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ALYDUS CALCARATUS IN NORTH AMERICA (HEMIPTERA: ALYDIDAE)

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Abstract.—The Nearctic *Alydus pluto* Uhler is synonymized with the Palearctic *Alydus calcaratus* (L.), and the New World range of the species extended some 1500 miles eastward, into Québec. A lectotype is designated for *Alydus pluto.* Characters to distinguish New World *A. calcaratus* from the similar New World species, *A. tomentosus* Fracker and *A. eurinus* Say, are discussed and figured. *A. tomentosus* is recorded from Arizona, and *A. pilosulus* Herrich-Schaeffer from New Mexico, both for the first time.

Key Words: *Alydus,* Nearctic, Palearctic, synonymy, range extension

Alydus calcaratus (L.) is a northern Palearctic species whose range extends as far east as Siberia (Vinokurov 1979) and China (Zheng, pers. commun.). What has been considered another species, *A. pluto* Uhler, occurs in the northwestern Nearctic (Alaska south into the transmontane American west), east into Saskatchewan (Schaffner 1964, Froeschner 1988) and now into Québec (see below). Schaffner, in an unpublished dissertation (1964), synonymized the two species; and Schaefer has independently confirmed this synonymy.

In his dissertation, Schaffner (1964) discussed *A. calcaratus* and *A. pluto* in detail. He noted that the Palearctic *A. calcaratus* varies considerably in size (male: 9.35–11.00 mm; female: 11.00–13.00 mm), color (dark brown to black), and degree of vestiture. *A. pluto* falls within these ranges, and its male and female genitalia closely resemble those of *A. calcaratus,* and are unlike those of any other *Alydus* species, except *A. zichyi* Horvath, of China.

One problem remains: In 1953 Sailer identified as *A. calcaratus* several specimens of *Alydus* from Alaska south into the United States. He did so because they did not resemble "any of the species recognized by Fracker [1918] as occurring in North America." Fracker included *A. pluto* in his paper, and clearly Sailer believed his specimens to differ. One of us (JCS) examined nearly 350 North American specimens under both species names, and several European *A. calcaratus,* and determined the two species to be the same (Schaffner 1964). CWS has examined the genitalia of Old World specimens and specimens studied by Sailer (at the U.S. National Museum), with these results:

The male genitalia of an *Alydus calcaratus* from the Belgorod Region of Russia are identical (in paramere, surcapsular spine, and the cuplike sclerite's extension) with the genitalia of several specimens determined by Sailer (1953) to be *A. calcaratus.* The genitalia are identical also with those of a specimen from Dilley, Oregon, studied by Fracker (1918) as *A. pluto.*

Similarly, the female genitalia of an *Alydus calcaratus* from Xin-jiang, China, and another from England, are very similar to those of several North American specimens

examined by Sailer (1953) and determined by him as *A. calcaratus*. The genitalia are very close also to specimens from Dilley, Oregon, apparently not seen by Fracker but of the same series as the male he studied (same label data and all from the H. G. Barber Collection; Fracker comments that he got his Dilley, Oregon specimen "from Mr. Barber").

We conclude that the *Alydus calcaratus* of Sailer is conspecific with the *Alydus pluto* of Fracker. Perhaps in thinking they were distinct, Sailer was misled by Fracker's figures, which are not wholly accurate.

Alydus calcaratus (Linnaeus)

Cimex calcaratus Linnaeus, 1758, p. 450 (orig. descr.)
Lygaeus calcaratus; Fabricius, 1798, p. 541 (note)
Lygaeus tibialis Fabricius, 1798, p. 451 (orig. descr.)
Alydus calcaratus; Fabricius, 1803, p. 251–252 (descr.)
Alydus tibialis Fabricius, 1803, p. 252 (descr.)
Alydus hirsutus Kolenati, 1845, p. 64 (orig. descr.)
Alydus atratus Motschulsky, 1859, p. 502 (orig. descr.)
Alydus tibialis; Stål, 1868, p. 65–66 (syn.)
Alydus pluto Uhler, 1872, p. 401–402 (orig. descr.) NEW SYNONYMY
Alydus atratus; Reuter, 1888, p. 535 (syn.)
Alydus hirsutus; Reuter, 1888, p. 535 (syn.)

Diagnosis.—The form of the male and female external genitalia, and the rounded posterior pronotal angles, distinguish *Alydus calcaratus* from all other Palearctic *Alydus*. The dark color (dark fuscous to black) of *A. calcaratus*, and the characters discussed below, will distinguish it from other Nearctic species.

Distribution.—Western Canada and Québec (see below), Alaska and northwestern United States east into Wyoming and south (via mountains) into the American southwest. Northern Europe from Great Britain east into Yakutia and south into the Peoples' Republic of China.

Until recently, *Alydus calcaratus* was recorded no further east in the New World than Saskatchewan (Schaffner 1964). However, in the University of Minnesota collection is a female *A. calcaratus* collected in August, 1922 (by William E. Hoffmann) in Cook County, Minnesota. More recently, four specimens (1 male, 3 females) were collected in Moisie, Québec, near the mouth of the St. Lawrence River: a range extension (from Saskatchewan) of some 1500–1800 miles. These specimens were collected (by Claude Chantal) two years apart, in August, 1989, and August, 1991, which suggests that the species is established here. The host plant(s) is not known. In the Palearctic, *Alydus calcaratus* feeds on legumes (Vinokurov 1979), like other members of the Alydinae (Schaefer 1980).

