

# Biological Sciences Section

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## THE LYGAEINAE (HETEROPTERA: LYGAEIDAE) OF PAKISTAN\*

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**Abstract.** This paper reports twenty species of Lygaeinae from Pakistan. Ten of these are new records. In addition, five more species that are likely to be found in Pakistan are mentioned. Brief descriptions for newly recorded species are included. Additional locality data is given for four species of *Spilostethus* and for *Karachicoris seidenstueckeri* Stys. Dorsal views and male and female genitalia of the newly recorded species and *Karachicoris seidenstueckeri* Stys are illustrated. Host plants are reported for a number of species. Geographic distribution of the 25 species is briefly discussed.

Ten species of Lygaeinae have been reported from Pakistan previously<sup>3,4,13,17</sup>: *Arocatus pilosulus* Distant, *Caenocoris nerii* (Germar), *Karachicoris seidenstueckeri* Stys, *Lygaeus equestris* (Linnaeus) *Spilostethus hospes* (Fabricius), *S. pandurus militaris* (Fabricius), *S. longulus* (Dallas), *S. rubriceps* (Horvath), *S. saxatilis* (Scopoli) and *S. s. montivagus* (Horvath). Hamid and Meher<sup>6</sup> recorded six additional genera to bring the total number of genera recorded from Pakistan to eleven. This paper reports another ten species of Lygaeinae from Pakistan and gives additional locality data for *Karachicoris seidenstueckeri* and our species of *Spilostethus*. In addition of these 20 species, we suspect that at least five more species, *Arocatus continctus* Distant, *Spilostethus pandurus elegans* (Wolff), *S. p. pandurus* (Scopoli), *S. trilineatus* (Fabricius) and *Tropidothorax leucopterus* (Goeze), should occur in Pakistan, since they have been reported from east and west of this area.<sup>13</sup>

The distribution of these 25 species shows three main patterns (Fig. 1): (1) A number of Pakistani species are distributed only westward. (2) A number of Pakistani species are distributed westward as well as eastward. (3) A number of species are distributed only eastward. Although our sample is small and the locality data on these species in Africa, the Middle East and India is less than desirable, there seem to be at least three or perhaps four routes of distribution involving Pakistan (Fig. 2). The species found in the Australian and Oriental regions seem to have moved south of the Himalayas in and out of Pakistan. The five species reported from China are also found in India. Three of these are also reported from southeast Asia. Four of the five species are also reported from the Middle East and three of these from southern Europe and parts of Africa. One is also from northern Europe. Whether

the Chinese species moved through Southeast Asia into and out of eastern China along the Indochina coast, or through the Middle East into and out of western China is difficult to decide at this point. Future studies will show that one or the other or perhaps both routes were available for such movements. The species reported from the west of Pakistan

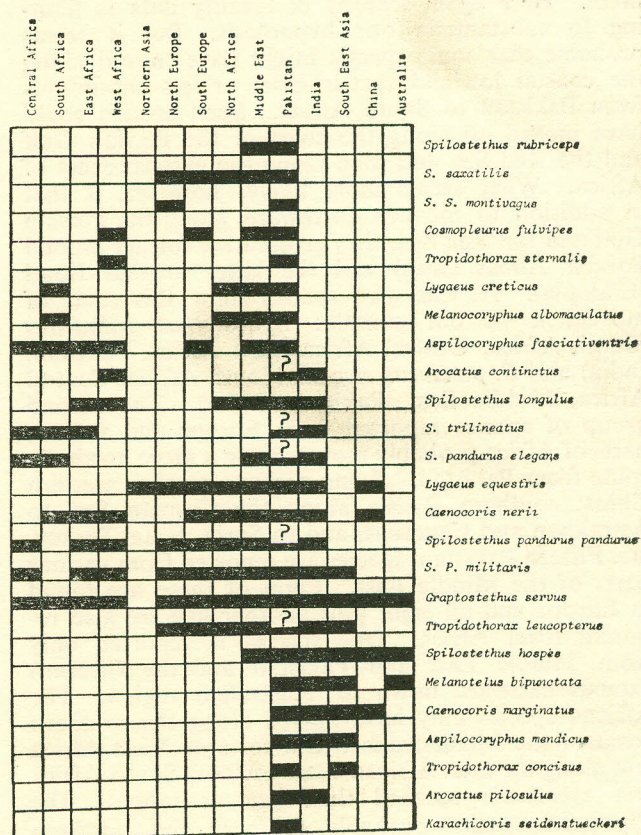


Fig. 1. Known distribution of Pakistan Lygaeinae.

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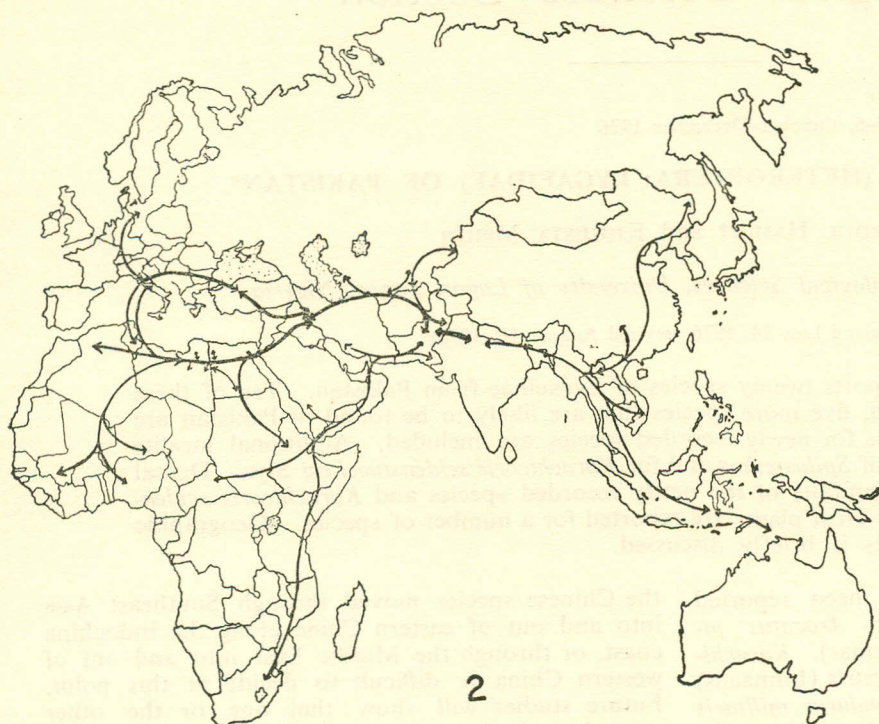


Fig. 2. Probable routes of distribution of Pakistani Lygaeinae.

indicate at least two or more directions of movement. Here again scarcity of locality data is limiting to substantiate our hypothesis. But it seems probable that some species might have moved along the coastal lowland that is more or less continuous from Pakistan to South Africa. Such species could have moved all along the coast of the Persian Gulf and the Red Sea and then along the eastern coast of Africa. What seems more likely, however, is that in addition to moving northward along the Persian Gulf and the Red Sea, they crossed the former around Bandar Abbas (Iran) and the latter around Jibuti (Ethiopia). At least two species show this route of movement in our sample: *Spilostethus trilineatus* (South Africa, Central Africa, East Africa, Pakistan, India) and *S. pandurus elegans* (South Africa, Central Africa, Middle East, Pakistan, India). The second group of species reported from Europe and various parts of Africa probably moved along a more northerly route from Pakistan. Some perhaps reached western China, southern Russia along the Caspian Sea to Astrakhan and Caucasus, and to Syria, Israel, Turkey, etc. Fifteen Pakistani species are reported from various parts of the Middle East. Eight of these are found in Europe and all eight plus another five are also reported from Africa. One species is reported only from Middle East and Pakistan and the fifteenth extends eastward down to Australian region. The African species may have moved along the southern coast of the Mediterranean Sea towards West Africa and along the East African coast towards South Africa and eventually reached their present ranges. The European species probably followed the northern coast of the Mediterranean Sea. There was apparently a great deal of exchange between Europe and through islan-jumping across the Mediterranean.

This accounts for the distribution of Pak-Afro-European species in our sample. Present known distribution of *Spilostethus saxatilis montivagus* (Horvath) is N. Europe-Central Europe-Pakistan (Kashmir). It probably occurs in Middle East also and has followed a route similar to other European species except that it does not occur in Africa.

This is rather tentative account of distribution of Pakistani Lygaeinae, primarily due to lack of distributional data. It would, however, be interesting to see if other groups of Heteroptera follow similar routes of distribution.

Working with very valuable material collected by staff of the Pentatomomorpha Scheme at the University of Karachi, we have come across some serious shortcomings in the way locality and other data is recorded on the labels. Very often the localities include only names of neighbourhoods or abbreviated names or English translations of the actual names (Sewage Garden instead of Gutter Bagicha). The name of the country is not included on any label. Despite the fact that we are familiar with the geographic area and most of the collectors, it is difficult to decide if some of the localities mentioned are in Pakistan or Bangla Desh (formerly East Pakistan). In view of the fact that many localities in Pakistan, India, Bangla Desh, perhaps in Afghanistan and Iran have the same or similar names, it is necessary to mention countries and states or provinces after the towns. Otherwise future political changes and relocation of insect material would pose great problems for workers who will not have the same advantages as we are fortunate to have today. Also the host plant data (wild bush or wild grass) whenever recorded, is ambiguous.

It seems desirable here to include some notes on

the collecting of seed-feeding Heteroptera in Pakistan. In Sind and Baluchistan provinces, which are more arid than other parts, vegetation other than in irrigated areas looks deceptively dry. We have found that many seed-feeding Heteroptera take refuge or feed and breed under these bushes, especially those that have piles of dried leaves and, or seeds around them. One has to kneel down and aspirate these insects. Netting is very unproductive except for a few species that stay on plants (e.g. *Spilostethus*, *Graptostethus*). Netting is also impractical because most of these bushes are well adapted to their xeric environs and have thorns and prickles of various kinds. Very often adults and nymphs hide in the cracks in the ground, especially around the stem of the host plant. In such cases moving the stem disturbs them and forces them to come out. Often pulling the bush out of the ground produces good results. We have been especially successful in collecting such Lygaeinae as *Melanotelus* and *Karachicoris* in this way. Occasionally we have found adults and nymphs of more than one species under the same plant [e.g. *Melanotelus bipunctata* (Dallas) and *Aspilocoryphus* spp.]. In such cases we have found it easier to sort out the nymphs before killing them. This is particularly necessary for the younger instars.

