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# Localities of Flower Chafers (Coleoptera: Scarabaeidae: Cetoniinae) in the Palestinian Territories (West Bank)

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## Abstract

Flower chafers (Cetoniinae) were collected from several habitats in the Palestinian Territories (West Bank) during several field trips conducted by the team at the Palestine Museum of Natural History. Nine species in four genera (*Aethiessa mesopotamica*, *Protaetia cuprea ignicollis*, *Protaetia funebris*, *Protaetia judith*, *Protaetia subpilosa*, *Oxythyrea cinctella*, *Oxythyrea noemi*, *Tropinota hirta suturalis*, and *Tropinota squalida pilosa*) were recorded. This study records additional localities of flower chafers in the Palestinian Territories.

**Keywords:** Flower chafers, Cetoniinae, Palestinian Territories, Distribution, Systematics.

## 1. Introduction

Scarabaeidae are found all over the world except in Antarctica. There are over 30,000 described species, with the subfamily Cetoniinae being of more than 4000 described species (Counts and Hasiotis, 2009). Twenty nine species of flower chafers were recorded from the Levant (Katbeh-Bader and Barbero, 1999; Tazuin and Rittner, 2012). Several studies dealt with the Cetoniinae of the historic Palestine localities (Bodenheimer, 1935; 1937; Chikatunov and Pavliček, 1997; Chikatunov *et al.*, 1999; Rittner and Sabatinelli, 2010; Sabatinelli *et al.*, 2010; Tazuin and Rittner, 2012). Table 1 summarizes all the previously recorded species.

The insect fauna of the Palestinian territories are poorly studied and requires additional investigation (Qumsiyeh and Isaaq, 2012). The establishment of the Palestine Museum of Natural History (PMNH) makes it easy to focus on taxonomical studies, and to study the West Bank (Qumsiyeh *et al.*, 2017).

This communication documents flower chafers' collection at the Palestine Museum of Natural History (PMNH) at Bethlehem University.

## 2. Materials and Methods

All specimens were collected from the Palestinian Territory of the West Bank by the Palestine Museum of Natural History team. A total of thirty-one areas were visited during trips from March, 2013 until June, 2017 (Table. 2). Flower chafers (Cetoniinae) were collected by a hand net on flowers from various localities and habitats,

specimens were prepared and deposited at PMNH. Identification was based on Rittner and Sabatinelli (2010), Sabatinelli *et al.* (2010) and Tazuin and Rittner (2012).

## 3. Results

Totally, nine species of the subfamily Cetoniinae was found in the Palestinian territories (West Bank). These include: (*Aethiessa mesopotamica* Burmeister, 1842, *Protaetia cuprea ignicollis* (Gory and Percheron, 1833), *Protaetia funebris* (Gory and Percheron, 1833), *Protaetia judith* (Reiche, 1871), *Protaetia subpilosa* (Desbrochers des Loges, 1869), *Oxythyrea cinctella* (Schaum, 1841), *Oxythyrea noemi* Reiche and Saulcy, 1856, *Tropinota hirta suturalis* (Ritter, 1913), and *Tropinota squalida pilosa* (Brulle, 1832)). Table (2) lists all Cetoniini reported from historic Palestine. Rittner and Sabatinelli (2010) revised species of the genus *Oxythyrea*.

*Aethiessa mesopotamica* Burmeister, 1842 (Figure 1-C)

**Materials Examined:** Bardalla (PMNH4056, PMNH 4057, 18.4.2014); Jiftlik (PMNH1708-8, PMNH1708-9, PMNH1708-15, PMNH1708-16, 27.3.2013); Abu Dees (PMNH1728-2, 22.4.2013); Yatta (PMNH E10532, 8.4.2013; PMNH E10409, 25.3.2017).

**Remarks:** Tazuin and Rittner (2012) include records from Ramallah, Jenin and 60 km North of Jericho, collected during March and April from the Jordan Valley and Mediterranean habitats reaching the most southern parts of the West Bank (Figure 2). *Aethiessa mesopotamica* is an east Mediterranean species. Katbeh-Bader and Barbero, (1999) recorded it from Jordan.

