FOUR NEW AND ONE KNOWN SPECIES OF THE GENUS *SARDIA* MEL. (FULGOROIDEA: DELPHACIDAE) FROM PAKISTAN

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ABSTRACT

Genus *Sardia* Melichar is one of the small genera of the family Delphacidae. Only a few species of the genus are recorded from Oriental, Palaearctic and Ethiopian regions. Previously, none of the species was recorded from Pakistan. During present studies, five species of the genus were described. Of these four species viz., *Sardia balakotiensis., Sardia campusii, Sardia sialkotensis* and *Sardia gilgitensis* treated as new species and *Sardia rostrata* Mel. has been treated as a new record from Pakistan. A key to Pakistani species of genus *Sardia* has also been prepared to accommodate all the species recorded from Pakistan.

INTRODUCTION

Genus *Sardia* is distributed all over the Oriental, Ethiopian and Palaearctic regions of the world. Melichar (1903) described the genus for the species *Sardia rostrata* Melichar recorded from Ceylon. Kirkaldy (1906) treated the same species under the genus *Haedeodalphax*. Distant (1906) regarded it as a species of genus *Sardia* and described along with Melichar's figures. But Distant (1916) recorded and again examined the same species and kept it as *S. rostrata*, added new locality records from India and provided a more exact drawings of the species. Distant *(loc. cit.)* also commented that Kirkaldy (1908) referred another species of the genus as *S. pluto* recorded from Ceylon without any reference. He also described a new species of the genus as *S. pronosal* is differing from *S. rostrata* in having apex of vertex being more truncate and not produced, less contracted and pronotum greyish white. Muir (1921) recorded and described another species of the genus known as *S. scampbelli* from South India. Fennah (1957) provided a new locality record of *S. pluto* from Southeast Polynesia. Dlabola (1981) recorded the same species from Iran. Fennah (1965) treated the same species as a sub-species and named its as *Sardia rostrata pluto.*

Stal (1804) worked on Queensland collection of the genus *Sardia* and compared it with the species recorded from India and Siagon but does not created a clear line of demarcation between the two species and revised the known species as a new record from Australia.

Uptill now, five species of the genus *Sardia* have been recorded from India, Pakistan and Sri Lanka. *Sardia rostrata* is widely distributed species and also has been recorded from Iran, Afghanistan and USSR. During the present studies, five species of the genus have been recorded from Pakistan. Out of which four are new to science and one is already known species. A key to the species of the genus *Sardia* from Pakistan is also provided.

Genus *Sardia*

Sardia, Melica Hom. faun. Ceylon. P. 96 (1903).
Hadeodelphax, Kirkaldy. Rep. exp. Stat. haw. Plant. Assoc. Bull. 1 p.410 (1906)
Type species: *Sardia rostrata* Melichar Hom. Faun. Ceylon, P. 96, t. ii, f. 4,a,b (1903).

KEY TO THE PAKISTAN SPECIES OF THE GENUS *Sardia*

1. Head moderately produced before eyes; paramere with a median broad process 2

   Head greatly produced before eyes; paramere with more than one process 3

2. Aedeagus tubular, nearly 3/4th part uniformly broad with a single dorsal apical tooth ..... ***S. campusii*, n.sp.**

   Aedeagus tubular with a series of teeth on dorso-apical margin ..... ***S. rostrata* Melichar**

3. Anal segment very small; paramere with rounded median projection on dorsal margin ..... ***S. gilgitensis*, n.sp.**

   Anal segment of moderate size; paramere with 1-3 projections on apical half of ventral margin 4

4. Aedeagus simple, tubular, curved; paramere with three dorsal processes, ventral margin smooth ..... ***S. sialkotiensis*, n.sp.**

   Aedeagus complex, strongly curved; median ventral projection with spines all over ..... ***S. balakotensis*, n.sp.**

Sardia rostrata Melichar

(Fig. 1 A-F)

Male

Form and Colour

Length 0.4 mm. Vertex and pronotum creamy white, vertex longer in middle line than broad at base, meeting with frons at subacute angle, apex wider than base, posterior margin truncate, apical margin convex with median carinae projecting, Y-shaped carinae distinct, submedian carinae uniting near apex; frons longer than broad, broadening towards clypeus, lateral margins shallowly concave, median carinae elevated, frons and half of clypeus black, antennae short, reaching base of clypeus. Ist segment very small, ring-like, 2nd segment about three times longer than Ist segment; pronotum broader than head, anterior margin sinuate, tricarinate, lateral carinae strongly diverging posteriorly, attaining hind margin; pronotum with spots on each half; mesonotum as long as vertex and pronotum together, lateral margins weakly concave, tricarinate, lateral carinae diverging posteriorly, not attaining posterior margin, scutellum black but externally creamy white, body black dorsoventrally. Wings, apical margin rounded, cubitus and Sc + R forking at the same level, 7 apical cells tinted with brown ochraceous colour and with an elongated marginal spot or middle of wing.