We have also confirmed our earlier finding<sup>7</sup> regarding the shape of the gonoporal opening in males. Thus, in the species reported here, the gonoporal opening has a number of different shapes. *Tropidothorax sternalis* (Dallas) has the most elaborate of the gonoporal openings in our sample. We also discovered, although our small sample size makes any general statement very tentative, that there is some correlation between the length of the gonoporal process in males and the length of the spermathecal duct in females. Thus, species with very long spermathecal ducts usually have short gonoporal processes and vice versa. It would be interesting to know how widely this is true and, if so, what are its functional implications.

All measurements in this report are in millimeters. The scale lines, unless otherwise indicated, equal 0.1 mm. All material examined is in A. Hamid collection unless the location is given. Most of the synonymy and key to the genera of Pakistani Lygaeinae is not recorded here. Reference should be made to Slater<sup>13</sup> and Hamid and Meher<sup>6</sup> respectively for such purposes.

**Checklist of Lygaeinae**

*Recorded From or Likely to be Found in Pakistan*

- \*1. *Arocatus continctus* Distant 1906
- 2. *A. pilosulus* Distant 1879
- 3. *Aspilocoryphus fasciiventris* (Stal) 1858
- 4. *A. mendicus* (Fabricius) 1755
- 5. *Caenocoris (Thunbergia) marginatus* (Thunberg) 1822
- 6. *C. nerii* (Germar) 1847
- 7. *Cosmopleurus fulvipes* (Dallas) 1852

\* Likely to be found in Pakistan.

- 8. *Graptostethus servus* (Fabricius) 1787
- 9. *Karachicoris seidenstueckeri* Stys 1972
- 10. *Lygaeus creticus* Lucas 1854
- 11. *L. equestris* (Linnaeus) 1758
- 12. *Melanocoryphus albomaculatus* (Goeze) 1778
- 13. *Melanotelus bipunctata* (Dallas) 1852
- 14. *Spilostethus hospes* (Fabricius) 1794
- 15. *S. longulus* (Dallas) 1852
- 16. *S. pandurus elegans* (Wolff) 1802
- 17. *S. p. militaris* (Fabricius) 1775
- 18. *S. p. pandurus* (Scopoli) 1763
- 19. *S. rubriceps* (Horvath) 1899
- 20. *S. saxatilis* (Scopoli) 1763
- 21. *S. s. montivagus* (Horvath) 1899
- \*22. *S. trilineatus* (Fabricius) 1794
- 23. *Tropidothorax concisus* (Walker) 1872
- \*24. *T. leucopterus* (Goeze) 1778
- 25. *T. sternalis* (Dallas) 1852

**Genus *Aspilocoryphus* Stal**

*Aspilocoryphus* Stal Enum. Hem. 4, 99, 117 (1874)

Eight species included in this genus are distributed in the Oriental, Ethiopian and Australian regions. The two species described in this paper are reported for the first time from Pakistan.

The two species, although they can be easily identified externally, do not show any significant differences in the structure of the male genitalia. Not only are the genitalia alike but also males of *A. mendicus* were found mating with females of *A. fasciiventris*. Males of *A. fasciiventris* were not found mating with females of *A. mendicus*. In view of this interbreeding it is not surprising to find some specimens with intermediate or mixed characters. A thorough study of the biology of these species is desirable to elucidate various aspects of the evolutionary processes taking place.

Members of this genus can be easily identified by their black heads and metathoracic scent gland orifices and by impunctate pleural surfaces.

**Key to the Pakistani Species of *Aspilocoryphus***

- 1. Median white spot on membrane circular, inner margins of black longitudinal fascia on pronotum distinctly narrower or converging anteriorly (Fig. 3) black pronotal fascia broader in anterior half..... *A. fasciiventris*
- Median white spot on membrane elongate, inner margins of black longitudinal fascia on pronotum more or less parallel throughout (Fig. 12), black pronotal fascia broader posteriorly..... *A. mendicus*

*Aspilocoryphus fasciiventris* (Stal) (Fig. 3).

*Lygaeus fasciiventris* Stal ofv. Vet. Akad. Forh., 15, 316 (1858).

General coloration brownish red; antennal segments and head black except lateral area in front of eyes pale yellow or red; eyes dark brown; pronotum

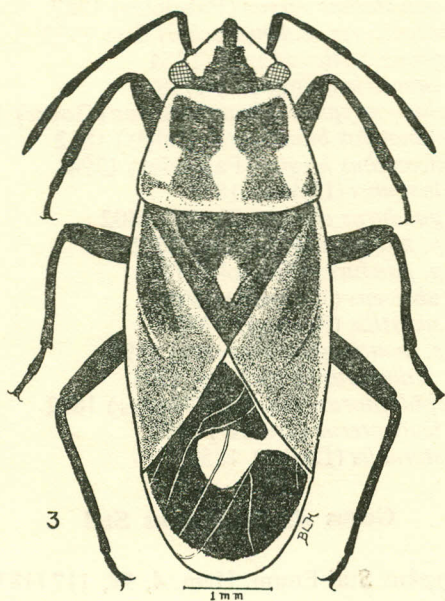
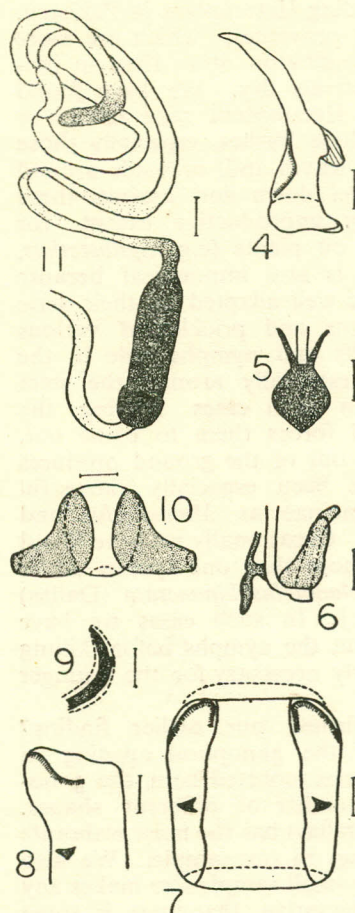


Fig. 3. *Aspilocoryphus fasciiventris* (dorsal view).

red except two longitudinal fascia and an irregular or oval spot on shoulders black, black longitudinal fascia broader in anterior half and some times connected to shoulder spots, scutellum black except apex red or yellow, a pair of nonpubescent black areas at junction of black and red areas; hemelytra red and black, membrane light brown with a pale area along apical and corial margin and a median pale circular spot connected to corial pale area; labium, legs and scent gland orifice dark brown, bucculae, exposed margins of sterna and pleura yellow, rest of thoracic sterna and pleura dark brown with a shiny black spot near posteriolateral angle of each pleuron, abdominal venter red with margins of sterna dark brown and some or all sterna with a dark brown area at anteriolateral angle.

Form oval, head slightly declivent, broader than long (2:1), ocelli closer to eyes than to each other; pronotum trapezoidal, broader than long (5:3), anterior margin narrower than posterior, a very low carina present; scutellum broader than long (1.4:1), shiny black area depressed, median carina low; hemelytra well developed, corial veins usually distinct, membrane slightly exceeding abdomen; male genitalia as in Figs. 4-10, lateral process of clasper (Fig. 4) conical, pointed and slightly directed downwards, gonoporal process moderately long, apex (Fig. 9) slightly notched but not swollen, phallosome (Figs. 7, 8) with a low apical lateral process and a median lateral outwardly directed conical process, sperm reservoir (Figs. 6, 10) small, wings minute, support sclerite (Figs. 5, 6) at base of vesical ductus seminis heavily sclerotized, apical half forked, forming a 'V' basal half diamond-shaped, spermatheca (Fig. 11) tubular with a uniformly swollen elongate bulb near base, proximal flange distinct, spermathecal duct moderately long, 8th female tergum like *Cosmopleurus fulvipes*.

*Body Measurements.* Male: Total length 6.3,



Figs. 4-11. Genitalia, *Aspilocoryphus fasciiventris*: (4) clasper, (5) support sclerite, (6) sperm reservoir (lateral view), (7) phallosome (dorsal view), (8) phallosome (lateral view), (9) gonoporal opening, (10) sperm reservoir (dorsal view), (11) spermatheca.

maximum width 2.5; length head 0.8, width 1.5, maximum width pronotum 2.2, median length 1.5, length corium 3.0, diagonal length membrane 2.8, length antennal segments I 0.4, II 1.0, III 0.8, IV 0.9, length labial segments I 0.7, II 0.6, IV 0.6.

*Material Examined.* W. Pakistan. Karachi: 2 males+2 females, 27. VII. 1972; 9 males+9 female 27. VIII. 1972; 2 males, 13. XII. 1971 (A. Hamid); Karachi University Campus, Karachi: 17 males+8 females (1 female in copulation with male of *A. mendicus*), 27. III. 1972; 6 males+4 females, 8. III. 1972 (A. Hamid); 27 mile N. Karachi: 10 males+12 females, 28. II. 1972 (A. Hamid and B. Hamid) Kifayat Agricultural Farm, 2 miles from Hub River Check Post: 1 male, 25. V. 1971. (A. Hamid).

*Host Plant.* *Crotalaria burhia* Ham. ex Bth. (Papilionaceae).

*Note.* This species is widely distributed in Africa and also in some parts of the Middle East.<sup>13</sup> Our series shows slight variations in coloration. Some specimens have entirely black heads. In a few specimens the margins of the longitudinal black fascia on the pronotum are fused anteriorly. In some other members the fuscous median spot on the membrane has an irregular shape.

*General Distribution.* Africa, Middle East, Pakistan (new record).

