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BULLETIN DE LA SOCIÉTÉ ENTOMOLOGIQUE SUISSE
64, 357–366, 1991

A revision of the genus *Codophila* MULSANT & REY (Pentatominae: Carpocorini) from Indo-Pakistan subcontinent

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The genus *Codophila* MULSANT & REY is redescribed with its four Indo-Pakistani species including a new one with reference to metathoracic scent gland complex, male and female genitalia. A key to the above species and a brief note on their relationships are also given.

INTRODUCTION

The carpocorine stinkbug genus *Codophila* MULSANT & REY is redescribed with *C. maculicollis* (DALLAS), *C. pusio* KOLENATI, *C. varicornis* (JAKOVLEV) and a new species *C. sariabensis* from Baluchistan with reference to their metathoracic scent gland complex, male and female genitalia. The above Indo-Pakistani taxa are keyed and a brief note on their relationship is also given.

METHODS

For the inflation of male aedeagus the technique of AHMAD (1986) was followed. For the dissection of female genitalia, particularly the spermatheca, for descriptions, measurements and the diagram the conventional techniques especially those used by ZAIDI & AHMAD (1989) were generally followed. Measurements are in millimetres and the diagrams to the given scales.

The following abbreviations are used for the Museums. British Museum of Natural History, London (BMNH); Natural History Museum, University of Karachi (NHMUK); Natural History Museum, Pakistan Agricultural Research Council, Malir Halt, Karachi (NHM, PARC); Natural History Museum Basel, Switzerland (NHM) and AHMAD's collection (AHMAD's coll.).

DESCRIPTIONS

Codophila MULSANT & REY

Codophila MULSANT & REY, 1867: 160; STÅL, 1872: 38; ATKINSON, 1888: 32; DISTANT, 1902: 158; KIRKALDY, 1909: 57; HALASZFY, 1959: 264; STICHEL, 1960–62: 755; LINNAVUORI, 1960: 12; PUSHKOV, 1965: 254; FUENTE, 1974: 170; AHMAD *et al.*, 1974: 40.

Type species Codophila varia (FABR.)

Head usually longer than broad, usually longer than pronotum; paraclypei usually as long as or only slightly longer than clypeus; labium reaching to

or slightly passing beyond hind coxae, with 2nd segment longest. Anterior margin of pronotum concave, almost equal to the head across eyes; lateral margins usually sinuate; scutellum always longer than broad with distinct apical lobe; metathoracic scent gland ostiole large, peritreme moderately developed, evaporatoria distinct. Abdomen usually broader than long; 7th abdominal sternum usually concave; connexiva usually exposed at repose.

Male genitalia: Pygophore usually broader than long, ventroposterior margin usually sinuate, lateral lobes prominent; paramere F-shaped, apex of blade subround or acute, outer margin with a hump; theca of inflated aedeagus elongate with thecal appendages, penial lobes elongate and broad, membranous conjunctival appendages elongate, vesica long, curved.

Female genitalia: First gonocoxae with posterior margin straight or concave with round or subround apices, wide apart; spermatheca with proximal duct longer than distal duct, bulb round.

Comparative note: This genus is closely related to *Dolycoris* in having labium passing beyond hind coxae, peritreme of metathoracic scent gland complex not much elongate but it can easily be separated from the same by body usually with coloured patches, head longer than broad and lateral margins of theca sinuate.

Key to the species of the genus *Codophila* MULSANT & REY from Indo-Pakistan subcontinent.

1. Head almost as long as or slightly shorter than pronotum, labium with 3rd segment shortest, dorsoposterior margin of pygophore medially sinuate or slightly concave, 1st gonocoxae triangular 2
- Head longer than pronotum, labium with 4th segment shortest, dorsoposterior margin of pygophore medially deeply concave, 1st goncoxae round . . . . . *maculicollis* (DALLAS)
2. Anteocular distance longer than remainder of head, labium reaching to or passing beyond hind coxae but not reaching to 3rd abdominal venter, dorsoposterior margin of pygophore concave 3
- Anteocular distance as long as remainder of head, labium reaching to 3rd abdominal venter, dorsoposterior margin of pygophore sinuate . . . . . *varicornis* (JAKOVLEV)
3. Antennae with 4th segment longest, labium passing beyond hind coxae, blade of paramere with acute apex, 9th paratergites reaching to fused posterior margin of 8th paratergites . . . . . *pusio* (KOLENATI)
- Antennae with 2nd segment longest, labium reaching to hind coxae, blade of paramere with subround apex, 9th paratergites passing beyond fused posterior margin of 8th paratergites . . . . . *sariabensis* sp. n.

