

Redescription of four species of *Acanthaspis* Amyot and Serville, 1843 (Hemiptera: Reduviidae: Reduviinae)

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ABSTRACT

This paper presents the redescription of four species of Reduviinae belonging to the genus *Acanthaspis* viz., *A. biguttula* Stål, *A. bistillata* Stål, *A. inscripta* Distant and *A. pedestris* Stål. These redescriptions are accompanied by micrometric analysis, camera lucida diagrams and colour microphotographs depicting essential morphological characters and additional distributional records.

Key words: Assassin bug, Alpha taxonomy, Indian fauna, Distributional records

INTRODUCTION

The subfamily Reduviinae Latreille (=Acanthaspidinae Distant) is a large cosmopolitan subfamily of 138 genera and 977 species¹. Distant^{2,3} recorded 92 species under 24 genera in 6 divisions of Acanthaspidinae from the Oriental region. In the checklist of Indian assassin bugs⁴, 98 species of reduviines under 25 genera were listed. Out of the total number of 98 species, 42 species belong to a single genus, *Acanthaspis* Amyot & Serville. It is characterized by the presence of ocelli, fossula spongiosa on fore- and midlegs, three-segmented tarsi and immature stages with three abdominal scent glands whose openings are located on the anterior margins of fourth, fifth and sixth terga⁵.

In this paper, we redescribe eleven species of *Acanthaspis*, because the original

descriptions lack many important characters, morphometry, drawings and microphotographs exhibiting diagnostic features including genitalia of these eleven species from the rest of the Oriental *Acanthaspis*. The paper also provides additional records on distribution.

MATERIAL AND METHODS

This study is mainly based on the materials kept in the Entomology Research Unit, St. Xavier's College (Autonomous), Palayamkottai, Tamil Nadu, South India. All drawings were made with the aid of a camera lucida. Colour microphotographs were taken using Olympus Zooming Binocular Research Microscope and Camera. All measurements in millimetres were obtained using calibrated micrometers. Morphological terminology mostly follows that of Distant^{2,3}.

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The dissected male genitalia of the bugs were soaked in hot 10% potassium hydroxide solution for approximately five minutes to remove soft tissue, rinsed in distilled water and observed under a binocular dissecting microscope.

Taxonomy

Acanthaspis^{6,2}

Body oblong-ovate shape; head shorter than pronotum usually elongate oval or oblong; ante- and postocular regions generally about almost equal in length; compound eyes well developed and usually protruded laterally; a pair of ocelli just behind the transverse sulcus; antennae four-segmented, scape slightly stout, pedicel almost longer than the scape, first flagellar segment usually twice the length of scape; rostrum three-segmented with the basal and medial segments almost equal in length, terminal segment the shortest, usually acutely curved and “bow” shaped or curved, rostral tip reaching the prosternal furrow; neck distinct; pronotum broader than longer, shorter anterior pronotal lobe separated from longer posterior lobe by a transverse sulcus, pronotum with anterior lobe prominently sculptured, anterior lobe without spines, posterior lobe discally spined or without spine or tubercles, lateral angles prominent; scutellum with the apex longly spinously produced and generally obliquely ascendant; anterior femora moderately incrassated, unarmed; fore- and midtibiae almost equal in length and the shortest and hind tibia the longest; fossula spongiosae on fore- and midtibiae; tarsi three-segmented, usually basal segment the shortest and the terminal segment the longest and ending with a pair of claws.

1. *Acanthaspis biguttula*⁷ (♂)

(Figs. 1–15)

Colour: Dull black; antennal base, scutellar base, basal region and two long streaks of corium and an inverted ‘V’ shaped streak in the outer region of membrane just below the corium, connexival spots above and beneath and spots to lateral margins of abdomen dull stramineous.

Structure

Head: Head (1.12 mm) incrassated, finely pubescent and shorter than prothorax (1.44 mm) (HL: PL = 1: 1.28); anteocular (0.4 mm) almost as long as postocular (0.44 mm) (AOL: POL = 1: 1.1), divided by an obsolete division just behind the compound eyes (0.28 mm) not laterally produced; ocelli prominent and placed on elevated regions, kept wide apart little below the transverse depression and lateral to the medial longitudinal depression; antennae finely pubescent, four-segmented (5.24 mm), scape swollen, outwardly deflexed and the shortest (0.6 mm) and not passing the apex of head, the pedicel (1.4 mm) almost as long as first flagellar segment (1.44 mm), the second flagellar segment (1.8 mm) the longest (S: P: F₁: F₂ = 1: 2.33: 2.4: 3); rostrum finely pubescent, three-segmented (1.36 mm), terminal segment (0.24 mm) the shortest, middle segment (0.64 mm) the longest and the basal segment (0.48 mm) twice the length of terminal segment (B: M: T = 1: 1.33: 0.5), acutely curved and bow shaped, rostral tip reaching the prosternal furrow; neck distinct.

Thorax: Prothorax pubescent, granulate, broader (1.76 mm) than longer (1.44 mm) (PL: PW = 1: 1.22), pronotum divided into anterior (0.72 mm) and posterior (0.72 mm) lobes of equal length (APL: PPL = 1: 1) by a transverse deep sulcus, anterior lobe basally broadly sulcate, posterior lobe centrally broad and deeply sulcate and also laterally sulcate; lateral angles of pronotum prominent but rounded; disk unarmed; scutellar spine acutely narrowing and horizontally produced.

Legs: Legs finely pubescent; foretibia (1.76 mm) almost as long as midtibia (1.8 mm), hind tibia (3 mm) the longest (FTL: MTL: HTL = 1: 1.02: 1.7); fossula spongiosae terminally occupy almost 2/5 of tibial length on fore- (0.5 mm) and midtibiae (0.5 mm) (FFS: MFS = 1: 1); tarsi three-segmented, basal segment the shortest, medial and terminal segments almost equal in length and the longest, separately and ending with a pair of claws.

Hemelytron: Hemelytron more than 2.5 times longer (3.72 mm) than broader (1.4 mm) (WW: WL = 1: 2.66) passing beyond the

abdominal apex but not covering the lateral margins of abdomen; corium minutely pubescent, almost as long as membrane.

Abdomen: Abdomen laterally richly pilose and apically pubescent beneath, more than 1.5 times longer (2.72 mm) than broader (1.68 mm) (AW: AL = 1: 1.62); connexivum finely pubescent, obscurely developed.

Measurements [in mm, ♂ (n= 6)]. Body length 6.08–6.16; head length 1.08–1.14, width 0.86–0.90; width between eyes 0.31–0.34, diameter of eye 0.26–0.30; length of anteocular area 0.38–0.41, postocular area 0.42–0.46; antennal length 5.22–5.28, lengths of antennal segments I: 0.58–0.62, II: 1.38–1.42, III: 1.42–1.46 and IV: 1.77–1.82; rostral length 1.33–1.38, lengths of rostral segments I: 0.46–0.50, II: 0.62–0.66 and III: 0.22–0.26; length of pronotum 1.42–1.46, width 1.72–1.78; length of anterior pronotal lobe 0.69–0.74, posterior pronotal lobe 0.68–0.74; lengths of forefemur: 0.82–1.86, -tibia: 1.74–1.78, fossula spongiosa: 0.48–0.52; midfemur: 1.82–1.86, -tibia: 1.78–1.82, -fossula spongiosa: 0.48–0.52; hind femur: 2.58–2.62, tibia: 2.98–3.02; length of hemelytron 3.69–3.74, width 1.38–1.42; length of abdomen 2.68–2.74, width 1.66–1.70.

