

A REVISION OF THE TRIBE AELIINI (HEMIPTERA: PENTATOMIDAE: PENTATOMINAE) FROM THE INDO-PAKISTAN REGION

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Abstract

Five genera and ten species of the tribe Aeliini Stål from the Indo-Pakistan region are keyed, compared to their closest allies and their geographical distribution given. A description of all the above genera and species of *Adria* Stål and *Bonacialus* Distant has been given. These species, including two new species of *Adria*, are described with special reference to their metathoracic scent gland complex and male and female genitalia.

Introduction

The tribe Aeliini, first proposed by Stål [1], is here recognised as comprising five genera (*Adria* Stål, *Aelia* Fabricius, *Aeliomorpha* Stål, *Bonacialus* Distant and *Gulielmus* Distant). For its nomenclatural history, refer to Distant [2], Kirkaldy [3], Pruthi [4], Abbasi [5], Ahmad and Zaidi [6], and Zaidi and Ahmad [7]. Members of this tribe occur in the Oriental, Ethiopian, Nearctic and Palearctic regions.

In the present paper, the key is given to the five genera and ten species that occur in the Indo-Pakistan region. All the species are redescribed, and distribution and comparative notes on their metathoracic scent gland complex and male and female genitalia are provided. The new species described are *Adria neoparvula* sp. nov. and *A. sindellus* sp. nov., both from Pakistan.

The technique given by Ahmad [8] was generally followed for the inflation of the aedeagus. The technique of Zaidi and Ahmad [7] was used for the dissection of female genitalia (particularly spermatheca) and for the measurements, illustrations and general de-

scriptions. All measurements are in millimeters.

The following abbreviations are used for the museums that loaned specimens: NHMUK-Natural History Museum, Department of Zoology, University of Karachi; MNH-Museum Natural History, London; USNM-United States National Museum of Natural History, Washington, D.C.; NHMB-Natural History Museum, Basel, Switzerland.

Tribe Aeliini

Aeliini Stål, 1872, *K. Svenska Vet. Akad. Förh.* **29** (3), 36; Stichel, 1960-62, *Illustrierte Bestimmungstabellen der Wanzen*, 547; Puchkov, 1965, *Acad. Sci. Kirgiskoi Inst. Biol., Frunze*: 198; Ahmad *et al.* 1974, *Karachi Ent. Soc. Suppl.* **1**, 45; Gross, 1975, Plant feeding and other bugs of South Australia, 365; Ahmad, 1979, *Karachi Ent. Soc. Suppl.* **4** (1), 43; 1980, *Proc. 1st Pakistan Congr. Zool. Ser. A*, 135.

Body elongate and oval; head elongate, usually broader than its length; paraclypei almost equal to clypeus or distinctly longer and enclosing it in front; antenniferous tubercles not visible from above; 1st antennal segment not reaching the apex of head; bucculae long, concealing most of the basal labial seg-

Keywords: Aeliini; Indo-Pakistan; Revision

ment; labium reaching to or passing beyond hind coxae; humeral angles of pronotum round, lateral margins smooth; scutellum longer than its breadth, apex round; mesosternum slightly carinate or sulcate; metathoracic scent gland ostioles of variable size and shape, peritreme and evaporatoria variously developed; membrane of hemelytra reaching to or passing beyond abdomen, latter unarmed at base, ventrally entire, without carina or sulcation; connexiva round.

Male Genitalia: Ventroposterior margin of pygophore sinuate, lateral lobes prominent, dorsolateral spines present or absent; inner margin of paramere with or without tooth-like structure, vesica moderately developed.

Female Genitalia: First gonocoxae large, apices acute or subrounded; 9th paratergites elongate, reaching to or short of posterior margin of fused 8th paratergites; spermatheca with distal spermathecal duct short, median dilation well developed with internal rod straight or curved but proximally slightly swollen, proximal duct thin and elongate; pump region moderately developed and bulb without finger-like processes.

Key to the Indo-Pakistan Genera of the Tribe Aeliini

(Members of the tribe Aeliini are distributed in Palearctic, Nearctic, Oriental and Ethiopian regions)

1. Paraclypei almost as long as and never enclosing clypeus in front. 2
— Paraclypei remarkably longer than clypeus and enclosing it in front. 3
2. Anterior margin of pronotum remarkably sinuate, meso- and metasterna slightly sulcate, metathoracic scent gland complex with peritreme and evaporatoria indistinct. (Distributed in Bengal, Ranchi, Bombay, Khandala in India; Maynmar, Punjab and Sindh in Pakistan; Senegal). *Adria* Stål
— Anterior margin of pronotum smoothly concave, meso- and metasterna slightly carinate, metathoracic scent gland complex with peritreme and evaporatoria distinct. (Distributed in Bengal, Bor Ghat and Bombay in India; Gilgit, Islamabad, Punjab and Sindh in Pakistan). *Aeliomorpha* Stål
3. Labium reaching passing beyond hind coxae, athoracic scent gland complex well developed. 4
— Labium reaching to or passing beyond middle coxae but not reaching hind coxae, metathoracic scent gland complex poorly developed. (Distrib-

uted in Western India, Bombay and Bor Ghat) *Gulielmus* Distant

4. Head longer than pronotum, antecular distance 2.0x longer than remainder of head. (Distributed in Kerani and Quetta in Pakistan) *Aelia* Fabricius
— Head shorter than pronotum, antecular distance slightly longer than remainder of head. (Distributed in Bombay and Bor Ghat India) *Bonacialis* Distant

I. Genus *Adria* Stål 1876

Adria Stål, 1876, *K. Svenska. Vet. Akad. Handl.* 14 (4), 55; Atkinson, 1888, *J. Asiat. Soc. Bengal*, 57, 34; Distant, 1902, *Fauna of British India Rhynchota, Heteroptera*, 1, 139; Kirkaldy, 1909, *Catalogue Hemipt. Cimicidae*, 1, 73; Stichel, 1960-62, *Illustrierte Bestimmungstabellen der Wanzen*, 11, Europa, 746; Puchkov, 1965; *Acad. Sci. Kirgiskoi Inst. Biol. Frunze*, 198; Ahmad *et al.*, 1974, *Karachi Ent. Soc. Suppl.* 1, 46; Ahmad 1979, *Karachi Ent. Soc. Suppl.* 4 (1), 43; Ahmad 1980, *Proc. 1st Pakistan Congr. Zool. Ser. A*, 135; Linnavuori, 1982, *Acta. Zoologica Fennica*, 88: 163.