Codophila maculicollis (DALLAS)
(Figs. 1, 5, 9, 13, 17, 21 & 25)

Pentatoma maculicollis DALLAS, 1851: 234. *P. arabica* STÅL, 1854: 233.
Carpocoris varius var. *maculicollis* HORVATH, 1897: 92; KIRKALDY 1909: 58 (as var. of *Codophila varia), Codophila maculicollis* ATKINSON, 1888: 32; DISTANT, 1902: 158; HOBERLANDT, 1954: 132; PUSHKOV, 1965: 254.

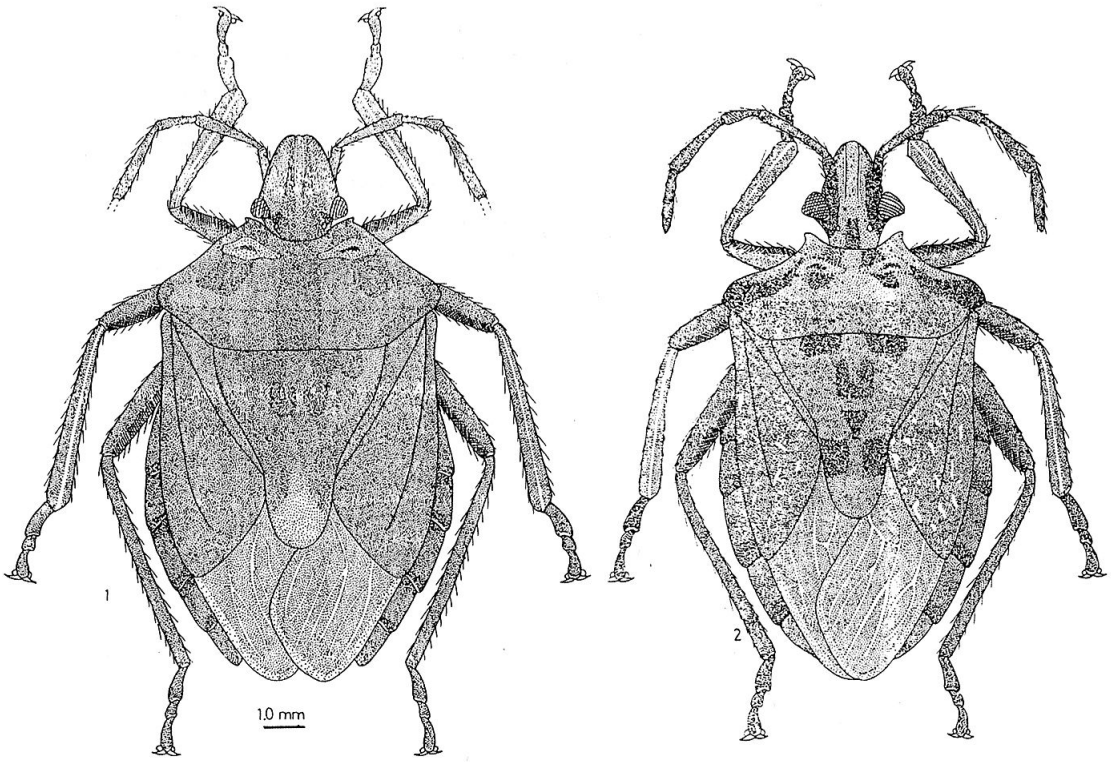

Fig. 1–2. 1 = *Codophila maculicollis* (DALLAS) dorsal view. 2 = *C. pusio* (KOLENATI) dorsal view.

Colouration: Body yellowish pink except 4 horizontal stripes on head and pronotum, 2 elongate stripes in middle of head, apex of pronotum, 6 spots on scutellum, clavus, $^1/_2$ of corium except a few yellow spots, joints of connexiva, antennae black; eyes and legs brown; ocelli pink.

Head: Anteocular distance distinctly longer than remainder of head, length of antennal segments I 0.55–0.90, II 1.5–1.9, III 0.85–1.10, IV 2.0, V mutilated; labium passing beyond hind coxae, length of labial segments I 1.5–1.8, II 1.8–2.0, III 1.3–1.4, IV 1.0–1.2; length anteocular distance 1.4–1.65; length remainder of head 1.2–1.5, width 2.4–2.85; interocular distance 1.5–1.8, interocellar distance 1.0–1.2.