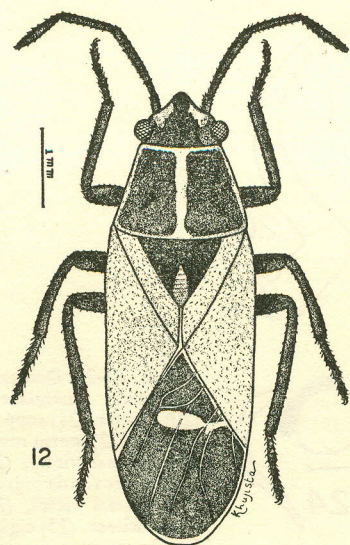


Fig. 12. *Aspilocoryphus mendicus* (dorsal view).

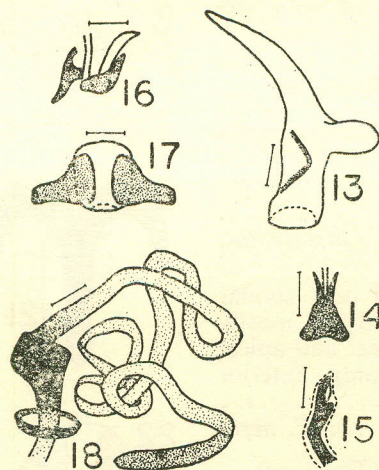
*Aspilocoryphus mendicus* (Fabricius) (Fig. 12)

*Cimex medicus* Fabricius Syst. Ent., 720 (1775).

General coloration dark brown, sometimes reddish brown; antennal segments and head black, in some specimens cheek areas light reddish brown, bucculae pale; pronotum dark brown to black except margins and median longitudinal line red; scutellum black except apex and sometimes lateral margins near apex red; hemelytra dark red, membrane dark brown with a pale white area along corial and apical margins and an elongate white median area connected to corial white area; labium, legs and scent gland orifice dark brown to black, thoracic sterna and pleura black, posteriolateral area of each pleuron pale with a shiny black spot, black spot sometimes confluent with other black markings, abdominal venter red or reddish brown, in male seventh to ninth segments darker than other abdominal sterna.

Form elongate, head broader than long (2:1), ocelli closer to eyes than to each other; pronotum trapezoidal, broader than long (5:3), carina lacking; scutellum broader than long (1.3:1); hemelytra well developed, corial veins usually indistinct, membrane reaching or slightly exceeding apex of abdomen; male genitalia as in Figs. 13-17, clasper (Fig. 13) with a thumb-like lateral process, apex of gonoporal process (Fig. 5) (slightly swollen and notched, process moderately long, sperm reservoir like *A. fasciiventris* (Figs. 16, 17), support sclerite at base of vesical ductus seminis (Figs. 14, 16) forked apically, basal margin curved, spermatheca (Fig. 18) tubular with a markedly swollen hatchet-shaped bulb near base, proximal flange distinct, spermathecal duct moderately long, eight female tergum like *Cosmopleurus fulvipes* (Fig. 42).

**Body Measurements.** Male: Length body 6.0, maximum width 2.1; length head 0.6, width 1.3; maximum width pronotum 2.0, median length 1.2, length scutellum 0.8, width 1.1, length corium 2.8,



Figs. 13-18. Genitalia, *Aspilocoryphus mendicus*: (13) clasper, (14) support sclerite (15) gonoporal opening, (16) sperm reservoir (lateral view), (17) sperm reservoir (dorsal view), (18) spermatheca.

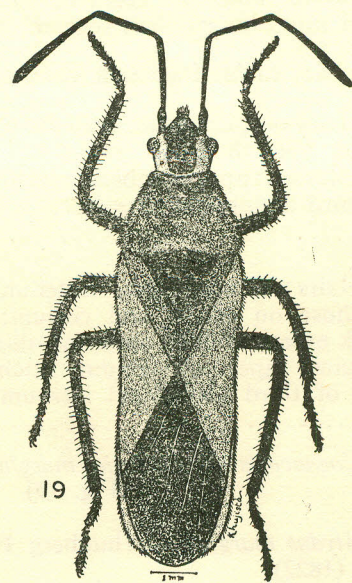


Fig. 19. *Caenocoris marginatus* (dorsal view).

diagonal length membrane 2.6, length antennal segments I 0.4, II 0.9, III 0.7, IV 0.7, length labial segments I 0.5, II 0.5, III 0.5, IV 0.4.

**Material Examined.** Pakistan. Tandojam: 3 males, 20. II. 1971 (Azher); Karachi University Campus, Karachi: 1 male (in copulation with female of *A. fasciiventris*) + 2 females, 27. III. 1972 (A. Hamid); 27 mi n. Karachi: 3 males + 1 female, 28. II. 1972. (A. Hamid and B. Hamid).

**Host Plant.** *Crotalaria burhia* Ham. ex Bth. (Papilionaceae)

**Note.** The male genitalia in *A. mendicus* and *A. fasciiventris* are very much alike, only differences being in the structure of the support sclerite and apex of the gonoporal process. However, the two species can be easily differentiated externally by the characters given in the key. The spermathecae in the two species are quite different in the structure of the basal bulb.

Distant<sup>3,4</sup> has described this species under *A. guttiger*, as distinct from *A. mendicus*. He gives Stal's<sup>15,16</sup> description of *A. mendicus* but the two species have subsequently been synonymized.<sup>2</sup> Although we are in no position to substantiate this synonymy we are following the current practice.<sup>1,3</sup>

**General Distribution.** Ceylon, India, Pakistan (new record), Philippine Is.

**Genus *Caenocoris* Fieber**

*Caenocoris* Fieber Eur. Hem., 44, 166 (1860).

Twenty species included in this genus are distributed in the Australian (3), Oriental (12), Ethiopian (4) and Palearctic (1) regions. One of the two species, *C. nerii*, described here has previously been reported from Pakistan.<sup>3,10,13,18</sup>

This genus can be distinguished from other genera of Lygaeinae from Pakistan by eyes that are set well away from the anteriolateral pronotal angles and by

the fourth antennal segment which is one-and-one-third times longer than segment two.<sup>6</sup>

**Key to the Pakistani Species of *Caenocoris***

Hairs on pronotum, scutellum and head markedly longer than those on clavus and corium; hemelytra unicolorous; apex of labium reaching posterior margin of third abdominal sternum.....*C. marginatus*.

Hairs on pronotum, scutellum and head similar to those on clavus and corium; hemelytra mostly black except at base, apex and along inner and apical margins; apex of labium reaching only anterior half of third abdominal sternum.....*C. nerii*.

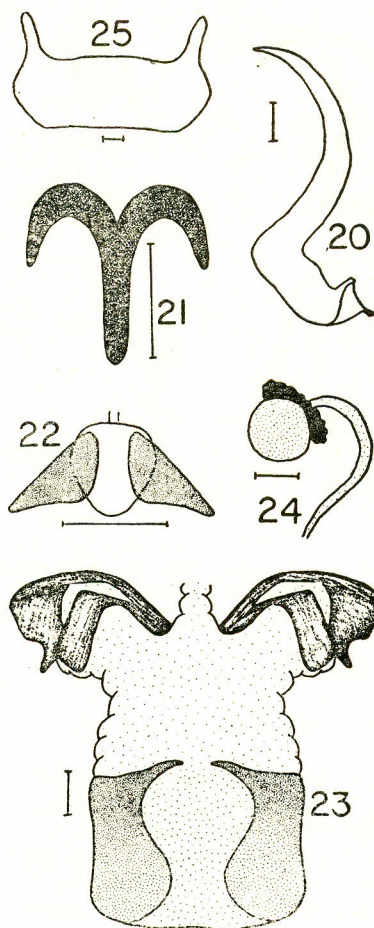
*Caenocoris (Thunbergia) marginatus* (Thunberg)  
(Fig. 19)

*Alydus marginatus* Thunberg Hem. Roster, Cap. 3, 3 (1822).

General coloration dark reddish brown, head and posteriorly bright red, anterior and posterior margins of pronotum lighter than rest, scutellum dark brown to black, apex red, clavus and membrane darker than corium, eyes, antennae, labium and legs uniformly dark brown to black, ventrolateral side of head red, venter dark brown except lateral margins of sterna, posterior margins of metapleura and scent gland orifice red, body covered with long hairs, those on hemelytra shorter than rest.

Form elongate, head broader than long (1.4:1), ocelli closer to eyes than to each other (1:5), eyes placed distantly from pronotal margin; pronotum broader than long (almost 2:1) anterior margin narrower than posterior, carinae lacking, a shallow transverse depression behind calli; scutellum slightly broader than long with a prominent transverse ridge in anterior half, longitudinal carina low; hemelytra well-developed, slightly exceeding abdomen; apex of labium reaching posterior margin of third abdominal sternum; male genitalia as in Figs. 20-23, clasper (Fig. 20) sickle-shaped, outer lobe lacking, sperm reservoir (Fig. 22) small, support sclerite (Fig. 21) with elongate central piece and horn-shaped lateral processes, gonoporal process very long, coiled like *C. nerii*, opening simple, conjunctiva (Fig. 23) with two basally confluent sclerotized areas near base of vesical ductus seminis, phallosome (Fig. 23) moderately sclerotized without processes, spermatheca (Fig. 24) oval with a well-developed distal flange, flange somewhat irregular in shape, duct short and more or less uniform in width, eighth female tergum (Fig. 25) with two large anteriorly directed processes.

**Body Measurement.** Male: Total length 10.2, maximum width 3.0, length head 1.3, width 1.8, maximum width pronotum 3.0, median length 1.5, length corium 5.1, diagonal length membrane 4.6, length antennal segments I 0.5, II 1.8, III 1.7, IV 2.5, length labial segments I 1.2, II 1.3, III 1.8, IV 1.2, range body length 10.0-12.7, maximum width 2.9. 2.9-3.8.



Figs. 20-25. Genitalia, *Caenocoris marginatus*: (20) clasper, (21) support sclerite, (22) sperm reservoir (dorsal view), (23) phallosome and conjunctiva (dorsal view), (24) spermatheca, (25) eighth female tergum.