Type Species: *Adria parvula* (Dallas)

Diagnostic Characters: Head broader than its length; paraclypei always as long as clypeus; labium usually reaching hind coxae; length of pronotum always shorter than its width, scutellum always longer than breadth, apical lobe prominent; metathoracic scent gland ostiole large, peritreme and evaporatoria indistinct; membrane of hemelytra usually as long as abdomen. Pygophore usually quadrangular, ventro-posterior margin sinuate, lateral lobes usually round; paramere sickle-shaped; aedeagus with one or two pairs of membranous conjunctival processes, vesica short; first gonocoxae broad, usually slightly overlapping each other; 9th paratergites elongate, usually reaching the fused posterior margins of 8th paratergites.

Comparative Note: *Adria* is closely related to *Aeliomorpha* in that it has paraclypei almost as long as clypeus and never enclosing the latter in front, but can be easily distinguished from it by the sinuate anterior margin of pronotum and the metathoracic scent gland ostiole which is extremely reduced.

Adria includes four species from the Oriental and Ethiopian regions of which three species, including two new ones from Indo-Pakistan areas, are herein keyed and described.

Key to the Indo-Pakistan Species of the Genus *Adria* Stål

1. Head distinctly shorter than pronotum, antennae with 2nd segment as long as 3rd. *parvula* (Dallas) (Eastern and Central India, Maynmar and Punjab in Pakistan).

— Head almost as long as pronotum, antennae with 2nd segment longer than 3rd.

2. Antennae with 3rd segment as long as 4th, pygophore broader than length, aedeagus with 2 pairs of membranous conjunctival appendages.

neoparvula sp. nov.

(Taxila, Punjab, Pakistan).

— Antennae with 3rd segment shorter than 4th, pygophore almost as long as broad, aedeagus with

a single pair of membranous conjunctival appendages.

sindellus sp. nov.

(Karachi, Makli, Sujawal, Mianiforest, Sindh Pakistan)

1. *Adria neoparvula* sp. nov. (Figs. 1, 2, 3, 4, 5)

Coloration: Body uniformly ochraceous with black punctures except antennal segments black; ocelli pink; eyes brown.

Head: Almost as long as pronotum; lateral margins of paraclypei entire, as long as clypeus; antecocular distance longer than remainder* of head; antennae with 2nd segment slightly longer than 3rd; length of antennal segments: I 0.3, II 0.35-0.45, III 0.4-0.5, IV 0.4-

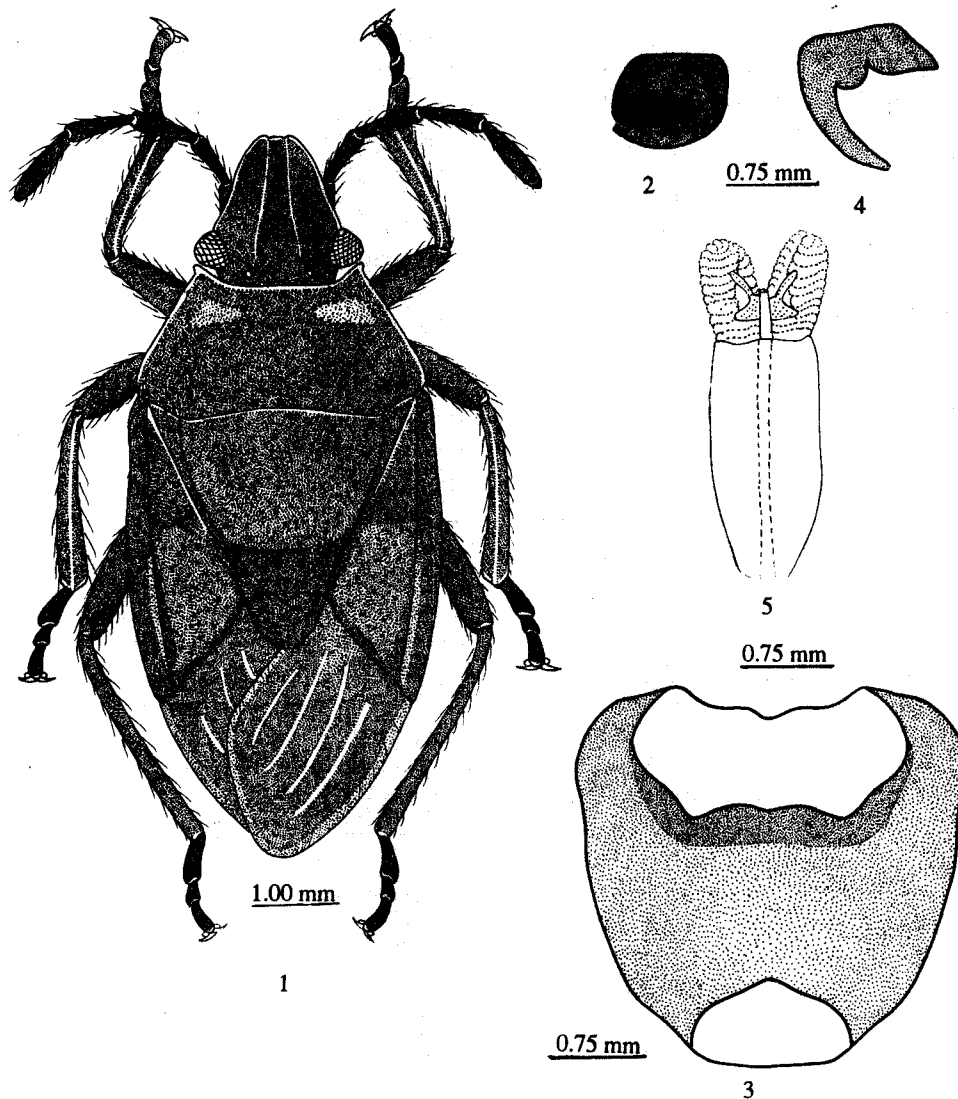


Figure 1. *Adria neoparvula* sp. nov.