Thorax and abdomen: Width of pronotum distinctly more than 2× its length; humeral angles subround, length of pronotum 2.7–3.1, width 6.5–8.2; length of scutellum 4.4–5.5, width 4.1–5.2; metathoracic scent gland ostiole (Fig. 5) small, round, peritreme short, broad with round apex, not passing beyond half of evaporatoria; length base scutellum-apex clavus 2.7–4.0; apex clavus-apex corium 2.5–3.05; apex corium-apex abdomen including membrane 2.4–3.0; apex scutellum-apex abdomen including membrane 3.1–4.3. Abdomen distinctly broader than long; total length, male 12.82, female 16.05.

Male genitalia: Pygophore (Fig. 9) distinctly broader than long, dorsoposterior margin sinuate, ventroposterior margin sinuate, medially notched; apex of paramere (Fig. 13) acute; inflated aedeagus (Figs. 17) with pair of lateral node-like thecal appendages, with an elongate dorsal membranous conjunctival

appendage, pair of ventral membranous conjunctival appendages, apically sclerotized, vesica distinctly passing beyond dorsal membranous conjunctival appendage.

Female genitalia (Fig. 21): First gonocoxae broad, round; 9th paratergites lobe-like, reaching to fused margin of 8th paratergites; pump region of spermatheca (Fig. 25) almost as long as distal spermathecal duct.

Material examined: Holotype female, North India, from Capt. Boys's Collection, in BMNH. Other material: 1 male, 1 female Inatkalain, 14.4.1908, 14.4.1909, in NIM, PARC.

Comparative note: This species is closely related to *C. varicornis* in general body shape but it can easily be separated from the same by head slightly longer than pronotum and dorsoposterior margin of pygophore medially deeply concave.

Codophila pusio (Kolenati)
(Figs. 2, 6, 10, 14, 18, 22 & 26)

Carpocoris pusio Kolenati, 1846: 45; Horvath, 1907: 294; Kirkaldy, 1909: 575. *Carpocoris bergi* Jakovlev, 1905: 102. *Codophila pusio,* Stichel, 1960–62: 594 & 755; Ahmad *et al.,* 1974: 40; Ahmad, 1979: 49.

Colouration: Body reddish except 2nd, 3rd, 4th and 5th antennal segments, lateral margins of clypeus and paraclypei, 4 spots adjacent to anterior margin and spots on each humeral angle of pronotum, 6 spots on scutellum, margins of exposed connexiva and tarsi black; middle of scutellum reddish

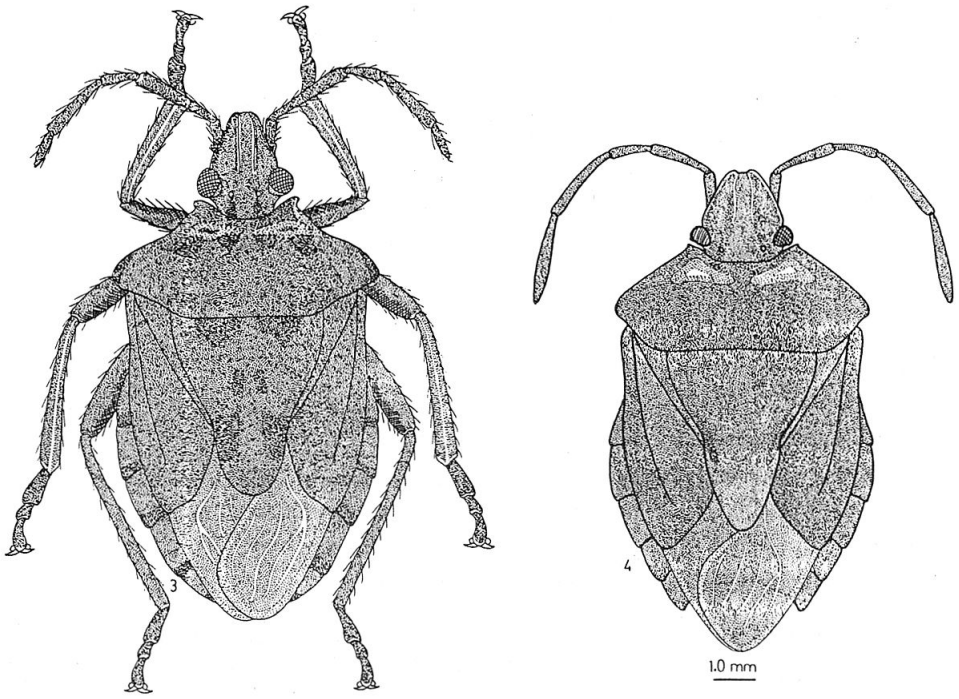

Fig. 3–4. 3 = *Codophila sariabensis* sp. n. dorsal view. 4 = *C. varicornis* Jakovlev dorsal view.

brown; stripes on paraclypei anterior ½ of pronotum and scutellum yellowish. In few specimens head with strips of black pores; labium light yellowish green distally black or brown red.

