

A revision of the genus *Canthecona* Amyot et Serville (Hemiptera: Pentatomidae: Pentatominae: Asopini) from Indo-Pakistan subcontinent with description of two new species from Pakistan*

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Summary

Two new species of the genus *Canthecona* Amyot et Serville (viz *neotibialis* and *populusi*) from Pakistan alongwith *C. furcellata* (Wolff) known from Bengal, Burma, Java, Bhamo and Ceylon and also presently recorded from northern areas of Pakistan and *C. parva* Distant known from Bangladesh, Mysore and Pusa, Bihar in India, are described with special reference to their metathoracic scent auricles and male and female genitalia. The new species are compared with the above species and also from Distant's (1902) species *binotata*, *ornatula*, *robusta* and *tibialis* all described from various parts of the Indian subcontinent. A key to all these species is also given.

Introduction

Excluding *C. discolor* Palisot the type species which is African all other species of the genus *Canthecona* Amyot et Serville are mostly Oriental with distribution in Phillipine, Java, Bhamo, Ceylon and various parts of Indo-Pakistan subcontinent. These occur in green hilly areas and are exclusively predacious, mostly living upon lepidopterous larvae of crop pests.

During a revision of the tribe Asopini from Indo-Pakistan subcontinent the present authors encountered a series of specimens of the genus *Canthecona* Amyot et Serville from different areas of Pakistan representing two new species and *furcellata* (Wolff) known from Bengal, Burma, Java, Bhamo and Ceylon. The genus *Canthecona* with the new species and the one recorded a new from Pakistan are described

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in detail with reference to their scent auricles, male and female genitalia alongwith parva Distans known from Bangladesh, Mysore and Pusa, Bihar in India, the above characters of which are mostly unknown (Distant 1902, Gapud 1981). The above species are compared with other Distant's (op. cit.) species i.e. binotata, ornatula, robusta and tibialis also known from Indian subcontinent. A key to all the above species is also given.

For the study of male genitalia specially for the inflation of aedeagi the technique of the first author (1986) was followed. For the study of the female genitalia, for description, measurements and illustrations the conventional procedures specially those used by the present authors (1981) were generally followed. All the measurements are in millimetres and all the illustrations are to the given scales. The following abbreviations are used for the museums: NHMUK = Natural History Museum, Department of Zoology, University of Karachi; NIMPARC = National Insect Museum Pakistan Agricultural Research Council, Karachi; BMNH = British Museum Natural History, London; USNM = United States National Museum of Natural History, Washington, D.C., U.S.A.; Lodos Coll. = Collection of Dr. N. Lodos, Ege University, Turkey; Ahmad's Coll. = Collection of Dr. Imtiaz Ahmad, Karachi University, Pakistan.

Canthecona Amyot et Serville 1843

Canthecona Amyot et Serville 1843, Histoire Naturelle des insectes. Hemipteres 81; Stal 1864, Hemiptera Africana 1: 66; 1870, K. svensk vetensk Akad. Handl. 2: 41; Distant 1902, Fauna of British India including Ceylon and Burma. Rhynchota. 1: 248; Schouteden 1907, Gen. Insect. Fasc. (52) 1: 43; Kirkaldy 1909, Felix Dames Berlin 1: 12; Abbasi 1974, Ph. D. thesis, Zool. Dept. Univ. Kar. 63; Ahmad et al. 1974, Karachi ent. Soc. Suppl. 1: 45; Ahmad, 1979, Karachi ent. Soc. Suppl. 4 (1): 46; 1980, Proc. 1st. Pakistan. Congr. Zool. Ser. A: 135; Gapud 1981, Ph. D. thesis (unpublished): 1-508.

Cimex (Canthecona) Stal 1867 Ofvers. vetensk. Akad. Forh. Stockh. 25 (7): 496.

Head: Body elongately ovate, slightly more than 2 1/2x longer than broad. Usually shorter than or sometimes equal to posterior of head including eyes; paraclypei usually as long as or sometimes slightly shorter than clypeus with outer margins strongly sinuate above eyes; labium moderately thickened, reaching hind coxae.