Figure 2. Metathoracic scent gland

Figure 3. Pygophore

dorsal view
ventral view
dorsal view,

Figure 4. Paramere

Figure 5. Inflated aedeagus

dorsal view
dorsal view

0.5, V 0.6-0.7; labium mutilated; anteocular distance 0.65-0.70; remainder of head 0.75-0.80 long; width 1.6-1.65; interocular distance 1.01-1.15; interocellar distance 0.6.

Thorax: Width of pronotum slightly more than 2.25x its length, humeral angles round, lateral margins slightly concave, pronotum length 1.4-1.45, width 3.1-3.2; scutellum distinctly longer than width, distinctly more than 1.5x longer than head length, apex round, scutellum length 2.5-2.6, width 2.0-2.2; metathoracic scent gland ostiole (Fig. 2) large, ovate; membrane of hemelytra as long as abdomen; base scutellum-apex clavus 1.6-1.8; apex clavus-apex corium 1.2-1.4; apex corium-apex abdomen including membrane 1.25-1.3; apex scutellum-apex abdomen including membrane 1.5-1.7.

Abdomen: Connexiva slightly exposed at repose, margins of sterna acute, total body length male 6.95-7.00.

Male Genitalia: Pygophore (Fig. 3) broader than length, dorso-posterior margin medially concave, lateral lobes broadly round, ventro-posterior margin deeply serrate; paramere (Fig. 4) sickle-shaped, apex of blade acute, outer margin sinuate; inflated aedeagus (Fig. 5) with a pair of ventral membranous conjunctival processes, vesica short, not reaching to half of the ventral membranous conjunctival appendages.

Specimens Examined: Holotype male PAKISTAN: Punjab, Taxila, 15. 10. 1978. Coll. I. Ahmad. In NHMUK. Paratypes 2 males same data as holotype, in the above museum and in MNH.

Comparative Note: This species is closely related to *sindellus* in having a head almost as long as pronotum and antennae with 2nd segment longer than 3rd, but can easily be distinguished from it by its pygophore, which is broader than its length, and its inflated aedeagus with two pairs of membranous conjunctival processes.

2. *Adria parvula* (Dallas) (Figs. 6, 7, 8, 9, 10, 11, 12)
Pentatoma parvula Dallas, 1851, British Mus. Publ., 246.
P. brevittate Walker, 1867, British Mus. Publ., 312.
P. brevivitta Lethierry and Severin, 1896, Cat. Gen. Hemip., 197.

Adria parvula Atkinson, 1888, *J. Asiat. Soc. Bengal*, 57, 34; Bergroth 1891, *Rev. d. Ent.*, 10, 203; Distant

1902, *Fauna of British India, including Ceylon and Burma. Rhynchota*, 1, 139; Kirkaldy 1909, *Cimicidae, Felix, Dames*, 73; Stichel 1960-62, *Illustrate Bestimmungstabellen der Wanzen, Europa*, (11-14), 746; Kumar 1962a, *Entomol. Ts. Arg.*, 83 (1&2), 9; 1962b, *Zoologica Poloniae* 12 (1), 3-31; Cheema *et al.* 1973, *Tech. Bull. Commonw. Inst. Biol. Control*, 16, 50; Ahmad *et al.* 1974, *Karachi Ent. Soc. Suppl.* 1, 46; Ahmad 1979, *Karachi Ent. Soc. Suppl.* 4 (1), 43; 1980, *Proc. 1st Pakistan Congr. Zool. Ser.*, A, 35; Linnavuori, 1982, *Acta. Zoologica Fennica*, 163, 88.

Coloration: Body uniformly ochraceous but base of antennal segments black; anterior disc of scutellum and clavus of hemelytra brownish ochraceous, ocelli pink; eyes brown.

Head: Distinctly shorter than pronotum; lateral margins of paraclypei slightly concave, as long as clypeus; anteocular distance slightly longer or almost equal to remainder of head; antennae with 2nd segment almost equal to 3rd; length of antennal segments: I 0.3, II 0.45-0.50, III 0.45-0.50, IV 0.40-0.45, V 6.0-7.0; labium reaching hind coxae with 3rd segment distinctly more than 2.25x shorter than 2nd; length of labial segments: I 1.0-1.5, II 1.3-1.6, III 0.5-0.6 IV 0.6; length anteocular distance 0.70-0.85, length remainder of head 0.7-0.8; width 1.7-2.1; interocular distance 1.2-1.3; interocellar distance 0.70-0.75.

Thorax: Width of pronotum slightly more than twice its length; humeral angles acute, lateral margins entire, pronotum length 1.5-1.8, width 3.3-3.7; scutellum distinctly longer than breadth, more than 1.5x longer than head length, apex acute, scutellum length 2.6-3.0, width 2.1-2.5; metathoracic scent gland ostiole (Fig. 7) large, ovate; membrane of hemelytra not longer than abdomen; base scutellum-apex clavus 1.6-2.0; apex clavus-apex corium 1.2-1.8; apex corium-apex abdomen including membrane 1.2-1.6; apex scutellum-apex abdomen including membrane 1.5-2.0.

Abdomen: Connexiva exposed at repose, margins of sterna subacute; total body length male 6.4-7.6, female 7.40-8.35.

