Four New Records of Beetles (Coleoptera) from the Palestinian Territories – West Bank

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Abstract: In this study, *Phoracantha recurva* (Family Cerambycidae), *Myrrha octodecimguttata* and *Hyperaspis trifurcata* (Family Coccinelidae) and *Sitaris solieri* (Family Meloidae) are reported for the first time from the Bethlehem district in the Palestinian territories (West Bank).

Keywords: Invasive, introduced species, first record, West Bank, Palestine, Cerambycidae, Coccinelidae, Meloidae.

Introduction

Most of the available information on the entomofauna of the West Bank is based on Bodenheimer, (1935 and 1937). After the establishment of the Palestine Museum of Natural History (PMNH) in Bethlehem, few publications addressed different groups of insects; Lepidoptera (Abusarhan, *et al.,* 2016; Handal, 2022), Orthoptera (Abusarhan, *et al.,* 2017), Coleoptera (Handal and Amr, 2017; Najajrah, *et al.,* 2019), Heteroptera (Handal, 2017; Handal and Qumsiyeh, 2019), Odonata (Adawi, *et al.,* 2017; Adawi, *et al.,* 2023), Diptera (Adawi, 2012; Sawalha, *et al.,* 2017; Adawi and Qasem, 2018, Adawi, *et al.,* 2023), and Mantodea (Handal, *et al.,* 2018), among others (Qumsiyeh, *et al.,* 2017). Much work and effort are still needed to investigate the diversity of insects in the West Bank. This short communication reports additional records of beetles from the Palestinian territories (West Bank).

Most of the members of the family Coccinelidae are predators on aphids and other small insects and they are known to be the best example of biological control (Hodek et al. 2015; Najajrah, *et al.,* 2019). More than 6000 species were described from the world (Hodek et al. 2015), and over seventy-five of them were recorded from Historic Palestine (Halperin et al., 1995; Mendel, *et al.,* 2020; Rittner and Nir, 2013). The family Cerambycidae contain borers recognized by their long antenna (Evans et al., 2004). Over 35000 species were described from across the world, and 104 species were found in Historic Palestine (Sama et al., 2010). Species of the family Meloidae, known as blister beetles, are plant feeders; some are predators and feed on other insects including bees (Lückmann and Assmann, 2006). About 7500 species were described from across the world, and 115 species were recorded from Historic Palestine (Ptashkovsky, 2013).

This report records four beetle species new to the insect fauna of Palestine: *Phoracantha recurva* (Family Cerambycidae), *Myrrha octodecimguttata* and *Hyperaspis trifurcata* (Family Coccinelidae), and *Sitaris solieri* (Family Meloidae)

Materials and Methods

Several field trips covering the Bethlehem district in the occupied Palestinian territories (West Bank) were conducted between April 2022 to October 2023. The Bethlehem district is located within four phytogeographical ecozones: The Mediterranean, Irano–Truranian, Saharo-Arabian, and the Sudanian penetration ecozones). All specimens were identified and deposited at the first author's personal zoological lab.

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Results

Four species of the order Coleoptera bleonging to three families (Coccinelidae, Cerambycidae and Meloidae) were recorded for the first time from the West Bank The insects were collected either by hand or using light traps and butterfly nets.

Coleoptera Coccinellidae

Myrrha octodecimguttata (Linnaeus, 1758) (Figure 1-A)

Materials: Three specimens were collected from Bethlehem city (31°42'48.7"N 35°12'13.9"E) on the 8th of July 2022; 26th of August 2022; and the 25th of October 2023. The specimens were collected from urban areas surrounded by conifers trees using light traps.

Remarks: The eighteen-spotted ladybird, *Myrrha octodecimguttata,* is a species introduced and documented in Historic Palestine in 2007 without any knowledge about its way of entrance. It was found to feed on the conifer aphid (*Cinara marittimae*) and was reported for the first time form the Palestinian territories in the West Bank area (Rittner and Nir, 2013). Although Najajrah, *et al.* (2019) listed thirty-five species of coccinellid from the Palestinian territories, he did not find this species. The eighteen-spotted ladybird was reported from Europe (Nedved and Djuric, 2022), Northwest Africa, Turkey, and Syria (Kovar 2007). It is known as a predator on pine tree aphids (Adriaens, *et al.,* 2008). This species was recorded from Historic Palestine in Jerusalem particularly areas in northern Jerusalem (Rittner and Nir, 2013).