Thorax: Pronotum moderately deflected, length of pronotum 1/2x longer than head length, anterior margin usually as broad as or slightly broader than width of head across eyes, anterolateral margins distinctly sinuate and slightly to moderately denticulate, humeral angles produced outward into long acute or obtuse spines, bifid at apices; scutellum always longer than broad at base without basal gibbosities; metathoracic scent gland with well developed evaporatoria; anterior femora with a prominent spine, and anterior tibiae weakly to considerably dilate.

Abdomen: Longer than broad, distinctly spined at base; ventroposterior margin of 7th abdominal sternum in female medially broadly or deeply concave with lateral angles produced into small acute spines.

Male genitalia: Pygophore distinctly broader than long; paramere somewhat wedge-shaped; inflated aedeagus with elongate well developed median dorsal membranous conjunctival appendage, bilobed at apex,

dorsolateral membranous conjunctival appendages without apical sclerotized processes, thecal shield always broader and longer than theca.

Female genitalia: First gonocoxae medially usually placed close to each other or sometimes slightly placed apart; 9th paratergites elongate, usually extending beyond or sometimes reaching posterior margin of 8th paratergites; spermathecal bulb never elongate, moderate, shorter than median dilation, pump region moderately developed with prominent distal and proximal flanges.

Comparative note: The genus Canthecona Amyot et Serville is most closely related to Andrallus Bergroth in having bilobed median dorsal membranous conjunctival appendage greatly extending caudally but it can easily be separated from the same by having fore tibiae weakly to considerably dilate and abdomen at base with a distinct spine.

Type species: Canthecona discolor Palisot

Key to the species of the genus Canthecona Amyot et Serville

1. Corium with a large red spot at apex, body brassy black, abdomen blackly punctate tibialis Distant
- Corium not as above, body and abdomen not as above 2
2. Abdomen with black or green spots on lateral margins or abdomen ventrolaterally metallic green 3
- Abdomen neither with black or green spots on lateral margins nor ventrolaterally metallic green 5
3. Abdomen with black spots on lateral margins, anterior tibiae prominently dilate neotibialis sp. n.
- Abdomen never with black spots on lateral margins, anterior tibiae moderately dilate 4
4. Series of subquadrate metallic green spots on lateral margins of abdomen present, head longer than broad, anteocular distance longer than remainder of head binotata Distant
- Abdomen metallic green, spots as above absent, head as long as broad, anteocular distance shorter than remainder of head ornatula Distant
5. Head broader than long, in male dorsolateral membranous conjunctival appendages without membranous processes 6
- Head as long as broad, in male dorsolateral membranous conjunctival appendages with pair of membranous processes 7
6. Second antennal segment longer than third, anteocular distance as long as remainder of head, anterior tibiae not or indistinctly dilate robusta Distant
- Second antennal segment shorter than third, anteocular distance shorter than remainder of head, anterior tibiae moderately dilate furcellata (Wolff)
7. Body dark ochraceous, second antennal segment equal to third, anterior margin of pronotum distinctly broader than width of head across eyes, in female ninth paratergites passing beyond fused posterior margins of eighth paratergites parva Distant
- Body luteous, reddish brown, second antennal segment longer than third, anterior margin of pronotum as broad as width of head across eyes, in female ninth paratergites never passing beyond fused posterior margins of eighth paratergites populusi sp. n.

Canthecona furcellata (Wolff) 1801

(Figs. 4, 8, 11, 14, 17, 20, 27)

Cimex furcellatus Wolff 1801, Icones Cimicum descriptionibus illustratae Erlangae. 5: 176; Dallas 1851, Brit. Mus. Publ. London: 91.

Asopus armiger Herr.-Schaff. 1844, Die Wanzenartigen Insecten Nurnberg 9: 119.

