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Denise Bellan-Santini. European species of *Haustorius* (Crustacea: Amphipoda: Haustoriidae) with description of a new Mediterranean species. *Journal of Natural History*, 2005, 15, pp.1101-1110. 10.1080/00222930400005773 . hal-00095596

**HAL Id: hal-00095596**

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Submitted on 24 Jan 2023

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# European species of *Haustorius* (Crustacea: Amphipoda: Haustoriidae), with description of a new Mediterranean species

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## Abstract

The genus *Haustorius* is represented by six species in the world; three are described as American species, three European including a new species described from the Mediterranean. This new species, *H. orientalis*, is similar to *H. algeriensis* Mulot, 1967 from the Algerian coast but differs in rostrum slightly exceeding in length the antennal lobes, merus of pereopod 7 with posterior margin lacking spines, and uropod 1 with two separate rows of spines.

**Keywords:** *Amphipoda*, *Haustoriidae*, *Haustorius orientalis*, *Mediterranean*, *new species*

## Introduction

The genus *Haustorius* Müller, 1775 is now represented by five valid described species: *Haustorius arenarius* (Slabber, 1769), *H. canadensis* Bousfield, 1962, *H. algeriensis* Mulot, 1967, *H. jayneae* Foster and Lecroy, 1991, and *H. mexicanus* Ortiz, Chazaro-Olvera and Winfield, 2001.

When in 1967, Mulot described *H. algeriensis* from the Algerian coast, he indicated that this species was the first *Haustorius* found in the Mediterranean sea and it remains unique (Bellan-Santini et al. 1989) and has never been sampled beyond its type locality of Sidi Fredj region: Bou Ismail Bay, Djinet Cape (Bakalem and Dauvin 1995). A new species collected on a beach at Michmoret (Israel coast) presents significant differences with the other species, and in particular with *H. algeriensis*. It brings the number of *Haustorius* to six species with three of them European.

## Taxonomy

***Haustorius orientalis* n. sp.**  
(Figures 1–5)

## *Material examined*

Holotype: one female of 6 mm; paratypes: 24 specimens (seven of them are females with oostegites), Museo Civico di Storia naturale Verona (MVRCr 429).

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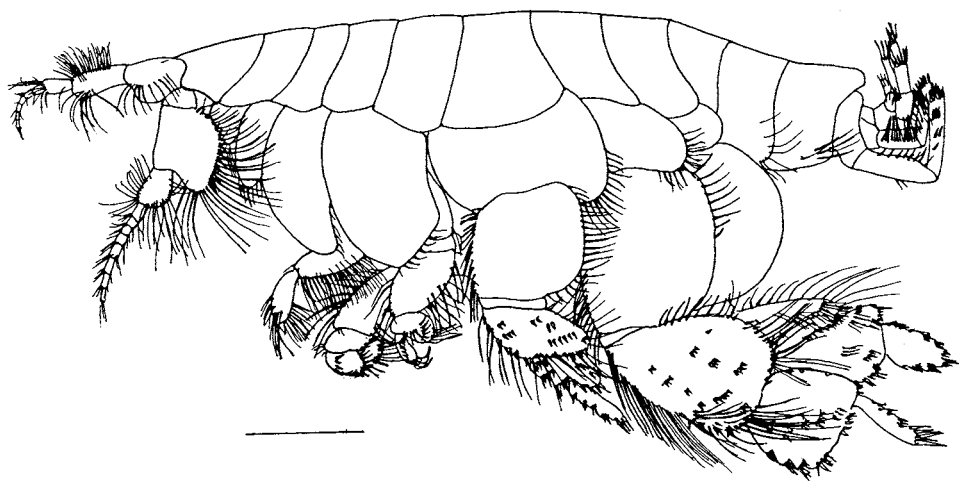


Figure 1. *Haustorius orientalis*, habitus. Scale bar: 1 mm.

#### *Type locality*

Michmoret beach (Israel coast), in the sand in the upper part of infralittoral zone.