Hyperaspis trifurcata Schaeffer, 1905 (Figure 1-B)

Materials: Nine specimens were collected from Bethlehem city (31°42'48.7"N 35°12'13.9"E) on the 20th of August 2023. All specimens were collected by hand from a home garden in the city and were found to be feeding on *Dactylopius opuntiae*.

Remarks: The trident lady beetle is a species recorded for the first time from the

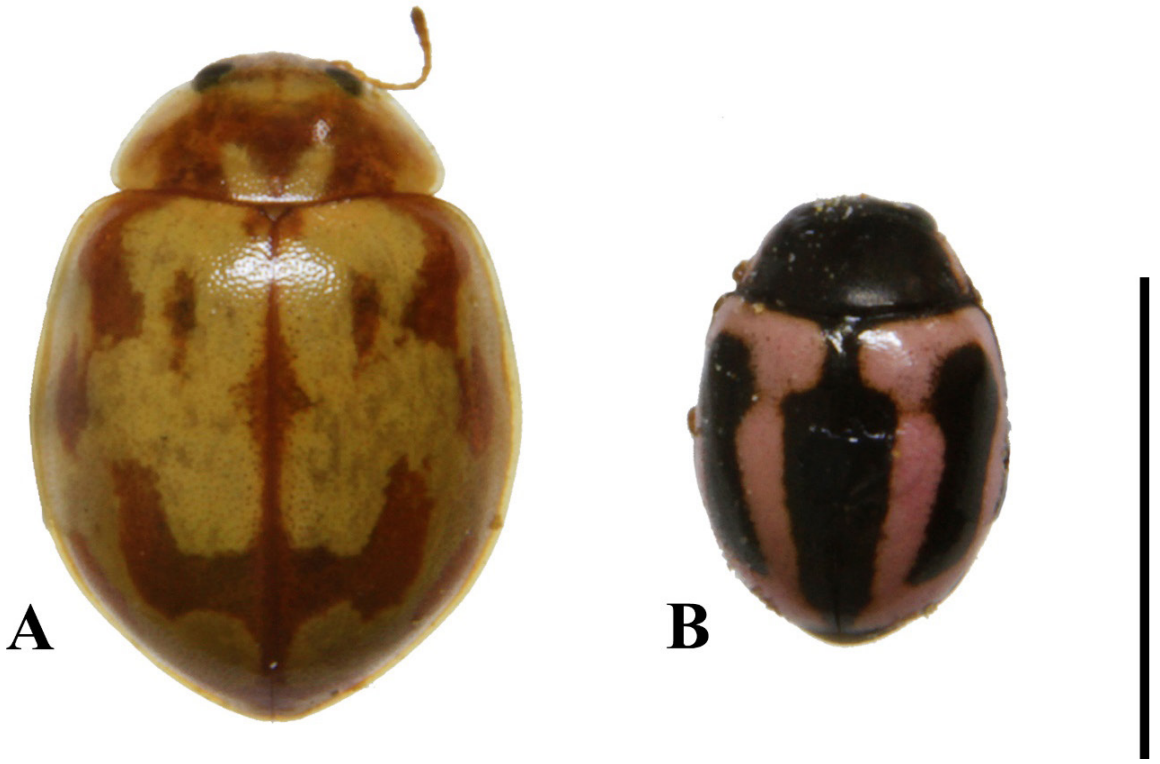

Figure 1. **A:** *Myrrha octodecimguttata*, **B:** *Hyperaspis trifurcata*, dorsal view. Scale Bar = 3.5mm.