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**Table 1.** List of Cetoniini reported from historic Palestine

Species	Localities	Reference
<i>Aethiessa mesopotamica</i>	Ramallah, Jenin, N Jericho	Bodenheimer (1937), Tauzin and Rittner (2012)
<i>Aethiessa floralis</i>	Palestine	Bodenheimer (1937)
<i>Aethiessa inhumata</i>	Palestine	Bodenheimer (1937)
<i>Cetonia delagrangi</i>	Ramallah	Tauzin & Rittner (2012)
<i>Oxythyrea abigail</i>	Gaza	Bodenheimer (1935; 1937), Tauzin and Rittner (2012)
<i>Oxythyrea cinctella</i>	Mikhmas, Massada, Jerusalem	Bodenheimer (1937), Rittner and Sabatinelli (2010), Tauzin and Rittner (2012)
<i>Oxythyrea noemi</i>	Ein Gedi, Jericho, Jerusalem, Mikhmas, Wadi Qilt.	Bodenheimer (1935; 1937) listed as <i>Oxythyrea funesta</i> , Chikatunov and Pavliček (1997) listed as <i>Oxythyrea funesta</i> , Rittner and Sabatinelli (2010), Tauzin and Rittner (2012)
<i>Protaetia (Cetonischema) speciosa jousselini</i>	Jerusalem	Tauzin and Rittner (2012)
<i>Protaetia (Potosia) angustata</i>	Palestine	Bodenheimer (1937) as <i>Potosia angustata</i>
<i>Protaetia (Eupotosia) mirifica koenigi</i>	Jerusalem	Tauzin & Rittner (2012)
<i>Protaetia (Eupotosia) affinis pyrodera</i>	Jerusalem	Bodenheimer (1937) as <i>Potosia affinis</i> , Tauzin and Rittner (2012)
<i>Protaetia (Netocia) afflicta</i>	Bethlehem, Gaza	Bodenheimer (1935) as <i>Netocia afflicta</i> , Bodenheimer (1937) as <i>Potosia afflicta</i> , Tauzin and Rittner (2012)
<i>Protaetia (Netocia) subpilosa dorchini</i>	Bethlehem, Ramallah, Nablis	Bodenheimer (1937) as <i>Potosia subpilosa</i> , Tauzin and Rittner (2012)
<i>Protaetia (Netocia) trojana galathea</i>	Jerusalem	Bodenheimer (1937) as <i>Potosia sibirica</i> , Tauzin and Rittner (2012)
<i>Protaetia (Netocia) vidua</i>	Jerusalem	Bodenheimer (1937) as <i>Potosia vidua</i> , Tauzin and Rittner (2012)
<i>Protaetia (Potosia) cuprea</i>	Jerusalem	Bodenheimer (1935; 1937) as <i>Potosia cuprea ignicollis</i> , Tauzin and Rittner (2012)
<i>Protaetia (Potosia) funebris funesta</i>	Jerusalem, Nablis	Bodenheimer (1937) as <i>Potosia funesta</i> , Chikatunov and Pavliček (1997), Chikatunov et al. (1999), Alparsèque and Tauzin (2006)
<i>Protaetia (Foveopotosia) judith</i>	Jerusalem	Bodenheimer (1937) as <i>Potosia judith</i> , Tauzin and Rittner (2012)
<i>Stalagmosoma albellum</i>	Palestine	Bodenheimer (1937) as <i>Stalagmopygus allbella</i>
<i>Tropinota (s. str.) squalida pilosa</i>	Ein Feshka, Jericho, Jerusalem, Qumran	Bodenheimer (1937) as <i>Epicometis squalida</i> , Bodenheimer (1937) as <i>Tropinota squalida</i> , Tauzin and Rittner (2012)
<i>Tropinota (s. str.) vittula</i>	Jerusalem	Bodenheimer (1937), Tauzin and Rittner (2012)
<i>Tropinota (Epicometis) hirta suturalis</i>	Jerusalem, Janin, Nablis, Bethlehem, Ramallah	Bodenheimer (1937) as <i>Epicometis hirta</i> , Tauzin and Rittner (2012)