#### *Diagnosis*

Body broad. Head with rostrum exceeding slightly the antennal lobes. Antenna 1, flagellum seven-articulate, accessory flagellum three-articulate. Antenna 2, eight-articulate. Pereiopod 5 very spinose. Pereiopod 7, merus without spines on the posterior margin. Uropod 1, rami unequal in length. Telson with two lateral setae, two plumose setae on the lobe and 12 terminal setae in two rows.

#### *Description*

Female, 6 mm. Body broad, eyes not visible in the animal preserved in alcohol. Last segment of pereon produced distally and overhanging reduced urosome. Rostrum exceeding in length slightly the antennal lobes. Antenna 1 with flagellum seven-articulate, accessory flagellum three-articulate. Antenna 2 little longer than A1, flagellum eight-articulate. Mouthparts normal. Mandible with incisor and a triarticulate palp, article 3 with lateral edge bearing 17 small setae in comb row. Maxilla 1 inner plate with 10 marginal setae. Maxilla 2 with inner plate linguiform, outer plate enlarged, lunate, both lined with long fine setae. Maxilliped with triarticulate palp, article 2 enlarged distally, article 3 geniculate. Coxa 1 long and deep, fringed at the posterior part with long plumose setae. Gnathopod 1 simple, carpus enlarged, propodus ovate, dactylus with a distal spine. Coxa 2 ovate. Gnathopod 2 little different from gnathopod 1 but minutely chelate. Coxa 4 larger than coxa 3. Pereiopods 3 and 4 similar, typical for the genus. Pereiopods 5–7 broad. Pereiopod 5 with rounded basis, fringed with long setae, ischium short, merus enlarged, spinose on the surface, fringed with spines and plumose setae, carpus less enlarged than merus, very spinose, propodus very spinose on the anterior margin and with five distal spines. Pereiopod 6, basis rounded, fringed with long setae, ischium short, merus expanded



Figure 2. *Haustorius orientalis*: antenna 1 (1); antenna 2 (2); maxilla 2 (3); mandible (4); rostrum (5). Scale bar: 100  $\mu$ m.