2. *Acanthaspis bistillata*⁸ (♂)

(Figs. 16–30)

*Acanthaspis picina*⁷

*Acanthaspis pictipes*⁹ (synonymized by Distant¹⁰)

Acanthaspis bistillata var. *picina*²

Colour: Black; lateral ocellar regions and antennal bases ochraceous; corium with a large luteous transverse spot behind the middle, apices of femora, tibiae and tarsi pale sanguineous.

Structure

Head: Head (2.48 mm) marginally pilose, shorter than prothorax (4.4 mm) (HL: PL = 1: 1.77); anteocular (0.48 mm) much shorter than postocular (1.2 mm) (AOL: POL = 1: 2.5), divided by a transverse sulcus just behind the compound eyes, a medial broad longitudinal sulcus just behind transverse sulcus tapering behind the ocelli; compound eyes (0.8 mm) well developed, globose and laterally

produced; ocelli just behind the transverse sulcus and lateral to the medial longitudinal sulcus, prominent and kept on elevated regions; antennae moderately pubescent (second flagellar segment absent in the specimens examined), scape (2.6 mm) swollen, outwardly deflexed and longer than the head, pedicel (3.8 mm) longer than the scape and first flagellar segment (5.2 mm) almost twice the length of scape (S: P: F₁: F₂ = 1: 1.46: 2: -); rostrum moderately pubescent, three-segmented (2.92 mm), curved and bow shaped, basal segment (1.4 mm) slightly longer than medial segment (1.12 mm), terminal segment (0.4 mm) the shortest and less than 1/3 the length of the basal segment and resting in the prosternal furrow (B: M: T = 1: 0.8: 0.28); neck distinct.

Thorax: Prothorax marginally pilose, broader (5.68 mm) than longer (4.40 mm) (PL: PW = 1: 1.29), shorter moderately sculptured anterior pronotal lobe (1.84 mm) separated from longer rugulose posterior lobe (2.56 mm) (APL: PPL = 1: 1.39) by a transverse sulcus; anterolateral angles prominent, posterolateral angles spinously produced and slightly recurved, posterior disk with two lateral short but prominent tubercles; scutellar spine long and obliquely ascending.

Legs: Legs richly pilose; fore- (4.80 mm) and midtibia (4.80 mm) equal in length and the shortest, separately and the hind tibia (7.60 mm) the longest (FTL: MTL: HTL = 1:1: 1.58); fossula spongiosae on the fore- (1.68 mm) and midtibiae (1.68 mm) (FFS: MFS = 1: 1) terminally occupying almost 1/3 of the tibial length; tarsi three-segmented, basal segment the shortest, terminal segment the longest and ending with a pair of claws.

Hemelytron: Hemelytron more than 2.5 times longer (12.40 mm) than broader (4.80 mm) (WW: WL = 1: 2.58) not passing beyond the abdominal apex and not covering the lateral margins of abdomen; corium sparsely pubescent, almost as long as membrane.

Abdomen: Abdomen dorsally marginally sparsely pilose and ventrally pilose, almost 1.5 times longer (8.80 mm) than broader (6.40

mm) (AW: AL = 1: 1.37), venter of abdomen distinctly convex; connexivum moderately well developed and slightly dorsally exposed.

Measurements [in mm, ♂ (n= 6)]. Body length 19.02–19.06; head length 2.46–2.50, width 2.47–2.50; width between eyes 0.87–0.90, diameter of eye 0.79–0.82; length of anteocular area 0.47–0.49, postocular area 1.18–1.21; lengths of antennal segments I: 2.59–2.61, II: 3.78–3.81, III: 5.18–5.22 and IV: -; rostral length 2.91–2.93, lengths of rostral segments I: 1.39–1.42, II: 1.10–1.13 and III: 0.39–0.41; length of pronotum 4.38–4.41, width 5.66–5.69; length of anterior pronotal lobe 1.83–1.85, posterior pronotal lobe 2.55–2.57; lengths of forefemur: 4.99–5.02, -tibia: 4.79–4.81, fossula spongiosa: 1.67–1.70; midfemur: 4.98–5.01, -tibia: 4.79–4.81, -fossula spongiosa: 1.67–1.69; hind femur: 6.87–6.89, tibia: 7.59–7.61; length of hemelytron 12.38–12.41, width 4.78–4.81; length of abdomen 8.79–8.81, width 6.38–6.42.

3. *Acanthaspis inscripta*¹¹ (♀)

(Figs. 31-40)

Colour: Head, antennal base, scape, rostrum, pronotum, scutellum and legs ochraceous; pedicel and first flagellar segment of antennae fuscous (second flagellar segment absent in the specimen examined); a central fascia to head beneath, a spot on the disk of head and its constricted base laterally connecting the eyes, compound eyes, a transverse impression between them, base of basal joint and apices of medial and terminal segments of rostrum, two small spots on anterior margin of pronotum, a spot, each near lateral angle, the transverse constriction between anterior and posterior pronotal lobes, coxae, trochanters, irregular lines and spots to sternum, a central basalscutellar spot and spots on the outer and apical areas of corium, basal angles of membrane, connexival spots and posterior segmental margins to abdomen black; wings piceous-brown with bases of lateral margins of corium and a large irregular transverse spot near its apex pale ochraceous; connexival spots above and beneath and body beneath ochraceous.

Structure

Head: Head (1.6 mm) marginally pilose, shorter than prothorax (2.2 mm) (HL: PL = 1: 1.38); anteocular (0.4 mm) half the length of postocular (0.8 mm) (AOL: POL = 1: 2), divided by a transverse depression, an elongate depression originating from the transverse depression runs up to antennal base; compound eyes (0.4 mm) rounded, well developed and laterally produced, a lateral fuscous furrow internal to the compound eyes; ocelli prominent and kept on elevated regions and wide apart little below the transverse depression; antennae moderately finely pubescent (second flagellar segment absent in the specimen examined), scape swollen, outwardly deflexed, the shortest (1.48 mm) and passing well beyond the apex of the head, pedicel (2.64 mm) much shorter than first flagellar segment (4.4 mm) (S: P: F₁: F₂ = 1: 1.78: 2.97: -); rostrum sparsely marginally pilose, three-segmented (2.16 mm), acutely curved and bow shaped, basal (0.88 mm) and medial (0.88 mm) segments equal in length, the terminal segment (0.4 mm) less than half the length of basal and medial segments, separately (B: M: T = 1: 1: 0.45), rostral tip reaching the prosternal furrow; neck distinct.