**Table 2.** List of visited localities and their coordinates.

Location	N	E	Location	N	E
Abu Dis	31° 45' 23.5188"	35° 15' 49.665"	Nabi Saleh	32° 0' 58.5792"	35° 7' 18.9048"
Ain Samia	31° 58' 35.925"	35° 20' 29.9184"	Nahaleen	31° 40' 54.336"	35° 7' 9.0156"
Al Ogga	31° 57' 6.2418"	35° 28' 33.1788"	Rtas	31° 41' 18.9414"	35° 11' 14.9706"
Bardalla	32° 23' 12.6816"	35° 28' 40.9038"	Silit Al Daher	32° 18' 59.835"	35° 11' 17.4438"
Beit Jaad	32° 28' 12.0864"	35° 21' 24.6096"	Slafit	32° 4' 39.7092"	35° 11' 14.9706"
Beit Ta'mar	31° 40' 19.0992"	35° 16' 37.5594"	Taibe	31° 57' 31.1472"	35° 17' 54.8052"
Beni Nuaim	31° 30' 44.4738"	35° 9' 51.699"	Tarqumia	31° 34' 37.5234"	35° 1' 36.8502"
Bethlehem	31° 43' 4.242"	35° 12' 20.9412"	Wadi Al Makhroun	31° 42' 58.0968"	35° 9' 27.4428"
Bir Zait	31° 57' 31.4382"	35° 11' 3.8466"	Wadi Fukeen	31° 42' 15.7746"	35° 6' 5.0544"
Dayr Ballout	32° 3' 26.0496"	35° 1' 59.4084"	Wadi Haramya	31° 59' 55.8558"	35° 13' 55.6458"
Jenin	32° 28' 35.1588"	35° 17' 19.428"	Wadi Nar	31° 43' 44.8998"	35° 17' 8.5344"
Jiftlik	32° 8' 33.0822"	35° 29' 54.135"	Wadi Qana	32° 9' 26.6142"	35° 7' 2.2188"
Kufr Al Deek	32° 3' 35.3442"	35° 5' 1.8672"	Yatta	31° 25' 58.1982"	35° 6' 52.9488"
Mar Saba	31° 42' 15.7278"	35° 19' 52.5324"	Ze'im	31° 47' 11.1222"	35° 15' 53.373"
Mikhmas	31° 51' 52.7934"	35° 16' 12.3744"			

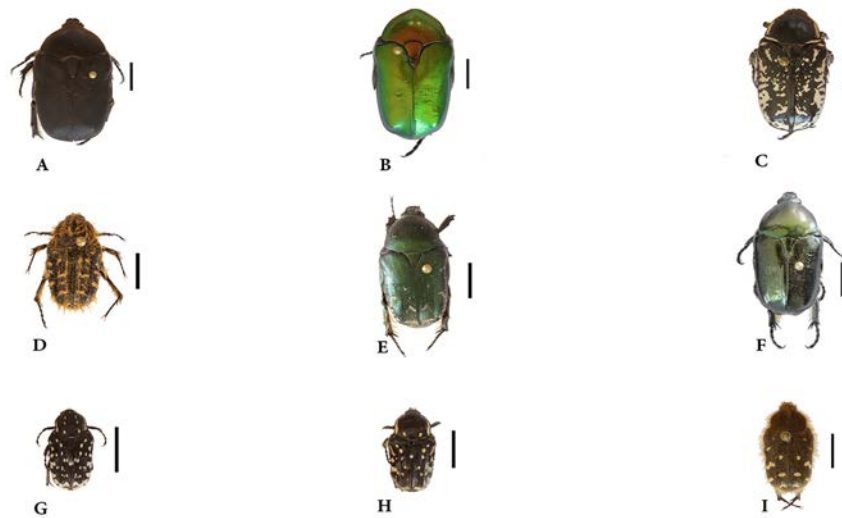
*Protaetia (Potosia) cuprea ignicollis* (Gory et Percheron, 1833) (Figure 1-B)