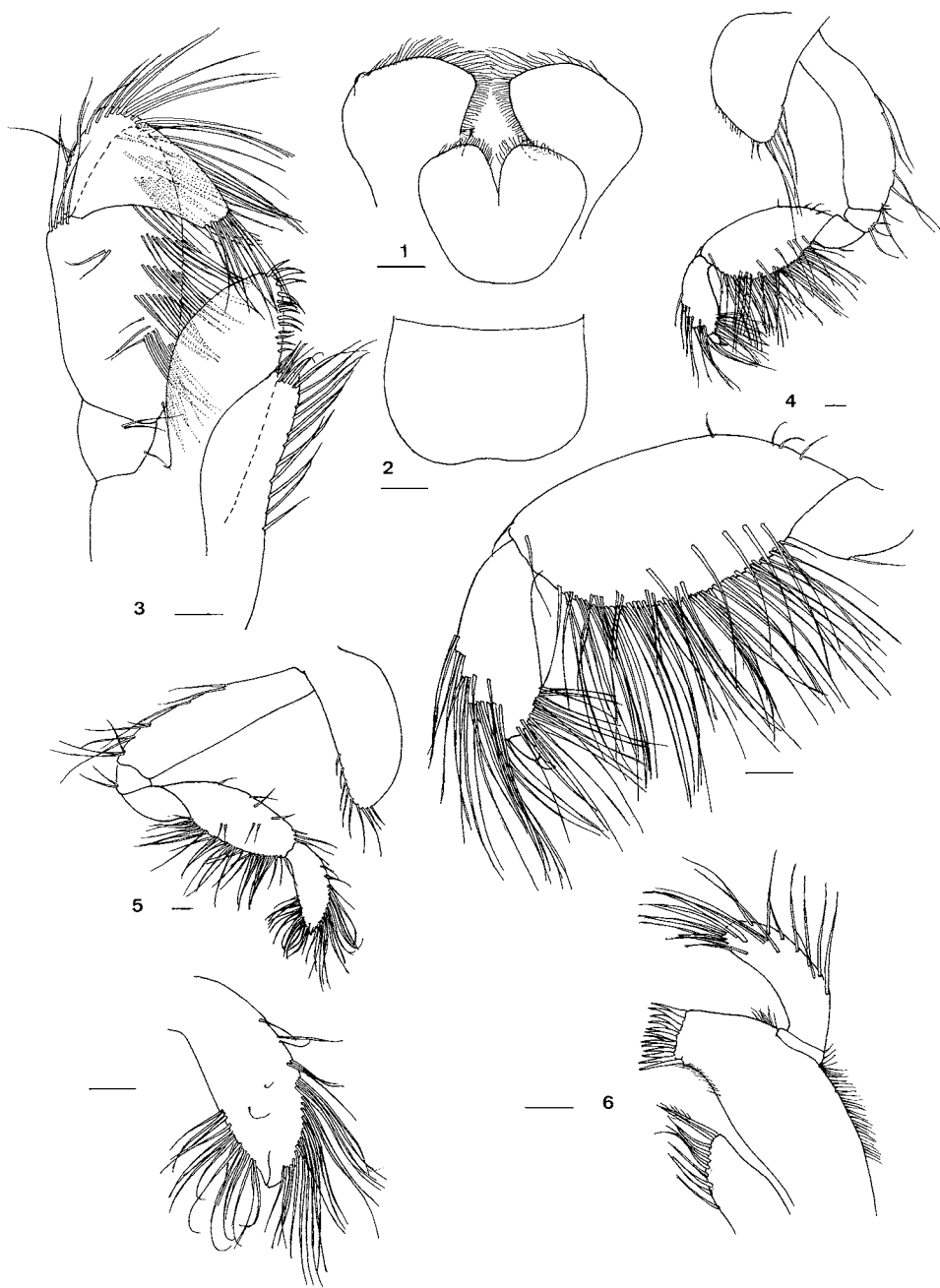


Figure 3. *Haustorius orientalis*: lower lip (1); upper lip (2); maxilliped (3); gnathopod 1 (4); gnathopod 2 (5); maxilla 1 (6). Scale bar: 100  $\mu$ m.

