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**A new species of the
flat bug genus *Aradus* FABRICIUS 1803 from China
(Heteroptera, Aradidae)**

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A b s t r a c t : Records of *Aradus crenatus* SAY 1832 reported from China by HSIAO (1964) and LIU (1981) proved to belong to a new species, which is described as *Aradus zhengi* sp. nov. Related species are *Aradus crenatus* SAY 1832 (North America), *Aradus gretae* KIRITSHENKO 1955 (Russian Far East) and *Aradus esakii* KORMILEV & HEISS 1976 (Japan), of which distinguishing characters are discussed and figured.

K e y w o r d s : Heteroptera, Aradidae, *Aradus*, new species, China.

Introduction

The species of the genus *Aradus* FABRICIUS 1803 occurring in China were first treated by HSIAO (1964), where he reported *A. crenatus* SAY 1832 from Gansu (NO). Also LIU (1981) included this species in the Chinese fauna of Aradidae and gave an additional record from Hubei (CE) province.

HEISS (1980) has shown, that European records reported as *A. crenatus* belong to *A. conspicuus* HERRICH SCHAEFFER 1835 or *A. inopinus* KIRITSHENKO 1955 respectively and the true *A. crenatus* is a nearctic species.

Therefore HEISS (2001) suspected, that the Chinese specimens might belong to a new species, which is now confirmed and described as *Aradus zhengi* sp. nov. below.

Material and Methods

Reference material from China, now available, belonging to Tianjin Museum of Natural History, Tianjin, P.R. of China and the collection of the author, enabled a comparative study of the new species, which is compared with three related species of neighbouring countries.

Additional material of *Aradus esakii* investigated: 2♂♂ Japan, Honshu, Mt. Nyugara, Ina Nagano, V-VII 84 lg. Ito (authors coll.); 2♂♂ 1♀ Japan, Honshu, Mt. Oyama, Kanagawa Pref., 22.VII.1974, Y. Notsu; 1♀ Honshu, Nishi-Tanzawa, Kanagawa Pref., Aug. 1987, Y. Notsu (coll. Nat. Science Mus. Tokyo); 1♂ Japan, Honshu, Sasari-toge, Kyoto Pref., 27.VI.1987, Y. Shono leg, 1♀ from the same locality 2.VI.84, Y. Shono leg. (coll. Shono).

The specimen from Hubei reported by LIU (1981) as *A. crenatus* could also be studied. It belongs most probably to *A. discompar* HSIAO, of which the holotype could not be located.

Measurements are given in millimeters or units (40 units = 1 mm).

Depositories of types: Tianjin Museum of Natural History, Tianjin, P.R. China (TMNH); collection E. Heiss, Tiroler Landesmuseum, Innsbruck, Austria (CEHI).

Taxonomy

Aradus zhengi sp. nov. (fig. 1, 2, 6, 7, 8)

H o l o t y p e : Male, labelled: "China, SE-Shaanxi, Danfeng – NE env., 900-1500 m, 28.-29.5.95, 33°45'-52'/110°22'-37', L + R Businsky lgt." (CEHI); Paratype female, labelled as holotype (CEHI); paratype female from China, Cheumen (Gansu), 10.V.19, which is the specimen mentioned by HSIAO (1964) and bearing his identification label (TMNH).

D i a g n o s i s : Distinguished from the related species of large size and wide, antero-laterally expanded pronotum by its distinct shape of pronotum and the genitalic structures of the male as shown in fig. 6-12.

D e s c r i p t i o n : Male. Macropterous. Body, legs and antennae covered with small setigerous tubercles, which are larger, darker and more prominent on pronotal carinae, corial veins, lateral margins of scutellum and on margins of dorsal external laterotergites (deltg). General coloration of body, hemelytra and antennae uniformly brown. Legs brown, yellowish are a preapical ring and the apex of femora, a subbasal and a preapical ring on tibiae and the tarsi except apex of segment II.

H e a d : Shorter than width across eyes (59/64); clypeus with nearly parallel sides, apex broadly rounded. Antenniferous tubercles reaching $\frac{1}{2}$ of antennal segment I, apices acute. Eyes globose, protruding laterally. Preocular tubercles distinct. Postocular portion of head rounded, strongly converging posteriorly, margins granular but without distinct postocular tubercles. Vertex medially with setigerous granules and laterad with 2 (1+1) ovate depressions, which are connected at base.

Antennae more than twice as long as width of head across eyes (in female, antennal segments III+IV missing in male), segment I subcylindrical, II+III cylindrical, IV fusiform with pilose apex. Relative length of segments $1/2/3/4 = 15/47/--/--$. Rostrum arising from an open atrium, reaching posterior margin of procoxae.