**Materials Examined:** Wadi Al Quff (PMNH4535, PMNH 4536, 3.5.2014); Nabi Saleh (PMNH1736-23,

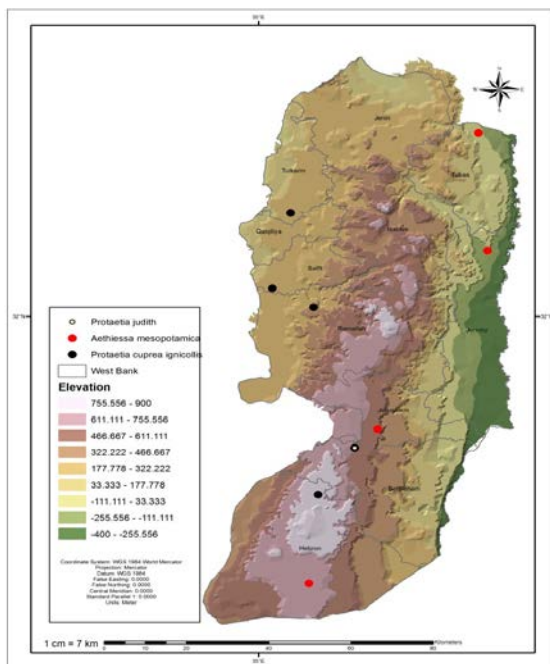
PMNH1736-24, 3.5.2013); Kufr Zabad (PMNH1755-9, PMNH1755-10, PMNH1755-12, 18.5.2013); Dayr Ballout (PMNH E10618, 28.4.2017). observed in Bethlehem.

**Remarks:** This is one of the common species of flower chafers in the West Bank (Figure 2). It is common in the Levant, and can be found in the eastern and southern Mediterranean (Chikaturonov *et al.*, 1999). It exhibits color

variation from shiny green to green red and blue green, while green and red green are the dominant colors of specimens collected in the West Bank (Tauzin and Rittner, 2012)



**Figure 1.** A: *Prottaetia funebris*. B: *Prottaetia cuprea*. C: *Aethiessa mesopotamica*. D: *Tropinota squalida pilosa*. E: *Prottaetia subpilosa*. F: *Prottaetia (Foveopotisia) judith*. G: *Oxythyrea noemi*. H: *Oxythyrea cinctella*. I: *Tropinota hirta suturalis*. bar = 5mm.

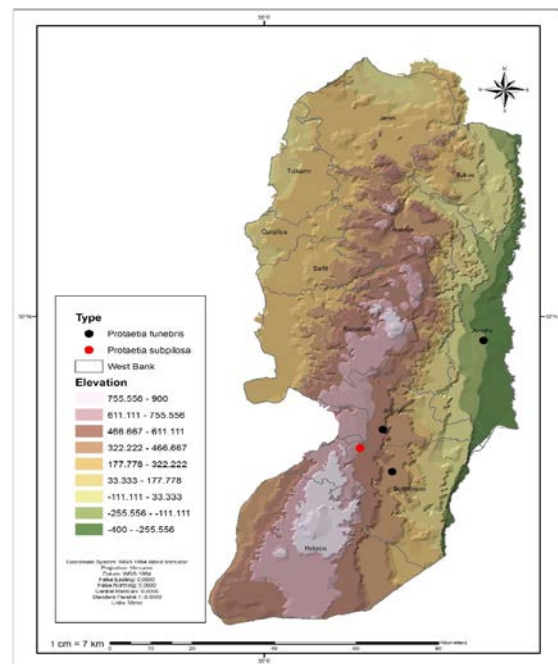


**Figure 2.** Distribution of *Aethiessa mesopotamica* (Red circles), *Prottaetia cuprea ignicollis* (Black circles) and *Prottaetia (Foveopotisia) judith* (open circle) in the Palestinian Territories.