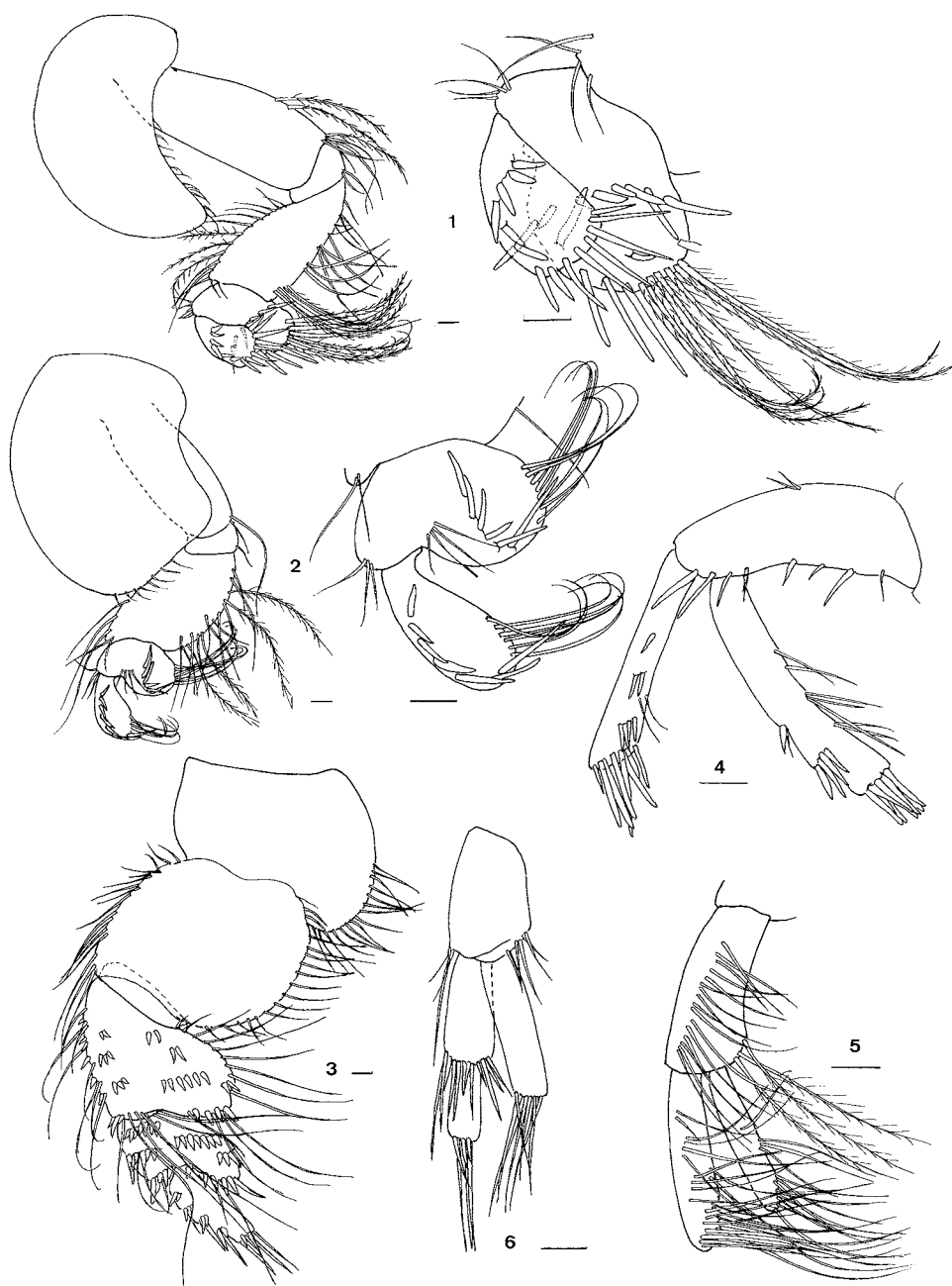


Figure 4. *Haustorius orientalis*: pereiopod 3 (1); pereiopod 4 (2); pereiopod 5 (3); uropod 1 (4); uropod 2 (5); uropod 3 (6). Scale bar: 100  $\mu$ m.



Figure 5. *Haustorius orientalis*: pereiopod 6 (1); pereiopod 7 (2); coxa 2 (3); coxa 3 (4); telson (5). Scale bar: 100  $\mu$ m.

with numerous spines on the surface and on the margins, long plumose setae on the anterior and distal margins, carpus subquadrate covered and fringed with spines, propodus fringed at the posterior margin with spines, seven distal spines. Pereiopod 7, basis large, anteriorly fringed with plumose setae, ischium short, merus produced posteroventrally, anterior margin spinose on the distal half, distal margin spinose, posterior margin without spines, fringed with long plumose setae, carpus and propodus fringed with many spines, short setae on the surface of the carpus. Epimeron 2 with the distal posterior corner quadrate. Epimeron 3 rounded posteriorly, without process, with long plumose setae on the surface. Uropod 1 rami unequal, peduncle and rami armed with strong spines, peduncle with two rows of four spines. Uropod 2, rami unequal, outer ramus longer than inner, peduncle and rami fringed with long setae. Uropod 3, peduncle shorter than rami, outer ramus longer than inner biarticulate, long setae on the distal margin. Telson cleft to the base, consisting of two widely separated lobes with two lateral and 12 distal long setae, two plumose setae on each lobe.

### Etymology

The specific name refers to the region of the type locality, in the oriental basin of the Mediterranean.

### Relationship

The different species of *Haustorius* differ from each other in the shape of the rostrum, uropod 1 and pereiopod 7 (denoted 5 by Bousfield 1965 and Mulot 1967). The three European species differ from the American ones essentially in the merus of P7, which has the proximal margin continuous with the posterior margin. It is sharply set off from posterior margin in American species (Barnard and Karaman 1991; Foster and Lecroy 1991) (Figure 5).