**Material Examined.** W. Pakistan. Murree: 5 males+1 female, 25. VI 1970 (Ahmed I.)

**General Distribution.** Ceylon, China, Formosa, India, Japan, Pakistan (new record).

*Caenocoris (Caenocoris) nerii* (Germer) (Fig. 26)

*Lygaeus nerii* Germer Faun., Eur., 24, 17 (1847)

General coloration black or dark brown with marking as follows: area around eyes, posterior margin and ventral side of head, shoulders of pronotum, apical one-half to two-thirds of scutellum, bases and inner and apical margins of hemelytra, and venter red; parts of thoracic pleura, antennae, legs, and labium dark brown; body covered with short irregularly spaced hairs.

Form elongate, head broader than long (1.5:1) ocelli closer to eyes than to each other (1:5), eyes placed distantly from pronotal margin; pronotum trapezoidal, broader than long (almost 2:1), anterior margin narrower than posterior, notum with a slight transverse depression behind calli, carina lacking; scutellum slightly broader than long (3:2.5), hemelytra well developed, slightly exceeding apex of abdomen in both sexes: apex of labium exceeding hind coxae but not reaching posterior margin of third abdominal sternum; male genitalia as in Figs. 27-31, clasper

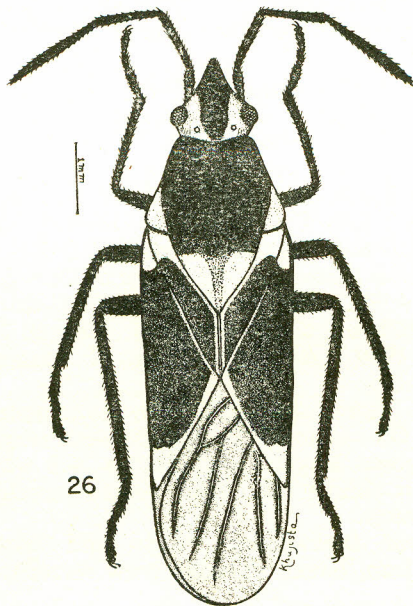


Fig. 26. *Caenocoris nerii* (dorsal view).

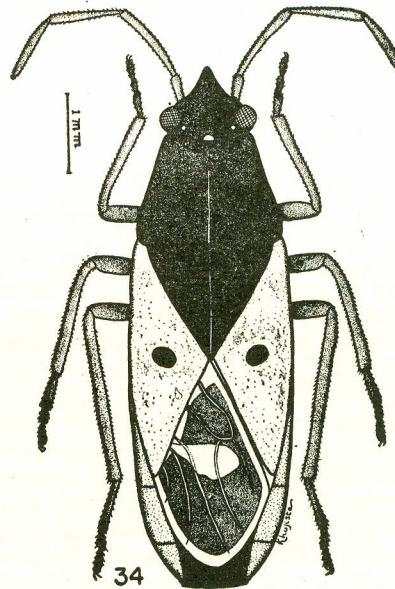
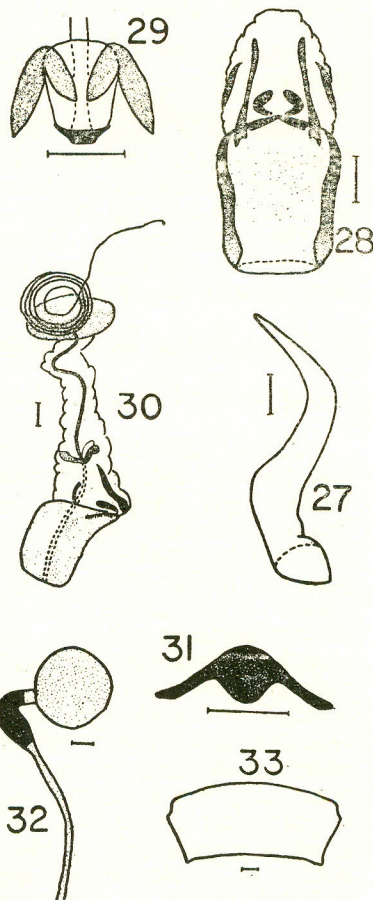


Fig. 34. *Cosmopleurus fulvipes* (dorsal view).



Figs. 27-33. Genitalia, *Caenocoris nerii*: (27) clasper, (28) phallotheca and conjunctiva (dorsal view), (29) sperm reservoir (dorsal view), (30) phallus (lateral view), (31) support sclerite, (32) spermatheca (33) eighth female tergum.

(Fig. 27) small, outer lobe lacking, sperm reservoir (Figs. 29, 30) small support sclerite (Figs. 30, 31) with broad centre and narrow lateral processes, secondary gonoporal opening simple, gonoporal process

(Fig. 30) very long and coiled, conjunctiva (Figs. 28, 30) with three heavily sclerotized areas near phallotheca, phallotheca (Figs. 28, 30) moderately sclerotized without processes, spermatheca (Fig. 32) large, oval, without flanges, spermathecal duct short, swollen apically, eighth female tergum (Fig. 33) without processes.

**Body Measurements.** Male: Total length 8.5, maximum width 2.7, length head 1.0, width 1.5, maximum width pronotum 2.4, median length 1.4, length corium 4.6, diagonal length membrane 3.6, length antennal segments I 0.4, II 1.2, III 1.0, IV 1.7, length labial segments I 1.1, II 1.1, III 1.3, IV 0.6, range body length 7.5-9.0, maximum width 2.1-2.8.

**Material Examined.** W. Pakistan 1 male + 3 females  
**Note.** We do not have exact locality data for the four studied specimens but the species has previously been reported from Sind Province.

**General Distribution.** Mediterranean, N., W., and E. Africa, China, Indian, Iran, Israel, Pakistan, Syria, Turkey.

**Genus *Cosmopleurus* Stal**

*Lygaeus* sg. *Cosmopleurus* Stal Ofv. Vet. Akad. Forh., 29, 41 (1872).

*Cosmopleurus* Stichel 1957, III Bst. Wanz. Eur., II: 4:3:68.

Only two species are included in this genus and both are distributed along the southern coast of the Mediterranean Sea, extending up to Syria and Iran. We are reporting *C. fulvipes* for the first time from Pakistan.

The genus can be identified by its crimson-red legs and black pronotum.

*Cosmopleurus fulvipes* (Dallas) (Fig. 34)

*Lygaeus fulvipes* Dallas, List Hem. B.M., 2, 536 (1852).

General coloration brownish red, head except a median pale spot on posterior margin, pronotum, scutellum and clavus black, eyes and ocelli dark red, antennae, corium except a median circular black spot, and exposed connexival sclerites red, membrane of hemelytra fuscous, margin and a median spot pale venter black coxae, trochanters, basal one-third of femora and tarsal segments two and three dark brown or black, body covered with short depressed hairs.

Form robust, head broader than long (1.7:1), tumid, eyes touching pronotal margin, ocelli closer to eyes than to each other (1:10), pronotum broader than long (1.5:1), with a low median longitudinal carina in posterior two-third and a transverse elevation in callar region, lateral pronotal margin as high as transverse elevation; scutellum slightly broader than long with distinct longitudinal and transverse carinae; hemelytra well developed but not exceeding apex of abdomen; labium long, reaching hind coxae; male genitalia as in Figs. 35-40, claspers (Figs. 35, 36) very stout, with a prominent outer lobe and three small inner lobes, sperm reservoir (Figs. 39, 40) well developed, wings triangular, support sclerite (Fig. 40) represented by a well sclerotized knob near apex of conjunctival ductus seminis, gonoporal process short and of uniform width, opening (Fig. 37) simple, phallosome (Fig. 38) with a low lateral ridge, spermatheca (Fig. 41) tubular, flanges lacking, duct very long and eciled with a minute

bulb near base, eighth female tergum (Fig. 42) simple with one median and two lateral anteriorly directed small processes.

**Body Measurements.** Male: Total length 7.3, maximum width 2.5, length head 0.8, width 1.4, pronotum 2.1, median length 1.5, length corium 3.6, diagonal length membrane 3.1, length antennal segments I 0.6, II 1.2, III 0.8, IV 1.2, length labial segments I 1.0, II 0.9, III 0.8, IV 0.7, range body length 7.0-8.5, maximum width 2.2-3.0.

**Material Examined.** W. Pakistan. Fort Sandaman; 1 male, 4. V. 1969, on wheat (Q. Abbasi); 1 male, 2. V. 1969, on wheat (Shadab); Khusab: 2 females, 24. IV. 1969 (Ahmed); Turbat; 1 female, 25. VI. 1960 (Farid).

**Note.** Some specimens show brachypterous tendencies. On one male the ratio between length corium and diagonal length membrane is 4:2 while in the other it is almost 1:1. Also female specimens have longer wings.

**General Distribution.** North and West Africa, Arabia, Iran, Israel, Pakistan (new record), Syria.

#### Genus *Graptostethus* Stål

*Lygaeus* sg. *Graptostethus* Stål 1868, Kongl. Svnsk. Vet. Akad. Hand. (11): 7: 73, 74.

*Graptostethus* Stål Ofv. Vet. Akad. Forh., 29, 42 (1872)

This genus includes 38 species distributed in Ethiopian (16), Oriental (16), Australian (6) and Palearctic (3) regions and also in some Pacific islands' e.g. Hawaii and Fiji (3).

The genus can be distinguished by its angulate metapleuron and light head or at least a red or yellow area mesally near posterior margin of head.

*Graptostethus servus* (Fabricius) (Fig. 43).

*Cimex servus* Fabricius, Mant. Ins. 2, 300 (1787).

General coloration reddish brown, head ventrally and laterally red, vertex, frons and tylus black, as median spot on posterior margin pale, eyes dark brown, antennae uniformly brown, anterior and posterior pronotal margins red or pale, anterior and posterior halves of pronotum each with a transverse black band, anterior in callar region, posterior across shoulders, posterior band incomplete medially, area between transverse bands red except two black circular spots near each shoulder, scutellum uniformly dark brown, inner and apical margins of calvus red, rest dark brown, corium dark brown except a narrow area along outer margin and a much wider area along inner margins red, membrane fuscous except apical margin and a triangular area near base of inner margins pale or whiter, venter mostly dark brown or black, prosternum and thoracic pleura with red areas, scent gland orifice red, legs and labium dark brown, body covered with short hairs.