***Prottaetia (Netocia) subpilosa*** (Desbrochers des Loges, 1869) (Figure 1-E)

**Materials Examined:** Bethlehem (PMNH6434, 1.5.2015).

**Remarks:** A single specimen was collected from Bethlehem (Figure 3). This is a small species of flower chafers. Its distribution extends along the East-Mediterranean including Greece, Turkey, Cyprus, Syria, Lebanon, Jordan and Palestine (Chikaturonov *et al.*, 1999). *P. subpilosa* varies in color from green, green blue and in rare situation black color (Tauzin and Rittner, 2012).



**Figure 3.** Distribution of *Prottaetia subpilosa* (Red circle) and *Prottaetia funebris* (Black circle) in the Palestinian Territories.

***Prottaetia (Potosia) funebris*** (Gory and Percheron, 1833) (Figure 1-A)

**Materials Examined:** Abu Dees (PMNH1728-1, 22.4.2013); Beit Ta'mar (PMNH5284, 22.10.2014); Al Ogga (PMNH5977, 9.3.2015).

**Remarks:** *Prottaetia funebris* is the largest species of Flower Chafers collected from the West Bank. Figure (3) shows the distribution of this species. This species is known in the Levant (Chikaturonov *et al.*, 1999). Alpinsèque and Tauzin, (2006) shows the complexity of this species and the colour variation.

**Protaetia (Foveopotosia) judith** (Reiche, 1871) (Figure 1-F)

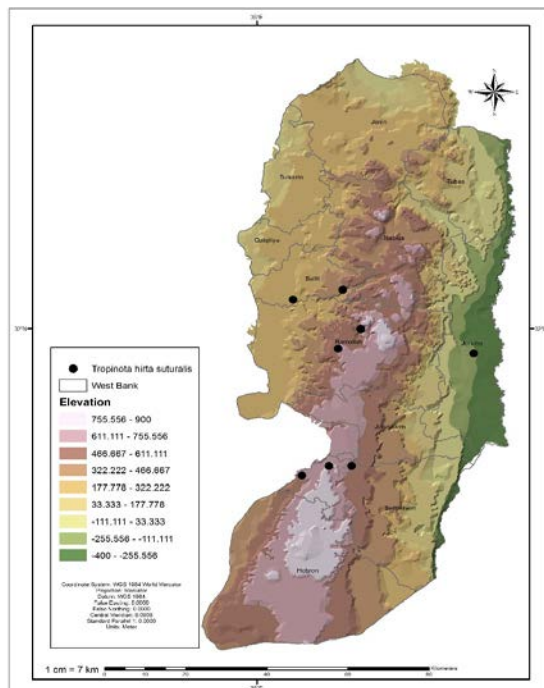
**Materials Examined:** Bethlehem (PMNH E10689, 24.11.2017)

**Remarks:** This is a rare species in the West Bank (Figure 2). It was recorded from several localities in northern Palestine (Tauzin and Rittner, 2012), with records around Jerusalem. Tauzin and Rittner (2012) stated that this species is limited to the Eastern edge of the Mediterranean (Rhodos, Cyprus, Turkey Syria and Lebanon).

**Tropinota hirta suturalis** (Ritter, 1913) (Figure 1-I)

**Materials Examined:** Bir Zait (PMNH3972, 15.4.2014); Bethlehem (PMNH5195, 21.3.2014); Al Ogga (PMNH5867, 9.3.2015); Salfit (PMNH6834, April. 2015 ; PMNH6838, March. 2015); Wadi Al Makhrou (PMNH7594, 23.9.2015); Wadi Fukeen (PMNH7602, PMNH7611, PMNH7613, 7.7.2016); Wadi Al Haramya (PMNH7684, 3.3.2016); Kufir Al Deek (PMNH E10569 & E10588-92, March.2017).

**Remarks:** This is a common species always found with *Oxythyrea noemi* on different species of flowers. Figure (4) shows the distribution of this species. This species is known from Europe and the Middle East (Chikatunov *et al.*, 1999; Tauzin and Rittner, 2012). *Tropinota hirta suturalis* is the only subspecies that is found in the Euro-Mediterranean area (Tauzin and Rittner, 2012).



