. The persistent spot No. 4 generally not touching the external margin of the elytra; male genitalia with median lobe not dentulate dorsally; apex of siphon sharply pointed on one side like a nib.....*H. septima*

**Remarks:**

Both pronotal and elytral spot pattern exhibit variation like the other 28-spotted species, *H. vigintioctopunctata* and *H. dodecastigma*, but here the variation is not so complicated. In our specimens, we observed 30 % specimens with 14 elytral spots, 15 % with 13, 30 % with 12 and 25 % with 11 elytral spots respectively. Few specimens also have 10 and 7 spots. Dharmaretnam (2002) observed 13 different spot combinations in Bataloa, Sri Lanka with 6 spots most abundant (56 %) followed by 8 spot pattern. Mahalya and Jesudasan (1996) observed 8-15 spots on each elytron in *H. septima* in India. They further stated that the elytral spot pattern is influenced by genetic factors as well as by environmental factors such as ambient temperature.

Some authors have confused this species with *H. vigintioctopunctata* due to their similar spot pattern. But they can be easily differentiated on male genitalia basis. Siphonal tip in *H. septima* is compressed on one side and tapering like a nib where it is uniformly but slightly tapering in *H. vigintioctopunctata*. Further *H. septima* is slightly larger and more convex dorsally than *H. vigintioctopunctata*. Its distinguishing character *H. dodecastigma* is already given in the key.

**Host plants:** The species was collected on Bitter gourd *Momordica charantia* and ribbed gourd *Luffa cylindrica* in the present study. It was also collected from Bitter gourd in India (Annad *et al.*, 1988) and from *Momordica charantia* and *M. subangulata* in Indonesia by Katakura *et al.*, 2001.

**Earlier Record from Pakistan:** The species is reported first time from Pakistan. Probably it was misidentified by previous authors, because it is sometimes rather common. This species was to be expected in Pakistan since it was reported to be a pest in India (e.g. Mahalya and Jesudasan 1996).

**Seasonal Occurrence:** Available collection data suggest that this species is active from August to December in Pakistan, however it was found most abundantly during August and September.

**Distribution:** Vietnam, Indonesia, Malaysia, India, Sri Lanka (Jadwiszczak and Wegrzynowicz, 2003).

## CONCLUSIONS AND RECOMMENDATIONS

*H. septima* is recorded as first record from Pakistan. During this study, the species was found widely distributed in the country and is a serious pest of Bitter gourd *Momordica charantia* beside ribbed gourd *Luffa cylindrica*. Due to high economic damage of this species, a detailed study is needed on its bionomics and integrated pest management.

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