Canthecona furcellata Stal 1871, Ofvers. vetensk. Akad. Forh. Stockh. 27: 619; Atkinson 1889, J. Asiat. Soc. Beng. 58: 126; Distant 1902, Fauna of British India including Ceylon and Burma. Rhynchota. 1: 248; DeNiceville

1903, India museum notes 5: 113.

Cantheconidea furcellata Kirkaldy 1909, Felix Dames Berlin: 1 13; Ahmad et al. 1974, Karachi ent. Soc. Suppl. 1: 45; Hsiao et al. 1978, Heteroptera 2: 320; Ahmad 1979, Karachi ent. Soc. Suppl. 4 (1): 46; 1980, Proc. 1st. Pakistan. Congr. Zool. Ser. A: 135.

Colouration: Body ochraceous, somewhat densely dark punctate.

Head: Broader than long; paraclypei narrow, round at apices, length of antennal segments, I 0.3 (0.25-0.3); II 1.43 (1.40-1.43); III 1.46 (1.41-1.46); IV 1.6 (1.55-1.6); V 1.5 (1.45-1.5); antennal formula 1 2 3 5 4 ; length of labial segments, I 1.0 (0.95-1.0); II 1.3 (1.25-1.3); III 1.1 (1.95-1.1); IV 1.0 (0.98-1.0); labial formula 1 = 4 3 2; antecular distance 1.0 (0.99-1.0); length remainder of head 1.1 (1.0-1.1); width 2.2 (2.19-2.2); interocular distance 1.10 (1.95-1.1); intercellular distance 1.06 (1.0-1.06).

Thorax: Width of pronotum about 2.1/2x more than its length, humeral angles produced into long spines, bifid at apices, length of pronotum 2.6 (2.5-2.6); width 6.6 (1.45-6.6); length of scutellum 4.0 (3.95-4.0); width 3.3 (3.25-3.3); metathoracic scent gland ostiolar (Fig. 4) peritreme dagger-shaped, medially sulcate, narrow at apex; anterior tibiae slightly dilate; distance base scutellum-apex clavus 3.0 (2.95-3.0); apex clavus-apex scutellum 1.0 (0.95-1.0); apex scutellum-apex abdomen including membrane 4.1 (4.0-1.0).

Abdomen: Ventroposterior margin of 7th female abdominal sternum medially broadly concave. Total length male: 12.8 (12.8-13.00), female: 13.5 (13.3-13.5).

Male genitalia: Pygophore (Fig. 8) with dorsolateral lobes subprominent, dorsolateral inner processes lobe-like; paramere (Fig. 11) with a short stem; inflated aedeagus (Figs. 14, 17, 20) with trunk-like median dorsal membranous conjunctival appendage, bilobed apically, pair of bag-like dorsolateral membranous conjunctival appendages without basal medially fused membranous conjunctival processes, dorsomedian thecal margin broadly concave.

Female genitalia (Fig. 23): First gonocoxae somewhat triangular; 9th paratergites reaching to posterior margin of 8th paratergites; triangulin and arcus slightly exposed in middle; 2nd gonocoxae with posterior margin straight; proctiger with posterior margin concave; spermathecal bulb (Fig. 27) comparatively oval, median dilation onion-shaped.

Material examined: 2 males, 1 female Punjab: Islamabad, Changamanga Canthecona furcellata (Wolff) on Withenia somnifera (L.) Dunal 2.6.1961, 7.7.1968, leg. A.A. Khan, det. by G.M. Black 1970, in NHMKU, in Ahmad's coll. and in Lodos coll. 7 males, 6 females, Punjab: Changamanga, Islamabad, Chichawatni; NWFP: Abbotabad, on Withenia somnifera (L.) Dunal, Dalbergia sissoo Roxb. 2.6.1961, 14.5.1974, 11.12.1976, 6, 8, 10, 17-10-1978, leg. I. Ahmad and N. A. Rana, in NHMKU.

Comparative note: This species is most closely related to robusta in having head broader than long but it can easily be separated from the same by having 2nd antennal segment shorter than third in contrast to 2nd antennal segment longer than 3rd in robusta and by other

characters as noted in the key and description.

