



# Observação Científica

## New host plant records for *Humerobates rostromellatus* Grandjean (Oribatida: Humerobatidae) in Italy

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**Abstract.** *Humerobates rostromellatus* Grandjean is an oribatid mite species commonly found in association with fruit trees like apple trees and plums. We sampled twigs and leaves of 12 different trees in the Apulia territories in Southern Italy in 2019. Here we report 11 new host plant records for *H. rostromellatus*; no damage has been observed on the trees associated with the mite populations.

**Keywords:** Apulia; cherry beetle mite; oribatid mites.

### Nova planta hospedeira de *Humerobates rostromellatus* Grandjean (Oribatida: Humerobatidae) na Itália

**Resumo.** *Humerobates rostromellatus* Grandjean é uma espécie de ácaro oribatídeo comumente encontrada em associação com árvores frutíferas como maçã e ameixa. Nós coletamos galhos e folhas de 12 árvores de diferentes espécies na região de Apulia, Sul da Itália em 2019. Nós registramos 11 espécies de árvores frutíferas como novos registros para *H. rostromellatus*; nenhuma árvore sofreu danos causados pelas populações de ácaros.

**Palavras-chaves:** ácaro da cereja; ácaro oribatídeo; Apulia.

*Humerobates rostromellatus* Grandjean (Oribatida: Humerobatidae), also known as cherry beetle mite, is a medium to large (750-1000 µm) heavily sclerotized oribatid mite used as bioindicator of air pollution (ANDRE et al., 1984). This species is dominant in dry habitats, and particularly prevalent on various types of fruit trees (MURPHY and BALLA, 1973). This mite species lives in tree barks (LEBRUN et al., 1978), and is considered arboricolous, although the species also occurs in other habitats like mosses (JALIL, 1969; GLIME, 2017). On trees, adults of *H. rostromellatus* migrate from the trunk to branches and leaves in spring/early summer to deposit their eggs (MURPHY and BALLA, 1973). The population moves back to the trunk during the fall, where they overwinter (JALIL, 1969) due to their ability to supercool (ANDRE et al., 1984).

The life cycle of *H. rostromellatus* takes 97 days from egg deposition to adult emergence, and adults can live on average 3 to 4 months under controlled conditions in the laboratory (JALIL, 1969). The species is known to feed on *Pleurococcus* alga on tree barks (MADGE, 1966), bryophytes (MURPHY and BALLA, 1973), as well as on fungi (RASMY and MACPHEE, 1970), but little evidence of a phytophagous habit exist (e.g., GEORGHIOU, 1959).

The species has been encountered in association with various plant species: it has been collected in orchards in Belgium (ANDRE et al., 1984); in barberry orchards in Canada,

*Chrysanthemum* L. flowers in Scotland, soils with *Primula* L. in Ireland, heather plants and carnation flowers in England, *Rhododendron* L. plants and *Trollius* L. roots in the Netherlands, *Citrus sinensis* (L.) Osbeck in Greece, and *Tillandsia usneoides* (L.) L. in Hawaii (HAMMER, 1969). Other plant association records include mites found in organic vineyards in Spain (SENICZAK et al., 2018), plum trees in England (MURPHY and BALLA, 1973), and grapefruit trees in Cyprus (GEORGHIOU, 1959). But the most studied fruit tree in regard to *H. rostromellatus* is the apple tree, with early studies in Ireland (MACQUILLAN, 1966), east Canada (RASMY and MACPHEE, 1970) and England (JALIL, 1969; MURPHY and BALLA, 1973).

In the case of Italy, Bernini et al. (1995) in their checklist for oribatid mite species listed *H. rostromellatus* occurring across the entire country, from Northern to Southern Italy, and both Sicily and Sardinia Islands. Although more than twenty years later *H. rostromellatus* is still the only species in the family Humerobatidae listed for Italy (SCHATZ, 2018), the plant species where the mite occur are not part of the aforementioned checklists. Therefore, our goal here was to report tree species where *H. rostromellatus* occurred in Italy.

The sites investigated in this study were located in Apulia territories in Southern Italy. Ten twigs (including their leaves) of 12 trees of 12 different species belonging to the families Anacardiaceae, Ebenaceae, Fagaceae, Lauraceae, Oleaceae,

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Pittosporaceae, Rhamnaceae, Rosaceae, and Simaroubaceae were haphazardly sampled between August and October 2019. Plant samples were kept in polyethylene bags containing a humid paper towel, stored in a refrigerator (at about +4°C) and later mites were collected from the samples under an Olympus SZH10 stereomicroscope at the Department of Soil, Plant and Food Sciences (DISSPA), University of Bari Aldo Moro. Mites were slide-mounted in Hoyer's medium and dried on a hot plate for a week. They were then identified to the species level under a compound microscope (Nikon Eclipse Ni) using keys in Norton and Behan-Pelletier (2009), and had their Italian distribution confirmed using Bernini et al. (1995) and Schatz (2018). Plants were identified following Fiori (1969) and visually inspected for damage.