Palestinian territories (Najajrah, *et al.,* 2019). This species was introduced in summer 2017 from Mexico, as a natural predator against the prickly pear cochineal, *Dactylopius opuntiae* (Cockerell, 1929) (Hemiptera: Dactylopiidae) which feeds on the Indian-fig prickly pear (*Opuntia ficus-indica*) and was first recorded on *Dactylopius opuntiae* in the north of Historic Palestine in 2013 (Mendel, *et al.,* 2020).

Family: Cerambycidae

***Phoracantha recurva* Newman, 1840 (Figure 2)**

Materials: Two specimens were collected from Bethlehem city (31°42'48.7"N 35°12'13.9"E) on the 16th of August 2022 and the 24th of September 2023. The specimens were collected from an empty land near houses using a butterfly net.

Remarks: The eucalyptus long-horned borer is a species native to Australia. Over the last thirty years, it has become an invasive species in south African, south American, and some Mediterranean countries (Ozdikmen and Caglar, 2005). This species was recorded from the north near Galilee in Historic Palestine in 2005 (Sama, *et al.,* 2010). It feeds on *Eucalyptus* spp. This is the first record of this species from the Palestinian territories in the West Bank.

The *Phoracantha semipunctata* is another species recorded from Historic Palestine. It somehow looks like *Phoracantha recurve* (Sama *et al.,* 2010). It is distinguished by its forewing color and patterns. *P. semipunctata* has wings covered mostly with dark brown and a zigzag line pattern and exhibits a cream-colored area in the middle. On the other hand, *P. recurva* is mostly creamy to yellowish in color with some dark brown areas primarily limited to the posterior end of the wing (Ptashkovsky, 2013).

Figure 2. *Phoracantha recurva,* dorsal view. Scale Bar = 10 mm.

Family Meloidae

***Sitaris solieri* Pecchioli, 1839 (Figure 3)**

Materials: One specimen was collected from Bethlehem City (31°42'48.7"N 35°12'13.9"E) on the 19th of October 2023. The specimen was found in botanical gardens and was collected by hand.

Remarks: This is the first documented record of this species from Palestine (West Bank). A photographed record from Jerusalem was made in 2010 by Oz Rittner and was posted on his personal website (http://israel-nature-site.com/?page_id=374). This species was collected and observed on Rosemary shrubs, *Rosmarinus* sp. in house gardens and was also observed at the Palestine Museum of Natural History botanical garden. According to Löbl and Smetana (2008), this species is distributed in the Palaearctic region (Europe: Croatia, France, Greece, Italy, Portugal, and Spain; North Africa: Algeria, Canary Islands, Marocco, and Tunisia; Asia: Turkey).

Figure 3. *Sitaris solieri,* dorsal view. Scale Bar = 10mm.

Discussion

Many efforts exerted by several researchers in the Palestinian territories, supported by several NGOs, universities, and the Environmental Quality Authority, are currently directed at studying the entomofauna of the Palestinian territories. The spread of many invasive insects around the world impose threats to countries that rely on agriculture as a source of economy. For instance, the palm weevil caused economic losses for the palm plantations in many countries (Kehat, 1999).

Other species of lady beetles, *Cryptolaemous montrouzieri*, were brought to control the infestation of *Dactylopius opuntiae* have been recorded by Najajrah, *et al.* (2019). The infestation of the *Dactylopius opuntiae* on the Indian-fig prickly pear was recorded by the Ministry of Agriculture in Palestine few years ago. It was reported from Jenin District and spread to several areas in the West Bank. *H. trifurcata* was recorded from Jordan for the first time in summer 2021 (Tawayah, *et al.,* 2023).

Several invasive species of the family Cerambycidae were reported from Historic Palestine, but have not yet been documented from the West Bank area (Sama, *et al.,* 2010, Friedman, *et al.,* 2008, Danilevsky, 2012, Rittner, 2016). This report increases the lady beetle fauna documented in the West Bank from thirty-five species to thirty-seven species (Najajrah, *et al.,* 2019). As for both the Cerambycidae and Meloidae families, they were not studied extensively in the West Bank area, so there is no updated list of the species that exist in this area. The researchers' knowledge depend on the literature that covers Historic Palestine such as Bodenheimer, (1935 and 1937) but lacks data on the West Bank and Gaza regions. Further studies on the insects of the West Bank should be encouraged and supported to reveal this region's biodiversity and to identify the invasive species that may pose a threat to the natural ecosystems.