Canthecona neotibialis sp. n.
(Figs. 1, 5, 24, 28)

Colouration: Body ochraceous; thickly punctate with dark brown punctures; apical half of corium with purplish fasciae.

Head: As long as broad; paraclypei broadly round at apices; length of antennal segment, I 0.4 (0.35-0.4); remaining segments mutilated; length of labial segments, I 1.4 (1.34-1.4); II 1.8 (1.7-1.8); III 1.6 (1.45-1.6); IV 1.3 (1.25-1.3); labial formula 4 1 3 2; antecular distance 1.2 (1.1-1.2); length remainder of head 1.3 (1.25-1.3); width 2.5 (2.4-2.5); interocular distance 1.3 (1.25-1.3) interocellar distance 0.8 (0.75-0.8).

Thorax: Width of pronotum about 3x more than its length, humeral angles strongly produced into long black acute spines, emarginate at apices, directed anterolaterad, length of pronotum 3.5 (3.45-3.5); width 9.3 (9.2-9.3); length of scutellum 5.0 (5.0-5.1); width 4.1 (4.0-4.1); metathoracic scent gland ostiolar peritreme (Fig. 5) dagger-like with posterior margin convex; anterior tibiae considerably dilate; distance base scutellum apex clavus 3.4 (3.35-3.4); apex clavus-apex scutellum 1.6 (1.5-1.6); apex scutellum-apex abdomen including membrane 4.6 (4.5-4.6).

Abdomen: Ventroposterior margin of 7th female abdominal sternum medially deeply concave. Total length female 15.7 (15.6-15.7).

Female genitalia (Fig. 24): First gonocoxae subtriangular; 9th paratergites reaching to posterior margin of 8th paratergites; triangulin and arcus exposed medially; 2nd gonocoxae with posterior margin concave; proctiger with posterior margin straight; spermathecal bulb (Fig. 28) comparatively large, oblong, median dilation wrinkled; baloon-like.

Material examined: Holotype female, NWFP: Abbotabad, on Dalbergia sissoo Roxb., 11.12.1976, leg. A. A. Khan, in NHMUK.

Comparative note: This species is most closely related to binotata in having lateral margins of abdomen with coloured spots but it can easily be separated from the same by having black spots on lateral margins of abdomen, in contrast to metallic green spots on lateral margins of abdomen in binotata and by other characters as noted in the key and description.

Canthecona parva Distant 1902
(Figs. 2, 6, 9, 12, 15, 18, 21, 25 and 29)

Canthecona parva Distant 1902, Fauna of British India including Ceylon and Burma. Rhynchota. 1: 250; Kirkaldy 1909, Felix Dames Berlin 1: 13; Hsiao et al. 1978, Heteroptera 2: 328.

Colouration: Body dark ochraceous, thickly punctate with dark brown punctures, membrane of hemelytra dark brown with two oval transparent apical spots.

Head: As long as broad; paraclypei round at apices, length of antennal segments, I 0.3 (0.25-3.0); II 1.3 (1.25-1.3); III 1.3 (1.25-1.3); IV 1.6 (1.55-1.6); V mutilated; length of labial segments, I 1.1 (1.0-1.1); II 1.3 (1.25-1.3); III 1.1 (1.0-1.1); IV 0.9 (0.85-0.9); labial formula 4 3 = 1 2; anteocular distance 1.0 (0.96-1.0); length remainder of head 1.0 (0.95-1.0); width 2.1 (2.0-2.1); interocular distance 1.0 (0.99-1.0); interocellar distance 0.77 (0.75-7.77).

Thorax: Width of pronotum about $2 \frac{3}{4}x$ more than its length, humeral angles produced into moderately long acute spines, directed antrolaterad, strongly emarginate at apices, length of pronotum 2.8 (2.5-2.8), width 7.3 (7.1-7.3); length of scutellum 4.3 (4.25-4.3); width 3.4 (3.35-3.4); metathoracic scent gland ostiolar peritreme (Fig. 6) sword-shaped, elongate with posterior margin curved, medially sulcate; anterior tibiae slightly dilate; distance base scutellum-apex clavus 2.8 (2.75-2.8); apex clavus-apex scutellum 1.5 (1.45-1.5); apex scutellum-apex abdomen including membrane 3.5 (3.4-3.5).