We found *H. rostralamellatus* present in 12 tree species in the Apulia territories, Southern Italy (Table 1), and their abundance varied between 1-20 individuals per tree. Most tree species are fruit trees and/or edible, including plum (*Prunus cerasifera*), a common widespread tree where the association with the mite has been detected elsewhere (MURPHY and BALLA, 1973). Nonetheless, and to the best of our knowledge, the association with all other trees is new to the literature.

We also report no visual damage in the trees associated with *H. rostralamellatus* populations, as seen before (GEORGHIOU, 1959). The lack of damage can be explained by trees not being the preferred food resource of *H. rostralamellatus*, or potentially because the mite populations could be top-down controlled. For instance, Lattin (1993) suggested *H. rostralamellatus* is associated with the European hemipteran *Brachysteles parvicornis* (Costa) after finding them together in *Pinus rigida* (Mill) in Massachusetts, but that this is probably a predator-

prey association (PÉRICART, 1972). Both the oribatid mite and the insect have been collected in another event from the same individual *Pinus silvestris* trees in Nova Scotia, Canada (LATTIN, 1993).

Although *H. rostralamellatus* has been listed for the entire Italian country (SCHATZ, 2018), the species is not endemic of the region. In fact, both Behan-Pelletier and Lindo (2019) and Subías (2004, electronic update 2021) consider *H. rostralamellatus* a semicosmopolitan species, and other records for Europe include Greece (e.g., MAHUNKA, 2008), Belgium (e.g., ANDRE, 1975), Sweden e.g., FRÖBERG et al., 1996), Austria (e.g., KRISPER et al., 2017), Portugal (e.g., SUBÍAS and SCHANTACHAEVA, 2015), France (e.g., CANCELA DA FONSECA, 1965), Finland (e.g., NIEMI et al., 1997), Spain (e.g., ARROYO and ITURRONDOBEITIA, 2003), Denmark (e.g., GJELSTRUP, 1978), Russia (e.g., VAN DER HAMMEN, 1952), Germany (e.g., WEIGMANN and KRATZ, 1982), British Isles (e.g., MONSON and LUXTON, 2020), Slovakia (e.g., STARÝ, 2006a) and Czech Republic (e.g., STARÝ, 2006b).

Ultimately, despite the association of this species with several species of fruit tree (including our new records in this paper), there is little evidence that the mite can be harmful to fruit trees (GEORGHIOU, 1959), but Jeppson et al. (2020) listed an exception: specifically, *H. rostralamellatus* can become harmful to cherries when, during wet seasons, the mites feed on the rinds of split fruits, where they populations can aggregate, and the mites thus need to be washed out of the fruits prior to packing. However, the mites do not appear to feed on healthy fruits (EVANS, et al. 1961), and caution should be taken by horticulturists not to mistake the species by actual plant feeders like *Bryobia* mites (Tetranychidae), for example.

**Table 1.** Tree species sampled for *Humerobates rostralamellatus* in the Apulia territories, Southern Italy.

Locality	Coordinates	Family	Host species
Giovinazzo	41° 10' 37" N 16° 41' 35" E	Pittosporaceae	<i>Pittosporum tobira</i> (Thunb.) W.T.Aiton
Giovinazzo	41° 10' 37" N 16° 41' 35" E	Rosaceae	<i>Prunus cerasifera</i> Ehrh. 1784 not Popov 1929 nor Lecoq & Lamotte 1848
Bitetto	41° 02' 23" N 16° 44' 22" E	Rosaceae	<i>Prunus dulcis</i> Batsch, 1801
Bitetto	41° 02' 24" N 16° 44' 29" E	Rosaceae	<i>Citrus limon</i> (L.) Osbeck
Bitetto	41° 02' 29" N 16° 43' 43" E	Rosaceae	<i>Mespilus germanica</i> L.
Bitetto	41° 02' 30" N 16° 44' 14" E	Lauraceae	<i>Laurus nobilis</i> L.
Bitetto	41° 02' 30" N 16° 44' 12" E	Anacardiaceae	<i>Schinus molle</i> L.
Bitetto	41° 02' 27" N 16° 45' 09" E	Rhamnaceae	<i>Rhamnus alternatus</i> L.
Bitetto	41° 02' 29" N 16° 43' 48" E	Oleaceae	<i>Olea europaea</i> L.
Bitetto	41° 02' 02" N 16° 44' 02" E	Simaroubaceae	<i>Ailanthus altissima</i> (Mill.) Swingle
Bitetto	41° 02' 27" N 16° 44' 12" E	Fagaceae	<i>Quercus</i> sp.
Bari	41° 06' 49" N 16° 52' 82" E	Ebenaceae	<i>Diospyros kaki</i> Thunb.

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