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References

Abusarhan MA, Handal E N, Ghattas M, Amr Z and Qumsiyeh M. 2016. Some Records of Butterflies (Lepidoptera) from the Palestinian Territories. *Jordan Journal of Biological Sciences*, **9(1):** 11-23.

Abusarhan MA, Amr Z, Ghattas M, Handal EN and Qumsiyeh M. 2017. Grasshoppers and Locusts (Orthoptera: Caelifera) from the Palestinian Territories at the Palestine Museum of Natural History. *Zoology and Ecology*, **27(2):** 143-155.

Adawi SH and Qasem, KR. 2018. The fauna, habitats and medically importance of mosquito larvae (Diptera: Culicidae) in Salfit district-Palestinian state. *Annual Research and Review in Biology*, **29(2):** 1-11.

Adawi SH, Qasem K, Zawahra M. and Handal EN. 2017. On some Records of Dragonflies (Insecta: Odonata: Anisoptera) from the West Bank (Palestine). *Jordan Journal of Biological Sciences,* **10(3):** 151-157.

Adawi SH. 2012. Presence of *Aedes albopictus* in Palestine–West Bank. *International Journal Trop Dis Health,* **2(4)**:301-310.

Adawi S, Handal E, Romdhane M and Hmida L. 2023. Contribution to the Occurrence of the Blackfly (Diptera: Similiidae) in the Palestinian Territories, West Bank. *International Journal of Trop Dis Health*, **44(17):** 20-26.

Adriaens T, San Martin y Gomez G. and Maes D. 2008. Invasion history, habitat preferences and phenology of the invasive ladybird *Harmonia axyridis* in Belgium. *BioControl,* **53**: 69–88.

Bodenheimer FS. 1935. **Animal life in Palestine**. - L. Mayer, Jerusalem. 507pp.

Bodenheimer FS. 1937. **Prodromus Faunae Palestinae. - Memoires de L' Institut d' Egypt, Cairo Egypte**. 286pp.

Danilevsky ML. 2012. A new species of genus Phytoecia Dejean, 1835 (Coleoptera, Cerambycidae) from Israel. *Гуманитарное пространство*, *1*(Приложение 1): 4-7.

Evans HF, Moraal LG and Pajares JA. 2004. Biology, ecology and economic importance of Buprestidae and Cerambycidae. *Bark and wood boring insects in living trees in Europe, a synthesis*, 447-474.

Friedman AL, Rittner O. and Chikatunov VI. 2008. Note: five new invasive species of longhorn beetles (Coleoptera: Cerambycidae) in Israel. *Phytoparasitica*, **36(3):** 242-246.

Halperin J. Merkl O and Kehat M. 1995. An annotated list of the Coccinellidae (Coleoptera) of Israel and adjacent areas. *Phytoparasitica*, **23**: 127-137.

Handal E N, Al Wahsh A, Ehrmann R, Amr Z, Battiston R and Qumsiyeh M. 2018. Mantids (Dictyoptera: Mantodea) from the Palestinian Territories with an updated list. *Articulata*, **33**: 91-105.

Handal EN and Qumsiyeh MB. 2019. First Record of the Western Conifer Seed Bug *Leptoglossus occidentalis* Heidemann, 1910 (Heteroptera, Coreidae) from Palestine. *Jordan Journal of Biological Sciences*, **12(5):** 657-658.

Handal EN and Amr Z. 2017. Additional localities for the Flower chafers (Coleoptera: Scarabaeidae: Cetoniinae) from the Palestinian Territories (West Bank). *Jordan Journal of Biological Sciences*, **11(4):** 389- 393.