Genitalia

Bilaterally symmetrical; broader than long, lateral margin oblique; anal segment broad, large, triangular, anal hooks laterally produced, reaching the base of anal segment, apically pointed, aedeagus short, broad, tubular, nearly uniform in thickness, with five teeth, sub-apically; parameres elongate, moderately widened basally than apically, apical angles strongly developed.

Materials examined

Ten males and 17 females from Karachi and Rawalpindi on grass and Sorghum by M. Anwar, dated nil; deposited in the Zoological Museum, Department of Zoology, University of Karachi, Karachi-Pakistan.

Sardia rostrata Melichar recorded and described from three zoographical regions of the world, cosmopolitan species. Melichar (1903), Distant (1906; 1916), Kirkaldy (1906) and Dlabola (1981) described the species from different localities of the world. For Pakistan, it is a new locality record. The male genitalia of the species is illustrated, Presently, it is recorded from Karachi and Rawalpindi on grass and Sorghum respectively, in quite good numbers.

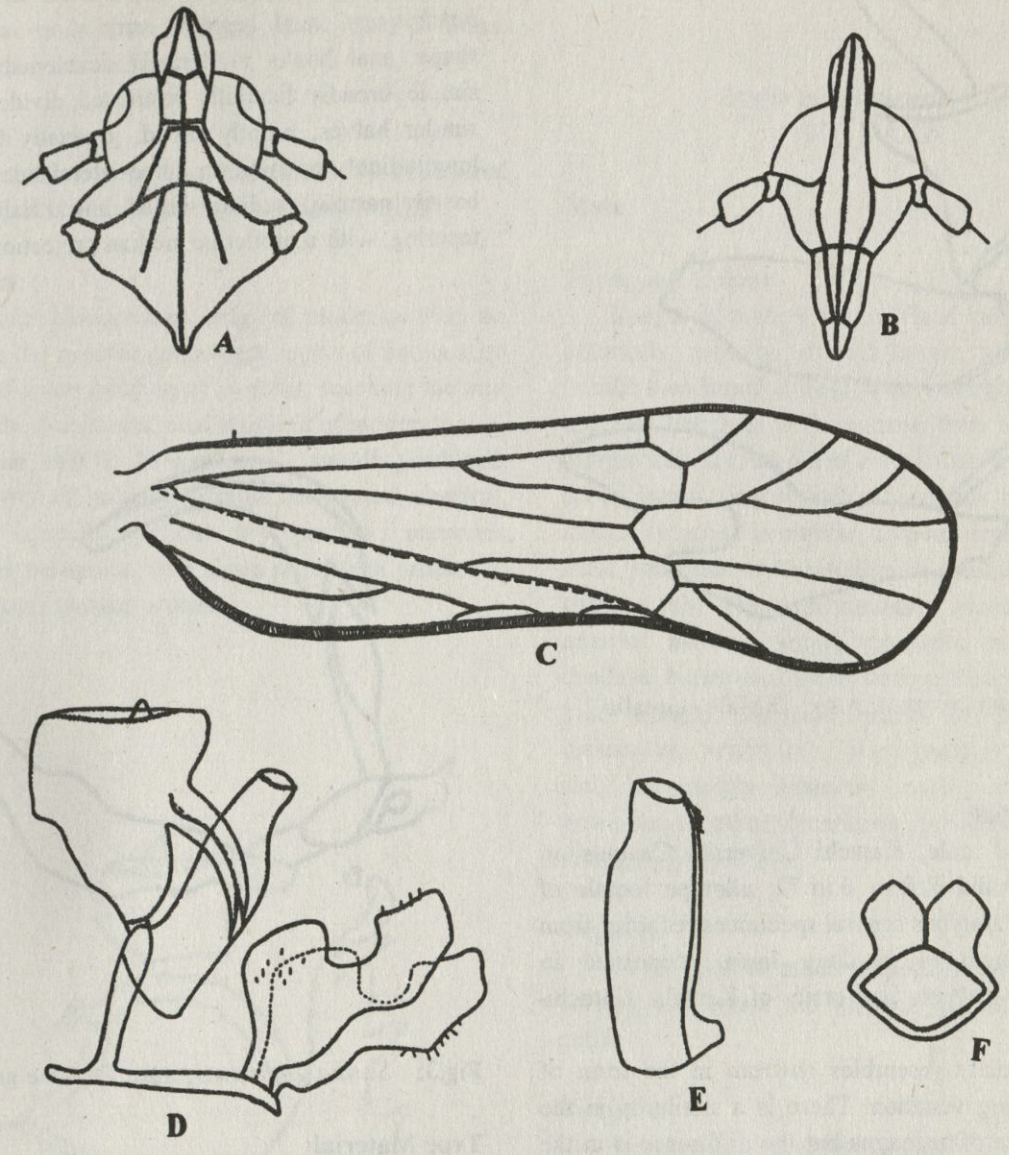

Fig.1: *Sardia rostrata* Melichar; A. Head dorsal view; B. Head frontal view; C. Tegmina; D. Male genitalia; E. Aedeagus; F. diapharm

***Sardia campusii*, n.sp.**

(Fig. 2 D)

Male

Form and Colour

Same as *Sardia rostrata.*

Tegmina

Same as that of genus.

Genitalia