General form elongate, head slightly broader than long (1.2:1), eyes touching anterior pronotal margin, ocelli closer to eyes than to each other (1:6), pronotum broader than long (1.4:1), callar region

Figs. 35-42. Genitalia, *Cosmopleurus fulvipes*: (35), (36) clasper, (37) gonoporal process (38), phallosome (lateral view), (39) sperm reservoir (dorsal view), (40) sperm reservoir (lateral view), (41) spermatheca (uncoiled to show length), (42) eighth female tergum.

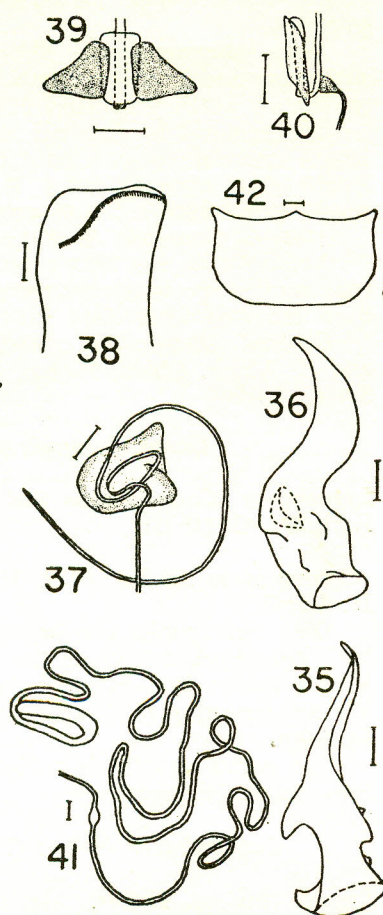
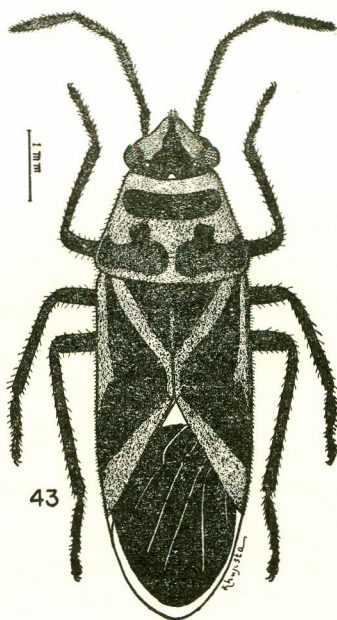




Fig. 43. *Graptostethus servus* (dorsal view).



slightly elevated, carinae lacking, scutellum broader than long, carina lacking, hemelytra well developed, membrane exceeding apex of abdomen, labium long, reaching hind coxae, male genitalia as in Figs. 44–50 clasper (Figs. 44, 45) stout, blade pointed and making a sharp angle with base, outer lobe small but distinct, inner lobe large and pointed basally, a small dorsal lobe present near inner lobe, sperm reservoir (Figs. 46, 47) well developed, wings triangular, support sclerite (Fig. 46) represented by a sclerotized knob at apex of conjunctival *ductus seminis*, gonoporal process (Fig. 50) short, apical process almost as long as gonoporal process, phallosome (Figs. 48, 49) with apical and median dorsal area well sclerotized, spermatheca (Fig. 51) tubular, duct long and with an elongate bulb near base, eighth female tergum (Fig. 52) with two large lateral anteriorly-directed processes.

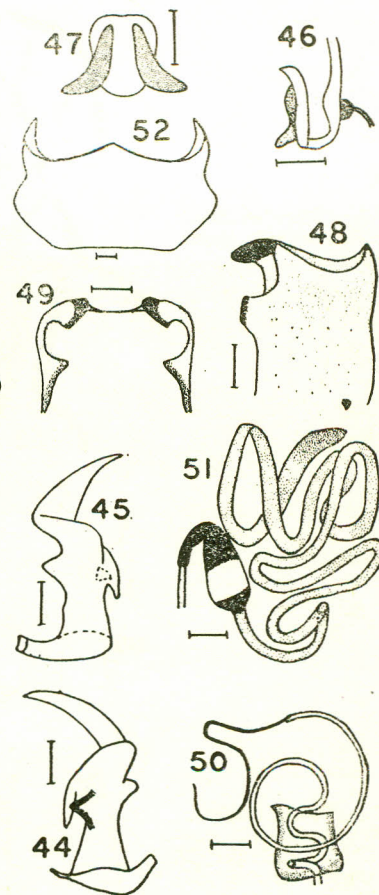
**Body Measurements.** Male: Total length 7.4, maximum width 2.4, length head 1.2, width 1.5, maximum width pronotum 2.4, median length 1.7, length corium 3.6, diagonal length membrane 3.6, length antennal segments I 0.6, II 1.1, III 0.8, IV 1.3, length labial segments I 0.9, II 0.9, III 0.8, IV 0.7, range body length 7.0–9.5, maximum width 2.0–3.5.

**Material Examined.** W. Pakistan. Malir: 1 male 18.I.1969 (N. Yasmin); 1 male, 18.I.1969 (Farid); 1 female, 19. IV. 1971 (A. Hamid); Gutter Bagicha, Karachi: 1 male, 11.III, 1968; 1 male + 5 females 15.IV.1971 (A. Hamid); Kujwani: 1 male, 6.VII.1970; Karachi University Campus, Karachi: 1 female, 19.V. 1971 (A. Hamid), Tarbela Dam: 1 male, 14.IV.72 (A. Hamid); Mirpur Sakro, Sind Province: 10 males + 10 females, 20.IV.1971 (A. Hamid).

**Note.** In some specimens apical margin of corium is much paler and brighter than other red areas of corium.

**General Distribution.** Africa (widely distributed), Mediterranean, Europe, Australia, South Pacific Islands, Malaysia, Indonesia, Burma, Ceylon, China,

Figs. 44–52. Genitalia, *Graptostethus servus*: (44,45) clasper, (46) sperm reservoir (lateral view), (47) sperm reservoir (dorsal view), (48) phallosome (lateral view), (49) phallosome (dorsal view), (50) gonoporal process, (51) spermatheca, (52) eighth female tergum.



India, Japan, Pakistan (new record), Syria, Tibet, Turkey.

#### Genus *Karachicoris* Stys

*Karachicoris* Stys, Acta Entomol. Bohemoslov. 69, 258 (1972)

This genus has been recently erected to include the only known species, *Karachicoris seidenstueckeri*. The species shows extreme brachyptery. Stys<sup>17</sup> studied twenty-five specimens when he described the species and only one female of these was macropterous. We have a very large series at hand now. Only one of these, a female, is macropterous. Immature stages of *K. seidenstueckeri* have been previously described.<sup>8</sup>

In view of Sty's recent description, we are only including information on male and female genitalia in this paper in addition to giving more locality data. The genus and specimens can be readily identified by using our earlier key.<sup>6</sup>

*Karachicoris seidenstueckeri* Stys (Fig. 53)

*Karachicoris seidenstueckeri* Stys Acta Entomol. Bohemoslov., 69, 262 (1972).

Male genitalia as in Figs. 54–60, clasper (Figs. 54, 55) with well developed blade and outer lobe, inner lobe small but distinct, sperm reservoir (Figs.

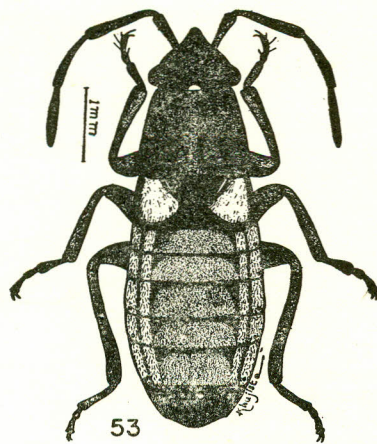


Fig. 53. *Karachicoris seidenstueckeri* (dorsal view).

specimen, 19.V.1971; 3 specimens, 1.IV.1971; 2 specimens, 1.VI.1971; 2 paratypes, 22.VII.1971; 40 specimens, 25.VIII.1971; 60 specimens, 29.XI.1971; 23 specimens, 10.VII.1971; 44 specimens (1 macrop-terous female), 13.XII. 1971; 11 specimens, 22.I.1972; 5.II.1972. 16 specimens, 28.II.1972; 10 specimens, 8.III.1972; 17 specimens, 15.III.1972; 51 specimens, 16.IV.1972; 2 specimens, 27.VII. 1972; Kathor: 1 specimen, 26.IV.1971; Malir: 27 specimens, 15.VIII. 1971; Thana Bulla Khan: 3 specimens, 28.II.1972 (A. Hamid).

*Host Plants.* *Salsola bryosma* (Roem and Schult) Dandy<sup>8</sup> and *Cenchrus biflorus* Roxb.

*General Distribution.* Pakistan.

**Genus *Lygaeus* Fabricius**

*Lygaeus* Fabricius Ent. Syst. 4,133 (1794).

This genus is widely distributed and contains a large number of species.<sup>13</sup> The two species described in this paper are being reported for the first time from Pakistan.

The two species can be easily identified because of the distinct colour pattern of their dorsum. Unfortunately we do not have a long series of either taxon to show the ranges of their distribution in Pakistan. In addition the specimens of *L. creticus* were obtained from the old collection of the Zoology Department at the University of Karachi and the exact locality and date of collection is not recorded. Members of this genus can be easily identified by their black legs and red or testaceous head or if black at least a pale median spot on posterior margin of head. The following key separates the two species.

**Key to the Pakistani Species of *Lygaeus***

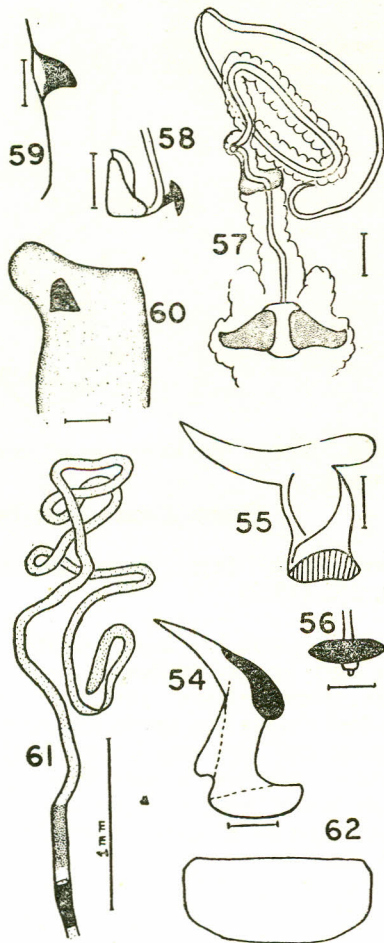
Head black except a pale median spot on posterior margin (Fig. 63), corium red except a median circular black spot, membrane fuscous throughout.....*L. creticus*.