Head: Anteocular distance slightly longer than remainder of head; length of antennal segments I 0.5–0.7, II 1.4–1.65, III 0.6–0.8, IV 1.5–1.7, V 1.2–1.45; labium passing beyond hind coxae, length of labial segments I 1.2–1.45, II 1.4–1.8, III 0.8–1.0, IV 0.9–1.1; length anteocular distance 1.15–1.4; length remainder of head 1.1–1.2; width 2.1–2.35; interocular distance 1.3–1.55; interocellar distance 0.9–1.0.

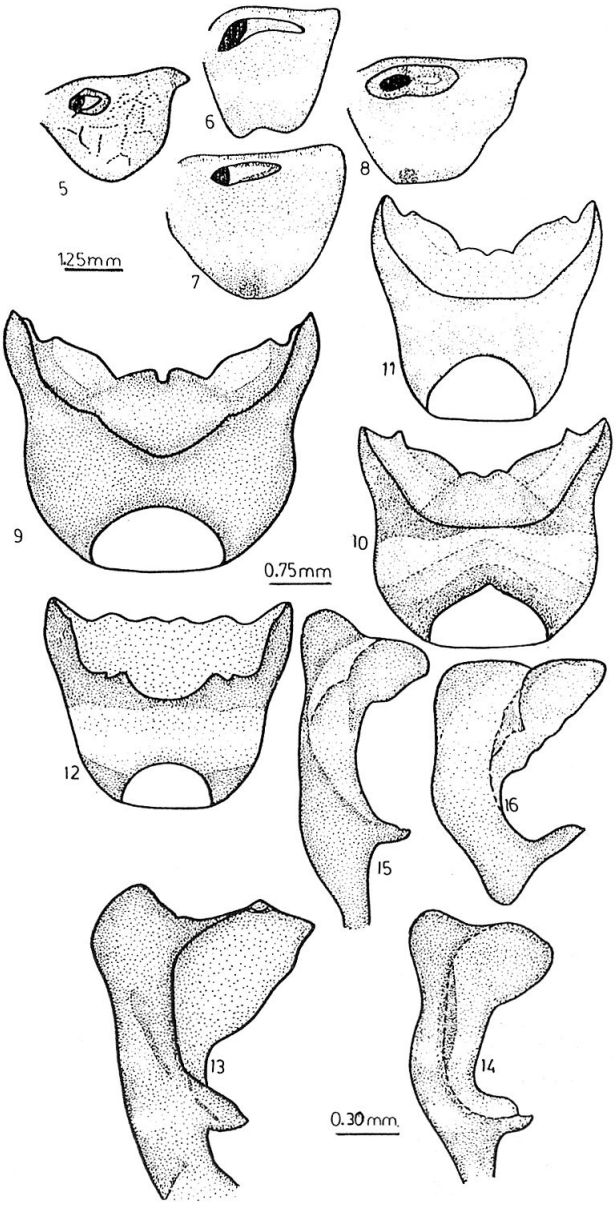

Fig. 5–16. *Codophila maculicollis:* 5 = scent gland, 9 = pygophore, 13 = paramere. *C. pusio:* 6 = scent gland, 10 = pygophore, 14 = paramere. *C. sariabensis:* 7 = scent gland, 11 = pygophore, 15 = paramere. *C. varicornis:* 8 = scent gland, 12 = pygophore, 16 = paramere. Scent glands = ventral view, pygophores = dorsal view, parameres = inner view.

Thorax and abdomen: Width of pronotum more than 2 ½× its length; humeral angles acute, length pronotum 2.0–2.5, width 5.3–6.4; length scutellum 3.7–4.5, width 3.1–3.7; metathoracic scent gland ostiole (Fig. 6) long, triangular, peritreme slightly elongate with round apex, slightly passing beyond ½ of the evaporatoria, length base scutellum-apex clavus 2.3–3.2; apex clavus-apex corium 2.0–2.6; apex corium-apex abdomen including membrane 2.0–3.0; apex scutellum-apex abdomen including membrane 2.4–3.5. Abdomen slightly broader than long; total length male 9.85–10.35, female 11.8–13.6.