Male Genitalia: Pygophore (Fig. 8) slightly broader than length, dorso-posterior margin medially slightly concave, lateral lobes acute, round, ventro-posterior margin sinuate; paramere (Fig. 9) sickle-shaped, apex of blade narrowed, outer margin straight; inflated aedeagus (Fig. 10) with a pair of ventral membranous conjunctival processes, vesica short, not passing be-

yond junction of ventral membranous conjunctival processes.

Female Genitalia (Fig. 11): First gonocoxae square, posterior margin deeply concave; 8th paratergites triangular; 9th paratergites elongate, lobe-like; arcus broad with posterior margin straight; spermatheca (Fig. 12) with proximal spermathecal duct more than three times longer than distal spermathecal duct, pump region slightly longer than distal spermathecal duct, spermathecal bulb elongate.

Specimens Examined: Holotype female East India in MNH; other material 25 males, 18 females, PAKISTAN: Punjab, Islamabad, Rawalpindi, Wah Garden, National Park, Faisalabad, Coll. A.A. Khan, I. Ahmad, M. Aslam, M. Rahim, S. Kamaluddin and M. Moizuddin, in NHMUK.

Comparative Note: This species is closely related to *neoparvula* in general body shape and size but can easily be distinguished from it by its head which is distinctly shorter than pronotum and by the 2nd seg-

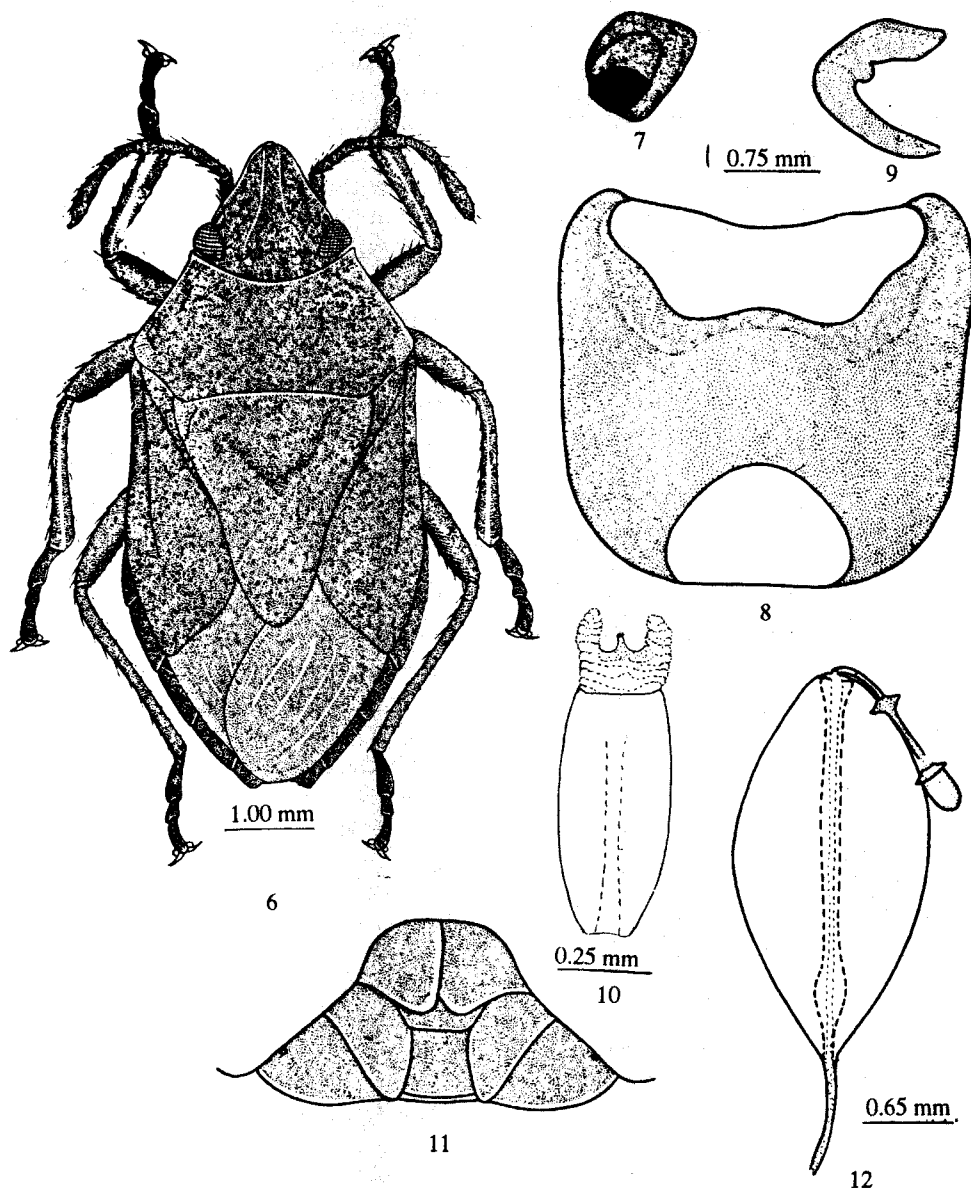


Figure 6. *Adria parvula* (Dallas)
Figure 7. Metathoracic scent gland
Figure 8. Pygophore
Figure 9. Paramere

dorsal view
ventral view
dorsal view
dorsal view

Figure 10. Inflated aedeagus
Figure 11. Female terminalia
Figure 12. Spermatheca

dorsal view
ventral view
dorsal view

ment of antennae which is as long as the 3rd.

3. *Adria sindellus* sp. nov. (Figs. 13, 14, 15, 16, 17, 18, 19)

Coloration: Body uniformly brownish ochraceous with dense black punctures except anterior disc of scutellum and clavus with black tinge.