Head red and black (Fig. 72), corium with a broad median transverse black band, membrane with a median circular area, a triangular basal area and margins white.....*L. equestris*.

*Lygaeus creticus* Lucas (Fig. 63).

*Lygaeus creticus* Lucas Rev. Mag. Zool., 280 (1854)

General coloration red and black, head black except a median spot on posterior margin pale, antennae, eyes, labium, legs black, pronotum black except area along three-fourths of lateral margin, shoulders and a median oval area red, scutellum black, clavus and corium red except a circular spot near inner and apical margin of clavus, apical argin of clavus and a circular median spot on corium black, membrane fuscous, thoracic sterna mostly black, abdominal venter mostly red, second, third and fourth sterna with black areas, body covered with short, fine, depressed hairs.

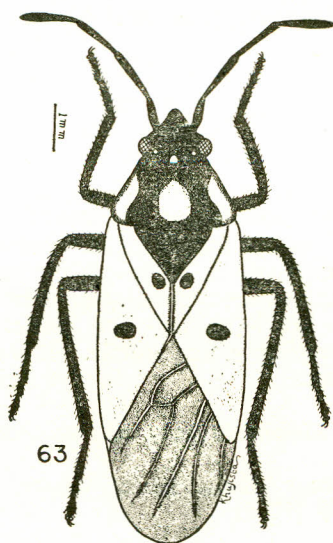


Figs. 54-62. Genitalia, *Karachicoris seidenstueckeri* (54,55) clasper, (56) support sclerite (57) phallus, dorsal view, (phallotheca omitted), (58) sperm reservoir (lateral view), (59) phallotheca dorsal view (left side). (60) phallotheca (lateral view) (61) spermatheca (uncoiled to show length) (62) eighth female tergum.

57, 58) medium-sized, wings and support sclerite (Figs. 56, 58) well developed, gonoporal process (Fig.57) short, not coiled, opening simple, phallotheca (Figs. 59, 60) with a pair of lateral conical projections, spermatheca (Fig. 61) tubular, duct very long coiled, proximal flanges distinct, eighth female tergum (Fig. 61) simple.

*Material Examined.* W. Pakistan. Kalri Lake near Thatta: 4 specimens, 30.V.1971; Karachi: 46 specimens, 16.II.1971; 7 specimens, 29.III.1971; 14 specimens, 5.IV.1971; 13 specimens.IV.1971; 1

Fig. 63. *Lygaeus creticus* (dorsal view).



General shape elongate, robust, head broader than long (1.5:1), ocelli closer to eyes than to each other (1:10), eyes touching anterior pronotal margin, pronotum with calli and lateral sides elevated, low median carina in anterior half, broader than long (1.7:1), scutellum with a T-shaped elevation, hemelytra well developed, exceeding apex of abdomen, male genitalia as in Figs. 64-69, pygophore (Fig. 66) medium sized, posterior margin in ventral view with a produced median area, anterior margin like *L. equestris*, hairs short and not as thick as in *L. equestris*, clasper (Figs. 64, 65) with well developed blade and outer lobe, inner lobe small conical projection on blade lacking, sperm reservoir (Figs. 67, 69) with well developed bulb and wings, support sclerite (Fig. 69) knob-like, gonoporal process short (Fig. 69), conjunctiva extending almost to gonoporal opening, phallosome (Fig. 68) with a continuous ridge along dorsal and apical sides, spermatheca (Fig. 70) tubular, duct very long, flanges lacking, eighth female tergum (Fig. 71) with three prominent anterior projections.

**Body Measurement.** Male: Length body 10.2, maximum width 3.5, width head 2.1, length head 1.4, maximum width pronotum 3.5, median length 2.0, length corium 5.3, diagonal length membrane 5.0, length antennal segments I 0.7, II 1.7, III 1.1, IV 1.3, length labial segments I 1.3, II 1.3, III 1.1, IV 0.9, range body length 10.0-12.0, maximum width 3.0-4.6.

**Material Examined.** W. Pakistan. 1 male + 2 females.

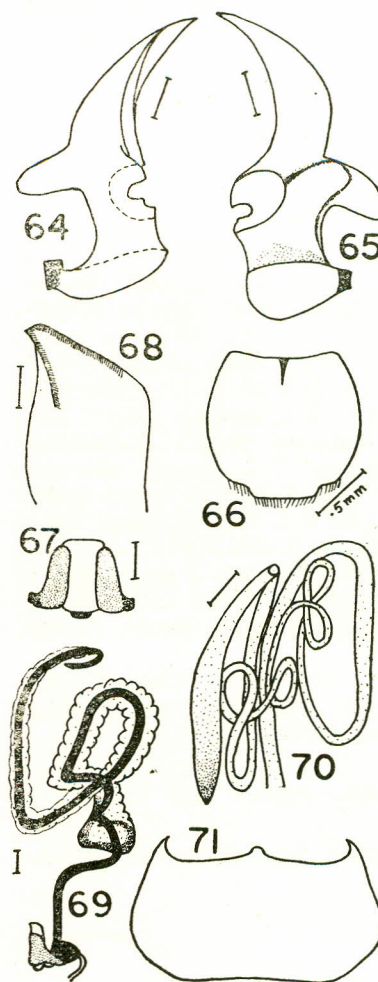
**Note.** We do not have exact locality data for the three studied specimens. In view of the known distribution of this species, it is more likely to be encountered in Baluchistan or the Frontier Province.

**General Distribution.** Mediterranean Area, Arabia, Afghanistan, Iran, Israel, Pakistan (new record), Syria, Turkey.

*Lygaeus equestris* (Linnaeus) (Fig. 72)

*Cimex equestris* Linnaeus, Syst. Nat. Edit., 10, 447 (1958)

General coloration bright red and black, head ventrally, laterally around eyes and ocelli, apex of



Figs. 64-71. Genitalia, *Lygaeus creticus*: (64, 65) clasper (66) pygophore (ventral view), (67) sperm reservoir (dorsal view), (68) phallosome (lateral view), (69) sperm reservoir and gonoporal process (lateral view), (70) spermatheca (71) eighth female tergum.

tylus and jugae and antennae black or dark brown, remaining areas of head bright red or pale, eyes and ocelli dark red, anterior one-half of pronotum exceeding calli and posterior margin black, posterior two-thirds of lateral margins and area between anterior and posterior black areas red, scutellum black, inner margin and apical one-half of clavus black with a distinct black shiny area near base of black area, rest of clavus red, corium red except for a median transverse black band running from outer margin to joint of inner and apical margin, membrane fuscous, margins, a triangular area near base, a median circular spot and a triangular area near middle of basal margin white, sometimes circular spot and triangular area near middle of basal margin connected to each other, abdominal venter mostly red, anteriolateral angle and medioventral areas of most sterna black, genital almost entirely black, body covered with very short depressed hairs, more prominent in black areas.

Form elongate, head broader than long (1.3:1), ocelli closer to eyes than to each other (1:8), eyes touching anterior pronotal margin, pronotum broader than long (1.5:1), areas anterior and posterior of calli depressed, carina lacking, scutellum with a T-shaped elevation, lateral margins slightly sinuate, hemelytra well developed, exceeding apex of abdomen, male genitalia as in Figs. 73-78, pygophore large

(Fig. 76), posterior margin in ventral view almost straight, anterior margins with a poorly sclerotized median area, lateral and posterior margins with long dense hairs, clasper (Figs. 73, 74) very stout, blade with a small projection, inner and outer lobes well developed, sperm reservoir (Fig. 77) moderately large, support, sclerite like *L. creticus*, gonoporal process (Fig. 78) moderately long, not coiled like *Caenocoris* (Fig. 30), phallosome (Fig. 75) with long dorsal and apical separate ridges, spermatheca (Fig. 79) tubular, duct moderately long, flanges lacking, eighth female tergum (Fig. 80) with three small anterior projections.

**Body Measurement.** Male: body length 10.7, maximum width 3.3, length head 1.3, width 1.7, maximum width pronotum 3.3, median length 2.0, length corium 5.5, diagonal length membrane diagonal length membrane 5.2, length antennal segments I 0.6, II 1.5, III 1.2, IV 1.4, length labial segments I 1.0, II 1.0, III 0.7, IV 0.6, range body length 10.0–11.0, maximum width 3.0–3.5.

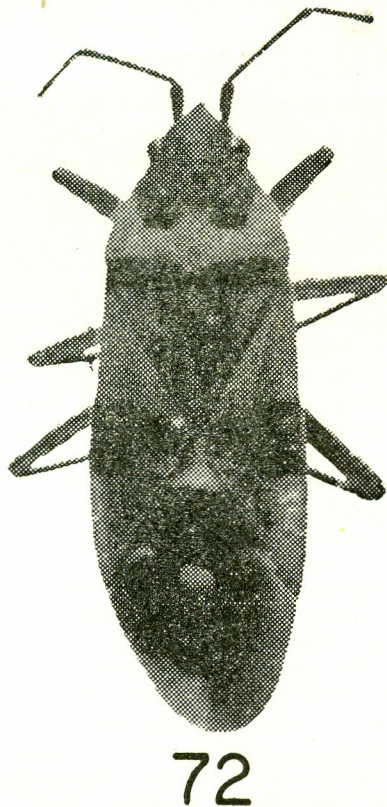
**Material Examined.** W. Pakistan. 2 males and 1 female, Abbotabad, 2.V.1971 (Ahmed I.); 1 female Rawalpindi, 25.XI.1971 (Ahmed); 1 female, Muree 12.IV.1972 (A. Hamid).