**Figure 4.** Distribution of *Tropinota hirta suturalis* in the Palestinian Territories.

**Tropinota squalida pilosa** (Brulle, 1832) (Figure 1-D)

**Materials Examined:** Wadi Al Quff (PMNH3721, PMNH3722, 28.2.2014); Mar Saba (PMNH4068, 13.1.2014); Al Ogga (PMNH1710-13, 27.3.2013; PMNH5870, 9.3.2015).

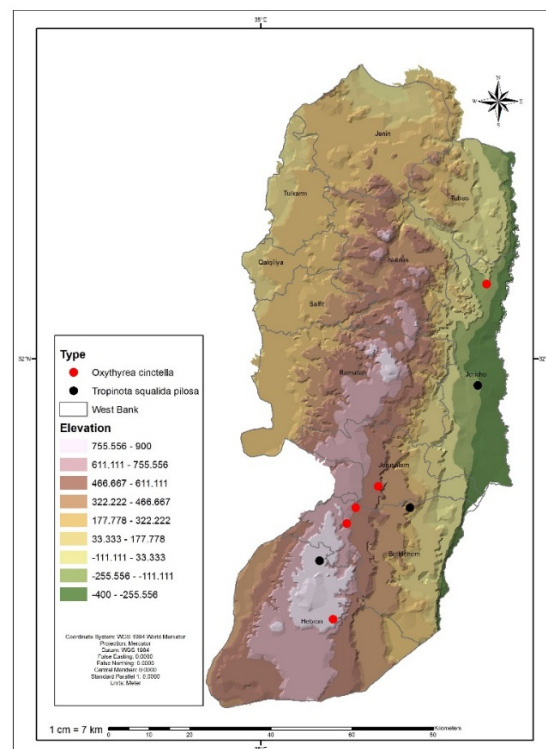
**Remarks:** This subspecies is known from North Africa to the Levant (Chikatunov *et al.*, 1999; Tauzin and Rittner, 2012). Figure 5 shows its distribution in the West Bank. Sabatinelli *et al.* (2010) described the morphological differences between *T. squalida* and *T. vittula*, supporting

the idea that shows that *T. vittula* is a separate species and not a subspecies.

**Oxythyrea cinctella** (Schaum, 1841) (Figure 1-H)

**Materials Examined:** Bethlehem (PMNH6092, 2.4.2015); Jiftlik (PMNH1708-3, 27.3.2013); Rtas (PMNH1711-12, 31.3.2013); Bani Nua'im (PMNH1714-20, 7.4.2013); Abu Dees (PMNH1728-4, 22.4.2013).

**Remarks:** This species is distributed in south Eastern Europe extending from Turkey and the southern states of the former Soviet Union and as far as China (Smetana, 2006). Usually *O. cinctella* is found with *Oxythyrea noemi* (Rittner and Sabatinelli, 2010). Figure 5 shows its distribution in the West Bank. In this study, specimens were collected during early spring (March and April).



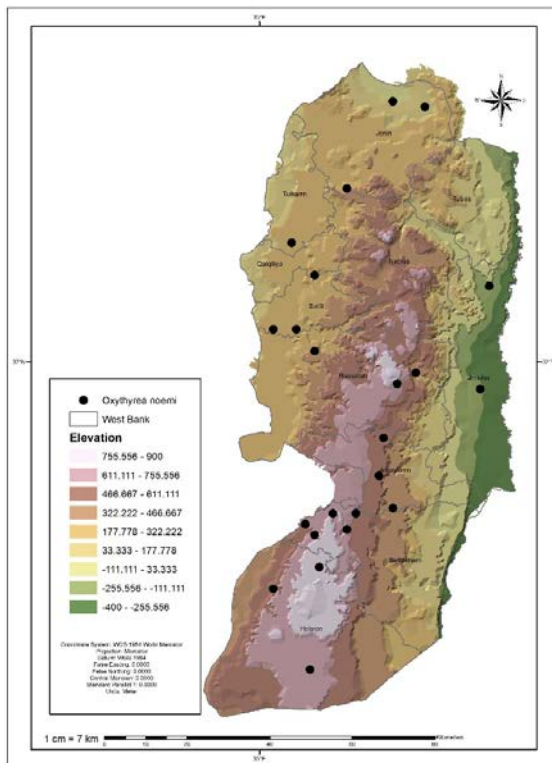
**Figure 5.** Distribution of *Oxythyrea cinctella* (Red circles) and *Tropinota squalida pilosa* (Black circles) in the Palestinian Territories.