Among the three European species, the Atlantic *H. arenarius* has a five-articulate accessory flagellum and the merus of P7 with three to four stiff spines groups at the posterior margin. The two other European species are Mediterranean. *Haustorius orientalis* differs from *H. algeriensis* in the rostrum exceeding slightly the antennal lobes (equal in length in *H. algeriensis*), the flagellum of A2 eight-articulate (nine-articulate in *H. algeriensis*), the third article of the mandibular palp with a comb of 17 small setae (14 in *H. algeriensis*), the merus posterior margin of P7 not spinose (three spines in *H. algeriensis*), and the peduncle of U1 with two clusters of four spines on the ventral margin (a row of spines in *H. algeriensis*).

### Key to the European *Haustorius* species (Foster and Lecroy 1991 modified)

1. P7 merus, proximal margin sharply set off from posterior margin    American species
- P7 merus, proximal margin rounded continuous with posterior margin (European species)    . . . . . 2
2. Accessory flagellum with four segments; P7 merus, posterior margin with three to four stiff spines    . . . . . *H. arenarius*
- Accessory flagellum three-segmented.    . . . . . 3
3. P7, merus, posterior margin lined continuously but rounded with three spines at the distal part. U1 peduncle with a row of spines on the ventral margin    . . . . . *H. algeriensis*



