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Shabana Mangi
Department of Zoology, Shah
Abdul Latif University,
Khairpur, Pakistan

Abdul Manan Shaikh
Department of Zoology, Shah
Abdul Latif University,
Khairpur, Pakistan

Hafeeza Gul
Department of Zoology, Shah
Abdul Latif University,
Khairpur, Pakistan

Reshma Sahito
Department of Zoology, Shah
Abdul Latif University,
Khairpur, Pakistan

Correspondence
Shabana Mangi
Department of Zoology, Shah
Abdul Latif University,
Khairpur, Pakistan

First record of *Picromerus Amyot and Serville (1843) (Hemiptera: Pentatomidae: Asopinae)* from Khairpur district Sindh, Pakistan

Shabana Mangi, Abdul Manan Shaikh, Hafeeza Gul and Reshma Sahito

Abstract

During the present study of the taxonomy of stink bugs, only a male and a female specimen of genus *Picromerus* Amyot and Serville (1843) were collected from the district Khairpur during March 2014 to October 2016. The present specimens resemble with *Picromerus orientalis* (Rishi and Abbasi 1973) in morphology and anatomy of female and male external genitalia including pygophore external appearance cup-shaped, dorsolateral lobe small, paramers sickle-shaped, spermathecal bulb elongated pump region broader, and identification was done with the help of available literature. However, this genus is being first time reported from Khairpur district of Sindh Pakistan.

Keywords: Stink bugs, *Picromerus orientalis*, Khairpur, Sindh, Pakistan

Introduction

Pentatomidae family is the fourth largest family of order Hemiptera called as 'Shield bugs' or 'Stink bugs' because they release strong unpleasant smell via a pair of aroma glands which unblock in the region of the metacoxae Rana [27]. Pentatomids so called because of having distinctive five sections in the antennae or also recalled because their body meterialized to have five segments, usually spherical, elliptical form, head often clypeated, antennae having five parts (Four in Serbaninae and Cyrtocorinae, and some Discocephalinae, Edesinae and Podopinae) induced in the lower portion of the head behind the tangential margins, labium four jointed commonly induced by the labrum towards the tip of the head De Clercq [12]. Scutellum nearly triangular, covering one-third of the abdomen or even entire in some (Subfamily Podopinae). Tarsi have three segments (Two in Phyllocephalinae), one or a pair of trichobothria on or near the spiracular line on each side of sterna 3-7. De Clercq [13]. Pentatomidae diverges into 800 genera and 4,700 species. McDonald, Rolston [24, 32]. Pentatomidae family classified into four subfamilies Phyllocephalinae, Podopinae, Pentatominae and Asopinae. Asopines are characterized body 7-25 mm, condense rostrum, the first section of labium is obviously thickened and free which enable rostrum to wing forward fully making it easier for predator to feed. Asopinae diverges into 300 species and 69 genera Imms [17]. Genus *Picromerus* proposed by Amyot and Serville with the diagnostic characters head tapered, much longer than wider, scutellum elongated than wider at the bottom; males contain a glandular scrap of hairs on abdominal venter; humeral position strongly developed. *Picromerus* is the famous genus of the predaceous Asopinae subfamily about 10 species have been identified worldwide. Most of the species distributed in Palaearctic region to Oriental region Zhang and Lin; Rider and Zheng [31, 43]. *Picromerus* are economically significant because they feed on various pest as larva of soldier beetle, beet worm, potato beetle, coleopteran larva, moth, earworm, soft bean caterpillar and flea beetle and flea beetles Coleopteran, Hymenoptera and Lepidoptera which are libelous to the various crops of Lucerne, cultivated cabbage, sweet potato, grain of cereal crops, wheat, rice, cotton, herbs, shrubs, bean, soybeans, tomato, green vegetables Lariviere and Larochelle [22].

