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A New Pteromalid Species: *Anisopteromalus quinarius* (Gokhman & Baur, 2014) Found in Tunisia

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ABSTRACT

A recently described species of Pteromalidae, Anisopteromalus quinarius (Hymenoptera: Pteromalidae) parasitizing Lasioderma serricorne (Coleoptera: Anobiidae), a pest of stored products, has been found for the first time in Tunisia. The affinities of the new species along with the related species are discussed in this paper.

Keywords: Parasitoid Wasp, *Anisopteromalus quinarius, Lasioderma serricorne*

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INTRODUCTION

In Tunisia, stored chickpeas are damaged by several species of weevil (Coleoptera: Anobiidae, Silvanidae, Chrysomelidae, Tenebrionidae, Curculionidae, Bostrichidae and Laemophloeidae) among which: *Lasioderma serricorne* (Fabricius) [Anobiidae], *Catharthus quadricollis (Guérin-Méneville) [Silvanidae], Oryzaephilus surinamensis* (Linnaeus) [Silvanidae], *Callosobruchus maculatus* (Fabricius) [Chrysomelidae], *Tribolium* spp. [Tenebrionidae], *Sitophilus zeamais* (Motschulsky) [Curculionidae], *Rhyzopertha dominica* (Fabricius) [Bostrichidae] and *Cryptolestes* spp. [Laemophloeidae] are the most frequently found ones.

The species of the genus Anisopteromalus Ruschka (Pteromalidae) are parasitoids of Coleopteran pests of stored products, more specifically they are parasitoids of anobiids, bruchids, curculionids and dryophthorids [1, 2]. Anisopteromalus species are also recorded as hyperparasitoids on *Plutella xylostella* Linnaeus (Lepidoptera) [3, 4, 5]. Eight species have been described so far in the genus of Anisopteromalus [2]: *Anisopteromalus apiovorus* [6]; *Anisopteromalus calandrae* [7]; *Anisopteromalus camerunus* [8]; *Anisopteromalus caryedophagus* [6]; *Anisopteromalus ceylonensis Sureshan* (2010) [1,9]; *Anisopteromalus glaber* [10], *Anisopteromalus schwenkei* [11] and *Anisopteromalus quinarius* [12], and the later which was recently identified by [13].

Anisopteromalus calandrae (Howard) (Pteromalidae) is an important parasitoid of pests of stored products such as cereals, e.g., the granary weevil *Sitophilus granarius* (Linnaeus) or the drugstore beetle *Stegobium paniceum* (Linnaeus). For a long time, *A. calandrae* has been considered as one of the major antagonists of these pest species and has also been used in biological control. However, the karyotypic investigation of [14] revealed that this parasitoid was in fact two distinct species. The second species was described only recently as *A. quinarius* Gokhman & Baur by [13]. Indeed, the 2 species differ in their karyotypes with the haploid chromosome numbers of n=7 andn=5, for A. calandrae and A. quinarius respectively.

The two species are generally similar morphologically 13]. The discovery of this new species is significant for any biological control project, as the two species differ strongly in their host preferences: Specifically, *A. quinarius* prefers to attack certain Anobiidae, for example *Stegobium paniceum or Lasioderma serricorn*e while A. *calandrae* prefers Sitophilus [13].

MATERIAL AND METHODS

In December, 2014, during the rearing of populations of *Lasioderma serricorn*e on chickpeas, at the Laboratory of Entomology, Regional Centre of Research on Horticulture and Organic Agriculture, Chott-Mariem, Tunisia (35° 55' 06.0" N,

10° 34' 34.9 "E), the authors observed the emergence of wasps belonging to the species *Anisopteromalus quinarius* [12], which is a new record for Tunisia. The wasps were located alongside two pest species, firstly *Lasioderma serricorne* and later *Rhizopertha dominica* (Coleoptera: Anobiidae and Bostrichidae). *Lasioderma serricorne* and its parasitoid were reared in rearing boxes (21 × 15 × 10 cm) at 28°C and a photoperiod (16 h light/8 h dark).
The specimens were captured by a mouth aspirator and placed in 70% alcohol in eppendorf tubes and sent to the department of Invertebrates, Natural History Museum, Bern, Switzerland, where the identification was confirmed. Specimens were studied with a Leica MZ 12.5 stereoscopic microscope; photographs were taken with a Nikon Coolpix 4600 camera.

RESULTS AND DISCUSSION

Taxonomy

Class: Insecta (Linnaeus, 1758)
Order: Hymenoptera (Linnaeus, 1758)
Suborder: Apocrita (Gerstaecker, 1867)
Superfamily: Chalcidoidea (Latreille, 1817)
Family: Pteromalidae (Dalman, 1820)
Subfamily: Pteromalinae (Dalman, 1820)
Genus: Anisopteromalus (Ruscka, 1912)
Species: *Anisopteromalus quinarius* (Gokhman& Baur, 2014)

Etymology

The species' name is derived Latin and means 'of five'. It refers to the haploid chromosome number, which is only five in this species. The name 'quinarius' is treated as a noun in apposition and does not change with gender [13].