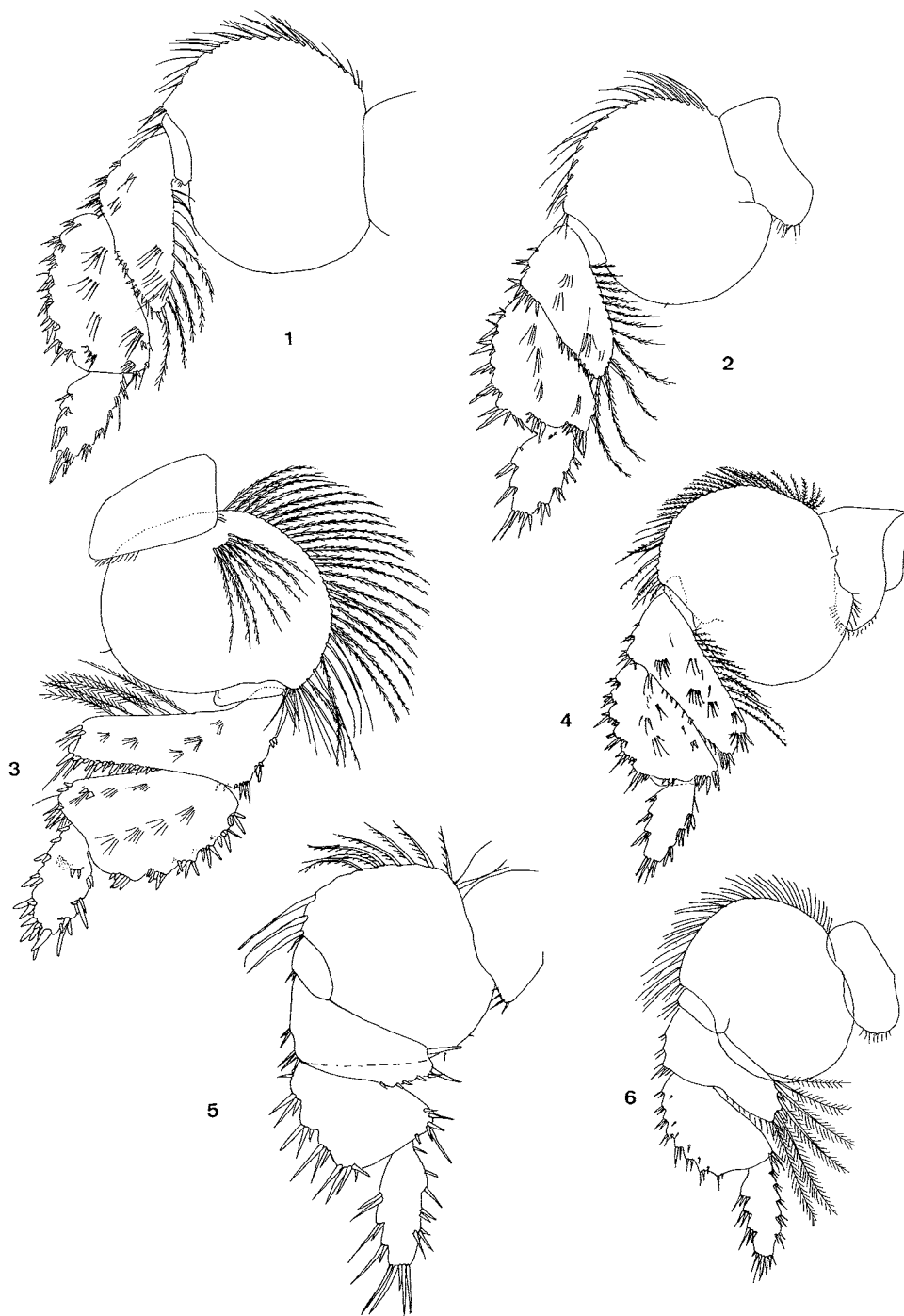


Figure 6. Pereiopod 7: *Haustorius orientalis* n. sp. (1); *H. algeriensis* from Bellan-Santini et al. (1989) (2); *H. jayneae* from Foster and LeCroy (1991) (3); *H. canadensis* from Bousfield (1960–61) (4); *H. mexicanus* from Ortiz et al. (2002) (5); *H. arenarius* from Sars (1895) (6).

- P7, merus, posterior margin lined continuously straight without spines at the distal part. U1 peduncle with two clusters of four spines on the ventral margin . . . . *H. orientalis*

## Comments

There are two groups of described *Haustorius*: the American and the European groups. The American has three species *H. canadensis*, *H. jayneae* and *H. mexicanus*. They have in common a strong character concerning the merus of pereopod 7 with the proximal margin sharply set off from posterior margin (Figure 6: 3, 4, 5). Foster and Lecroy (1991) report also a great number of undescribed haustoriid species as pointed out by Bousfield (1970), Fox and Bynum (1975) and Thomas (1976).

For the European coast, three species of *Haustorius* have been described: *Hautorius arenarius* distributed from the Norwegian coast to Morocco (Moore 1984; Menioui and Bayed 1986; Palerud and Vader 1991; Dauvin 1999; Bellan-Santini and Costello 2001; Cherkaoui et al. 2003; Dauvin and Bellan-Santini 2004); *Haustorius algeriensis*, distributed on the Algerian coast from Bou Ismail Bay to Cap Djinet (Mulot 1967; Bakalem and Dauvin 1995); and *Haustorius orientalis* n. sp. described from the Israeli coast, Michmoret beach (near Netanya).

The three European species are close with a merus of the pereopod 7 with proximal margin rounded, continuous with posterior margin (Figure 6: 1, 2, 6).

On the ecology of these species little is known for *H. algeriensis* and *H. orientalis*. The two species live in sandy beaches as other *Haustorius*, at the upper infralittoral level, between 0 and –5 m for *H. algeriensis* (Bakalem and Dauvin 1995) and with another peracarid species, a Mysidea, probably *Gastrosaccus* for *H. orientalis* (P. Chevaldonné, personal communication). For *H. arenarius* interesting data are believed by different authors. Vader (1965), on the Elbe estuary populations, considers that this species is euryhaline, it lives on exposed shores at the intermediate zone and shows a preference for coarse sand with 50% or less of sediment finer than 210 µm. For Moore (1984), in the Clyde sea area, it “is confined to upper half of intertidal area and prefers rather loose sand”. Dennell (1933) considers this species to be a burrowing and filter feeder. Cherkaoui et al. (2003) give more complete information on the population of the Bou Regreg estuary (Morocco). *H. arenarius* was sampled in stations between 0.5 and 6 m; with fine sand with 0.2–10.2% of silt <63 µm and 2.58–2.68% of organic matter, the salinity is normal at 34.7 PSU. The *H. arenarius* community is composed of two assemblages dominated, respectively, by *Gastrosaccus spinifer* and *Solen marginatus*.

## Acknowledgements

I thank Maoz Fine who has collected this material and Pierre Chevaldonné who gave it to me.

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