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OZOGNATHUS CORNUTUS AS SUCCESSFUL COLONISER  
OF AN EXTREMELY SIMPLIFIED ISLAND ECOSYSTEM  
(*Coleoptera Ptinidae*)

SUMMARY

*Ozognathus cornutus* is a rapidly spreading alien species in the Mediterranean, where it generally occupies relatively complex ecological contexts. Its recent finding on the tiny islet Pietra del Bagno in the Aeolian Archipelago is the first record for a micro-insular environment that can be considered extreme in the light of its remarkable floristic poverty and severe edaphic conditions.

*Key words:* saproxyllophagous beetles, small Mediterranean islet, alien species.

RIASSUNTO

*Ozognathus cornutus* come colonizzatore di successo in un ecosistema insulare estremamente semplificato. *Ozognathus cornutus* è una specie aliena in rapida espansione nel Mediterraneo, dove generalmente occupa contesti ecologici relativamente complessi. Il recente ritrovamento sul piccolo isolotto Pietra del Bagno nell'arcipelago eoliano rappresenta la prima segnalazione per un ambiente microinsulare che, alla luce della notevole povertà floristica e dei severi condizionamenti esercitati dalla salinità, può essere considerato estremo.

*Parole chiave:* coleotteri saproxilofagi, isolotti mediterranei, specie aliene.

INTRODUCTION

Islands are considered as hotspots of biological invasions, and their biodiversity is particularly exposed to alien invading species (DRAKE *et al.*, 2002; RUSSELL *et al.*, 2017; MOSER *et al.*, 2018). However, in the case of small islets (< 1 km<sup>2</sup>), whose ecological contexts are simplified and characterized by low

species richness, it is possible that the same constraints that selectively influence colonization processes may also minimize the extent and effects of biological invasions. Although not well studied from this point of view, some examples from the Mediterranean islets suggest the persistence of a “conservative” character and a certain resilience despite the high level of habitat disturbance, especially concerning their plant communities (LO CASCIO & PASTA, 2012, 2020). Contrariwise, less information is still available concerning the alien arthropods.

An intriguing test of this pattern can be provided by invasive species that have spread rapidly in the Mediterranean area, such as the saproxylophagous ptinid beetle *Ozognathus cornutus* (LeConte, 1859).

This species, native to North America, has recently spread in Central and South America (PHILIPS, 2002; HONOUR & ROTHMANN, 2017), Europe (ZAHRADNIK & MIFSUD, 2005; BERCEDO *et al.*, 2005), Near East (MIŁKOWSKI, 2019), North Africa (ZAHRADNIK & MIFSUD, 2005), Australia (PLANT HEALTH AUSTRALIA, 2019), New Zealand (BERCEDO *et al.*, 2005), as well as in remote oceanic islands such as the Canary (GARCÍA *et al.*, 2017), Madeira (ZAHRADNIK & MIFSUD, 2005) or Reunion (ZAHRADNIK & POUSSEREAU, 2022).

In Italy it was firstly recorded in 2011 from Campania and Sicily (CUSIMANO *et al.*, 2014; CERASA & LO VERDE, 2021), later from Sardinia (BAZZATO *et al.*, 2021) and for the Aeolian Archipelago, where *O. cornutus* occurs at least since 2015 and currently inhabits all the seven main islands (LO CASCIO *et al.*, 2022). So far, however, it had not been found in the numerous islets surrounding these latter, despite the fact that their biological assemblages are subject to constant monitoring since long time (see LO CASCIO & PASTA, 2020; LO CASCIO *et al.*, 2022).

In the present paper the first record of this species for the islet of Pietra del Bagno is given, together with some remarks about the ecological context of this unexpected finding.

## MATERIAL AND METHODS

### *Study area*

Located about 500 m off the western coast of the island of Lipari, Pietra del Bagno (Fig. 1) is a basaltic islet with a surface of 3,290 m<sup>2</sup> (of which only 1/3 is not covered by waves during storms) and a maximum altitude of 21 m a.s.l.

Very poor plant communities, that just include *Malva arborea* (L.) Webb & Berthel., *Mesembryanthemum nodiflorum* L. and *Limbara crithmoides* (L.) Dumort ssp. *longifolia* (Arcang.) Greuter, are covering the top and the eastern slope (LO CASCIO & PASTA, 2020).



