

**THE COCKCHAFERS AND DUNG-ROLLERS OF PAKISTAN OF THE DESMONYCNINAE,  
EUCHIRINAE AND RUTELINAE (PELTONOTINI, PARASTASIINI AND ADORRHINIPTIINI)  
ALONG WITH THE DESCRIPTION OF FIVE NEW SPECIES OF  
ANOMALA (COLEOPTERA: SCARABAEIDAE).**

MOHAMMAD ABDULLAH and (Miss) ROSHAN ARA ROOHI

*P. C. S. I. R Laboratories Karachi-32*

(Received June 13, 1968)

Keys (with distinguishing characters) are presented for the identification of the genera and species of the Desmonycinae, Euchirinae and Rutelinae (Peltonotini, Parastasiini, and Adorrhinyptiini) of East and West Pakistan. Five new species of *Anomala* Samouelle (Anomalini, Rutelinae) are described from West Pakistan: *A. anwari* sp. n., *A. yunusi* sp. n., *A. akbari* s. n., *A. lyallpurensis* sp. n., and *A. ikrami* sp. n. A revised key to the nineteen West Pakistan species of *Anomala* is also included.

### Introduction

This is the latest of a series of papers on the Scarabaeidae of Pakistan. The preceding papers have already been published in this journal (Abdullah and Roohi, 1968).

Little is known about the bionomics of the groups treated here. Nothing is known about the Desmonycinae. Larvae of the Euchirinae feed in and upon decaying wood—the decaying interiors of old tree-trunks, and when mature upon the sweet exudations from various trees. Our *Propomacrus macleayi* (Hope, 1841) Deyr., 1874 is associated with the oak tree, *Quercus incana*. Of the Rutelinae, nothing is known about the Peltonotini. The Parastasiini feed in the larval state upon rotting wood. We are not aware of the habits of the Adorrhinyptiini or the species of *Anomala* Samouelle (Anomalini) described in this paper.

### Systematics

#### *Desmonycinae:*

There is only one genus *Desmonyx* Arrow, 1907 with one species *D. humeralis* Arrow, 1907 found near East Pakistan in Burma, Ruby Mines. This species may be found in East Pakistan.

The group has not been recorded in or near West Pakistan.

#### *Euchirinae*

There is only one genus *Propomacrus* Newman, 1837 with four species likely to be found in East Pakistan which are separated as follows (Arrow, 1917).

1. Pygidium clothed with long erect hairs; shorter, with the widest part behind the middle.

In the male, clypeus longer; front femur with a triangular lamina in front 2

Pygidium clothed with short, close-lying hairs, long only at the extremity; elytra longer, with the widest part before the middle, the pale blotches confluent. In the male, clypeus very short; terminal process of the front tibia very long; femur with an acute tooth near the middle

*P. parryi* (Gray, 1848) Deyr., 1874

2. Moderately broad and compact; pale blotches of the elytra scattered 3

Very broad and compact; pale blotches of the elytra confused and often annular. In the male, front tibia very gently curved, its terminal process long

*P. gestroi* (Pouill., 1913) Arrow, 1917

3. Elytra almost without pale longitudinal lines. In the male, anterior half of the front tibia strongly and abruptly curved, its terminal process shorter than the median process

*P. macleayi* (Hope, 1841) Deyr., 1874

Elytra with pale longitudinal lines. In the male, anterior half of the front tibia very gently and not abruptly curved, its terminal process rather longer than the median one

*P. henrici* (Pouill., 1913) Arrow, 1917

The group has not been recorded in West Pakistan.

#### Rutelinae

(vide Abdullah and Roohi, 1968)

(a) *Peltonotini*.—There is only one genus *Peltonotus* Burm., 1847 with two species from East Pakistan which could be separated as follows (Arrow, 1917).

1. Pygidium clothed with long hair; clypeus without a marginal tooth  
*P. morio* Burm., 1847

Pygidium with hair  
*P. pruinosus* Arrow, 1910

The group has not been recorded from West Pakistan.

(b) *Parastasiini*.—The following key is presented for the identification of the genera and species from East Pakistan (Arrow, 1917).

1. Ante-ocular ridges very prominent; not clothed with dense hair dorsally  
*Fruhstorferia* Kolbe, 1894 2

Ante-ocular ridges not very prominent 3

2. Light-coloured; hind legs slender  
*F. dohertyi* Ohaus, 1905

Dark-coloured; hind legs short and thick  
*F. birmanica* Arrow, 1907

3. Four posterior tibiae very spinose at their outer edges; mandibles of the male not produced laterally  
*Peperonota* Westw., 1847 4

Four posterior tibiae not very spinose at their outer edges  
*Parastasia* Westw., 1841 5

4. Chestnut-brown with some parts yellow  
*P. harringtoni* Westw., 1847

Testaceous with some parts black or brown  
*P. cristata* Arrow, 1917

5. Clypeus strongly bidentate in front 6

Clypeal margin bluntly bilobed; elytra punctate in lines  
*P. ochracea* (Waterh., 1875)  
Arrow, 1917

6. Pygidium everywhere densely sculptured; scutellum long and sharp-pointed; elytra without posterior yellow spot  
*P. rufopicta* Westw., 1841

Pygidium not everywhere densely sculptured 7

7. Clypeus very small; pronotum coarsely punctate  
*P. indica* Ohaus, 1898

Clypeus not very small, pronotum finely punctate 8

8. Red, with the head black  
*P. sulcipennis* Gestro, 1888

Red, with the head, scutellum and base of elytra black  
*P. alternata* Arrow, 1899

The group has not been recorded from West Pakistan.