Thorax: Prothorax finely pubescent and marginally pilose, broader (3.40 mm) than longer (2.20 mm) (PL: PW = 1: 1.55), shorter anterior lobe (0.80 mm) strongly sculptured, finely granulated and separated from longer posterior lobe (1.40 mm) (APL: PPL = 1: 1.75) by a transverse sulcus; anterolateral angles prominent, posterolateral angles produced into short tubercular spines, slightly directing upwards, posterior lobe with a median broad deep sulcus and two lateral sulci; disk unarmed; scutellar spine short and obliquely erect.

Legs: Legs sparsely pilose; fore- (3.04 mm) and midtibia (3.04 mm) equal in length and the shortest, separately and hind tibia (4.88 mm) the longest (FTL: MTL: HTL = 1: 1: 1.6); fossula spongiosae on fore- (1.44 mm) and midtibiae (1.44 mm) (FFS: MFS = 1: 1) almost terminally occupying half the length of tibiae;

tarsi three-segmented, basal segment the shortest, terminal segment the longest and ending with a pair of claws.

Hemelytron: Hemelytron almost thrice longer (8.68 mm) than broader (3.00 mm) (WW: WL = 1: 2.89) passing well beyond the abdominal apex but not covering the abdomen laterally; corium moderately pubescent, almost as long as membrane.

Abdomen: Abdomen dorsally, marginally moderately pilose, ventrally laterally and apically pilose, more than 1.5 times longer (5.60 mm) than broader (3.48 mm) (AW: AL = 1: 1.61); connexivum moderately well developed.

Measurements [in mm, ♀ (n=1)]. Body length 11.8; head length 1.6, width 1.4; width between eyes 0.6, diameter of eye 0.4; length of anteocular area 0.4, postocular area 0.8; lengths of antennal segments I: 1.48, II: 2.64, III: 4.4 and IV: -; rostral length 2.16, lengths of rostral segments I: 0.88, II: 0.88 and III: 0.4; length of pronotum 2.2, width 3.4; length of anterior pronotal lobe 0.8, posterior pronotal lobe 1.4; lengths of forefemur: 3.0, -tibia: 3.04, fossula spongiosa: 1.44; midfemur: 3.6, -tibia: 3.04, -fossula spongiosa: 1.44; hind femur: 4.4, tibia: 4.88; length of hemelytron 8.68, width 3.0; length of abdomen 5.6, width 3.48.

4. *Acanthaspis pedestris*⁷ (♂)

(Figs. 41-55)

Colour: Fuscous-testaceous; ocelli, ocellar region, antennae, rostrum and legs brownish ochraceous; micropterous wings, connexival spots above and beneath, a median and two lateral spots and rows of hairs throughout the dorsum of the abdomen yellowish.

Structure

Head: Head (2.4 mm) elongate, terminally and marginally richly pilose, shorter than prothorax (2.6 mm) (HL: PL = 1: 1.08); compound eyes (0.6 mm) large prominent and laterally produced, head behind the compound eyes transversely depressed medially; anteocular (0.6 mm) half the length of postocular (1.2 mm) (AOL: POL = 1: 2); ocelli, kept on elevated region just behind the transverse sulcus; antennae finely pubescent, four-segmented (9 mm), scape (1.8 mm)

elongately swollen, outwardly deflexed and shorter than the pedicel (2.4 mm), first flagellar segment (3.2 mm) the longest, second flagellar segment (1.6 mm) shorter than pedicel (S: P: F₁: F₂ = 1: 1.33: 1.78: 0.89); rostrum sparsely pilose, three-segmented (2.8 mm), acutely curved and bow shaped, reaching up to the prosternal furrow while at rest, basal (1.2 mm) and medial (1.2 mm) segments equal in length, terminal segment (0.4 mm) the shortest and almost 1/3 the length of basal and medial segments, separately (B: M: T = 1: 1: 0.33); neck distinct.

Thorax: Prothorax marginally pilose, broader (3.20 mm) than longer (2.60 mm) (PL: PW = 1: 1.23), divided into longer anterior pronotal lobe (1.60 mm) and shorter posterior pronotal lobe (1.00 mm) (APL: PPL = 1: 0.63), pronotum differentiated into three prominent areas by two well defined transverse furrows, the first furrow found almost across the middle dividing anteriorly the pronotum from the rest and the second furrow separating posteriorly the triangular proscutellum bearing the prominent postscutellar spine from a middle narrow strip of proscutum bearing the rather obscure lateral spine on either side; pronotum anteriorly delimiting a narrow collar and bearing three prominent longitudinal sinus furrows, the inner two furrows meeting posteromedially, demarcating a median sculptured triangular area; posterolateral angles of pronotum angulate and collar acutely pointed laterally; disk unarmed; scutellum moderately developed with short obliquely ascending scutellar spine.

Legs: Legs richly pilose; fore- (3.60 mm) and midtibia (3.60 mm) equal in length and the shortest, separately and hind tibia (5.60 mm) the longest (FTL: MTL: HTL = 1: 1: 1.56); fossula spongiosae terminally occupying almost 1/3 of tibial length on fore- (1.32 mm) and midtibiae (1.32 mm) (FFS: MFS = 1: 1); tarsi three-segmented, basal segment the shortest, terminal segment the longest and ending with a pair of claws.

Hemelytron: Micropterous, rudimentary wings not extending beyond metathorax.

Abdomen: Abdomen dorsally moderately pilose and ventrally laterally and terminally richly pilose, longer (6.80 mm) than broader (5.40 mm) (AW: AL = 1: 1.26), the paired scent gland orifices prominently placed laterally on the first abdominal segment; the connexivum of the abdominal segments distinctly deflexed.

Measurements [in mm, ♂ (n= 6)]. Body length 13.13–13.19; head length 2.38–2.42, width 1.89–1.94; width between eyes 0.70–0.74, diameter of eye 0.58–0.61; length of anteocular area 0.59–0.62, postocular area 1.19–1.21; antennal length 8.98–9.02, lengths

of antennal segments I: 1.78–1.81, II: 2.39–2.42, III: 3.19–3.22 and IV: 1.58–1.61; rostral length 2.78–2.82, lengths of rostral segments I: 1.19–1.21, II: 1.18–1.21 and III: 0.38–0.41; length of pronotum 2.58–2.61, width 3.18–3.21; length of anterior pronotal lobe 1.59–1.62, posterior pronotal lobe 0.99–1.02; lengths of forefemur: 3.58–3.61, -tibia: 3.59–3.61, fossula spongiosa: 1.31–1.34; midfemur: 3.58–3.62, -tibia: 3.59–3.62, -fossula spongiosa: 1.30–1.33; hind femur: 4.98–5.03, tibia: 5.58–5.62; length of abdomen 6.78–6.83, width 5.38–5.42.