Many authors contributed their significant work on the taxonomy of *Picromerus* and related family in the world including Leston; Imms *et.al.* Schouteden; Javahery. Day; Oran; Greathead Linnavouri; Rider; Kontodimas; Azim; Konvicka and Fric; Zahu, Liu and Bu; [10, 11, 17, 18, 19, 20, 28-33, 43]. Very small piece of work had done in Pakistan. Ahmed; Ahmad and McPherson; Rana; Abbasi; [1-4, 27]. Therefore, the interest was taken for the study the taxonomy of related family, a systematic study of stink bugs (Hemiptera, Pentatomidae,

Asopinae) of district Khairpur and its adjoining areas.

Materials and Methods

The study was carried out in District Khairpur of Sindh, Pakistan during March 2014 to October 2016. During the current survey, the specimens were collected from different localities of District Khairpur. Stink bugs were captured by light trap and traditional patterns collecting them with hands from various crops fields. The collected specimens were kept in jars; they were made faint and paralyzed by chloroform. Materials were safely mounted and preserved properly in specific wooden insect's boxes and labelled as per standard procedure. Naphthalene balls were used for protection and preservation of insects from predators (ants), fungus and have been described by the help of relevant literature Rana [27]. The abdomen of male bugs was exercised at the base and boiled in Potassium hydroxide (KOH) for 10-15 minutes. Pygophore, Parameres and Aedeagus, male genitalia were removed from abdomen with the help of fine forceps and washed with tap water and observed under the dissecting microscope by Ahmed, Ahmed and McPherson [1-4]. Female abdomen were exercised at the base and boiled in Potassium hydroxide (KOH) for 5-10 minutes. Female genitalia was removed from the abdomen with the help of fine forceps, washed with tap water and examined with the help of dissecting microscope Schaefer [34]. Dissected materials were preserved into the micro vial with a drop of glycerin and pinned the specimen. All measurements were taken into mm (millimeters) by using an ocular micrometre. Illustrations were drawn on graph paper by using ocular graph under the dissecting microscope Afzal and Ahmed [6]. Images were traced with rotating pointer on butter paper.

Results

Number of specimen collected. 493

Number of specimen identified. 2

Locality. Khairpur, Sindh, Pakistan.

Picromerus Amyot et Serville

Having rounded shape, considerably body rounded, longer than breadth and elongated, considerably broader.

Head: The head larger than wide, the anterior and posterior sides of the head is equal in size, antaeocular, through eyes, clypeus larger than paraclypeus, outer sides dented, upper sides of eyes thick. Rostrum strong and reached up to the hindcoxae.

Thorax: The head and pronotum equal in length, but extensive anterior sides, pronotal angles are almost pointed, a little spine attached to the stretched spine. The scutellum wider than longer at the base, peritreme obvious, metathorax scent gland located at the side of peritreme. All fore femora armed with minute spine, fore tibiae unarmed.

Abdomen: Body elongated larger than wide, second abdominal segment armed with minute spines in male and minute bristles appears on the lateral side of seventh abdominal torso of female specimen

Female genitalia: Gaps present between the first gonocoxae, ninth paratergites developed above the posterior periphery of eighth paratergites, Spermathecal bulb small, elliptical in shape, noticeably smaller than middle dilation, pump section obviously well developed, proximal, distal flanges equal and trunk like at the middle.

Male genitalia: Pygophore elongated as compare to broad, parameres f shaped as small regular area at the angle, lateral lobe similar to thumb, inflated aedeagus well developed enlarge, two lobes of dorsal membranous conjunctival appendages trunk like, sclerotized process absent at the dorsal sides of membranous conjunctival swelling areas, thecal shield strength, lengthened well developed and broader than theca.

Picromerus orientalis (Rishi 1973)

Body coloration: Body dark brownish, black head, color of eyes dark brown, pink ocelli, clypeus covered with dark brownish lines, paraclypeus brown, dark black, brown spots or dots on the whole surface of body, basal second, third sections of antennae black, remaining sections grayish to blackish, pronotal angles black, black to brown pronotum, scutellum dark black, achromatic dots on the tip of scutellum.