Pygofer broader than long; anal segment moderately large, with anal hooks, hooks apically pointed; aedeagus elongated, broad, tubular, nearly of uniform thickness. Apically only with one tooth directed dorsally, gonopore terminal; paramere basally narrow, medianly giving rise to a process of nearly equal width.

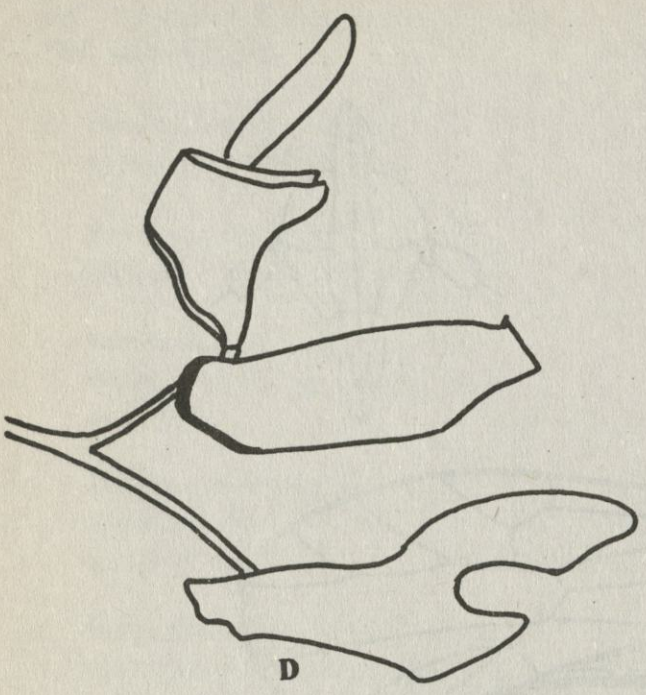

Fig.2: *Sardia compusii* n.sp.; D.Male genitalia

Type Material

Holotype male, Karachi University Campus on grass by Khalid Rahim 6.iii.72; allotype female of same data. Paratypes several specimens recorded from the Department of Zoology lawns, deposited in Zoological Museum, University of Karachi, Karachi-Pakistan.

This species resembles *rostrata* in the form of head and wing venation. There is a similarity in the general shape of aedeagus but the difference is in the number of teeth on aedeagus, in the present species, there is only a single tooth while in *S. rostrata,* there are five teeth. In the shape of paramere, this species is quite close to *S. balakotiensis,* n.sp.

***Sardia gilgitensis,* n.sp.**

(Fig. 3 D)

Male

Form and Colour

Same as of *S. balakotiensis,* n.sp.

Tegmina

Same as in *S. balakotiensis,* n.sp.

Male genitalia

Symmetrical, pygofer very similar to that of *S. balakotiensis* anal segment very short, squarish in shape, anal hooks moderately developed, aedeagus simple, broadly distinctly bifurcated, divided into two similar halves, basally broad, gradually tapering, a longitudinal line runs on dorso-lateral side, paramere basally narrow, medially broad, apical half gradually tapering, with a moderate median projection.