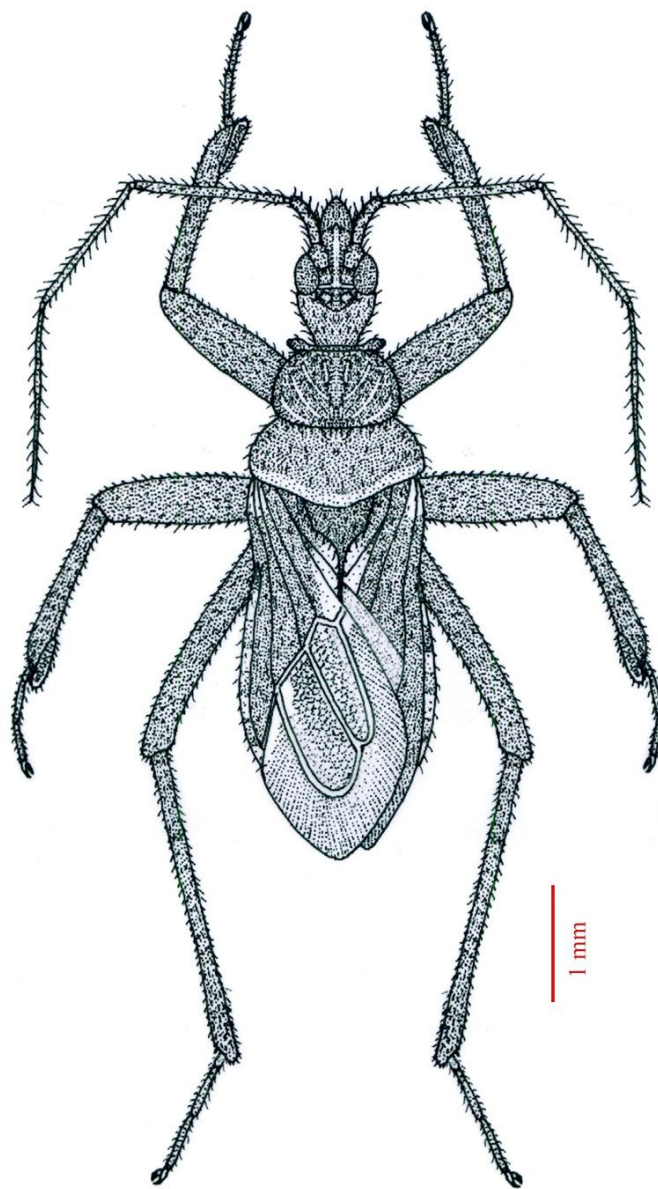
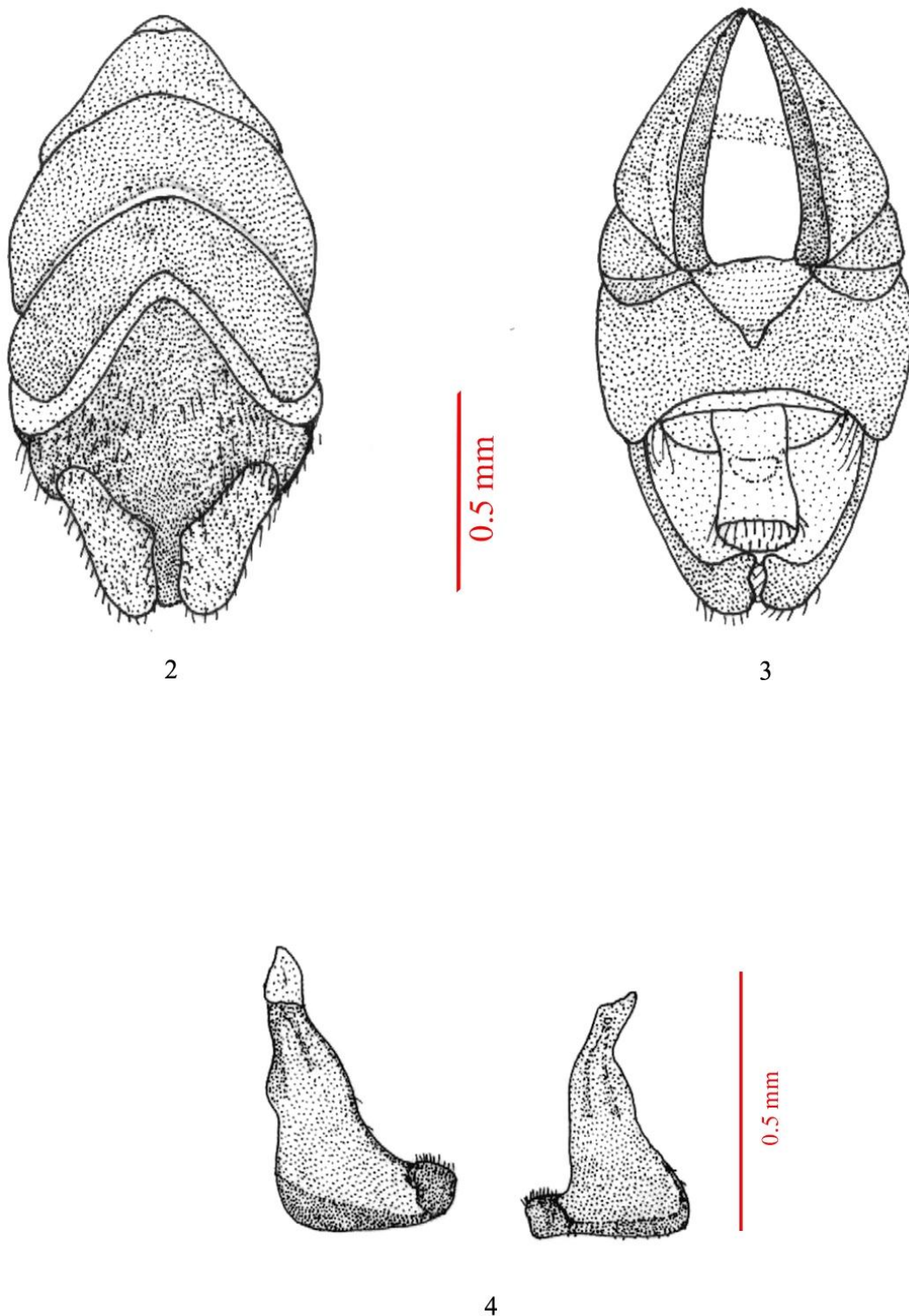
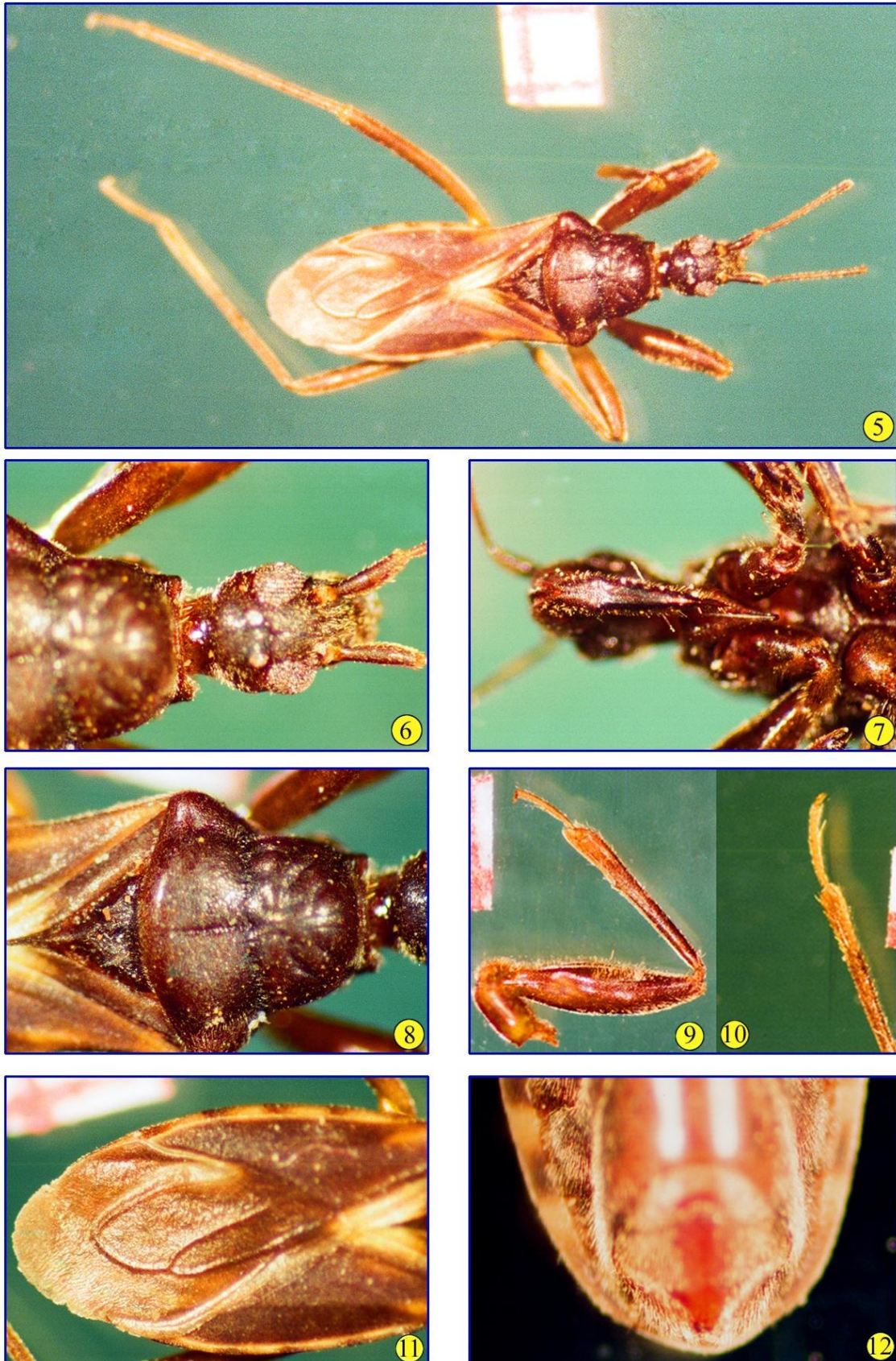