Abdomen: Ventroposterior margin of 7th female abdominal sternum medially deeply concave. Total length male 11.8 (11.6-11.8), female 12.1 (12.0-12.1).

Male genitalia: Pygophore (Fig. 9) with dorsolateral lobes subprominent, dorsolateral inner processes lobe-like; paramere (Fig. 12) with short stem; inflated aedeagus (Figs. 15, 18, 21) with elongate trunk-like median dorsal membranous conjunctival appendage, bilobed medially, pair of bag-like lobes in dorsolateral membranous conjunctival appendage, with pair of basal membranous conjunctival processes, dorsomedian thecal margin deeply concave.

Female genitalia (Fig. 25): First gonocoxae somewhat conical; 9th paratergites elongate; distinctly passing beyond posterior margin of 8th; triangulin and arcus not exposed; 2nd gonocoxae with posterior margin convex; proctiger with posterior margin slightly convex; spermathecal bulb (Fig. 29) large, oblong, median dilation onion-shaped.

Material examined: Holotype male, India: Mysore, Canthecona parva Distant "Type" in BMNH, London. 1 male 2 females India: Pusa, Bihar, feeding on caterpillar of Utethesia pulchella 18.7.1914 leg. P. Su. C., in NIMPARC.

Comparative note: This species is most closely related to populusi in having head as long as broad but can easily be separated from the same by anterior margin of pronotum distinctly broader than width of head across eyes in contrast to anterior margin of pronotum as broad as width of head across eyes in populusi and by other characters as noted in the key and description.

Canthecona populusi sp. n.
(Figs. 3, 7, 10, 13, 16, 19, 22, 26 and 30)

Colouration: Body luteous, densely punctate with reddish brown punctures.

Head: As long as broad; paraclypei narrow, round at apices, length

of antennal segments, I 0.3 (0.28-0.3); II 1.1 (1.09-1.1); III 1.1 (1.09-1.1); IV .3 (1.25-1.3); V 1.1 (1.09-1.1); antennal formula 1 2 = 3 4 5; length of labial segments, I 0.9 (0.85-0.9); II 1.2 (1.18-1.2); III 1.0 (0.99-1.0); IV 0.9 (0.85-0.9); labial formula 1 = 4 3 2; anteocular distance 0.85 (0.83-0.85); length remainder of head 1.1 (1.09-1.1); width 1.9 (1.85-1.9); interocular distance 0.9 (0.85-0.9); intercellar distance 0.6 (0.58-0.6).

Thorax: Width of pronotum $2 \frac{1}{2}$ x more than its length, humeral angles strongly produced into long acute spines; prominently emarginate at apices, directed anterolaterad, length of pronotum 2.6 (2.55-2.6); width 6.7 (6.65-6.7); length of scutellum 3.9 (3.85-3.9); width 3.3 (3.25-3.3); metathoracic scent gland ostiolar peritreme (Fig. 7) moderately elongate, sword-shaped, posterior margin curved medially, sulcate; anterior tibiae obsoletely dilate; distance base scutellum-apex clavus 2.1 (2.0-2.1); apex clavus-apex scutellum 1.8 (1.75-1.8); apex scutellum-apex abdomen including membrane 3.1 (3.1-3.0).

Abdomen: Ventroposterior margin of 7th female abdominal sternum medially deeply concave. Total length male 10.1 (9.9-10.1), female 12.1 (11.9-12.1).

Male genitalia: Pygophore (Fig. 10) with subprominent, small dorsolateral lobes, narrow, round posteriad, dorsolateral inner processes well developed; paramere (Fig. 13) with a short stem; inflated aedeagus (Figs. 16, 19, 22) with elongate trunk-like median dorsal membranous conjunctival appendage, bilobed medially, pair of dorsolateral membranous conjunctival appendages, large bag-like with pair of basal membranous conjunctival processes, dorsomedian thecal margin deeply concave.