**Oxythyrea noemi** Reiche and Saulcy, 1856 (Figure 1-G)

**Materials Examined:** Wadi Al Quff (PMNH3937, 22.3.2014 ; PMNH4344, 3.5.2014); Al Ogga (PMNH5972, 9.3.2015); Bethlehem (PMNH6085, PMNH 6091, PMNH6095, 2.4.2015 ; PMNH7689, 6.3.2016); Al Makhrou (PMNH6169, 15.4.2015); Beit Jaad (PMNH 6607, 19.3.2015); Wadi Fukeen (PMNH7612, PMNH 7615, 7.7.2016); Jenin (PMNH7781, PMNH7783, April.2016 ; PMNH7833, PMNH7834, PMNH7840, 12.4.2016); Jiftlik (PMNH1708-1, PMNH1708-4, PMNH 1708-6, 27.3.2013); Rtas (PMNH1711-7, 31.3.2013); Tarqumia (PMNH1712-1, PMNH1712-10, PMNH1712-13, PMNH1712-19, PMNH 1712-6, PMNH 1712-9, 4.4.2013); Wadi Nar (PMNH1727-3, 13.4.2013); Ain Samia (PMNH1731-4, PMNH1731-7, 12.4.2013); Mikhmas (PMNH1733-3, 1733-4, 27.4.2013); Taibe (PMNH1734-11, 12.4.2013); Nahaleen (PMNH1735-11, 1735-12, 1735-13, 2.5.2013); Nabi Saleh (PMNH1736-16,

PMNH 1736-19, PMNH1736-27, PMNH1736-29, 3.5.2013); Ze'im (PMNH1749-11, PMNH1749-13, PMNH 1749-4, 13.5.2013); Kufr Zabad (PMNH1755-10, 18.5.2013); Wadi Qana (PMNH1756-28, 17.5.2013); Silit Al Daher (PMNH 1809-6, 14.6.2013); Yatta (PMNH E10369, 25.3.2017); Kufr Al Deek (PMNH E10587, PMNH E10586, March. 2017); Dayr Ballout (PMNH E10672, PMNH E10672, April. 2017).

**Remarks:** This is the most common species found in the West Bank, inhabiting various types of habitats (Figure 6). It was reported from across the Levant, Egypt and Cyprus (Rittner and Sabatinelli, 2010).



**Figure 6.** Distribution of *Oxythyrea noemi* (Black circles) in the Palestinian Territories.

#### 4. Discussion

Within the Levant, Tauzin and Rittner (2012) listed twenty-nine species. So far, a total of twenty-two species of Cetoniinae have been reported from Palestine (see table 1). According to Tauzin and Rittner (2012), the distribution patterns of the Cetoniinae of Palestine shows several affinities. Of the reported species in this study, *Oxythyrea noemi*, *Protaetia afflicta*, *Protaetia judith*, *Protaetia affinis* are considered eastern Mediterranean, *Aethiessa mesopotamica* and *Protaetia funebris* are southwestern Asiatic, *Tropinota squalida* is Mediterranean, *Tropinota hirta* spp. is European-Mediterranean, while *Oxythyrea cinctella* is Turano-Mediterranean.

Rittner and Sabatinelli (2010) re-examined specimens of *Oxythyrea funesta* at Tal Abib Museum, and found that these specimens are actually *Oxythyrea noemi*, and considered all previous records of *O. funesta* listed in

Bodenheimer (1937) and Chikatunov and Pavliček (1997) are *O. noemi*.

Further studies should be conducted over longer periods and cover different habitats in the Palestinian territories to update the distribution of this little known group.

#### Acknowledgment

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