Male genitalia: Pygophore (Fig. 10) slightly broader than long, dorsoposterior margin concave; apex of paramere (Fig. 14) acute; inflated aedeagus (Fig. 18) with pair of node-like thecal appendages, pair of ventral membranous conjunctival appendages, apically sclerotized, vesica sligthly passing beyond ventral membranous conjunctival appendages.

Female genitalia (Fig. 22): First gonocoxae triangular; 9th paratergites lobe-like, reaching to fused posterior margin of 8th paratergites; pump region of spermatheca (Fig. 26) almost as long as distal spermathecal duct.

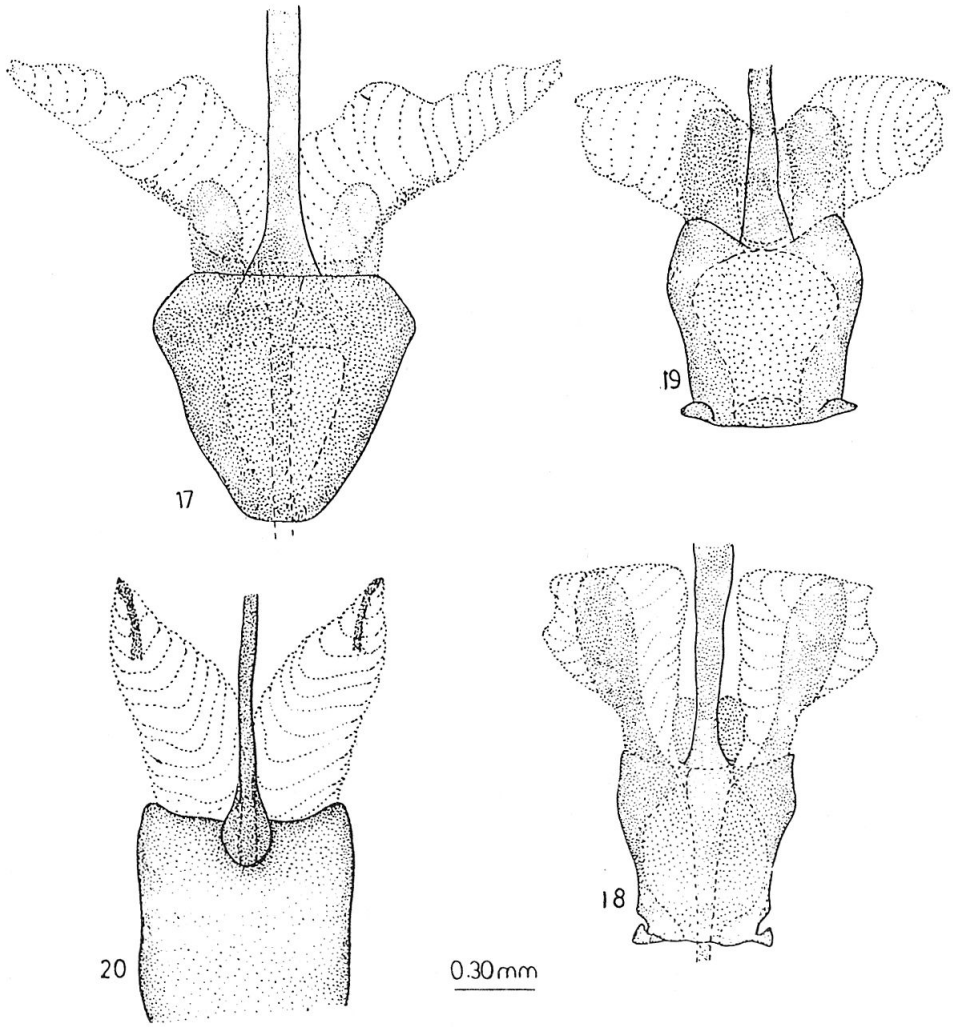

Fig. 17–20. Aedeagus of *Codophila maculicollis* (17), *C. pusio* (18), *C. sariabensis* (19) and *C. varicornis* (29), all dorsal view.

Material examined: 8 male, 6 female (Baluchistan) Ahmadun, Huna lake, Ziarat, Near Bostan, 25, 29, 30,7.1983, leg M. MOIZUDDIN and I. AHMAD in NHMUK in AHMAD's coll. and in NHM.