Head: Almost as long as pronotum; lateral margins of paraclypei almost straight, as long as clypeus; anteocular distance slightly longer than remainder of head; antennae with 2nd segment slightly longer than 3rd; length of antennal segments: I 0.2-0.3, II 0.3-0.4, III 0.4-0.5, IV 0.50-0.55, V 0.65-0.70; labium reaching hind coxae with 3rd segment more than 1.25x

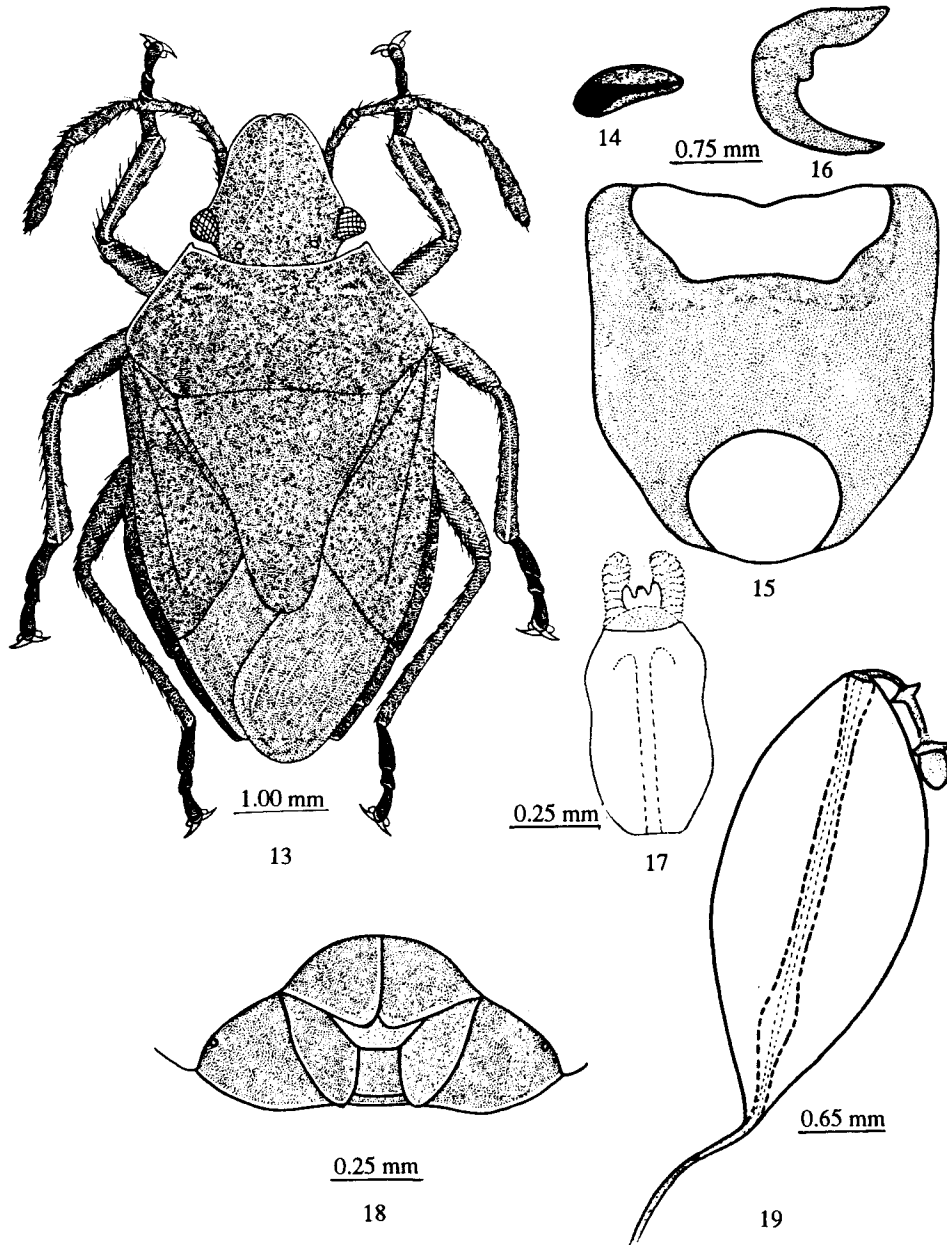


Figure. 13. *Adria sindellus* sp. nov.

Figure. 14. Metathoracic scent gland

Figure. 15. Pygophore

Figure. 16. Paramere

dorsal view
ventral view
dorsal view
dorsal view

Figure. 17. Inflated aedeagus

Figure. 18. Female terminalia

Figure. 19. Spermatheca

dorsal view
ventral view
dorsal view

longer than 2nd; length of labial segments: I 1.8-1.1, II 0.8-0.9, III 0.5-0.6, IV 0.35-0.5; anteocular distance 0.75-0.80, length remainder of head 0.7, width 1.6-1.75; interocular distance 1.1-1.3; intercellar distance 0.6-0.8.

Thorax: Width of pronotum distinctly more than twice its length, humeral angles subround, lateral margins straight; length of pronotum 1.45-1.5, width 3.2-3.4; scutellum distinctly longer than breadth, more than 1.25x longer than head length, apex subround; scutellum length 2.5-2.7, width 2.1-2.3; metathoracic scent gland ostiole (Fig. 14) large, round; membrane of hemelytra not longer than abdomen; base scutellum-apex clavus 1.9-2.0; apex clavus-apex corium 0.9-1.2; apex corium-apex abdomen including membrane 1.2-1.5; apex scutellum-apex abdomen including membrane 1.55-1.65.

Abdomen: Connexiva only slightly exposed at repose, margins of sterna acute; total body length male 7.00-7.25, female 7.25-7.35.

Male Genitalia: Pygophore (Fig. 15) almost as long as breadth, dorso-posterior margin medially slightly concave, lateral lobes subround, ventro-posterior margin sinuate; paramere (Fig. 16) sickle-shaped, apex of blade pointed, outer margin substraight; inflated aedeagus (Fig. 17) with a pair of ventral membranous conjunctival processes, vesica short, reaching to half of the ventral membranous conjunctival processes.