Female genitalia (Fig. 26): First gonocoxae somewhat triangular; 9th paratergites elongate, reaching to posterior margin of 8th paratergites; triangulin and arcus slightly exposed; 2nd gonocoxae with posterior margin concave; proctiger with posterior margin concave; spermathecal bulb (Fig. 30) large, round, median dilation elongate, balloon-like.

Material examined: Holotype male Punjab: Chichawatni, on Populus nigra L. 11.12.76, leg. A. A. Khan, in NHMUK. Paratypes 12 males, 11 females, Punjab: Shahdra, Islamabad; NWFP: Abbotabad, Taxila, on the above host plant, 2.3.1969, 19.11.1975, 11.12.1976, 10.1.1977, 23.10.1977, 13, 15.10.1978, 26.2.1979, leg. Q. A. Abbasi, I. Ahmad, M. Moizuddin and A. A. Khan in the above museum at USNM, in Ahmad's coll. and in Lodos coll.

Comparative note: This species is most closely related to parva as noted above but can easily be separated from the same by luteous reddish brown body as compared to dark ochraceous body in parva and by other characters as noted in the key and description.

Özet

Hint-Pakistan Bölgesi'nden iki yeni türün tanıtımı ile Canthecona Amyot et Serville (Hemiptera:Pentatomidae: Pentatominae:Asopini) cinsinin revizyonu

Bu makalede, Hint-Pakistan Bölgesi'ndeki türlere dayanılarak Canthecona Amyot et Serville cinsinin revizyonu yapılmaktadır. Bundan ayrı olarak C. neotibialis n. sp. ve C. populusi n. sp. türlerinin orijinal tanımları yapılmakta, C. furcellata (Wolff) ve C. parva Distant türleri tanıtılmakta ve türler için teşhis anahtarı verilmektedir.

References

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Key To The Letterings

bl.: blade; dis.spd.: distal spermathecal duct; dmc. app.: dorsal membranous conjunctival appendage; ev.: evaporating area; gp. gonopore; o.: ostiole; per.: peritreme; piv.: pivot; pro.: proctiger; prx.f.: proximal flange; prx.sp.d.: proximal spermathecal duct; sp.b.: spermathecal bulb; sp.p.: spermathecal pump; st.: stem; th.: theca; ves.: vesica; 1st. gox.: first gonocoxae; 8th.pt.: eighth paratergite; 8th. sp.: eighth spiracle; mc.app.: ventral membranous conjunctival appendage.

Illustration Of Figures

Figures Canthecona furcellata (Wolff.): 4. metathoracic scent gland ostiole (ventral view), 8. Pygophore (dorsal view), 11. Paramere (inner view), 14. Inflated aedeagus (dorsal view), 17. Inflated aedeagus (ventral view), 20. Inflated aedeagus (lateral view), 23. Female terminalia (ventral view), 27. Spermatheca (dorsal view.).

Figures C. neotibialis sp. n.: 1. Entire female (dorsal view), 5. Metathoracic scent gland ostiole (ventral view), 24. Female terminalia (ventral view), 28. Spermatheca (dorsal view).

Figures C. parva Distant: 2. Entire male (dorsal view), 6. Metathoracic scent gland ostiole (ventral view), 9. Pygophore (dorsal view), 12. Paramere (inner view), 15. Inflated aedeagus (dorsal view), 18. Inflated aedeagus (ventral view), 21. Inflated aedeagus (lateral view), 25. Female terminalia (ventral view), 29. Spermatheca (dorsal view).

Figures C. populusi sp. n.: 3. Entire male (dorsal view), 7. Metathoracic scent gland ostiole (ventral view), 10. Pygophore (dorsal view), 13. Paramere (inner view), 16. Inflated aedeagus (dorsal view), 19. Inflated aedeagus (ventral view), 22. Female terminalia (ventral view), 30. Spermatheca (dorsal view).



