



## Taxonomy of Two Species of *Priassus* Stål (Heteroptera: Pentatomidae) Along with Their New Distributional Records in India

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### ABSTRACT

A description and diagnosis of two species of genus *Priassus* Stål are provided. The morphological notes, new distributional records of these species and main external genitalia features are discussed and illustrated with 19 images in color. The two species studied i.e. *Priassus spiniger* Haglund and *Priassus exemptus* (Walker) are the new records from North India. A key to the studied species is also given.

**Keywords:** *Priassus*, external genitalia, description, North India.

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### INTRODUCTION

The genus *Priassus* Stål [1] is represented by 4 species throughout the World namely; *excoffieri* Martin [2], *exemptus* (Walker) [3], *spiniger* Haglund [4], *testaceus* Hsiao & Cheng [5]. It is more restricted to the Indo-Malayan region. As per taxonomic history, genus *Mesopriassus* was first proposed by Kiritshenko (1951) [6] without description; later, Stichel (1961, 1962) [7] also enlisted this genus without any descriptive notes. Finally, Kiritshenko (1964) [8] provided its description and validated this genus and its species. Popov (1964) [9] later synonymized *Mesopriassus* under Genus *Priassus* where he placed its type species, *Mesopriassus vetustus*, as a junior synonym of *Priassus exemptus*. As far as the review of this genus is concerned, Datta *et al.*, (1985) [10] studied Indian Pentatomidae. They described very briefly a few morphological characters of *Priassus exemptus* (Walker) [3]. They illustrated the structure of clasper as robust, forked and asymmetrical at the apex. They also reported its distribution from Naga Hills and Burma. Rider *et al.*, (2002) [11] provided a checklist of all known Chinese

Pentatominae species along with their synonymical, distributional, and nomenclatural notes. They reported *Priassus excoffieri* Martin [2] from Yunnan, *Priassus exemptus* from Taiwan, Xizang, Afghanistan, Tajikistan, India, and Myanmar; *Priassus spiniger* from Fujian, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Xizang, Yunnan, Zhejiang, India, Myanmar, and Indonesia. They further provided a valid name, synonymy (if any) along with their distribution in China and outside of China. Azim (2011) [12] studied the diversity of Pentatomid bugs in India. The author reported the distribution of *Priassus exemptus* from Meghalaya, Shillong, Forest area based on collection deposited in the museum of Indian Agricultural Research Institute, New Delhi. Akoev *et al.* (2018) [13] recorded 23 species of Pentatomidae associated with trees, shrubs and woody understory vegetation of protected areas of South-Eastern Kazakhstan, with notes on natural history. They reported 5 females and 1 male specimen of *Priassus exemptus* (Walker, 1968) [3]. They concluded this species as a narrowly oligophytophagous and a seed predator of *Acer turkestanicum*, *A. negundo* in that region. The present article includes a detailed description of the two species along with the

illustrations of morphological structures and external genitalia also. The methodology for studying external genitalia was followed as per the procedure given by Kaur (2012) [14]. The study has also reported the new distributional records of these species.

#### GENUS *PRIASSUS* STÅL

*Priassus*, Stål (1868) [1] *Öfv. Vet.-Ak. Förh.*, p. 518.

**Type species** – *Priassus spiniger* Haglund

**Diagnosis of the Genus:** Head is somewhat narrowed on the anterior side; the portion in front of eyes is as long as broad, the head (clypeal) lobes are equal in length or clypeal lobes are a little longer than the clypeus and slightly separated at their apices; basal joint of antennae do not reach the apex of head; labium reaching up to posterior coxae; pronotum have concave, sinuate lateral margins, finely serrated, truncated behind eyes, acute anterior angles, lateral angles are prominent and acutely produced outwards; length of scutellum is more than half the length of abdomen, its apex is subacute; apical angle of corium is little produced; mesosternum is carinate, the carination is elevated and somewhat laminate; base of abdomen is armed with a long spine, which reaches the intermediate coxae of leg.

#### 1. *Priassus spiniger* Haglund (Fig. 1A)

*Priassus spiniger*: Haglund (1868) [4] *Stett. Ent. Zeit.*, 24: p. 160.

