

About the male external genitalia of *Alydus calcaratus* (Linnaeus, 1758) (Hemiptera, Heteroptera)

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ABSTRACT: In this study, the male genitalia of *Alydus calcaratus* belonging to the Alydidae (Hemiptera: Heteroptera) family were examined, photographs of adults and illustrations of male external genitalia are provided.

KEYWORDS: *Alydus calcaratus*, male genitalia, parameres, aedegus, pygophora

INTRODUCTION

The family Alydidae comprises approximately 200 known species belonging to 50 genera worldwide. Sixty-nine species belonging to 26 genera are found in the Palaearctic Region (Dolling, 2006).

The nominative subfamily of the family Alydidae is Alydinae, which is represented in Türkiye by 8 species belonging to 5 genera (Çerçi et al., 2024).

This short note presents the redescription of one of these species, *Alydus calcaratus*, and photographs of the male parameres and pygophora.

The genital capsule (pygophora), aedagus (phallus), and parameres were removed from male specimens for examination. Because a genital preparation was required

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for diagnosis, the male genitalia were removed and a genital preparation was made. For this purpose, the abdominal portion of the specimen was removed and soaked in hot water containing 10% KOH for 2–10 minutes, depending on the group.

The parts outside the genitalia were cleaned under a stereo microscope. The remaining genitalia were first washed with water and then soaked in 70% ethyl alcohol.

The removed genitalia were either attached to a separate small piece of cardboard or placed in a small Eppendorf tube filled with glycerin and pinned next to the specimen.

Olympus SZX7 and Leica Z-16APO stereomicroscopes were used in the studies.

The identified *A. calcaratus* specimen collected by Dr. Suat Kiyak was used as material in this study. The material is stored in the Gazi Zoology Museum.

Family ALYDIDAE Amyot & Serville, 1843

Subfamily ALYDINAE Amyot & Serville, 1843

***Alydus* Fabricius, 1803**

***Alydus calcaratus* (Linnaeus, 1758)**

Material examined: 1 male (Ankara Çaldağı 1180 m)

Redescription: The width of the head equal to the length of the posterior margin of the pronotum. Head varies from blackish brown to black, and with two spots on the distal of tylus. Legs of males rather thick and with strong spines.

The antennae 4 segments, the last of which curved. The first and second antennal segments usually reddish-brown, becoming blackbrown distally; the third segment black-brown, sometimes broadly reddish-brown proximally; the fourth segment blackish-brown.

The body dark brown, blackish-brown, or black, covered with long, dense black hairs perpendicular to the surface and also with shorter, semi-oblique, lighter hairs.

The tylus usually yellow-brown. The proximal part of the pronotum brownish with a black-brown median and spots; the distal part black-brown or black, usually with a yellow-brown median.

The scutellum blackish-brown or black, with a button-shaped distal corner that yellowish or whitish.

The hemielytra brown or dark brown, sometimes yellow-brown. The veins dark. The membrane whitish-grey with brown or dark brown veins, or the membrane brown or dark brown and with black veins.

The dorsum red, with black proximal and distal parts.

The paratergites dark brown or black-brown, with a yellow lateral proximal corner. The ventral side black, glossy. The legs densely black-haired.

The femurs black-brown or black, with three long spines on the hind leg femur. The tibiae reddish-brown. The distal and sometimes proximal parts blackish-brown or black. The first tarsus segment reddish-brown proximally and the distal parts blackish-brown or black. The second and third tarsus segments blackish-brown or black. (Figure 1).