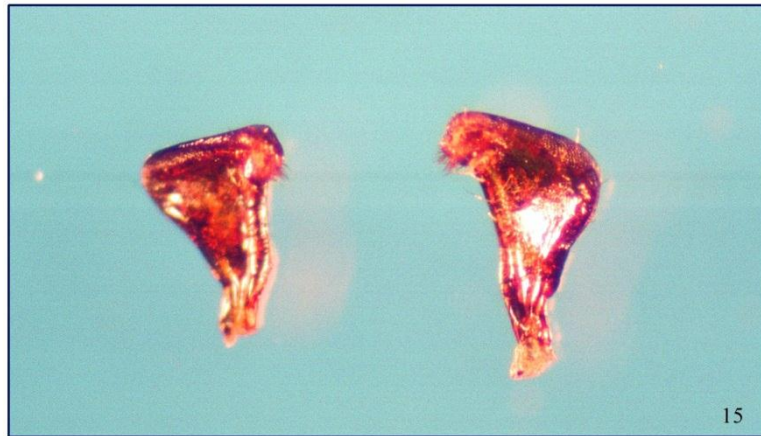
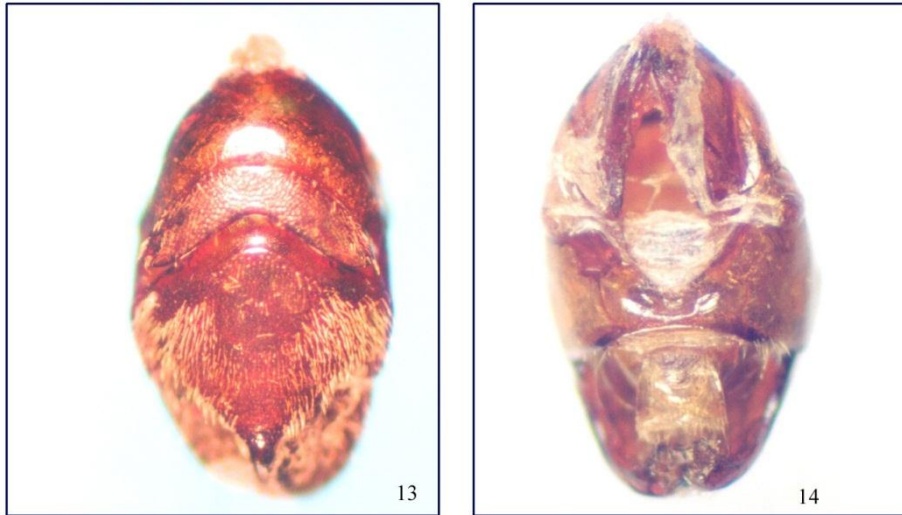
FIGURE 1. *Acanthaspis biguttula* Stål ♂: habitus, dorsal view.



FIGURES 2–4. *Acanthaspis biguttula* Stål ♂ genitalia : 2 & 3. phallosoma dorsal & ventral views and 4. parameres.



FIGURES 5–12. *Acanthaspis biguttula* Stål ♂ : microphotographs showing 5. entire insect 6. head 7. rostrum 8. thorax 9 & 10. foreleg and midtibiae with fossula spongiosae 11. abdomen (dorsal) and 12. abdomen (ventral) with genitalia.



FIGURES 13–15. *Acanthaspis biguttula* Stål ♂ genitalia : microphotographs showing 13 & 14. phallosoma dorsal & ventral views and 15. parameres.