#### MALE:

**Measurements (in mm):** Head length: 2.40; width across eyes: 3.28; interocular space: 1.60; interocellar space: 1.075; preocular distance: 1.10; length of posterior head including eyes: 0.90; antennal segments lengths: I<sup>st</sup>: 0.50, II<sup>nd</sup>: 1.30, III<sup>rd</sup>: 2.0, IV<sup>th</sup>: 2.64, V<sup>th</sup>: 2.68; pronotal length: 4.50; width across humeral angles: 9.60; scutellar length: 7.75; scutellar width: 6.27; length of abdomen: 9.25; maximum width of abdomen: 9.75; length of abdominal spine: 1.40; length of rostral segments: I<sup>st</sup>: 1.35 II<sup>nd</sup>: 1.60, III<sup>rd</sup>: 1.90, IV<sup>th</sup>: 1.40; Distance: base of scutellum-apex of clavus: 2.19; apex of clavus-apex of scutellum: 5.94; apex of scutellum-apex of

abdomen including membrane: 5.61; total body length: 22.50.

**Dorsal Coloration:** Head with lateral margins and apical one-third region is yellow with pale carmine red fascia, finely punctured with black, rest of the region is dark yellow and impunctate; eyes are dark red with melanic suffusions; ocelli dark red; antennae yellow, apical two antennal segments infused with brown; pronotum yellow, its anterolateral area, pronotal angles are pale carmine reddish with black punctures, posterior area is with scattered punctures along with two transverse yellowish callosities, infused with red and black punctures; scutellum is yellow, finely punctured with concolorous spots; clavus and corium concolorous, costal margin with series of small black punctures; hemelytral membrane hyaline with brown suffusions on lateral sides; connexiva yellow, finely punctuate with red infusion. **Ventral Coloration:** Labium is dark yellow with black apex; lateral area of head is impunctate, bright yellowish in color; legs yellow, apical portion of tibiae and entire tarsi pale yellowish-brown; area between legs, metathoracic scent gland peritreme, evaporatorium and lateral area of sternum are shining yellowish and impunctate, with few scattered black spots on pro and mesosternum; abdomen and genital capsule dark yellow with brown suffusions; abdominal disk impunctate; connexiva with lateral margins brownish-yellow; spiracles distinctly bordered with black.

#### STRUCTURE:

**Head** (Fig. 1B): Head broad, moderately declivent, subrounded at apex; paraclypei equal to clypeus; apical one-third of clypeus is depressed, rest is raised medially; paraclypeal lobes slightly sinuous, reflexed anterolaterally; antennal segmental formula – I<II<III<IV<V; labium long, reaching metacoxae, labial lengths formula – I<IV<II<III. **Thorax:** Pronotum (Fig. 1C) deflected anteriorly, anterior margin greater than width across eyes, concave, truncated behind eyes, with small subacute angles directed anteriorly, lateral margins finely serrated, humeral angles prominent and subacute; scutellum raised anteriorly, broad at base, beyond frena narrowed as snake head-like apical lobe; metathoracic scent gland osteolar peritreme (Fig. 1D) long, somewhat banana-

shaped, raised, narrowly rounded at apex, extending halfway to metapleural margin; evaporatorium distinctly broad, with well defined anterior and posterior margins, covering almost the entire sternite; legs hairy.

**Abdomen:** medially convex, laterally flattened; abdominal venter with a long spine reaching mesocoaxae; ventroanterior margin of abdominal sternite VII<sup>th</sup> deeply concave, somewhat an inverted V-shaped, with subacute angles (Fig. 1E); hemelytral membrane slightly passing beyond abdominal apex; genital capsule pilosed.

#### FEMALE:

**Measurements (in mm):** Head length: 3.04; width across eyes: 3.80; interocular space: 1.8; interocellar space: 1.15; preocular distance: 1.30; length of posterior head including eyes: 1.50; antennal segments lengths: I<sup>st</sup>: 0.70, II<sup>nd</sup>: 1.0, III<sup>rd</sup>: 1.30, IV<sup>th</sup>: 2.80, V<sup>th</sup>: 2.90; pronotal length: 4.75; width across humeral angles: 10.8; scutellar length: 8.25; scutellar width: 6.62; length of abdomen: 10.50; maximum width of abdomen: 11.10; length of abdominal spine: 1.80; length of rostral segments: I<sup>st</sup>: 1.20, II<sup>nd</sup>: 1.90, III<sup>rd</sup>: 2.0, IV<sup>th</sup>: 1.30; Distance - base of scutellum-apex of clavus: 5.94; apex of clavus-apex of scutellum: 2.05; apex of scutellum-apex of abdomen including membrane: 6.105; total body length: 22.50.