Head: The length of head longer than breadth, head length 1.7 mm (1.7 - 2mm), breadth 1.2 mm (1.2-1.4mm) paraclypeus raised areas absent, rounded smooth, breadth longer than clypeus, five sections of antennae, first section start from the head and third section smaller than the second section. The length of 1st antennal section 0.3mm (0.3-0.4mm), 2nd section 1.7mm (1.7-1.8) and 3rd section 1.5mm (1.5-1.6mm), 4th section 1.5mm (1.5-1.9mm), 5th section length 1.3mm (1.3-1.8mm) antennal formula 5>4>3>2>1, rostrum four sections goes up to the metacoxae, the 1st length rostrum section 2mm (1.2-2mm), the length of 2nd section 2.1mm (1.5-2.1mm) the length of 3rd section 1.1mm (1.1-1.2mm) the length of 4th section 1mm (.8-1.1) labial formula 3 < 2 = 4 < 1, anterior anteaocular space length 1mm, head posterior distance. 2mm and the space transversely the inter ocular 1.4mm.

Thorax: Pronotum longer than broader, pronotal length 2.4mm (2.4-2.7mm), breadth 6.2mm (6.2-7mm), the width of pronotum highly abundant than length, pronotal humeral angles pointed curved, as well as equally needle like shape, with small spine present on its, lateral sides widened, hollow shaped, sinuate, anterior edges breadth as broader, head across the eyes, lateral sides wrinkled. Scutellum (triangular) have a three sides, lightish or grayish spot on the tip, scutellum length 7mm (7-7.2mm), breadth 3mm (3-4mm), the width of scutellum smaller than longer, vaporizations through peritrem, sickled shaped areas (4mm).

Abdomen: Outcurve rounded lateral sides of abdomen thick, flat, thin ventrolateral margins and other sides are thick, the full-length female *Picromerus orientalis* 12.2mm (11mm).

Female genitalia: Triangular 1st gonocoxae, inner margins parallel, convex outer edges posterior sides outward, eighth paratergites similar in shapes of ninth paratergites, longer and trunk like in shape, apex sinuate broader, triangular, 2nd-second gonocoxae, convex posterior sides elongated. Spermathecal bulb, pump region broader, inflatable median dilation, the distal section of duct shorter than proximal section of duct.

Male genitalia: Lateral edges of pygophore cup-shaped, dorsolateral lobe little, dorsoposterior margins widened sword-shaped, dorsolateral margins lobe like. The stem of parameres small, blade-sharp edges long bent, the gap in the basal half slender pointed and pointed at the tip, inflated

aedeagus elongated, apically two lobes of conjunctive appendages, alongbag-liketapered apically, spoon over like

penial appendages, thecal dorsolateral median margins widened inward u shaped.

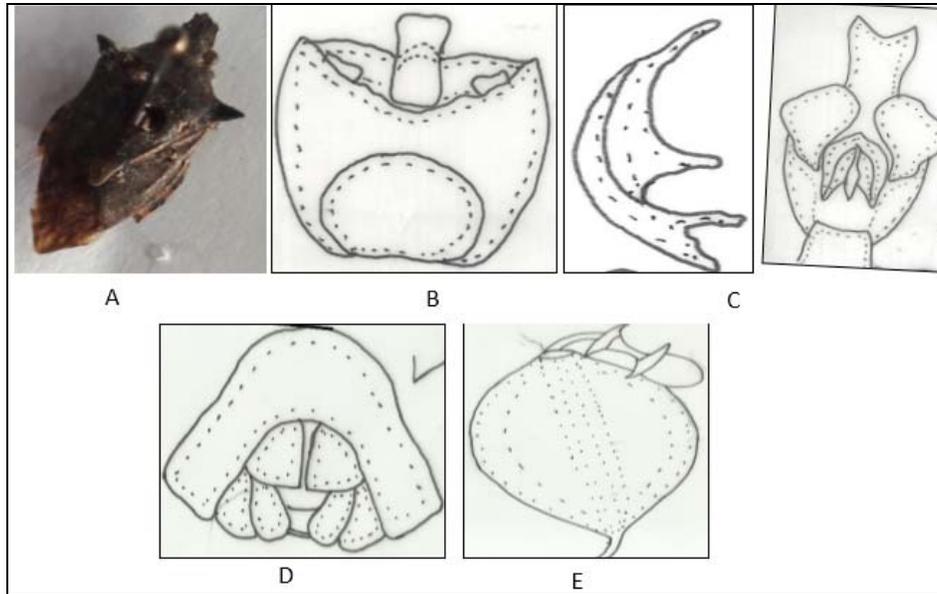


Fig 1: A; Pygophore 2mm B. Paramere: 3mm C. Terminalia: 2mm D. Aedeagus: 4mm E. Spermatheca: 2mm.