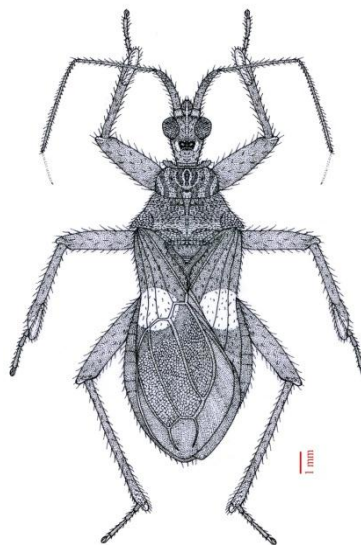
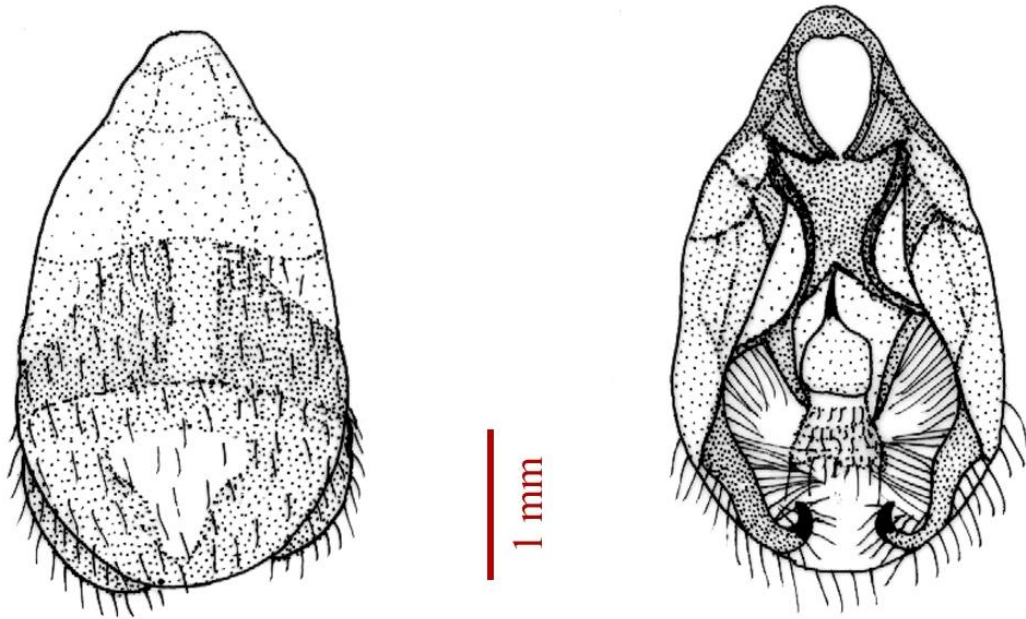
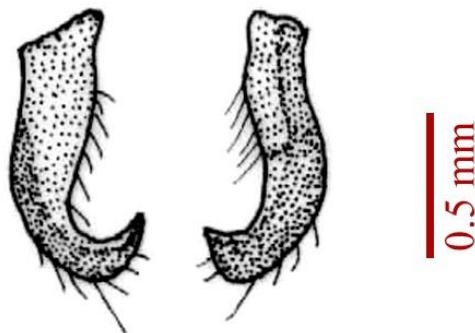


FIGURE 16. *Acanthaspis bistillata* Stål ♂: habitus, dorsal view.



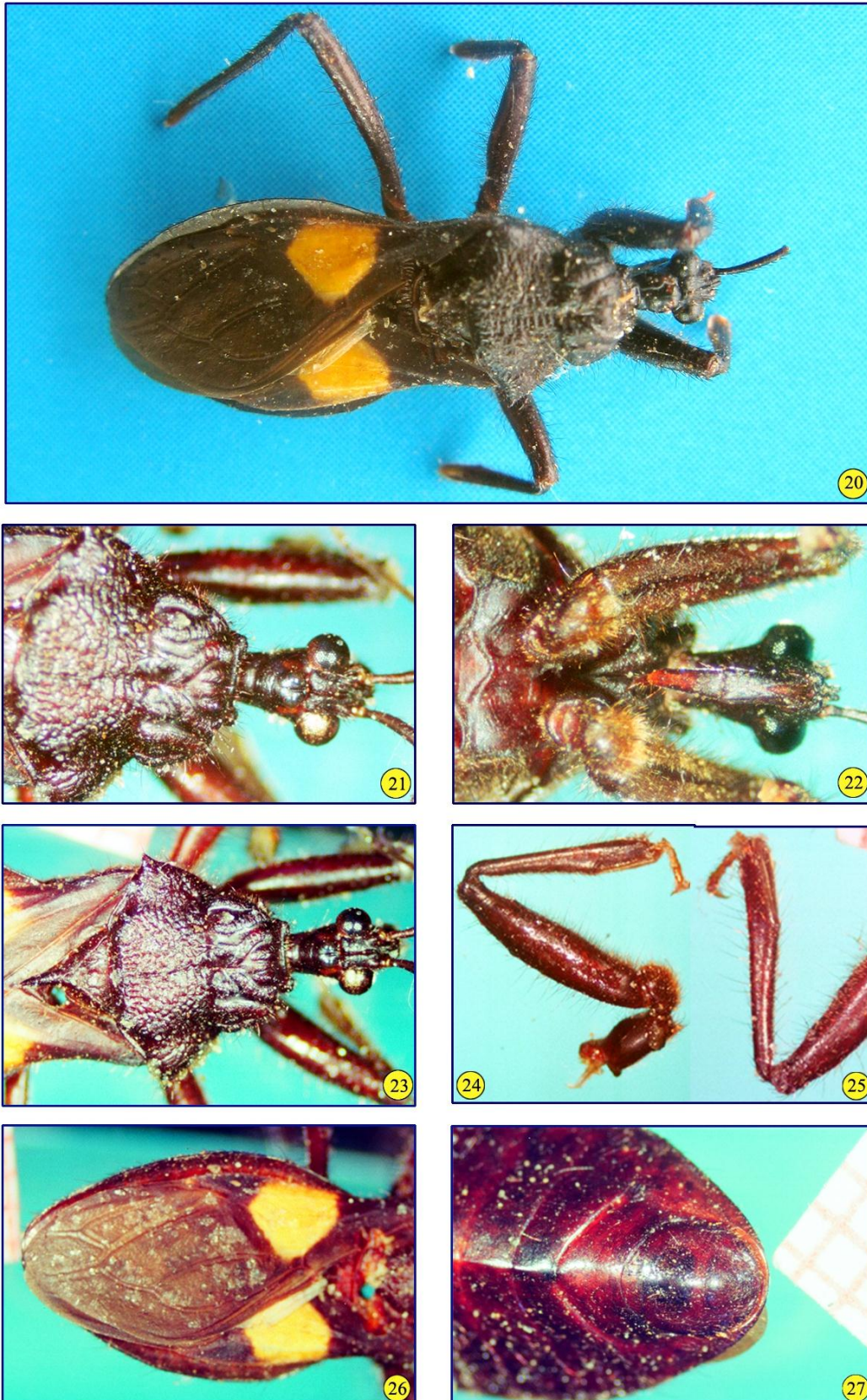
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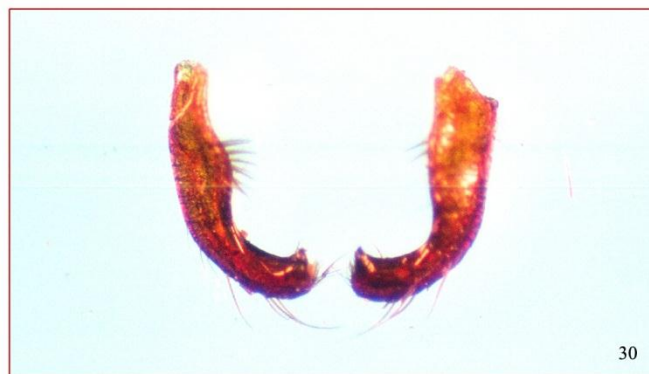