P r o n o t u m : Nearly 2.5 times wider than long (144/58); anterolateral lobes broadly rounded and expanded, their margins with large setigerous tubercles; posterolateral margins with smaller tubercles, strongly converging towards rounded posterior lobes. Posterior margin concave at middle. Disk with four longitudinal carinae and carinate humeri, all densely beset with setigerous tubercles.

S c u t e l l u m : Triangular, longer than wide (80/54) with elevated lateral margins with setigerous tubercles, which are reduced in size and density on basal posterior half, leaving a narrower smooth portion. Disk raised at basal $1/3$, with an elevated granulate ridge at middle.

A b d o m e n : Ovate in outline with posterolateral angles of deltg II-VI progressively

projecting, deltg VII truncate posteriorly. Corium roundly dilated and reflexed at base, reaching anterior margin of deltg IV. Veins of corium prominent with darker setigerous tubercles along the margin adjacent to membrane. Membrane fully developed, veins indistinct, surface wrinkled. Spiracles II-VII ventral, remote from lateral margin, VIII lateral and visible from above.

Genitalic structures: Genital segment VIII cup – like with lamellate expanded and raised posterior lobes. Pygophore subglobose, flattened dorsally (fig. 7). Parandria as fig. 8; parameres as fig. 6a-6c; tergite IX formed by 2 (1+1) small rounded lobes (fig. 7).

Legs: Slender, trochanters fused to femora, marked by a suture.

Female: Similar to male but larger and abdomen more rounded laterally (fig. 2), with posterolateral angles of deltg II-VI less projecting. Paratergites VII triangular.

Etymology: It is a pleasure to dedicate this species to the estimated colleague and eminent Chinese Heteropterist Dr. Le Yi Zheng of Nankai University, Tianjin.

Measurements: Holotype male: Length 9.3 mm; width of abdomen across tergite IV 4.5 mm. Paratype female: Length 9.9 mm; relative length of antennal segments I/II/III/IV = 15/46/37/28; ratio antennae / width of head 2.17; width of abdomen 5.5 mm. Paratype female (Cheumen): Length 10.2 mm; width of abdomen 5.65 mm.

Discussion: *Aradus zhengi* sp. nov. was confounded with the closely related nearctic species *A. crenatus* SAY, which is distinguished by the different shape of pronotum with more straight lateral margins (fig. 3) and by other shape of parameres and tergite IX in males (fig. 9a-c, 10). The East-Palaearctic *A. gretae* KIR., of which only the female holotype is known to date, can easily be distinguished by the more rounded shape of pronotum (fig. 4) and the thicker and shorter yellowish antennae. Of the same size is also *A. esakii* KORM. & HEISS so far only known from Japan, but the latter can be recognized by a more slender body, a different shape of pronotum (fig. 5), shorter antennae with longer segment I, petiolate segment II and segment III which is ochraceous except at base and apex. Parameres of male (Fig. 11a-d) and tergite IX (fig. 12) show also clear differences to *A. zhengi* sp. nov.

Acknowledgments

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Zusammenfassung

Die Meldungen von *Aradus crenatus* SAY 1832 durch HSIAO (1964) und LIU (1981) für China beruhen auf Belegstücken, welche sich nun als neue Art herausstellten, die als *Aradus zhengi* sp. nov. beschrieben wird. Die Unterscheidungsmerkmale der nächstverwandten Arten *Aradus crenatus* SAY 1832 aus Nordamerika, *Aradus gretae* KIRITSCHENKO 1955 von Primorsky Krai und *Aradus esakii* KORMILEV & HEISS 1976 aus Japan, werden diskutiert und abgebildet.