**Coloration and Structure:** Body form of female specimen is similar to males except they are darker in color than males; 5<sup>th</sup> antennal segment is paler; abdominal venter is more calloused; ventroanterior and ventroposterior margin of VII<sup>th</sup> abdominal sternite is broadly concave, somewhat an inverted U-shaped, with acute posterior angles (Fig. 1F).

**Female Genitalia:** 1<sup>st</sup> gonocoxae are not wide apart, triangular in shape, outer margin is raised, posterior margin is convex; 2<sup>nd</sup> gonocoxae is medially fused, its posterior margin is straight; 8<sup>th</sup> paratergites are subquadrate in shape, its posterior margins are angulated; 9<sup>th</sup> paratergites are elongate, lobe-like, narrowed at posterior margins, extending much beyond the fused posterior margin of 8<sup>th</sup> paratergites with medially concave outer margins (Fig. 1G); spermatheca (Fig. 1H) is with distinct distal and proximal flanges; pump region is sclerotized and tube-like, distinctly

smaller than distal spermathecal duct; bulb is rounded with three finger-like elongate processes (one short); medial dilation is long with a small proximal dilation; posterior spermathecal duct distinctly is shorter than distal spermathecal duct.

**Male Genitalia:** Pygophore (Fig. 1I) is distinctly longer than broad, lateral margins are convex, with prominent acutely pointed dorsolateral lobes that are slightly bent inwards; ventroposterior margin is laterally sinuate, medially V-shaped; dorsal opening is small, inverted U-shaped; paramere (Fig. 1J) is elongated, L-shaped, with a small process at base, apex of blade is acute, outer margin is with two angulated ridges; aedeagus (Fig. 1K, 1L) is with slightly elongated theca, a pair of ventral membranous conjunctival appendages, a pair of sclerotized beak-like medial penial lobes; vesica is moderately long, reaching apical margins of appendages; ejaculatory reservoir is somewhat broad.

**Material Examined: Himachal Pradesh:** Andhretta, 13. vii. 2010 - 3♀♀, 1♂; Bilaspur, 21. x. 2010 - 1♂

**Distribution:** Myanmar; India (Himachal Pradesh, Meghalaya).

**Remarks:** Three female and two male specimens of the species were studied. The only variation in color of antennae, legs, abdomen exists among the population, from being paler to darker in color. *Priassus spiniger* is usually collected in abundance from the light trap as compared to wild vegetation. It is a new record from North India as it is reported for the first time from the localities of Himachal Pradesh. Earlier it has been reported from Meghalaya.

#### 2. *Priassus exemptus* (Walker) (Fig. 2A)

*Prionaca exemptus*, Walker (1868) [3] *Cat. Het.*, 3: p. 569.

*Priassus exemptus*: Distant (1902) [15] *Faun. Brit. Ind. Rh.*, 1: p. 206.

#### FEMALE:

**Measurements (in mm):** Head length: 1.90; width across eyes: 2.20; interocular space: 1.40; interocellar space: 0.65; preocular distance: 1.0; length of posterior head including eyes: 0.90; antennal segments lengths: I<sup>st</sup>: 0.40, II<sup>nd</sup>: 0.70,

III<sup>rd</sup>: 1.0, IV<sup>th</sup>: 1.15, V<sup>th</sup>: 1.10; pronotal length: 2.56; width across humeral angles: 5.61; scutellar length: 4.753; scutellar width: 3.75; length of abdomen: 5.61; maximum width of abdomen: 5.28; length of abdominal spine: 0.40; length of rostral segments: I<sup>st</sup>: 0.90, II<sup>nd</sup>: 1.0, III<sup>rd</sup>: 1.0, IV<sup>th</sup>: 0.80; Distance – base of scutellum-apex of clavus: 3.25; apex of clavus-apex of scutellum: 1.125; apex of scutellum-apex of abdomen including membrane: 4.50; total body length: 12.5.