**General Distribution.** Europe, N. Africa, China, India, Iran, Israel, Japan, Pakistan (new record), Siberia, Syria, Turkistan, Turkey.

### Genus *Melanocoryphus* Stål

*Lygaeus* sg. *Melanocoryphus* Stål Ofv. Vet. Akad. Forh. 29 7:41 (1872)

Fig. 72. *Lygaeus equestris* (dorsal view).



*Melanocoryphus* Stål Enum., Hem., 4, 111 (1874)

Prior to 1965 this genus contained 45 species distributed in all major zoogeographic areas of the world.<sup>13</sup> Recently<sup>9</sup> the genus was revised and a new genus, *Horvathiolus* Josifov, was erected to include a portion of the genus *Melanocoryphus* Stål. The criteria for this splitting were mainly the shape of the opening of the male genital capsule and various combinations of colour characters. The new grouping has been questioned lately.<sup>14</sup>

We have only one species of the genus *Melanocoryphus* in our sample. It is a new record from this area.

*Melanocoryphus albomaculatus* (Goeze) (Fig 81)

*Cimex albomaculatus* Goeze, Ent. Beytr, 2, 279 279 (1778)

General coloration black and red, head, antennae, labium and legs dark brown to black, anterior pronotal margin black, caller region, lateral sides, a median semicircular area along posterior margin and median carina joining caller region and semicircular area red, remaining posterior half of pronotum

Figs. 73–80. Genitalia *Lygaeus equestris*: (73, 74) clasper, (75) phallosome (lateral view) (76) pygophore (ventral view), (77) sperm reservoir (dorsal view), (78) gonoporal process, (79) spermatheca, (80) eighth female tergum.

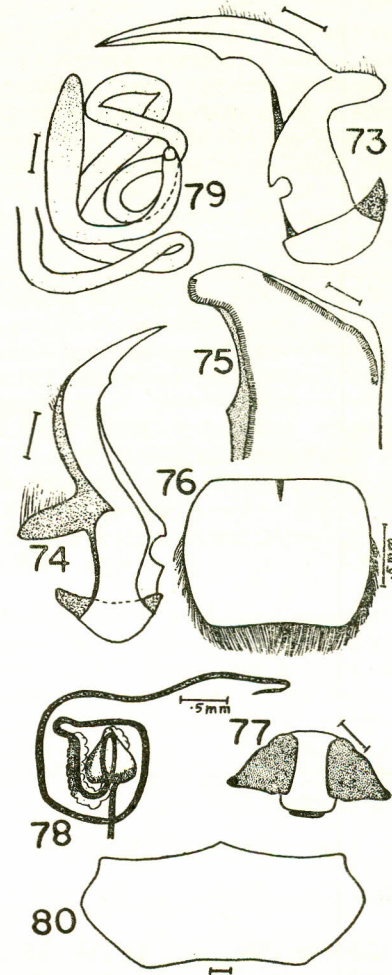
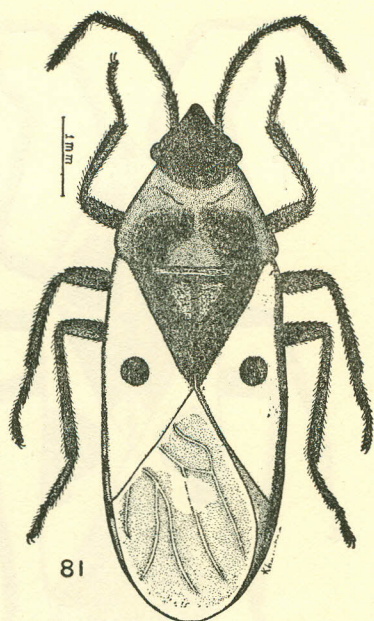
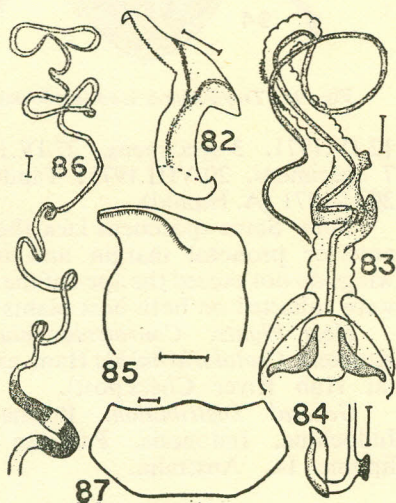


Fig. 81. *Melanocoryphus albomaculatus* (dorsal view).



Figs. 82-87. Genitalia, *Melanocoryphus albomaculatus*: (82) clasper, (83) phallus dorsal view (phalotheca omitted), (84) sperm reservoir (lateral view), (85) phalotheca (lateral view) (86) spermatheca (uncoiled to show length), (87) eighth female tergum.



black, scutellum and clavus dark brown, corium red except circular median spot black, membrane fuscous, margins and a median ovalalarea white, median white area joined to basal margina white area, thoracic sterna and pleura, median are of abdominal sterna, third, fourth and genital segments black, remaining steranal areas red except a small black spot on anterior lateral angle of abdominal sterna 3-5 black.

Form oval, head broader than long (1.6:1), eyes touching anterior pronotal margin, ocelli closer to to eyes than to each other (1:10), pronotum with caller region and lateral margins elevated, scutellum with a T-shaped carina, lateral areas to median carina depressed, hemelytra exceeding apex of abdomen, male genitalia as in Figs. 82-85, clasper (Fig. 82) with well developed blade, inner surface serrated, outer lobe distinct, inner lobe lacking, sperm reservoir (Figs. 83, 84 ) well developed, support sclerite (Fig. 84) small, gonoporal process (Fig. 83 ) moderately long, not coiled, opening simple, phalotheca (Fig. 85)

with a ridge along apical margin, spermatheca (Fig. 86) tubular, tapering to a fine at apex, duct long, basally swollen, no flanges, eighth female tergum (Fig. 87) without processes.

**Body Measurements.** Male: Body length 7.3, maximum width 2.5, head length 0.9, width 1.5, maximum width pronotum 2.2, median length 1.3, length corium 3.5, diagonal length membrane 3.6, length antennal segments I 0.5, II 1.1, III 0.7, IV 1.1, length labial segments I 0.7, II 0.7, III 0.6, IV, 0.5, range body length 7.0-8.5, maximum width 2.5-3.6.

**Material Examined.** W. Pakistan, 1 male\* and 1 female, Chutair, 8.V.1969 (Shadab and Q. Abbasi) 1 female Lyallpur, 5. XI. 1969 (Aslam).

**General Distribution.** Europe, N. Africa, Caucasus, Iran, Pakistan (new recrod), Turkistan, Turkey.

**Genus *Melanotelus* Reuter**

*Melanotelus* Reuter Rev. 'd Ent.14, 200,202 (1885);

*Melanotelus* Scudder, Pacif. Insects, 10, 155(1968)

Reuter<sup>11</sup> originally erected this genus in 1885. The type species was fixed by Distant<sup>3</sup> as *M. argillaceus* Reuter from Mauritius. Bergroth<sup>1</sup> synonymized it with *Lygaeosoma* Spinola. Scudder<sup>12</sup> removed *Melanotelus* from synonymy with *Lygaeosoma* although he gave no distinguishing characters. Slater and Sperry<sup>14</sup> agree that this action is justified. Accordingly they referred the following six species to *Melanotelus argillacea* Reuter (from Mauritius), *bipunctata* (Dallas) (from Burma, Ceylon, India, Indochina, Indonesia (type locality), Philippines, Australia), *sordida* Distant (from India), *timorensis* Distant (from Timor), *villiersi* Hoberlandt (from French Sudan) and *villosula* (Stal) (from E., W., N., S. Africa, Natal (type locality), Arabia, Israel, Syria). In our key to the genera of Pakistani Lygaeinae<sup>6</sup> the members of the genus *Melanotelus* will key out to *Lygaeosoma*. They can be identified from that genus by using the following characters.

- Metapleura posteriorly obliquely truncate.....*Lygaeosoma*
- Metapleura posteriorly externally strongly produced.....*Melanotelus*

*Melanotelus bipunctata* (Dallas) (Fig. 88)

*Lygaeus bipunctatus* Dallas, List Hem. B.M., 2, 547 (1852).

General coloration reddish brown, head, antennae, labium and legs uniformly brown to dark brown, pronotum pale brown with a pair of dark brown spots near anterior margin and one pair of large dark brown areas on shoulders, clavus and corium reddish brown, membrane dark brown, apex, angle of basal and inner margin and a median area along basal margin white, venter pale brown, thoracic pleura with a pair of dark brown spots, genital segments dark brown, body covered with long, thick hairs.

Form oval, head broader than long (2:1), swollen,

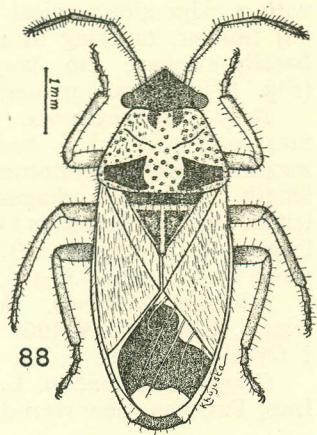
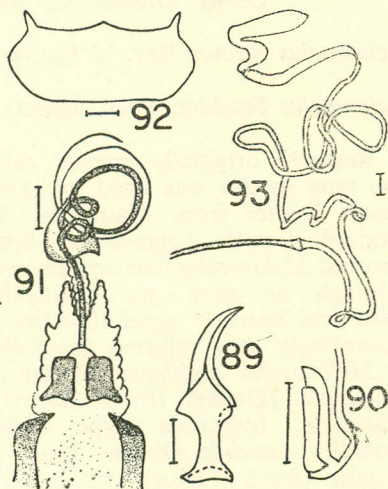


Fig. 88. *Melanotelus bipunctata* (dorsal view).



Figs. 89-93. Genitalia, *Melanotelus bipunctata*: (89) clasper, (90) sperm reservoir (lateral view) (91) phallus, dorsal view (phallosome omitted), (92) eighth female tergum (93) spermatheca.