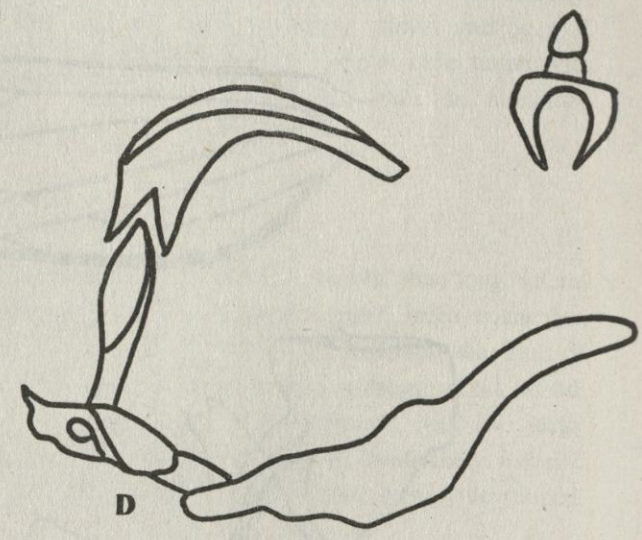

Fig.3: *Sardia gilgitensis,* n.sp; D. Male genitalia

Type Material

Holotype male, Gilgit on grass by M. Anwar, paratype one male and 11 females from Skardu by Khalid Rahim, recorded on 9.vi.75; deposited in Zoological Museum, University of Karachi, Karachi-Pakistan.

***Sardia sialkotensis,* n.sp.**

(Fig.4 D)

Form and Colour

Head, pronotum and scutellum brown ochraceous, tip of vertex as wide as base; pronotum as long as

scutellum, lateral carinae of pronotum and scutellum in a straight line; median carinae of frons forked at a distance one by third (1/3) from the base of frons; frons broader in middle.

Tegmina

Shorter than body, reaching almost fifth abdominal segment, with a black patch along apical margin.

Genitalia

Pygofer broader than long, of moderate size, no hooks on the pygofer diaphragm, a pair of hooks arise at base of lower opening of pygofer, reaching the mid level of the diaphragm; anal segment of moderate size, rectangular, anal hooks very small, laterally produced, apices rounded; aedeagus simple, elongated, slendral, directed ventrally without any process; paramere elongated, triangular, with three prominent processes, apically with twisted process.

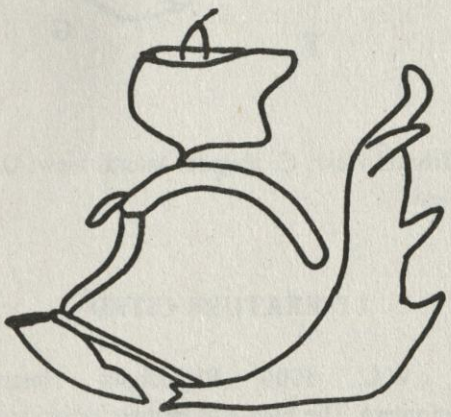

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Fig.4: *Sardia sialkotensis*, n.sp; D. Male genitalia

Type Material

Holotype male, Sialkot, on grass; recorded by M. Anwar on 19.xi.75. Quite a good number of paratypes recorded from Balakot, Jhelum, Abbottabad on berseem, grass and wheat.

***Sardia balakotiensis*, n.sp.**

(Fig. 5 A-G)

Male

Form and Colour

Length of male 4.4 mm. Head strongly produced anteriorly, cephalic process longer, vertex longer in middle than broad at base, lateral margins converging, apically rounded, apex narrow than base, posterior margin truncate, devoid of carination; frons longer than broad, lateral margin shallowly convex, median carinae absent, broadest at middle, clypeus devoid of carinae; head, pronotum and scutellum of greenish colour, face shiny green; pronotum distinctly broader than head, anterior margin sinuate, posterior margin slightly concave, bicarinate, lateral carinae diverging, attaining hind margin; central carinae of pronotum and mesonotum pale with a black parallel line on lower side; mesonotum distinctly smaller than head and pronotum together, bicarinate, lateral carinae slightly diverging posteriorly;

Tegmina

Black, hyaline, much surpassing abdomen, Sc + R forking just above the level of nodal cell, 7 apical cells.

Genitalia

Symmerical, pygofer broader than long, with posterior-later margin strongly oblique, a sub-conical projection close to ventral margin, anal segment short, rectangular, anal hooks slightly developed; aedeagus complicated, giving rise a pair of strongly slender processes, directed, ventrally, main aedeagus tubular, strongly recurved, directed, ventrally; paramere basally narrow, subapically give rise to a process, greatly produced.