Comparative note: This species is closely related to *C. sariabensis* as noted in the comparative note of that species.

Codophila sariabansis sp. n.
(Figs. 3. 7, 11, 15, 19, 23 & 27)

Colouration: Body reddish except $^1/_2$ of 2nd and entire 3rd, 4th and 5th antennal segments, clypeus, 4 spots adjacent to anterior margin and spots on humeral angles of pronotum, spots on scutellum, apex of tibiae and tarsi reddish black; anterior of pronotum and scutellum yellowish.

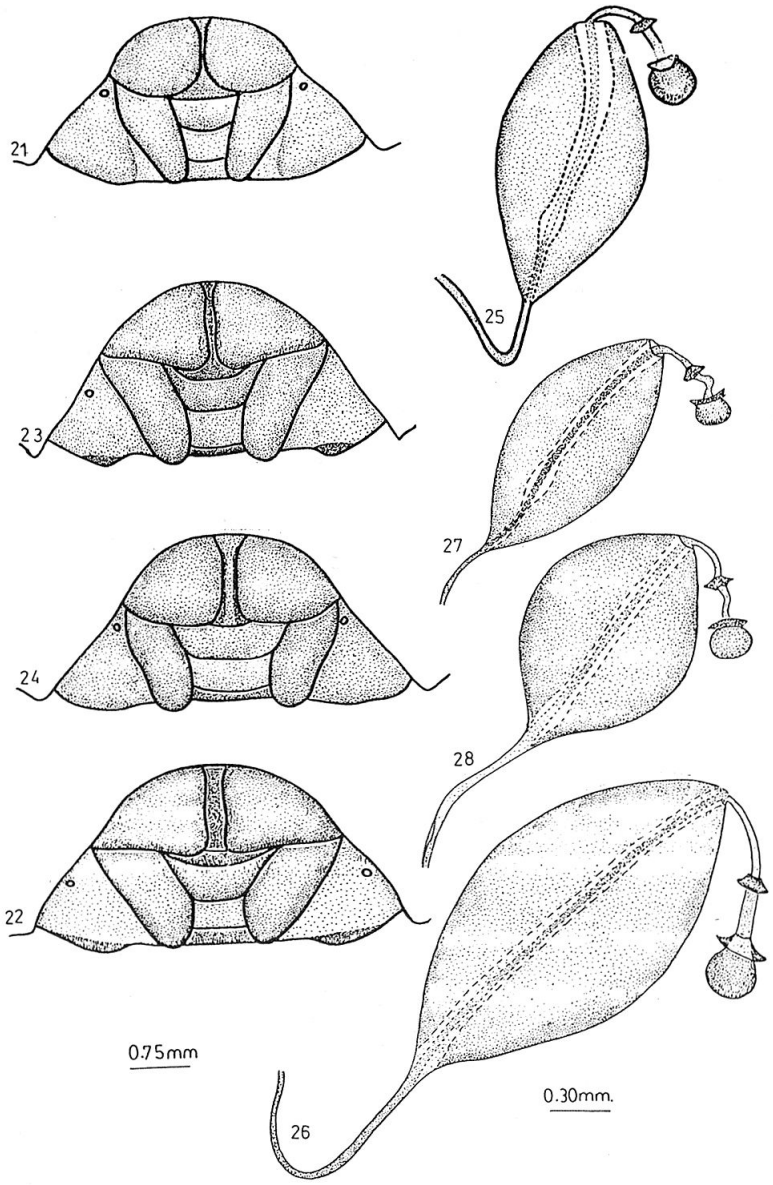

Fig. 21–28. Female terminalia (ventral view) and spermatheca (dorsal view) of *Codophila maculicollis* (21, 25), *C. pusio* (22, 26), *C. sariabensis* (23, 27) and *C. varicornis* (24, 28).

Head: Anteocular distance longer than remainder of head; length of antennal segments I 0.6–0.7, II 1.8–1,85, III 0.75–0.85, IV 1.5–1.55, V 0.7–0.85; labium reaching to hind coxae, length of labial segments I 1.3–1.4, II 1.5–1.65, III 0.8–0.9, IV 0.9–1.05; length anteocular distance 1.3–1.55; remainder of head 1.1–1.3; interocular distance 1.5–1.55; interocellar distance 0.95–1.0.