**Dorsal Coloration:** Head brownish-yellow, with reddish-brown punctures; eyes black with red tinge, area around eyes pale, impunctate; ocelli red; antennal segments brownish-yellow, apical two segments darker; pronotum brownish-yellow, anterior portion darker, medial area pale, posterior area with grayish-black tinge, finely punctured with dark brown; anterior pronotal area with two transverse yellow impunctate callosities; scutellum punctured with dark brown, base and apex is pale and impunctate; clavus, corium, and costa is concolorous to scutellum; anteriormost area of costal margin pale and impunctate; hemelytral membrane transparent; connexiva brownish-yellow, anterior and posterior margins spotted with dark brown punctures. **Ventral Coloration:** Labium brownish-yellow, apex black; head and sternum pale, less punctate; some spots on sternum near legs black; legs brownish-yellow, tarsi darker; abdomen, metathoracic scent gland peritreme, connexiva, genital capsule brownish-yellow; abdomen slightly paler and centrally impunctate, laterally it is scarcely punctured with light brown; spiracles reddish-brown.

#### STRUCTURE:

**Head** (Fig. 2B): Head is somewhat convex, moderately deflected; paraclypeal and clypeal lobes equal, lateral margins of former are sinuate before eyes, narrowed apically; I<sup>st</sup> antennal segment do not reach apex of head; antennal segmental formula – I<II<III<V<IV; labium is long, reaching posterior coxae, labial lengths formula – IV<I<III<II. **Thorax:** Pronotum (Fig. 2C) is slightly raised posteriorly, anterior pronotal margin is concave, truncate behind eyes, with subacute tubercles, directed anteriorly; anterolateral margins are concave and finely

serrated; humeral angles are subprominent and obtuse, posterior margin is straight; scutellar width is subequal to total abdominal length, apex is shorter than corium and broad at base, beyond frena, it is narrowed distinctly and subacute at apex; metathoracic scent gland osteolar peritreme (Fig. 2D) is short and of uniform length, reaching only one-fourth way to metapleural margin; evaporatorium is broad, with well developed anterior margin, covering about half of sternite. **Abdomen:** convex, depressed laterally; connexiva is exposed at repose with posterior acute connexival angles; spiracles are large; legs pubescent; ventroanterior margin of VII<sup>th</sup> abdominal sternite is somewhat straight medially, oblique laterally, ventroposterior margin is broadly concave (Fig. 2E); hemelytra membrane passes beyond the abdominal apex.

**Female Genitalia:** 1<sup>st</sup> gonocoxae are small, plate-like, curved downwards, medially placed but not wide apart; 2<sup>nd</sup> gonocoxae are fused medially, posterior margin is slightly concave; 8<sup>th</sup> paratergites are small, its posterior margins are with acute processes; 9<sup>th</sup> paratergites are elongate, lobe-like, placed widely apart, narrowly rounded at apices, passing beyond the fused posterior margins of 8<sup>th</sup> paratergites (Fig. 2F); spermatheca (Fig. 2G) is with distinct distal and proximal flanges; pump region is narrow, tube-like, about 2X shorter than distal spermathecal duct; bulb is rounded with two downwardly directed acute processes; medial dilation is rounded, with proximal small semisclerotized dilation, directed posteriorly; posterior spermathecal duct is subequal to distal spermathecal duct.

#### Material Examined:

**Punjab:** Patiala, 13. ix. 2010 - 1♀; Dehradun, 16. ix. 2010 - 1♀

**Distribution:** India (Punjab, Uttarakhand, Sikkim, Nagaland)

**Remarks:** Only a single female specimen was studied. It is also a new record from North India (earlier being reported from Sikkim and Nagaland)

#### Key to the studied species of genus *Priassus* Stål

1. Body length: 22.5 mm; lateral margins of corium marked with black spots; humeral angles

of pronotum prominent, subacute; lateral lobes of head sinuous, not produced into any kind of projection; spermathecal bulb with three finger-like processes (two long, one short); 1<sup>st</sup> gonocoxae angulated at outer margin..... *spiniger*

#### Haglund [4]

- Body length: 12.5 mm; lateral margins of corium without black spots; humeral angles of pronotum subprominent, somewhat roundish; lateral lobes of the head with slight protuberances before apex; spermathecal bulb with two long finger-like processes; 1<sup>st</sup> gonocoxae rounded at outer margin.....