Fig. 1 — The islet of Pietra del Bagno.

There are no terrestrial vertebrates, while the only (seasonally) resident bird is the Yellow-legged Mediterranean gull *Larus michahellis* Naumann, 1840, occurring with about 15 breeding pairs (MASSA *et al.*, 2015).

Likewise, LO CASCIO *et al.* (2022) recorded just the following beetle species: apart from *Ochetebius quadricollis* (Mulsant, 1844) (Hydraenidae), temporary settler on the rock pools, *Thorictus grandicollis* Germar, 1817 (Dermestidae), *Blaps gigas* (L., 1767), *Scaurus striatus* F., 1792, *Stenosis intermedia* (Solier, 1838) (Tenebrionidae), *Aspidapion radiolus* (Marsham, 1802) (Brentidae), *Otiorhynchus meligunensis* Magnano, 1992 and *Trachyphloeus laticollis* Boheman, 1842 (Curculionidae). Other detected arthropods are *Pyrrochoris apterus* L., 1758 (Heteroptera Pyrrhocoridae), *Pseudomogoplistes squamiger* (Fischer, 1853) (Orthoptera Mogoplistidae), two species of Hymenoptera Formicidae, one Crustacea Isopoda and three species of Araneae.

#### *Finding circumstances*

*Ozognathus cornutus* has been found for the first time during a further entomological survey on the islet in January 2024. Specimens were collected directly on the ground and kept in flasks filled with ethyl acetate, then mounted on glue boards and identified using a 10x40 stereoscope. All the sampled specimens are kept in the collections of the authors.

## RESULTS AND DISCUSSION

*Ozognathus cornutus* is a saproxylophagous species that feeds, develops and completes the metamorphosis on decaying tissues within galls and vegetal organic material, including dried fruits, small wood shavings and faecal matter in galleries open by wood-boring insects (TRÓCOLI *et al.*, 2020; CERASA & LO VERDE, 2021). Its host plants have been listed by BAZZATO *et al.* (2021) and by KOUTSOUKOS & DEMETRIOU (2023), and includes mainly trees, but also seeds, fruits and pods of herbaceous or annuals.

In the Aeolian Islands, however, this species has so far been found in habitats with a rather high level of plant diversity, such as meso- and thermophilous scrubland, and almost exclusively on woody or shrubby plants (P. Lo Cascio, *pers. obs.*).

Its extent on Pietra del Bagno sounds therefore interesting, because the islet represents a significantly different context. Moreover, at the time of our visit, no gull nests were yet present and *Malva arborea* was in a strong dormant phase, with only a few seedlings developing. The islet summit (an area of less than 100 m<sup>2</sup>) was entirely covered with dead stems of this plant and a dense layer of olive seeds (Fig. 2), which are usually regurgitated by seagulls (see ANDO *et al.*, 2023).

During a monitoring of about one hour in broad daylight, several dozen of adult individuals of *O. cornutus* were observed wandering among the plant remains and debris. Together with pre-imaginal stages of *Pyrrochoris apterus*, this species was the most abundant on the islet, while only a few tenebrionids and a cricket were found under stones.

Due to its small size and its very poor plant assemblage, Pietra del Bagno constitutes an extremely simplified ecosystem and probably the smaller micro-insular environment inhabited by this species.

The occurrence on the islet confirms as *O. cornutus* possesses considerable ecological plasticity, enabling it to successfully colonize and exploit not only environments without tree vegetation and other substrates than galls or decaying wood (CERASA & LO VERDE, 2012), but also those characterized by scarce and scattered plant coverage, strong salinity, as well by edaphic and spatial constraints. On the other hand, the absence of other saproxylophagous beetles from the islet, and thus of possible competitors, could easily explain the remarkable population density found.

The possible negative impact of *O. cornutus* on the islet's native biological diversity is however difficult to assess, given the lack of information on the ecological network of this species within its native and recently invaded range.



Fig. 2 — The habitat of *Ozognathus cornutus* on the islet, a dense layer of dead stems of *Malva arborea* and olive seeds.

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