Thorax and abdomen: Width of pronotum distinctly more than 2× its length; humeral angles subround, length pronotum 2.4–2.6; width 5.8–6.05; length scutellum 4.0–4.2, width 3.7–3.85; metathoracic scent gland ostiole (Fig. 7) large, ovate, peritreme broad, leaf-like with acute apex, slightly passing beyond ½ of evaporatoria; length base scutellum-apex clavus 2.6–2.7; apex clavus-apex corium 2.2–2.3; apex corium-apex adomen including membrane 2.3–2.45; apex scutellum-apex abdomen including membrane 2.8–2.9. Abdomen almost as long as broad; total length, male 11.2–12.0, female 12.55–13.5.

Male genitalia: Pygophore (Fig. 11) distinctly broader than long, dorsoposterior margin concave; apex of paramere (Fig. 15) subround, inflated aedeagus (Fig. 19) with pair of node-like thecal appendages, a thumb-like dorsal membranous conjunctival appendage, pair of ventral membranous conjunctival appendages, apically sclerotized, vesica distinctly passing beyond dorsal membranous conjunctival appendage.

Female genitalia: (Fig. 23): First gonocoxae triangular; 9th paratergites elongate, sligthly passing beyond fused posterior margin of 8th paratergites; pump region of spermatheca (Fig. 27) slightly shorter than distal spermathecal duct.

Material examined: Holotype male Pakistan (Baluchitan), Sariab, on Apple, 26.7.1983, leg. I. Ahmad in NHMUK. Paratype 1 male, 4 female Pakistan (Baluchistan) Sariab, Ahmadun, Quetta on Apple, 24, 26, 30,7.1983, leg. I. Ahmad and M. Moizuddin in NHMUK, and in Ahmad's coll.

Comparative note: It is most closely related to *C. pusio* sp. n. in having anteocular distance longer than remainder of head and dorsoposterior margin concave but can easily be separated from the same in having 2nd antennals longest and other characters noted in the key and description.

Codophila varicornis (Jakovlev)
(Fig. 4, 8, 12, 16, 20, 24 & 28)

Mormidea varicornis Jakovlev, 1876: 85. *Dolycoris varicornis* Kirkaldy, 1909: 59. *Codophila varicornis* Stichel, 1960–62: 755; Ahmad, 1980: 137.

Colouration: Body ochraceous, with reddish tinge, except base of 3rd antennal segment, clypeus and lateral margins of paraclypei, spot on anterior margin of pronotum, margins of exposed connexiva black; posterior ½ of pronotum and anterior disc of scutellum brownish black; eyes brown.

Head: Anteocular distance as long as remainder of head; length of antennal segments I 0.4–0.45, II 0.7–0.75, III 0.5, IV 0.8–0.9, V 0.83–1.00; labium reaching to hind coxae, length of labial segments I 1.0–1.1, II 0.9–1.0, III 0.8, IV 0.8; length anteocular distance 0.9–1.0; length remainder of head 0.8–1.0; width 2.0–2.1; interocular distance 1.4–1.5; interocellar distance 0.9–1.0.

Thorax and abdomen: Width of pronotum more than 2 ½× its length, humeral angles slightly denticulate, length pronotum 2.0–2.2, width 5.1–5.4; length scutellum 3.6–3.8, width 3.2–3.4; metathoracic scent gland ostiole (Fig. 8) large, ovate, peritreme elongate; length base scutellum-apex clavus 2.2–2.3; apex clavus-apex corium 2.1–2.2; apex corium-apex abdomen including membrane 1.7–2.3; apex scutellum-apex abdomen including membrane 2.3–2.7. Abdomen almost as long as broad; total length, male 9.7, female 10.6.

Male genitalia: Pygophore (Fig. 12) almost quadrangular, dorsoposterior margin deeply sinuate; apex of paramere (Fig. 16) narrow; inflated aedeagus (Fig. 20) with pair of elongate dorsal thecal appendages, a dorsal membranous conjunctival appendage, apically sclerotized, vesica not passing beyond dorsal membranous conjunctival appendage.

Female genitalia (Fig. 24): First gonocoxae broad, triangular; 9th paratergites elongate, passing beyond fused posterior margin of 8th paratergites, pump region of spermatheca (Fig. 28) slightly longer than distal spermathecal duct.

Material examined: 1 male, 1 female; 16.9.1962 lodged at BMNH.

Comparative note: This species is closely related to *C. sariabensis* and *C. pusio* in having labium with 3rd segment shortest, but it can easily be separated by its long labium reaching to the 3rd abdominal venter, and dorsoposterior margin of pygophore sinuate, laterally toothed, and other characters as noted in the key and description.