#### exemptus (Walker) [3]

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#### Abbreviations:

8<sup>th</sup> pt. - Eight paratergites; 9<sup>th</sup> pt. - Ninth paratergites; Sp. b. - Spermathecal bulb; Dis. f. - Distal flange; Prx. f. - Proximal flange; Dis. sp. d. - Distal spermathecal duct; Prx. sp. d. - Proximal spermathecal duct; Md. - Median dilation; Sp. p. - Spermathecal pump; Vpm. - Ventroposterior margin; Dl. l. - Dorsolateral lobes; Dms. - Dorsomedial surface; DO. - Dorsal Opening; Bl. - Blade; Stm. - Stem; Bp. - Basal plate; Piv. - Pivot; Th. - Theca; Ves. - Vesica; Gp. - Gonopore; Pl. - Penial lobe; Vmc. app. - Ventral membranous conjunctival appendages; Dlmc. app. - Dorsolateral membranous conjunctival appendages; Mdmc. App. - Median dorsal membranous conjunctival appendages; Th. App. - Thecal appendages; Ej. r. - Ejaculatory reservoir.

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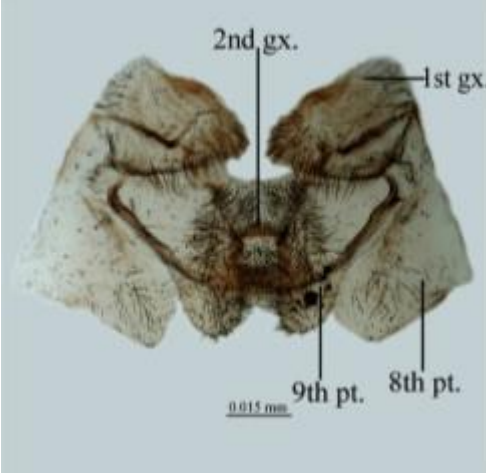
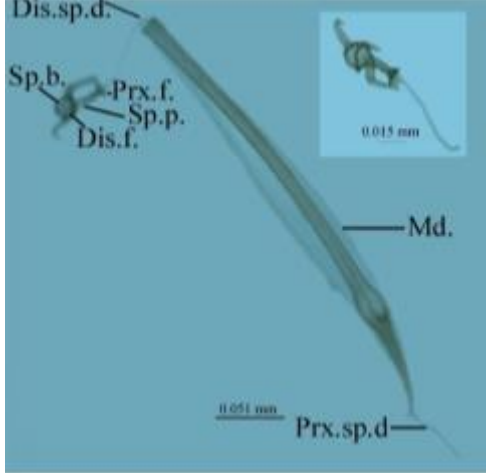
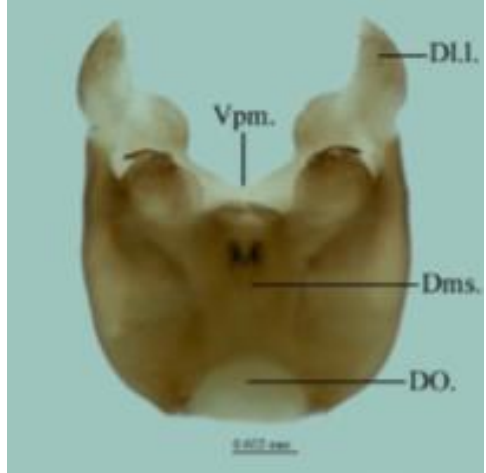
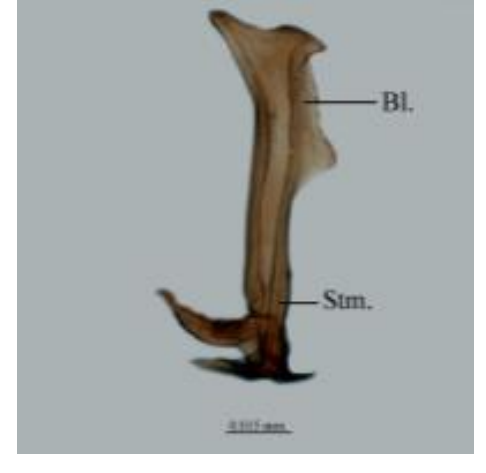
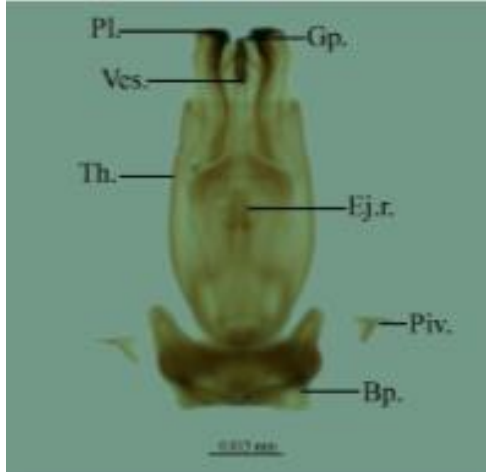
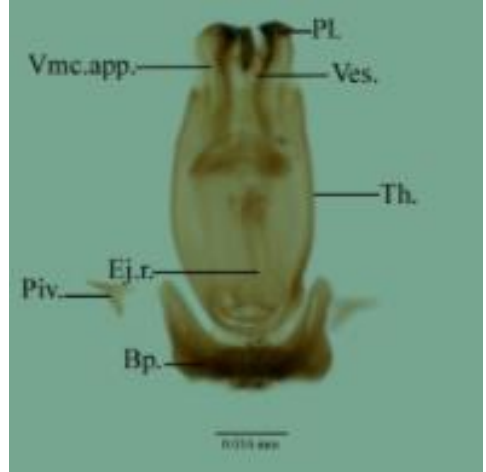
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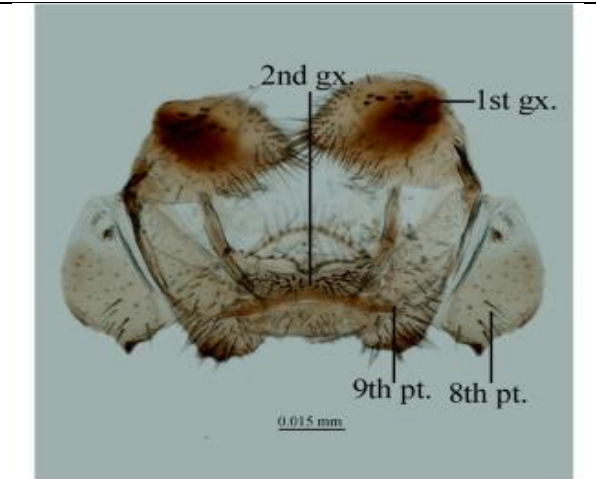