DESCRIPTION

Female: The head is olive-green and the abdomen is black uniform; the body size is (2-2.5mm) (fig. 1a); mesosoma is greenish black (fig. 1b); eyes and ocelli are dark reddish brown (fig. 1c); and antenna with scape and pedicel is light brown. First and second anellus are testaceous, and the rest of flagellum is fuscous (fig. 1d). The wings are hyaline, and the veins are dark brown (fig. 1e). Coxae is concolourous with mesosoma; femora are brownish yellow with paler apices; the fore tibia is white apically and pale yellow in basal half; the fore tarsi is pale brown (fig. 1f) and the head is distinctly reticulate and moderately setose.
Male: Similar to the female in colour, the body size is small (1.5-2mm) (fig. 2a). There is a sexual dimorphism in colour on the abdomen: the male exhibits a lack of pigmentation in the ventral base of the gaster (fig. 2 b, c).

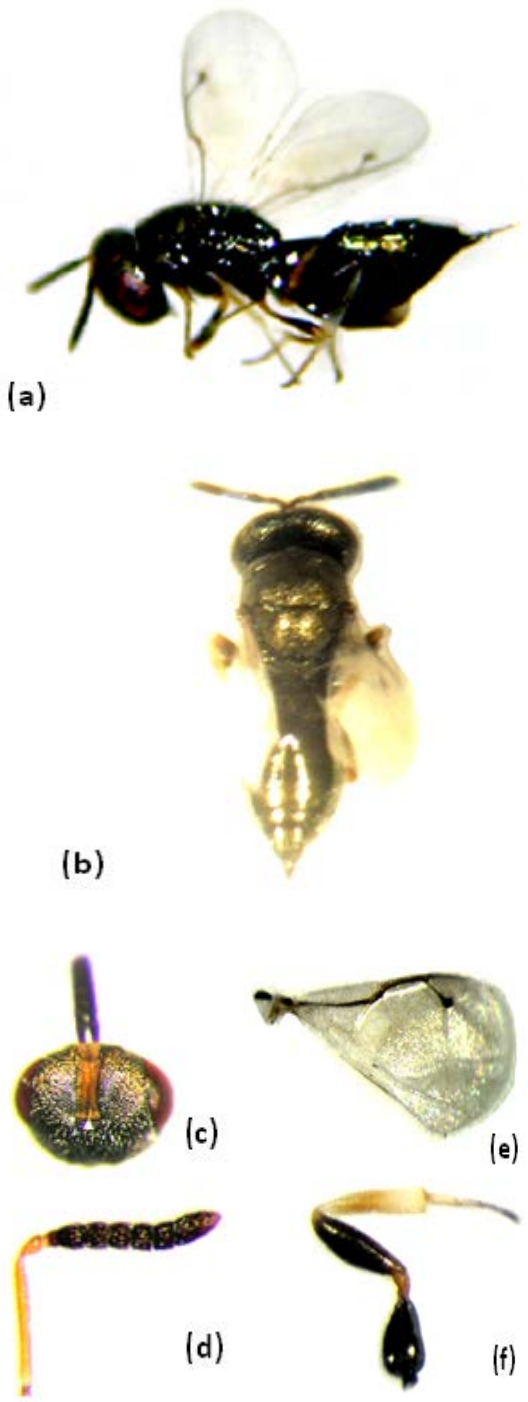

Fig. 1 *A. quinarius* female: (a) lateral view, (b) mesosoma in dorsal view, (c) head in frontal view, (d) atenna, (e) forewing, (f) leg.

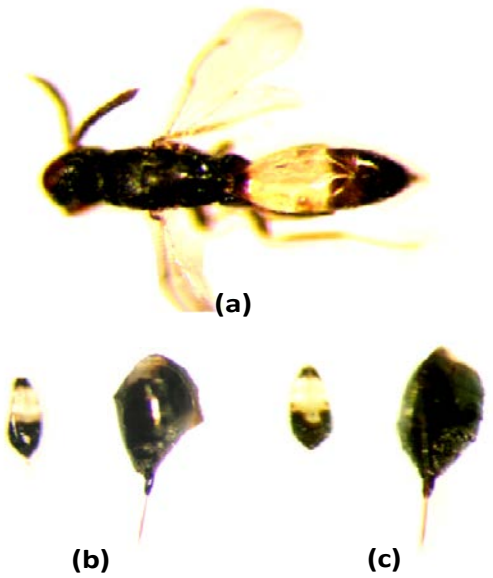

Fig. 2 (a) *A. quinarius* male in lateral view, (b) gaster in dorsal view of male and female, (c) gaster in ventral view of male and female.

Biology

The insect is a parasitoid wasp of cosmopolitan distribution that attacks several species of weevils in stored grains. The host preferences of this species contrasts somewhat with those of *A. calandrae*. Specifically, it prefers to attack certain Anobiidae, for example *Stegobium paniceum* or *Lasioderma serricorne*; however, it can easily be reared on *Sitophilus* spp. [13]. *A. quinarius* is an idiobiontic ectoparasitic wasp. The females use their ovipositor to drill holes in e.g. chickpeas, paralyze the host larvae and place an egg on the outside of the host larva. The wasp larva develops on the outside of the host while sucking out its inside. Finally, the wasp larva pupates and hatches (fig. 3).

Fig. 3 Pupa of *A. quinarius* (arrow) attached to a *L. serricorne* larva.

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