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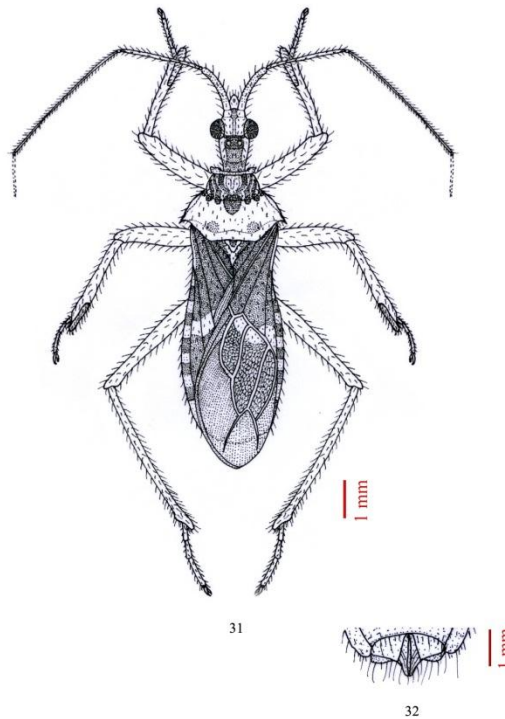
FIGURES 17-19. *Acanthaspis bistillata* Stål ♂ genitalia: 17 & 18. phallosoma dorsal & ventral views and 19. parameres.



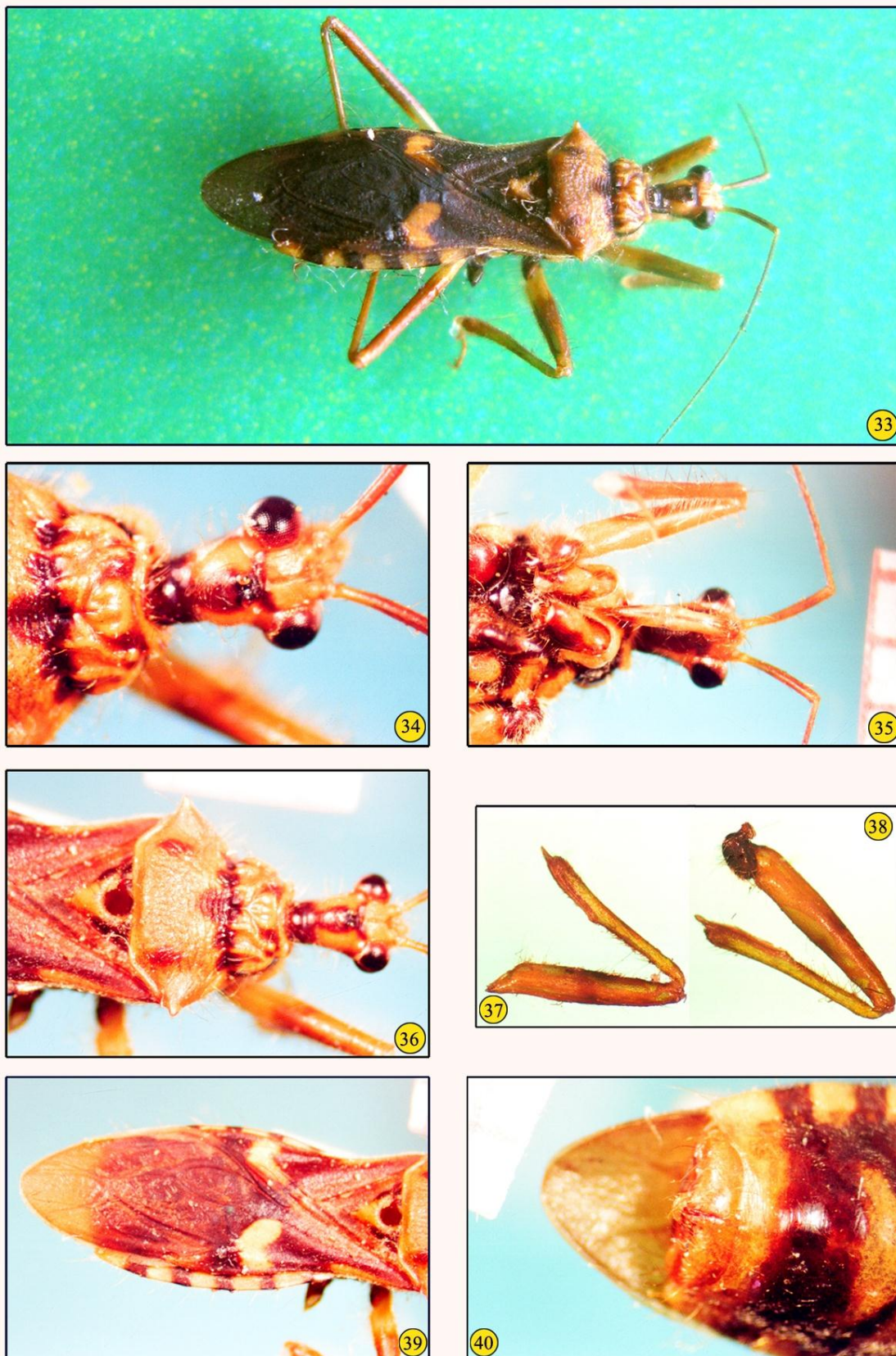
FIGURES 20–27. *Acanthaspis bistillata* Stål ♂ : microphotographs showing 20. entire insect 21. head 22. rostrum 23. thorax 24 & 25. fore- and midleg with fossula spongiosae 26. abdomen (dorsal) and 27. abdomen (ventral) with genitalia.



FIGURES 28–30. *Acanthaspis bistillata* Stål ♂ genitalia : microphotographs showing 28 & 29. phallosoma dorsal & ventral views and 30. parameres.



FIGURES 31–32. *Acanthaspis inscripta* Distant ♀: 31. habitus, dorsal view and 32. apical segments of abdomen with genitalia, ventral view.



FIGURES 33–40. *Acanthaspis inscripta* Distant ♀: microphotographs showing 33. entire insect 34. head 35. rostrum 36. thorax 37 & 38. fore- and midleg with fossula spongiosae 39. abdomen (dorsal) and 40. abdomen (ventral) with genitalia.