Discussion

The genus *Picromerus* proposed by Amyot and Serville (1843) with type species *P. bidens* Linnaeus, 1758. Other species added in this genus included *P. fasciiceps* Zheng and Liu, *P. griseus* (Dallas, 1851) *P. obtusus* Walker, 1867; *P. Orientis* Rashi and Abbasi, 1973; *P. nigrivitta* Walker, 1867; *P. sundanus* Breddin, 1902; *P. lewisi* Scott, 1874; *P. angusticeps* Jakovlev; *P. vicinus* Signoret, 1880; *P. similis* Distant, 1883; *P. viridipunctatus* Yang, 1934; *P. elevatus* sp. Zhao, Liu and Bu, 2013; genus *Picromerus* also reported from various regions of Pakistan Ahmed reported *P. bidens* during 1974 from Punjab and Nazeer recovered *P. Orientis* from various localities of KPK, Mardan and Abbottabad.

P. bidens recovered by Nazeer, [27] from Punjab differs by present species in having pronotal angle pointed abdomen broader than longer; parameter F shape; Pygophore broader than long.

P. fasciiceps Zheng and Liu, [43] varying by present species in having head black at the middle having wide longitudinal yellow-white strip; anterolateral pronotal with adult-witted tooth; dorsal surface of the body in tumescent and rugulose humeral angles correct, small and dark, abruptly formed. *P. griseus* Dallas [10], varying by present specimens in Body dark brown; pronotum without pale vertical midline, the apex of pronotal lateral angle with an obvious fang. The golden spots in basal angles of scutellum not obviously. Connexivum entirely black, rarely with mottled yellow spots. Membrane not surpassing the end of the abdomen. *P. lewisi* Scott, [35] differ from present species in Dorsoposterior rim of pygophore curved with two subsquare parandria and sparse setae; ventral-posterior rim, with a shallow and wide medial notch, laterally convex and sinuate, lateral-posterior angle short and rounded, higher than the notch bottom. Paramere short and thick, inner surface with a transverse ridge, outer margin a little straight, apex obtuse and hooked, inner branch short and straight, directed latero-posteriorly. Adages with one pair of basolateral conjunctively lobes, which divided into two branches: proximal one and distal one; Proximal limb shorter, arc distal twig extended, narrow and with sclerotized

apex. Apical conjunctival lobe extended and spitted, extended away as of apical fraction of theca visibly. Vesica conspicuously stretched away from the centre of median penial plates.

P. viridipunctatus Yang [41], body golden brown, head above and beneath anterolateral pronotal submargins, incisures of connexivum and ventral surface of pronotal angles, lateral area of sternum more or less marked with metallic-green shades, anterolateral margins of pronotum broadly paler, pronotal lateral angles diverge asymmetrically, the frontal twig extremely lengthy and the apex shortly curved and a longitudinal golden midline from median of anterior region to peak of scutellum, membrane vaguely outstripped abdomen. Present specimens closely resemble with *P. Orientis* identified by Rana [27] from various localities of KPK, Mardan and Abtoaba of Pakistan in having head wider than long, humeral angles are pointed along with small spines obtuse, tubercle ochraceous, defied spines present, paraclypeus longer than clypeus sperm thecal blub short elliptical in shape, phagophore wider and longer.

Conclusion

The present specimens closely resemble with *P. Orientis* identified by Rana in 1985 in all the diagnostic features like pygophore external look cup-shaped, dorsolateral lobe small, Parameres sickle-shaped, spermathecal bulb elongated pump region broader, however, this genus is being first time reported from district Khairpur, Sindh, Pakistan.

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