Handal EN. 2017. First record of *Deroplax silphoides* from the West Bank – Palestine. *Entomologia Hellenica*, **26:** 13-16.

Handal EN. 2022. The Geranium Bronze Butterfly, *Cacyreus marshalli* Butler, 1898 (Lycaenidae: Lepidoptera), A New Invasive Species and Additional Records to the Butterfly Fauna of the Palestinian Territories - West Bank. *Jordan Journal of Natural History*. **9(2):** 68-70.

Hodek I. van Emden F and Honěk A. 2015. Ecology and Behaviour of the Ladybird Beetles (Coccinellidae) Edited book. *Blackwell Publishing Ltd*. 561 pp.

Kehat M. 1999. Threat to date palms in Israel, Jordan and the Palestinian Authority by the red palm weevil, *Rhynchophorus ferrugineus*. *Phytoparasitica*, **27(3):** 241-242.

Kovar I. 2007. Coccinellidae. *In*: Löbl, I. & Smetana, A. (Eds), **Catalogue of Palaearctic Coleoptera, Vol. 4**. Apollo Books, Stenstrup, pp. 568–631.

Löbl I and Smetana A. 2008. **Catalogue of Palaearctic Coleoptera. Volume 5**: Tenebrionoidea. Catalogue of Palaearctic Coleoptera. Volume 5: Tenebrionoidea. Apollo Books, 670 pp.

Lückmann J and Assmann T. 2006. Reproductive biology and strategies of nine meloid beetles from Central Europe (Coleoptera: Meloidae). *Journal of Natural History*, **39(48):** 4101-4125.

Ptashkovsky Y. 2013, **Beetles of Israel**. Atlas-determinant, 2nd edition, 243pp.

Mendel Z, Protasov A, Vanegas-Rico JM, Lomeli-Flores JR, Suma P and Rodríguez-Leyva E. 2020. Classical and fortuitous biological control of the prickly pear cochineal, *Dactylopius opuntiae*, in Israel. *Biological Control*, **142**: 104157.

Najajrah M, Qumsiyeh M and Sweleh Kh. 2019. Systematic list, geographic distribution and ecological significance of lady beetles (Coleoptera: Coccinellidae) from the West Bank (Central Palestine). *Zootaxa*, **4664 (1):**1–46.

Nedved O and Djuric M. 2022. **Ladybirds of Europe**, Habiport. 208.

Ozdikmen H and Caglar U. 2005. Three interesting records of longhorn beetles in Turkish fauna (Coleoptera: Cerambycidae). *Russian Entomological Journal*, **14(1):** 59-60.

Rittner O and Nir A. 2013. First record of *Myrrha octodecimguttata* (Coleoptera: Coccinellidae) and *Epuraea ocularis* (Coleoptera: Nitidulidae) from Israel. *Zootaxa*, **3609(3):** 349-350.

Rittner O. 2016. *Pyrrhidium sanguineum* (Linnaeus, 1758) (Coleoptera: Cerambycidae), a newly introduced saproxylic beetle in Israel. *Israel Journal of Entomology*, **46:** 133-135.

Sama G, Buse J, Orbach E, Friedman ALL, Rittner O and Chikatunov V. 2010. A new catalogue of the Cerambycidae (Coleoptera) of Israel with notes on their distribution and host plants. *Munis Entomology and Zoology*, **5(1):** 1-51.

Sawalha SS, Ramlawi A, Sansur RM, Salem IM and Amr ZS. 2017. Diversity, ecology, and seasonality of sand flies (Diptera: Psychodidae) of the Jenin District (Palestinian Territories). *Journal of Vector Ecology*, **42(1):** 120-129.

Tawayah M, Mahasneh A and Haddad N. 2023. First Record of the Predator Ladybeetle, *Hyperaspis trifurcata* (Schaeffer) (Coleoptera: Coccinellidae) Feeding on the Cochineal Scale Insect, *Dactylopius opuntiae* (Hemiptera: Dactylopiidae), in Jordan. *International Journal of Innovative Science and Research Technology*, **8(9):** 1313-1316.