Female Genitalia (Fig. 18): First gonocoxae triangular, with posterior margins straight; 2nd gonocoxae quadrangular; 8th paratergites broad; 9th paratergite elongate, hump-shaped; arcus short with posterior margin concave; spermatheca (Fig. 19) with proximal spermathecal duct more than two times longer than distal spermathecal duct, pump region slightly longer than distal spermathecal duct, spermathecal bulb elongate.

Specimens Examined: Holotype male PAKISTAN: (Sind), Thatta 7. 9. 1977. Coll. A.A. Khan in NHMUK. Paratypes 16 male 15 female, Karachi, Makli, Sujawal, Miani Forest, Coll. M. Rahim, A.A. Khan, M. Aslam in above museum in Ahmad's collection and in USNM.

Comparative Note: This species is closely related to *neoparvula* in having a head almost as long as its pronotum and antennae with 3rd segment as long as 4th, but can easily be distinguished from it by anten-

nae with 3rd segment shorter than 4th, pygophore almost as long as breadth and inflated aedeagus with one pair of membranous conjunctival processes.

II. Genus *Aelia* Fabricius 1803

Aelia Fabricius, 1803, *Systema Rhyngotorum secundum ordines genera species adjectis synonymis, locis, observationibus, descriptionibus*. *Brunovigae*, 1-34; Laporte, 1832, *Mag. Zool.*, 1 (52-55), 55; Dallas, 1851, *British Mus. Publ.*, 222; Fieber, 1868, *Verh. Zool. Bot. Ges. Wien*, 18, 465; Horvath, 1903, *Ann. Mus. Nat. Hist. Nat. Hungar., Budapest*, 1, 404; Kirkaldy, 1909, *Cimicidae, Felix Dames Berlin*, 76; Lodos, 1958, *Ann. Mag. Nat. Hist. Ser.*, 13 (1), 795; 1981, *Eppo. Bull.*, 11 (2), 92; Eva, 1959, *magyarország Allatrilaga Fauna Hungariae*, 17, 250; Stichel, 1960-62, *Illustrierte Bestimmungstabellen der Wanzen*, 11, Europa, 747; Linnavuori, 1960, *Ann. Zool. Soc., Zool. Bot. Fennice, Vanamo*, 22 (1), 15; Puchkov, 1965, *Acad. Sci. Kirgiskoi. Inst. Biol., Frunze*, 199; McDonald, 1966, *Quaest Ent.*, 2, 20; Hsiao, 1978, *Acta Entomologica Sinica*, 21 (3), 325; Fuente, 1974, *Inst. Espanol. Entomol., Madrid.*, 68 (30), 166; Ahmad and Zaidi, 1988, *Sarhad J. Agric.*, 4 (4), 456. (For detailed description).

Type Species: *Aelia acuminata* (L.)

Diagnostic Characters: Paraclypei always longer than clypeus, enclosed in front; labium reaching to or passing beyond hind coxae, 1st segment usually reaching to posterior margin of head, anterior angles of pronotum with or without denticles, scutellum always longer than breadth, metathoracic scent gland complex well developed, with large ostiole, peritreme elongate, evaporatoria distinct; membrane of hemelytra always longer than abdomen. Pygophore usually broader than length; ventro-posterior margin almost straight, dorso-posterior margin medially concave, paramere usually straight.

Comparative Note: *Aelia* is closely related to *Bonacialis* in that paraclypei remarkably longer than clypeus and enclosing the clypeus in front, and a well-developed metathoracic scent gland complex, but can easily be distinguished from the same by its head which is longer than its pronotum and anteocular distance twice remainder of the head.

Aelia comprises 29 species [3, 6, 9] from Nearctic, Palearctic and Ethiopian regions of which only the following species is represented from Indo-Pakistan areas described in detail by Ahmad and Zaidi [6].

4. *Aelia baluchistanensis* Ahmad and Zaidi

Sarhad J. Agric. 4 (4), 455-461.

Characterised by a head as long as pronotum, labium passing beyond hind coxae, pygophore broader than length, dorso-posterior margin medially shallowly concave.

Specimens Examined: Holotype male PAKISTAN: Baluchistan, Kerani, Coll. M. Moizuddin, Paratypes 5 males, Baluchistan, Kerani, Urak, Kuchlakh, Coll. M. Moizuddin and I. Ahmad in NHMUK., in Ahmad's collection and in NHMB.

III. *Aeliomorpha* Stål 1858

Aeliomorpha Stål, 1858, *K. Svenska Vet. Akad. Handl.* 11 (2), 313; 1876, *K. Svenska Vet. Akad. Handl.*, 14 (2), 79; Atkinson, 1888, *J. Asiat. Soc. Beng.*, 57, 37; Distant, 1902, *Fauna of British India, including Ceylon and Burma. Rhynchota*, 1, 138; 1918, *Fauna of British India, including Ceylon and Burma. Rhynchota*, 6, 127; Kirkaldy, 1909, *Cimicidae. Felix Dames, Berlin*, 1, 76; Stichel, 1960-62, *Illustrierte Bestimmungstabellen der Wanzen*, 11 Europa, 748; Puchkov, 1965, *Acad. Sci. Kirgiskoi Inst. Biol., Frunze*, 198; Linnavuori, 1975, *Biol. Soc. Port. Cienc. Nat.*, 15, 39; 1982, *Acta Zoologica Fennica*, 87; Ahmad *et al.*, 1974, *Karachi Ent. Soc. Suppl.* 1, 45; Ahmad, 1979, *Karachi Ent. Soc. Suppl.*, 4 (1), 33; 1980, *Proc. 1st Pakistan Congr. Zool. Ser.*, A, 135; Zaidi and Ahmad 1990, *Pakistan J. Sci. Ind. Res.*, 33 (4), 163-168 (for detailed description and key).

Tetratoma Signoret, 1851, *Ann. Soc. Entomol. Fr.*, 9 (2), 339.

Pentatoma subgenus *Aeliomorpha* Stål, 1864-65, *Hemip. Africana*, 1-3, 173.