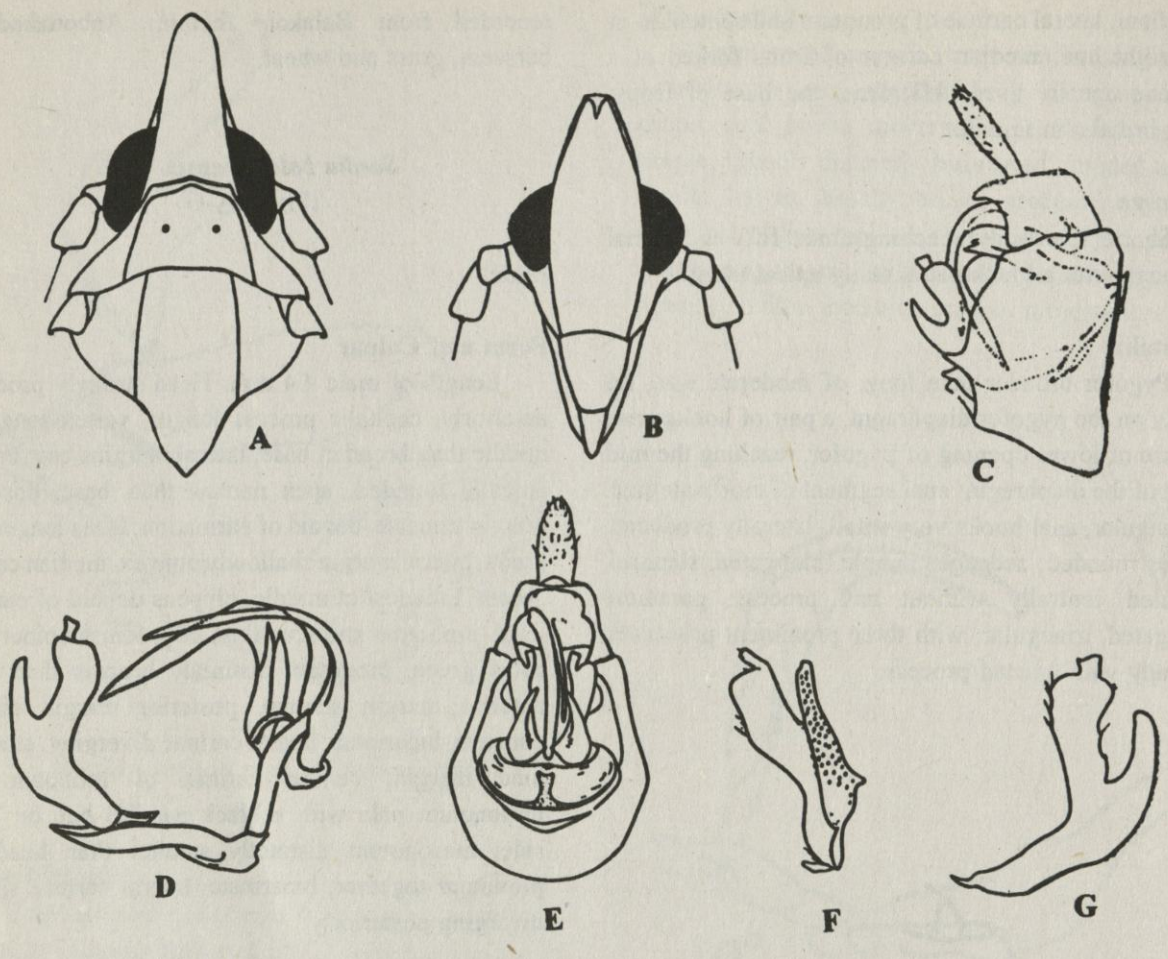

Fig.5: *Sardia balakotensis* n.sp.; A. Head dorsal view; B. Head frontal view; C. Pygofer lateral view; D. Male genitalia; E. Pygofer posterior view; F. Paramere lateral view.

Material

Holotype male Balakot on grass by M. Anwar, 9.vi.75; allotype female of same data; deposited in Zoological Museum, University of Karachi, Karachi, Pakistan.

Distribution

This species has been recorded only from Balakot, Pakistan.

Remarks

This species is greatly different from *Sardia rostrata* in the shape of head, carination and colour. Male genitalia is entirely different as shown in the Figure 5.

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