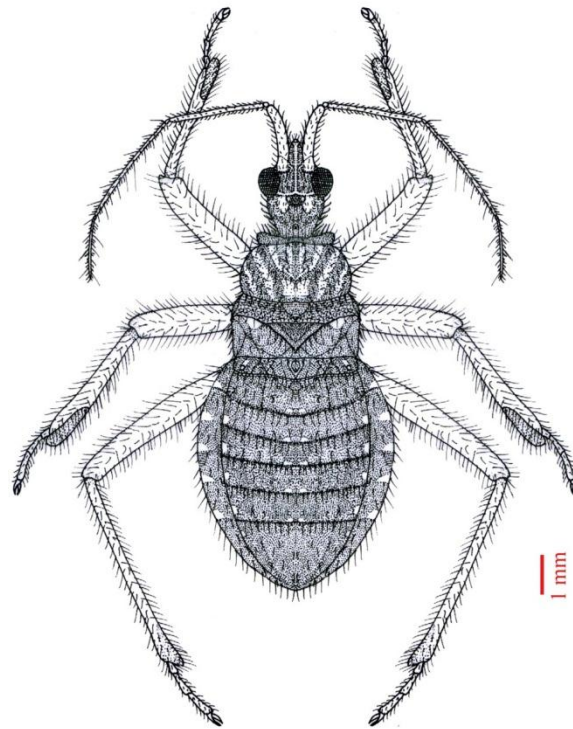
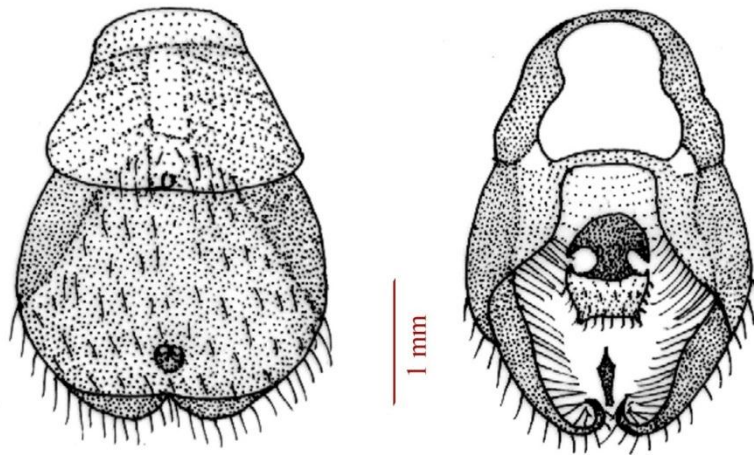
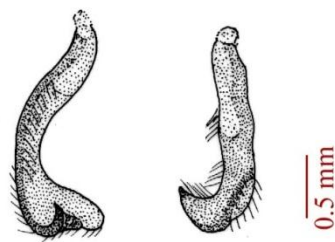


FIGURE 41. *Acanthaspis pedestris* Stål ♂: habitus, dorsal view.



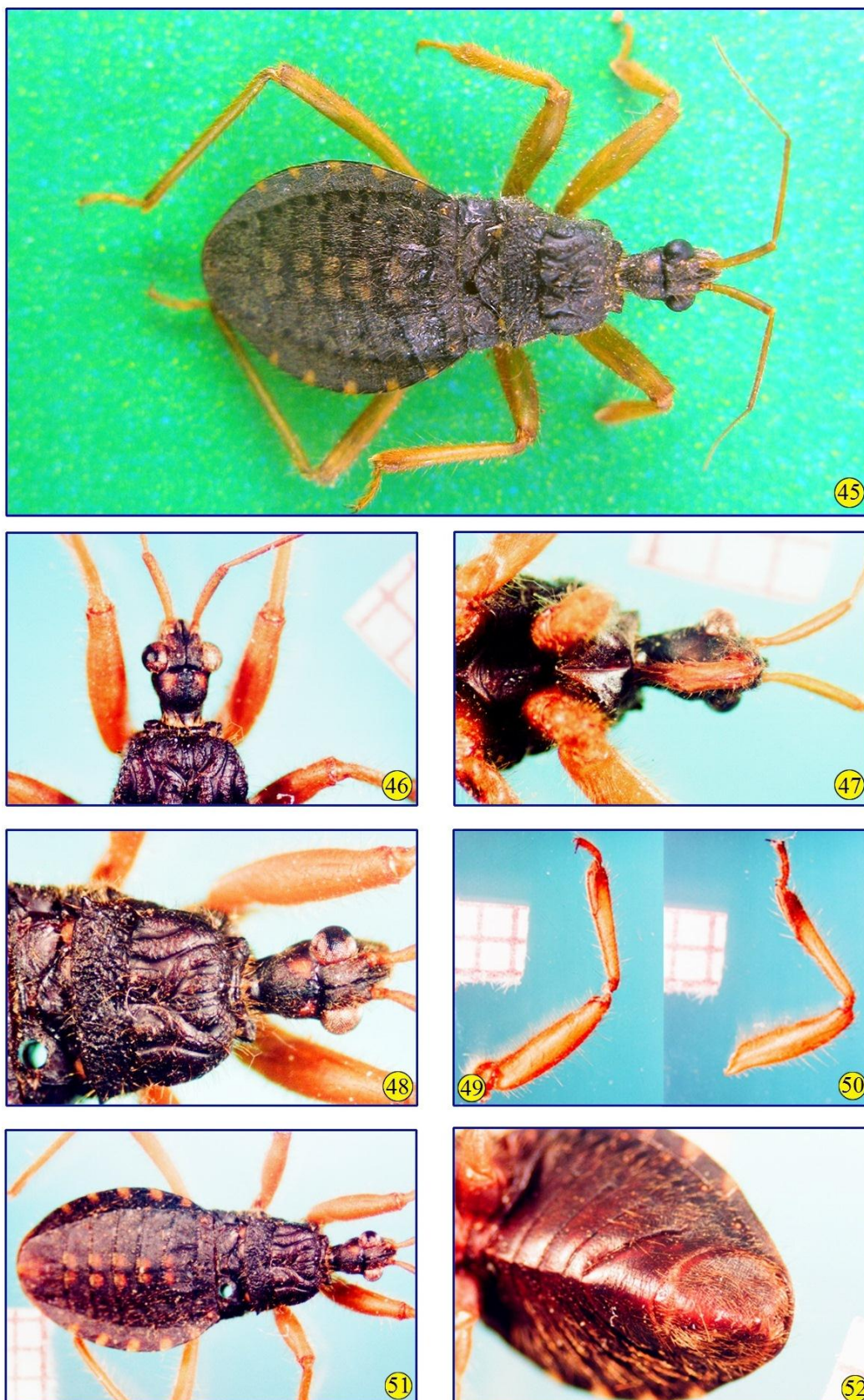
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FIGURES 42-44. *Acanthaspis pedestris* Stål ♂ genitalia: 42 & 43. phallosoma dorsal & ventral views and 44. parameres.



FIGURES. 45-52. *Acanthaspis pedestris* Stål ♂ : microphotographs showing 45. entire insect 46. head 47. rostrum 48. thorax 49 & 50. fore- and midleg with fossula spongiosae 51. abdomen (dorsal) and 52. abdomen (ventral) with genitalia.



FIGURES 53-55. *Acanthaspis pedestris* Stål ♂ genitalia : microphotographs showing 53 & 54. phallosoma dorsal & ventral views and 55. parameres.

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