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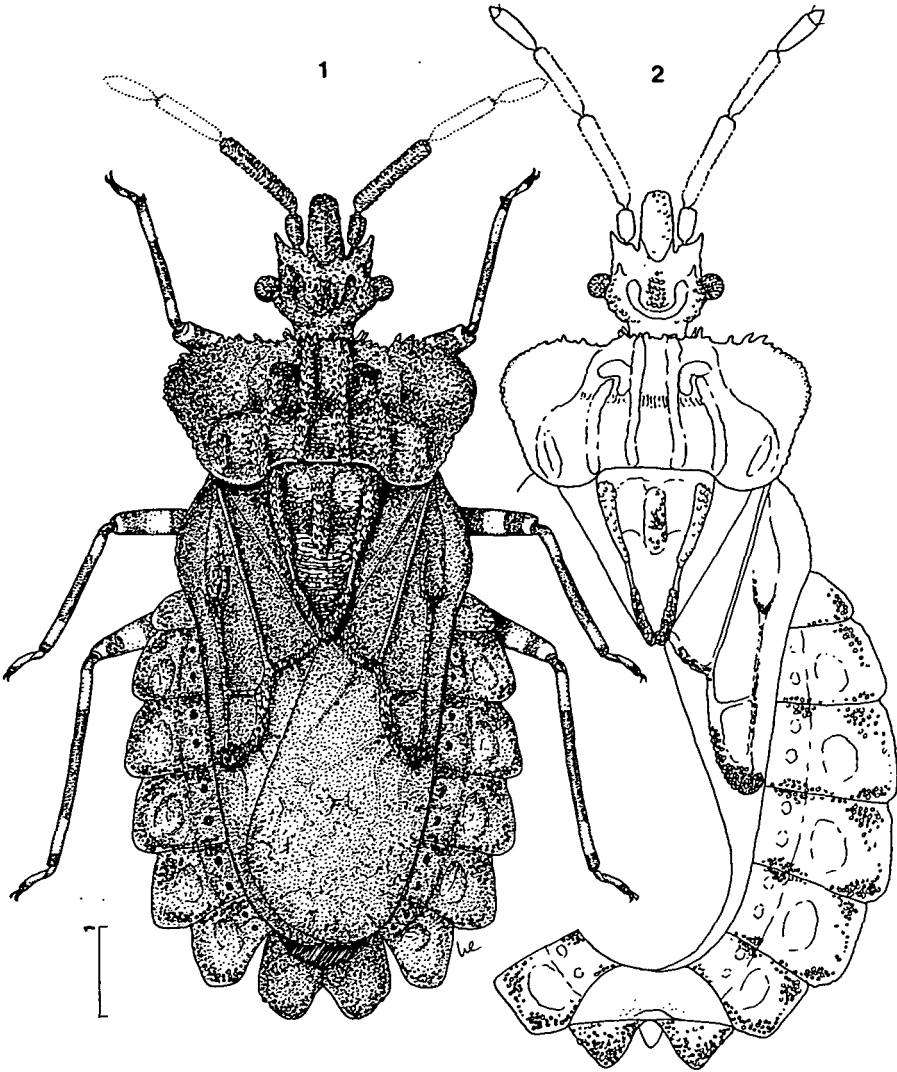


Fig. 1-2. *Aradus zhengi* sp. nov., dorsal view. 1 – Holotype male; 2 – Paratype female from locality of holotype. Scale 1 mm.

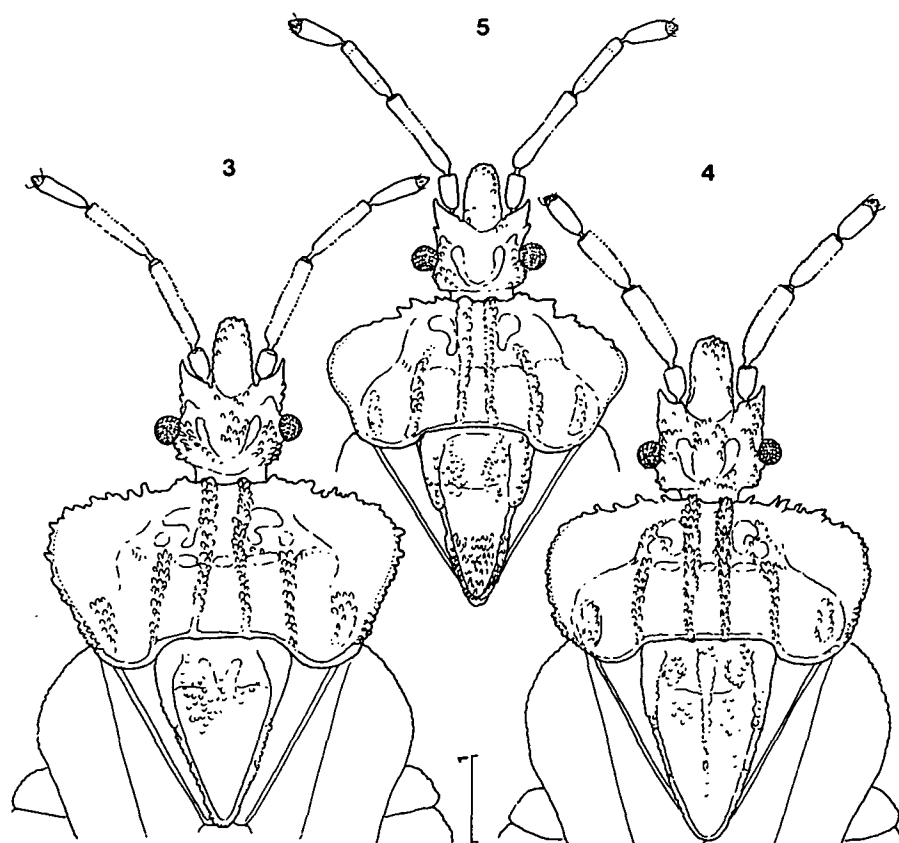


Fig. 3-5. Anterior portion of female *Aradus* species, dorsal view. 3 – *A. crenatus* (Maryland, USA); 4 – *A. gretae*, holotype (Primorsk Terr.); 5 – *A. esakii* (Mt. Nyugana, Honshu, Japan). Scale 1 mm.