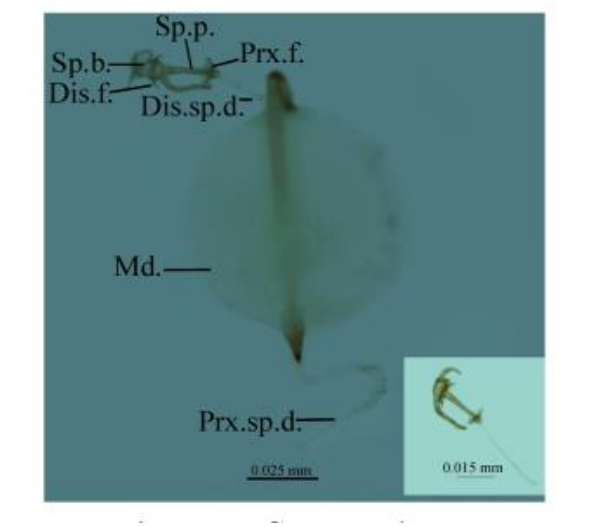
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<i>Priassus spiniger</i>	
	
<p>Fig. 1A Adult</p>	<p>Fig. 1B Head (D.V.)</p>
	
<p>Fig. 1C Pronotum (D.V.)</p>	<p>Fig. 1D Scent Gland</p>
	
<p>Fig. 1E Male abdomen (V.V.)</p>	<p>Fig. 1F Female abdomen (V.V.)</p>

<b>Plate 2</b> <b><i>Priassus spiniger</i> Haglund</b>	
	
<b>Fig. 1G Genital Plate</b>	<b>Fig. 1H Spermatheca</b>
	
<b>Fig. 1I Pygophore (D.V.)</b>	<b>Fig. 1J Paramere</b>
	
<b>Fig. 1K Aedeagus (D.V.)</b>	<b>Fig. 1L Aedeagus (V.V.)</b>



<i>Priassus exemptus</i> (Walker)	
	
<p>Fig. 2A Adult</p>	<p>Fig. 2B Head (D.V.)</p>
	
<p>Fig. 2C Pronotum (D.V.)</p>	<p>Fig. 2F Genital Plate</p>
	
<p>Fig. 2E Female abdomen (V.V.)</p>	<p>Fig. 2G Spermatheca</p>