Type Species: *Aeliomorpha simulans* Stål

Diagnostic Characters: Paraclypei always as long as clypeus; labium distinctly passing beyond hind coxae; 1st segment almost reaching to posterior margin of head; anterior margin of pronotum concave or sinuate, scutellum as long as or slightly longer than breadth with distinct apical lobe; metathoracic scent gland complex well developed, evaporatoria distinct. Pygophore usually as long as broad, ventro-posterior margin usually sinuate, with one or two pairs of membranous conjunctival processes, vesica always short. First gonocoxae usually apically round, not meeting or touching each other; 9th paratergite elongate, usually not reaching posterior margin of fused 8th paratergite. *Aeliomorpha* is largely Ethiopian in distribution with

14 species known to date, only three of which are represented from Indo-Pakistan areas recently described in detail by Zaidi and Ahmad [10].

Comparative Note: *Aeliomorpha* is closely related to *Adria* in that it has paraclypei almost as long as clypeus and never enclosing the latter in front, but can easily be distinguished from it by anterior margin of pronotum concave and meso- and metasternum carinate.

5. *Aeliomorpha fletcheri* Distant

Pakistan J. Sci. Ind. Res. 33 (4), 164-165.

Characterised by head length almost as long as broad, labium just passing hind coxae, dorso-posterior margin of pygophore toothed, ventro-posterior margin sinuate and 1st gonocoxae lobe-like.

Specimens Examined: Holotype male, South India: Sri Lanka, Coimbatore Coll. Brinbrigg Fletcher in MNH; other material 49 males, 10 females PAKISTAN: Northern areas Gilgit, Punjab, Islamabad, Rawalpindi, Chuniyan, Changamanga, Rahimyar Khan, Faisalabad, Sind, Karachi, Malir Hyderabad, Mianiforest, Tandojam, Wair, Sakrand, Baluchistan, Quetta, Pishin, Urak, Turbat, Coll. F. Ahmad, M. Shadab, I. Ahmad, A.A. Khan, M. Aslam, Ramazan and S. Kamaluddin in NHMUK, in Ahmad's collection and NHMB.

6. *Aeliomorpha lineaticollis* (Westwood)

Pakistan J. Sci. Ind. Res. 33 (4), 166.

Characterised by a head distinctly longer than pronotum, labium reaching third abdominal venter, dorso-posterior margin of pygophore straight, medially toothed, ventro-posterior margin sinuate, medially convex, 1st gonocoxae broad and round.

Specimens Examined: 1 male (holotype), *Pentatoma lineatipes* Bengal in Oxford Museum; other materials, 26 males, 29 females PAKISTAN: Sind, Karachi, Tandojam, Hyderabad, Thatta, Kohsarforms, Sujawal, Sakrand, Mianiforest, Shadi Pali, Punjab, Islamabad, C.D. Nursery, Shahdra, Chuniyan, Rawalpindi, Coll. I. Ahmad, A. Khan, N.A. Khan, S. Kamaluddin, A.A. Khan, M. Moizuddin, M. Shadab, M. Rahim, Q.A. Abbasi, N.A. Rana, in NHMUK and MNH.

7. *Aeliomorpha pusana* Distant

Pakistan J. Sci. Ind. Res., 33 (4), 167-168.

Characterised by a head distinctly longer than pronotum, labium reaching 3rd abdominal venter, dorso-posterior margin of pygophore medially deeply

convex, ventro-posterior margin entire and 1st gonocoxae triangular.

Specimens Examined: Holotype male, Punjab: Jullundhar in NHM, other materials: 100 males and 90 females PAKISTAN: Sind, Karachi, Hyderabad, Tandojam, Thatta, Mianiforest, Kohsarform, Kotlalo, Nawabshah, Bandmurad, Punjab, Rawalpindi, Islamabad, C.D. Nursery, Wah garden, Chunian, Baluchistan, Sibi, Muzaffarabad in Azad Kashmir, Coll. N.A. Rana, M. Mohsin, A.A. Khan, Naseer, I. Ahmad, M. Moizuddin, M. Aslam, A. Khan, S. Kamaluddin and R.H. Zaidi in NHMUK, and USNM.

IV. *Bonacialus* Distant 1901

Bonacialus Distant 1901, *Ann. Mag. Nat. Hist.*, 7, 346; 1902, *Fauna of British India, including Ceylon and Burma. Rhynchota*, 1, 136; Kirkaldy 1909, *Cimicidae Felix Dames Berlin*, 74.

Type Species: *Bonacialus dixoni* Distant

Diagnostic Characters: Paraclypei distinctly longer than clypeus, antennae with 1st segment shortest; la-

bium passing beyond hind coxae, anterior margin of pronotum concave, length of scutellum longer than head length, anterior angles with denticles, scutellum broader than length; metathoracic scent gland complex poorly developed; membrane of hemelytra longer than abdomen. First gonocoxae almost quadrangular and distinctly broader than 9th paratergite.

Bonacialus is a monotypic genus known only from Bombay in India.

Comparative Note: *Bonacialus* is closely related to *Aelia* in general body shape but can easily be distinguished from it by its head which is shorter than the pronotum.

7. *Bonacialus dixoni* Distant (Figs. 20, 21, 22)

Bonacialus dixoni Distant 1901, *Ann. Mag. Nat. Hist.*, 7, 347; 1902, *Fauna of British India, including Ceylon and Burma. Rhynchota*, 1, 137; Kirkaldy, 1909, *Cimicidae. Felix Dames, Berlin*, p. 74.