Alydus calcaratus is thus recognized as a Holarctic species, largely restricted to the north. It arose perhaps in the Palearctic and arrived in the New World via Beringia. It shares this transboreal distribution with several mirid species (Wheeler and Henry 1992), some rhopalids (*Stictopleurus*) (Schaefer 1993), and certainly other insect species.

Uhler (1872) described *Alydus pluto* from specimens collected in Colorado; Ross Fork, Idaho; Louisiana; and Kansas. Schaffner (1964) believed the Louisiana specimen certainly, and probably the Kansas specimen as well, are not *A. pluto* (he had seen neither), because of their localities (see below). Schaffner did study the Idaho specimen, and Schaefer has seen the Colorado specimen. Both are *A. pluto*. The Colorado specimen bears a red type label with "No. 686"; additional labels are 1) Col.; 2) Smith; 3) P. R. Uhler Collection. We designate this male specimen from Colorado the lectotype of *Alydus pluto* Uhler.

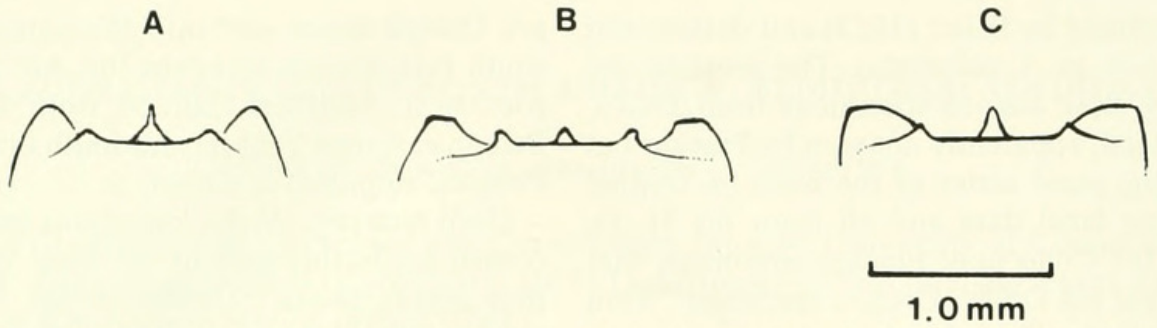

Fig. 1. Border of male's genital capsule, ventral view. A. *Alydus calcaratus*, B. *Alydus tomentosus*, C. *Alydus eurinus*.

The closest relatives of *Alydus calcaratus* are *A. zichyi* and *A. tomentosus* Fracker (Schaffner 1964). The first species occurs in China, and differs from both the others in its angulate posterior pronotal corners. *A. tomentosus* is found in the southwestern United States (but one record from South Dakota) south into Guatemala (Schaffner 1964), a distribution generally more southern than that of *A. calcaratus*. The two species overlap in the American southwest. In material from the Cornell Collection, CWS finds two large (13.5 mm) nearly black female *A. calcaratus* from Socorro Co., New Mexico, and two dark males from Larimer Co., Colorado. Significantly, both locales are high (7000 ft and 6000 ft, respectively), which suggests these bugs live in an "altitudinally northern" habitat.

According to Fracker (1918), the fourth antennal segment of *A. tomentosus* is longer than the second and third combined, but shorter in *A. pluto* (= *A. calcaratus*). But Schaffner (1964) finds that this is not always so: in *A. tomentosus* the fourth segment may be longer or shorter than, or equal to, the second plus the third. *A. calcaratus* differs from *A. tomentosus* in having a row of short, dark, recumbent setae along the apical half of the hind tibia's anterior surface. However, because the row is irregular and the setae often obscure, this character is not so useful as those of the genitalia.

Alydus eurinus Say, which occurs throughout the Nearctic, is another dark robust species sometimes confused with *A. calcaratus* (as *A. pluto* in Fracker 1918). Indeed, from its locale, the Louisiana specimen referred to by Uhler (1872) is almost certainly *A. eurinus*. In the *A. eurinus* female the valvulae lack fingerlike processes, nor are the male's parameres parallel to each other in caudal view; both features characterize *A. calcaratus* and *A. tomentosus*.

The three species can be easily distinguished by features of the male's genital capsule:

Alydus calcaratus: In ventral view, the projections of the lateral rim are obtuse; and the cuplike sclerite can be seen projecting above the ventral rim and narrowing suddenly to a needlelike extension (Fig. 1A). (Note: we do not find the slight expansion shown by Fracker [1918, Fig. 2] at the base of this extension.) The surcapsular spines (dorsal surface) bear 2–3 small teeth subterminally on their lateral surfaces, and the spines' tips are hooked. (In some specimens there may be another small lateral tooth along the surcapsular spine; this small tooth may occur on one spine and not on the other.)

Alydus tomentosus: In ventral view, the projections of the lateral rim are broad and low; and the cuplike sclerite is only slightly visible (Fig. 1B). The surcapsular spines (dorsal surface) bear laterally a single large subterminal tooth, and the spines' tips are simple.

Alydus eurinus: In ventral view, the projections of the lateral rim are broader than in *A. calcaratus*, and not so low as in *A.*

tomentosus; and cuplike sclerite is visible and not narrowed as in *A. calcaratus* (Fig. 1C). The surcapsular spines (dorsal surface) bear laterally a large tooth halfway along their lengths, and the spines' tips are only slightly hooked.

New Records for Other Species of *Alydus*

The material from Cornell University allows these new state records:

Alydus tomentosus Fracker: Arizona, Cochise Co. (Froeschner 1988 records from Colorado)

Alydus pilosulus Herrich-Schaeffer: New Mexico, Bernalillo Co. (Froeschner 1988 records from many other states, including Texas)

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