RELATIONSHIPS

Codophila has the sister group relationship with those of *Cappaea* ELLENRIEDER in having coloured spots or stripes on the body and appears to follow two lines of evolution. The first line includes only *C. maculicollis* having the derived character of paramere with black spot on its outer margin. The second group comprises *C. sariabensis, C. varicornis* and *C. pusio* with the synapomorphy of shorter head which is usually shorter than pronotum. *C. varicornis* has autapomorphy of a very long labium reaching to 3rd abdominal venter. *C. sariabensis* has the autapomorphy of deeply sinuate ventroposterior margin of pygophore and *C. pusio* with acute apex of paramere.

REFERENCES

AHMAD, I. 1980. Insect fauna of Pakistan and Azad Kashmir; some groups within the order Hemiptera. *Proc. 1st. Pakistan Congr. Zool. Ser A.* pp. 115–155.

AHMAD, I. 1986. A foot-proof-technique for inflation of male genitalia in Hemiptera (insecta). *Pakistan J. ent. Kar. 1* (2): 111–112.

AHMAD, I., ABBASI, Q. A. & KHAN, A. A. 1974. Generic and supergeneric keys with reference to a check list of pentatomid fauna of Pakistan (Heteroptera: Pentatomidae) with notes on their distribution and food plants. *Karachi ent. Soc. suppl. 1:* 1–113.

ATKINSON, E. T. 1888. Notes on Indian Rhynchota: Heteroptera. *J. Asiat. Soc. Beng. 57:* 1–73.

DISTANT, W. L. 1902. *The fauna of British India including Ceylon and Burma. Rhynchota 1.* Taylor and Francis, London.

DALLAS, W. S. 1851. *List of specimens of hemipterous insects in the collection of the British Museum.* Brit. Mus. Publ. London.

FUENTE, J. A. 1974. Revista Española de Entomología. *Inst. Español. Entomol. Madrid. 68* (30): 1–201.

HALÁSFY, E. 1959. Heteroptera II. Poloskák II. *Magyarország Állatvilága. Fauna Hungriae 17:* 1–227.

HOBERLANDT, L. 1954. Hemiptera – Heteroptera from Iran I. *Acta ent. nat. Pragae 29:* 121–148.

HORVÁTH, G. 1897. Description d'Hémiptères nouveaux et notes diverses. *Revues d'Entomologie, 16:* 81-97.
HORVÁTH, G. 1907. Hemiptera nova vel minus cognita e Regione Palaearctica. *Musei Nat. Hung. Ann., 5:* 289-323.
JAKOVLEV, B. E. 1869-1900. Hemipterous Heteroptera of the Russian fauna (Russian title). *Bull-Soc. Nat. Moscou, 50:* 85-124.
JAKOVLEV, B. E. 1905. *Pyeck 9th Ogo 3p 5:* 102. In: STICHEL, W. 1960-62 (original not seen).
KIRKALDY, G. W. 1909. *Catalogue of the Hemiptera (Heteroptera) with biological and anatomical references, lists of food plants and parasites etc. 1. Cimicidae.* Felix Dames, Berlin.
LINNAVUORI, R. 1960. Hemiptera of Israel. *Ann. Zool. Soc. Zool. Bot. Fennice. Vanomo 22* (1): 1-71.
MULSANT, E. & REY, C. 1865-1879. Historic naturelic des punaises de France. *Ann. Soc. Linn. Lyon 13:* 291-367.
PUCHKOV, K. G. 1965. Shield bugs of central Asia (Hemiptera: Pentatomidae). *Acad. Sci. Kirgiskoi SSR. Inst. Biol. Frunze.* 329 pp. (in Russian).
STÅL, C. 1854. Naya Hemiptera. *Oefv. Kongl. Svenska Vet. Akad. Foerh. 11* (8): 231-255.
STÅL, C. 1872. Genera Pentatomidarum Europae disposuit. *Oefv. Kongl. Svenska. Vet. Akad. Foerh. 29* (3): 31-40.
STICHEL, W. 1960-62. Illustrierte Bestimmungstabellen der Wanzen. II Europa Vol. 4, pp. 592-601.
ZAIDI, R. H. & AHMAD, I. 1989. Redescription of a little known Aeliine genus *Gulielmus* Distant (Hemiptera - Pentatomidae: Pentatominae) with special reference to male and female genitalia. *Pakistan J. Sci. Ind. Res. 32* (2): 95-97.

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