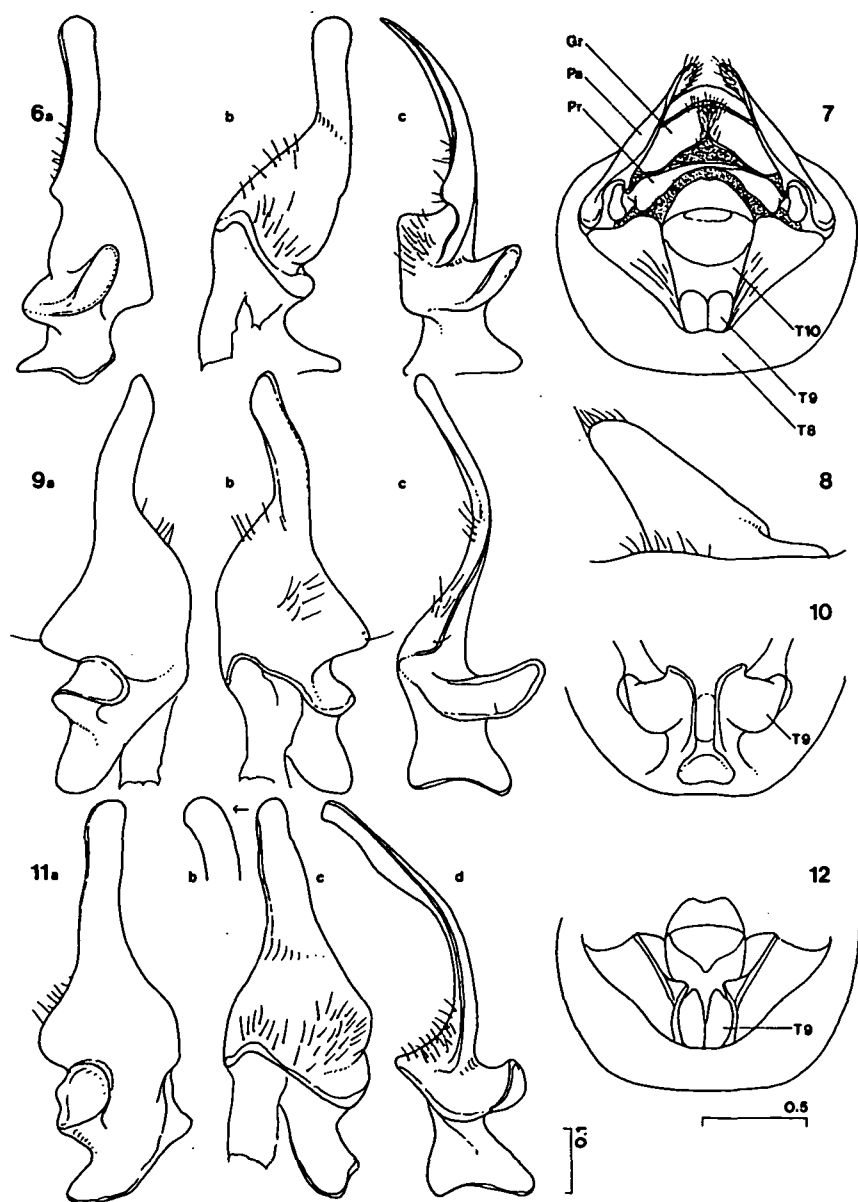


Fig. 6-12. 6-8 – *Aradus zhengi* sp. nov.; 9, 10 – *A. crenatus*; 11, 12 – *A. esakii*; 6a-c, 9a-c, 11a-d – left paramere in different positions; 7 – pygophore, dorsal view; 8 – parandrium; 10, 12 – basal portion of pygophore with tergite IX. Abbreviations: Gr deeply grooved anterolateral rim of pygophore; Pa parandrium; Pr paramere; T8 tergite VIII (pygophore); T9 tergite IX; T10 tergite X (anal cone). Scale 0.1 mm for fig. 6, 9, 11; 0.5 mm for fig. 7, 8, 10, 12.

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