Coloration: Body ochraceous except clypeus, lateral margins of pronotum, spots on each basal angle of

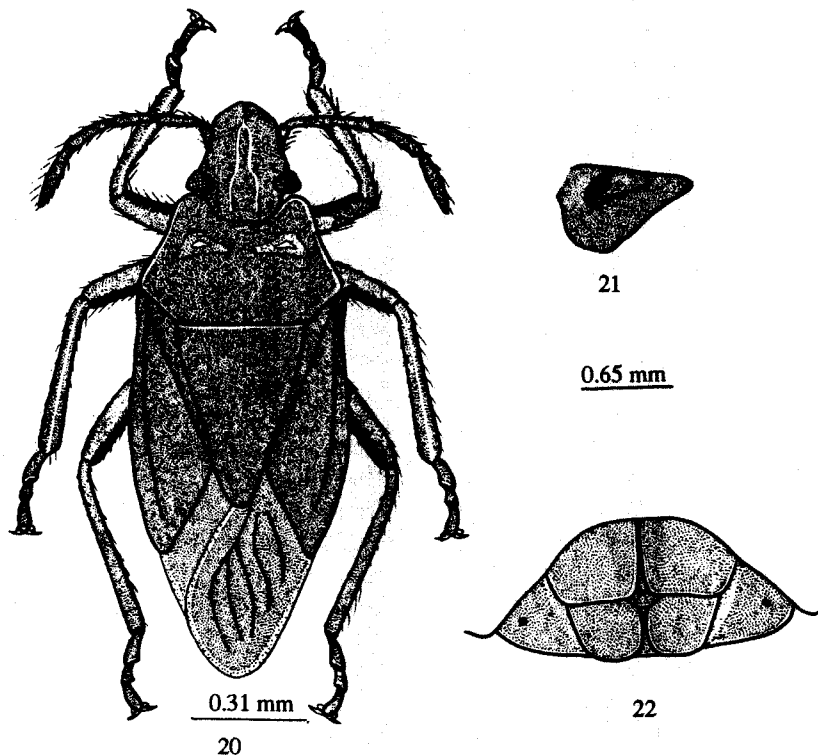


Figure 20. *Bonacialus dixoni* Distant
Figure 21. Metathoracic scent gland
Figure 22. Female terminalia

dorsal view
ventral view
ventral view

scutellum and elongate spot on apex of scutellum yellowish; antennae dark ochraceous.

Head: Distinctly shorter than pronotum, lateral margins of paraclypei concave, distinctly longer than clypeus, anteocular distance longer than remainder of head; antennae with 2nd segment slightly longer than 3rd; length of antennal segments: I 0.30-0.35, II 0.6-0.7, III 0.5, IV 0.9, V 1.10-1.15; labium just passing hind coxae, length of labial segments: I 1.2-1.3, II 1.4-1.5, III 0.55-0.60, IV 0.60-0.65; anteocular distance 1.2-1.3; length remainder of head 1.0-1.1, width 1.95-2.10, interocular distance 1.3; interocellar distance 0.8.

Thorax: Pronotum width more than 1.5x wider than its length, humeral angles round, lateral margins straight but medially slightly depressed; pronotum length 1.9-2.0, width 3.6-4.0; scutellum distinctly longer than head length, scutellum length 3.0-3.3, width 2.3-2.6; metathoracic scent gland ostiole (Fig. 21) large, ovate, peritreme elongate, apex round, evaporatoria distinct; membrane of hemelytra distinctly longer than abdomen; base scutellum-apex clavus 2.3-2.55; apex clavus-apex corium 1.6-1.7; apex corium-apex abdomen including membrane 2.0-2.1; apex scutellum-apex abdomen including membrane 2.5-2.7.

Abdomen: Slightly longer than breadth; connexiva only slightly exposed at repose; total body length male 9.6; female 10.4.

Female Genitalia (Fig. 22): First gonocoxae broad, quadrangular with posterior margins straight; 8th paratergite triangular; 9th paratergite almost as long as breadth, reaching the fused posterior margin of 8th paratergite.

Material Examined: Holotype female, India: Bombay, Bor Ghat MNH.

V. *Gulielmus* Distant 1901

Gulielmus Distant, 1901, *Ann. Mag. Nat. Hist.*, 7, 347; 1902, *Fauna of British India, including Ceylon and Burma. Rhynchota*, 1, 136; Kirkaldy, 1909, *Cimicidae. Felix Dames*, Berlin, p. 74; Zaidi and Ahmad, 1989, *Pakistan J. Sci. Ind. Res.*, 32 (2), 95 (for detailed description and key).

Type Species: *Gulielmus laterarius* Distant

Diagnostic Characters: Paraclypei longer than

clypeus, enclosing it in front; anteocular region longer than remainder of head, anterior angles of pronotum without denticles, lateral margins entire; metathoracic scent gland complex with large ostiole, peritreme and evaporatoria poorly developed; ventro-posterior margin of pygophore substraight; paramere F-shaped; membranous conjunctival processes one or two pairs. First gonocoxae broad, 9th paratergite lobe-like, spermathecal bulb blunt.

Gulielmus is only known from Bombay, India. It includes two species [7].

Comparative Note: *Gulielmus* is closely related to *Aelia* in general body shape and size but can easily be distinguished from it by labium passing beyond middle coxae but not reaching the hind coxae, and a poorly-developed metathoracic scent gland complex; in contrast to labium reaching or passing beyond hind coxae and a well-developed metathoracic scent gland complex.

8. *Gulielmus laterarius* Distant

Pakistan J. Sci. Ind. Res. 32 (2): 95.

Characterised by a head as long as its breadth; labium passing beyond middle coxae but not reaching hind coxae; pygophore distinctly broader than its length and 1st gonocoxae broad with posterior margin substraight.

Specimens Examined: Holotype female, West India: Bombay, Bor Ghat, Coll. Dixon in MNH, other materials: 1 male and 1 female, India, Coll. Distant 1912 in MNH.

9. *Gulielmus marmoratus* Distant

Pakistan J. Sci. Ind. Res., 32 (2): 95.

Characterised by a head broader than its length, labium just reaching the hind coxae; pygophore longer than breadth and 1st gonocoxae broad with posterior margin round.

Specimens Examined: Holotype male, West India: Bombay, Bor Ghat, Coll. Dixon in MNH; other materials: 1 male, 1 female India: Bor Ghat, 1911, Coll. Distant in the above museum.

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