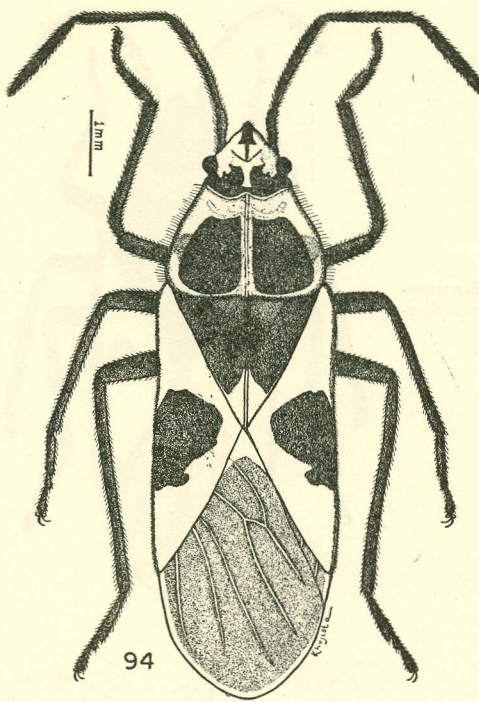


Fig. 94. *Tropidothorax concisus* (dorsal view).

12.IV.1971. 3 specimens, 27.IV.1971; Manghopeer: 7 specimens, 20.VIII.1971; Tandojam; 1 specimen, 20.II.1971 (A. Hamid).

*Note.* Some specimens lack the brown spot on the anterior pronotal margin and in many specimens wings do not exceed the apex of the abdomen. Nymph were collected on both host plants as indicated below.

*Host Plants.* *Convolvulus pluricaulis* Choisy (at Kunker), *Crotalaria burhia* Ham. ex. Bth. Papilionaceae (at Hub River Checkpost).

*General Distribution.* Burma, Ceylon, India, Indochina, Indonesia, Pakistan (new record), Philippine Is., Australia.

**Genus *Tropidothorax* Bergroth**

*Tropidothorax* Bergroth Ann. Soc. Entomol. Belg., 38, 547 (1894)

This genus includes 14 species distributed in the Palearctic (8), Oriental (5) and Ethiopian (1) regions. Two species have also been reported from New Caledonia (one exclusively from there). We have two species of this genus in our collection. Both of them show a disjunct distribution. Since the taxonomy of this genus is less than desirable, the species identification is rather tentative. Future studies will therefore throw more light on the distribution of these species.

The genus can be identified by its red or orange scent orifice and carinate pronotum.

**Key to the Pakistani Species of *Tropidothorax***

Scutellum entirely black, calli red (Fig. 94).....  
 .....*T. concisus*

ocelli hard to see because of hairs, but closer to eyes than to each other (1:8), eyes touching anterior pronotal margin, pronotum lacking carina, callar region slightly elevated, pronotum broader than long (1.4:1) scutellum with a T-shaped carina, sides of median carina depressed, hemelytra well developed, membrane exceeding apex of abdomen in most cases, male genitalia as in Figs. 89-91, clasper (Fig. 89) small, blade well developed, inner and outer lobes conical and small sperm reservoir (Figs. 90, 91) well developed, support sclerite lacking (Fig. 90), gonoporal process (Fig. 91) moderately long, apical process distinct, phallosome simple, ridges lacking, spermatheca (Fig. 93) elongate, duct long and very thin, proximal flange present, female eighth tergum (Fig. 92) with a pair of lateral processes.

*Body Measurement.* Male: Body length 5.5, maximum width 2.2, length head 0.6, width 1.2, maximum width pronotum 2.0, median length 1.4, length corium 3.0, diagonal length membrane 2.5, segments I 0.4, II 0.8, III 0.6, length labial segments II 0.5, III 0.5, IV 0.6.

*Material Examined.* W. Pakistan. Changamanga: 1 specimen, 15.IV.1969; Hub River Checkpost: 120 specimens, 24.V.1971, Karachi: 1 specimen, 25.XI.1967; 1 specimen, 5.II.1971; 2 specimens, 9.III.1971; 4 specimens, 11.VIII.1972; Kathor: 6 specimens, 26.IV.1971, Kunker: 48 specimens,

Figs. 95-101. Genitalia, *Tropidothorax sternalis*: (95,96) clasper, (97) sperm reservoir (lateral view), (98) phallus, dorsal view (phallotheca omitted), (99) gonoporal opening, (100) spermatheca (uncoiled to show length), (101) eighth female tergum.

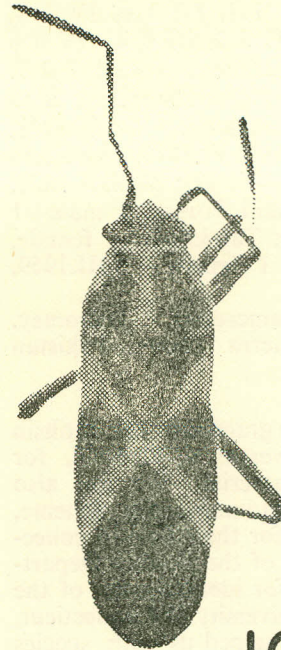
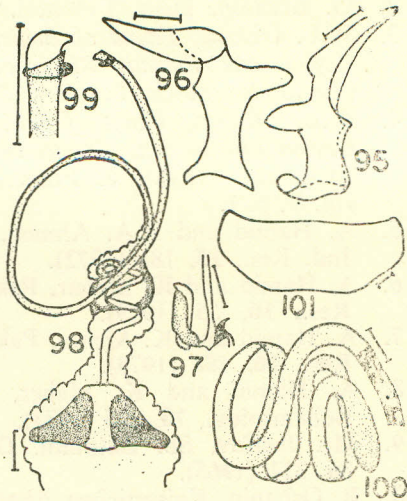


Fig. 102. *Tropidothorax sternalis* (dorsal view).

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Scutellum black but with pale median longitudinal carina, calli black or dark brown (Fig. 102).....  
.....*T. sternalis*.

*Tropidothorax concisus* Walker (Fig. 94)

*Lygaeus concisus* Walker Cat. Hem. B.N., 5, 60, 61 (1872).

General coloration brown and light red, head red except tylus and a pair of spots between ocelli black, antennae, legs and labium black, anterior one-third, lateral and posterior margin and a median longitudinal carina on pronotum red, posterior two-thirds of pronotum except the red carina black, scutellum black, clavus black except apex and base red or pale, corium red except a triangular median area black, membrane dark brown, apical margin and basal angle white, thoracic sterna black with areas around legs and posteriolateral margins and sometimes anterior margins red, abdominal venter black except most of third sternum and lateral margins of few other sterna red, third to sixth sterna with a prominent round black lateral spot.

Form elongate, head slightly broader than long (1.3:1), ocelli closer to eyes than to each other (1:4), eyes touching anterior pronotal margin, pronotum markedly elevated posteriorly, posterior margin markedly wider than anterior margin (1.8:1), median carina low but distinct, scutellum with a low median carina, hemlytra long, exceeding apex of abdomen, lateral margins straight or slightly concave.

**Body Measurements.** Female.. body length 9.0 maximum width 2.8, head length 1.3, width 1.7, length corium 4.5, diagonal length membrane 4.3, length antennal segments I 0.6, II 1.6, IV length labial segments I 0.8, II 0.6, III 0.6, IV 0.8.

**Material Examined.** One female, K. Ghat, 6.III.1969, (A.Q. Abbasi).

**Note.** The locality given on the data label is ambiguous. We suspect that it refers to Kamal Ghat in Bangladesh (formerly East Pakistan). We are including this species here to report a new record from the Subcontinent.

**General Distribution.** Flores, Lombok, Sumbawa, Pakistan or Bangladesh (?) (new recrod).

*Tropidothorax sternalis* (Dallas) (Fig. 102)

*Lygaeus sternalis* Dallas List Hem. B. M. 2, 546(1152).

General coloration black and pink, head black, vertex and juga pink, eyes, antennae, labium and legs dark brown, pronotum with two longitudinal black bands on either side of median longitudinal carina, median carina, anterior, lateral and posterior pronotal margins pink, scutellum black except median carina pink, clavus dark brown, apex pale, corium with a median triangular dark brown area, outer, inner and apical margins and basal two-fifths pale pink, membrane fuscous, basal angle and apical margin white, venter mostly black, all ventral prothoracic margins, prosternum, sclerites lateral to all legs, scent gland orifice and posterior and lateral margins of some abdominal sterna red.

Form elongate, head broader than long (1.6:1) eyes touching anterior pronotal margins, ocelli closer to eyes than to each other (1:7), pronotum like *T. concisus* but median carina present almost throughout median length, scutellum with a median carina, wings exceeding apex of abdomen, male genitalia in Figs. 95-99, clasper (Figs 95, 96) small but stout, blade with a small lobe, outer lobe well developed and fingerlike, inner lobes small and conical, sperm reservoir (Figs. 97, 98) with well developed wings and bulb, support sclerite (Fig. 97) small with a minute dorsal process, gonoporal process (Fig.98) moderately long, opening (Figs. 98, 99) with well defined shape and a pair of subapical processes, spermatheca (Fig. 100) elongate, duct moderately long, flanges lacking, eighth female tergum (Fig. 101) simple.

**Body Measurements.** Male: Body length 6.4, maximum width 2.0, head length 0.8, width 1.3, maximum width pronotum 1.9, median length 1.3, length corium 3.0, diagonal length membrane 3.0,

antennal segments I 0.04, II 1.1, III 1.0, IV 1.4, length labial segments I 0.7, II 0.7, III 0.4, IV 0.6 range body length 5.5-7.5, maximum width 1.7-2.5.

*Material Examined.* Pakistan. Gulamullah, Sind Province: 11 males+2 females, 20.IV.1971, (A. Hamid); Hyderabad: 1 male, 7.VI.1970, (Ali Khan Lyallpur: 1 female, 17.IV.1969, (Farid); Malir: 1 male, 18.1.1968 (Farid Ahmed); Miani Forest: 1 male+1 female, 7.VI.1970 (Ali Khan); Tandojam: 1 female, 24.III.1969 (Farid); Thatta: 1 female, 6.III.1969, (I. Ahmed).

*General Distribution.* Cameroons, Dahomey, Guinea, Liberia, Nigeria, Sierra Leone, Pakistan (new record).

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