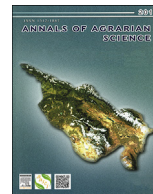




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Parasitoid complex of *Gossyparia spuria* (Modeer) (Hemiptera: Acanthococcidae) from eastern anatolia with new records for the Turkish fauna

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ABSTRACT

Three species parasitoids of *Gossyparia spuria* (Modeer) (Hemiptera: Acanthococcidae) have been recorded from Eastern Anatolia, two of them *Coccophagus gossyparia* Gahan and *C. excelsus* Erdos (Hymenoptera: Aphelinidae) are new for Turkey. *Coccophagus excelsus* is new to the Middle East, and has previously been recorded from Hungary, Poland and Romania.

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Introduction

The European elm scale, *Gossyparia spuria* (Modeer) (Hemiptera: Acanthococcidae) is often regarded as a pest on ornamental elms (*Ulmus* spp.) (Ulmaceae) [1,2]. It has spread in the Holarctic Region and previously recorded in Turkey by Bodenheimer [3]. This species is very common almost all over Turkey on ornamental elms [4]. Besides their feeding on the plants directly, the large quantity of honeydew produces coats on the leaves and the sooty mold *Coniothecium effusum* [5] forms and covers the foliage [6].

Studies on parasitoid-scale insect relationships can help in our understanding of the generic composition of scale insects. Kozár & Japoshvili [7] undertook a phylogenetic analysis of the insect-parasitoid relationships of the Palaearctic Acanthococcidae. Noyes [8] indicated that *G. spuria* has 17 parasitoid species belonging to three different families (Aphelinidae, Encyrtidae, Pteromalidae) in the Palaearctic region. According to the same source, the genus

Coccophagus Westwood (Hymenoptera: Aphelinidae) is one of the most species-rich genus, and includes four species known as parasitoids of this pest.

The parasitoid complex of *G. spuria* has been studied previously by Viggiani [9] in Italy and Japoshvili et al. [1] in Georgia. Here we present a study about the parasitoid complex of *G. spuria* in Eastern Anatolia.

Material and methods

The Van Lake basin is located among the Irano-Turanian, Euro-Asian and Mediterranean subregion of the Palaearctic Zoogeographical Region. This study was conducted in the provinces of Ağrı, Bitlis, Hakkari, Iğdır and Van, with altitudes ranging between 800 and 2300 m. The study was conducted in areas with mixed urban, residential, cultivated, and wild areas. The main crops grown in the area are pomes, stone fruits and cereals.

Sampling was carried out twice per week during spring and summer in the years of 2005 and 2008. Mealybug specimens were collected from ornamental, cultivated and wild plants. To obtain parasitoids, infested plant parts were put into plastic bags and taken to the laboratory. Parasitised mealybug were put into plastic caps covered by fine mesh material and put into 25 ± 2 °C, 65 ± 5%

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relative humidity and 16 h of artificial light of ≈ 4000 Lux in a controlled environment room. The emerging adult parasitoids were transferred into vials containing 70% ethyl alcohol.

The acanthococcids were slide-mounted and identified by the first author. Preparation of the acanthococcid specimens for identification entailed using the methodology of Kosztarab & Kozár [2], and identifications were made using the keys and plates of Kozar et al. [6].

The second author prepared the acanthococcid specimens and identified them. Card mounting and slide mounting of parasitoids were done following Noyes [8] and determination of species were made using keys and plates of Compere [10], Yasnosh [11], Japoshvili, Karaca [12] and additional works, dealing with closely related species. Voucher specimens of parasitoids are deposited in the collection of Entomological collection of the Agricultural University of Georgia, Tbilisi, Georgia; specimens of the acanthococcid hosts are deposited in the Coccoidea collection, Çukurova University, Agriculture Adana, Turkey. New species records for Turkey are indicated with asterisk.

Results

Coccobius annulicornis Ratzeburg, 1852

Material examined: 2 females, card mounted (samples were destroyed by a collection predator, legs and forewing remain), ex *Gossyparia spuria*, **AGRI**; Tutak, 31.05.2005, 39°32'698"N, 42°45'943"E, 1600 m, *Ulmus* sp. (KN: 1619).

**Coccophagus gossyparia* Gahan, 1927

Material examined: 4 females, card mounted, 1 female slide mounted, 3 females in gelatin capsule, ex *Gossyparia spuria* Van, Muradiye-Ünseli, 08.06.2005, 38°59'219" N, 43°35'490"E, 1709 m, *Ulmus* sp. (KN: 1674); 10 females in gelatin capsule, 3 females, card-mounted, 3 females, ex *Gossyparia spuria*, **AGRI**; Tutak, 31.05.2005, 39°32'698" N, 42°45'943"E, 1600 m, *Ulmus* sp. (KN: 1619).

**Coccophagus excelsus* Erdos, 1956

Material examined: 1 female, slide mounted, ex *Gossyparia spuria*, **Van**, Muradiye-Ünseli, 08.06.2005, 38°59'219"N, 43°35'490"E, 1709 m, *Ulmus* sp. (KN: 1674).

Comment. This species was previously recorded from Hungary, Poland and Romania [8].

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