Figure 1. *Alydus calcaratus* **A)** dorsal view **B)** ventral view

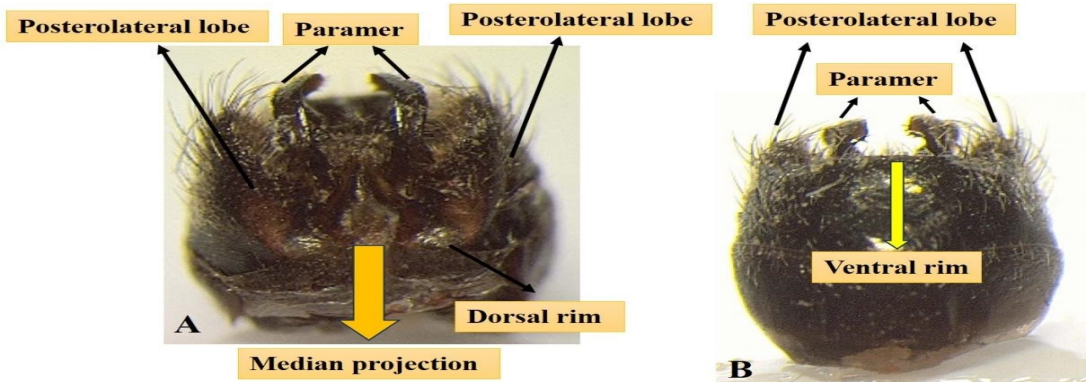


Figure 2. Parts of the genital capsule of *Alydus calcaratus* **A)** Structures visible in the dorsal view; **B)** Structures visible in the ventral view.

Description of the paramere and pygophore of *Alydus calcaratus* (Figure 2) is given below.

Genital Capsule (Pygophore):

Genital capsule rectangular, strongly sclerotized, and dark brown in general coloration.

In dorsal view (A), posterolateral lobes broad, slightly narrowed toward apices, and densely setose.

Parameres long, slender, and slightly curved inward apically. Dorsal rim concave with a distinct and broad median projection, which is deeply sclerotized.

In ventral view (B), the ventral rim moderately concave medially and covered with dense setae along the lower margin.

The general shape and relative proportions of the posterolateral lobes and parameres symmetrical in both views.

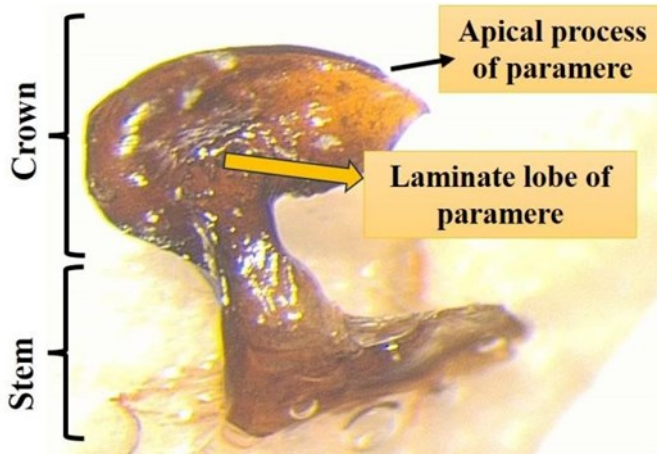


Figure 3. Morphological structure and components of the paramere in *Alydus calcaratus*

Parameres: The paramere structure generally transversely elongate and slightly curved laterally. In the image, particularly the crown region (including the apical process and laminate lobe) distinct. The apical process curved and ends in a bluntly truncate form, slightly directed upward. The surface exhibits distinct laminar reflections and smooth brightness, suggesting that it rich in micro-sculpture. The laminate lobe appears as a broad, flattened connecting structure linking the apical process with the main body of the paramere. From the anterior view, this lobe forms a distinct bridge-like structure, defining the overall C-shaped appearance of the paramere. (Figure 3) Overall, the structure shows a strong curvature and a clearly developed lamination in the crown region. This appearance represents a position in which the asymmetry at the apical portion of the paramere particularly the difference in inclination of the apical projection clearly visible.



Figure 4. Aedeagus structure of *Alydus calcaratus* **A)** Ventral view; **B)** Dorsal view.

Aedeagus: The aedeagus generally elliptical and tapering at both the basal and apical ends. The widest part of the structure is the middle region. In the image, the phallosome appears dark brown at the base and gradually becomes lighter toward the apex. (Figure 4) This indicates that the degree of sclerotization higher in the basal region. The capitate processes broad at the base, narrow in the middle, and slightly widened again at the apex.

For this group, it can be stated that the aedeagus does not exhibit significant differences; however, the paramere shows distinct variation at the species level, while the structure of the genital capsule provides differentiation at both the generic and species levels.

In particular, **paramere morphology**, together with the structures of the **median projection**, **ventral rim**, **posterolateral lobes**, and **dorsal rim** of the genital capsule, constitutes important diagnostic characters within the group. Among these, the **median projection (median process)** and **paramere structure** represent the most reliable characters for species identification.

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