(c) *Adorrhinyptiini*.—There is only one genus *Adorrhinyptia* Arrow, 1917 with two species in Pakistan, one *A. ruficollis* (Kraatz, 1895) Arrow, 1917 from East Pakistan and another *A. dorsalis* (Burm., 1855) Arrow, 1917 from West Pakistan.

(d) *Anomalini*.—(Vide Abdullah & Roohi, 1968).—The following revised key is offered for the identification of the nineteen West Pakistani species of the genus *Anomala* Samouelle, 1819 which includes the five new species described below.

1. Mesosternum produced between the mesocoxae 2

Mesosternum not produced between the mesocoxae 13

2. Pronotum of one colour dorsally as well as laterally (*i.e.*, without prominent spots) 3

Pronotum of more than one colour 8

3. Dorsal surface green 4

Dorsal surface yellow or brown 6

4. Elytra with the humeral or apical calli ruby-red  
*A. stoliczkae* Sharp, 1873

Elytra entirely green 5

5. Ventral surface green  
*A. anwari* **sp. n.**

Ventral surface black  
*A. viridis* (Fabricius)

or a new species described by Abdullah & Roohi, 1968.

6. Dorsal surface brown 7

Dorsal surface yellow with the pronotum rosy  
*A. xanthonota* Arrow, 1917

7. Body narrow (Fig. 2)  
*A. yunusi* **sp. n.**

- Body broad *A. qadrii* Abdullah & Roohi, 1968
8. Pronotum brown and black 9
- Pronotum green and red  
*A. moorei* (Kraatz, 1892)  
Arrow, 1917
9. Pronotum with one black spot on the disc 10
- Pronotum with two black spots on the disc 12
10. Elytra without longitudinal bands 11
- Elytra with longitudinal bands  
*A. lyallpurensis* **sp. n.**
11. Elytra black with a yellowish brown spot near base  
*A. shafqati* Abdullah & Roohi, 1968
- Elytron yellowish brown with a black spot near base  
*A. akbari* **sp. n.**
12. Elytron black with two brown spots  
*A. ikrami* **sp. n.**
- Elytron brown without prominent spots  
*A. ashrafii* Abdullah & Roohi, 1968
13. Pronotum of one colour dorsally as well as laterally 14
- Pronotum of more than one colour 16
14. Dorsal surface green; clypeus of the male with rounded or obtuse front angles; elytra of the female not angularly dilated 15
- Dorsal surface testaceous or reddish; clypeus of the male with sharp front angles; elytra of the female angularly dilated  
*A. dorsalis* (Fabricius, 1775)  
Burm., 1844
15. Legs and ventral surface uniform deep green, not at all golden or fiery; aedeagus with the parameres narrowed apically  
*A. chlorosoma* Arrow, 1917
- Legs and ventral surface not uniform deep green; aedeagus with the parameres dilated apically  
*A. dimidiata* (Hope, 1831)  
Arrow, 1917
16. Base of the pronotum completely margined 17

- Base of the pronotum not completely margined 18
17. Pronotum with a black triangular spot on each side  
*A. rugosa* Arrow, 1899
- Pronotum with the lateral margins green in the male and with two green spots in the female  
*A. fulviventris* (Blanch., 1851)  
Arrow, 1917
18. Elytra strongly striate-punctate  
*A. lineatopennis* Blanch., 1851
- Elytra without strongly-marked grooves or lines of punctures  
*A. xanthoptera* Blanch., 1851

The new species described below have the characteristics of the section VI of *Anomala* species (Arrow, 1917). The seventh abdominal sternite is entire in the female and slightly emarginate in the male.

1. *Anomala anwari*, **new species** (Fig. 1)

*Holotype*.—Female, West Pakistan, Balakot (A.M. Anwar), August 22, 1965, at the University of the Panjab, Lahore.

*Shape* as in Fig. 1.

*Colour*.—Dorsal and ventral surface metallic green with the following exceptions: eyes brown with small fuscous spots; clypeus coppery-red at base; antennae, maxillary and labial palpi dark brown to fuscous; front coxae fuscous.

*Vestiture*.—Meso- and metatibiae each with two rows of ctinidia. Pygidium clothed with long, erect pubescence (Fig. 1). Ventral surface sparsely pubescent; dorsal surface (except pygidium and propygidium) smooth.

*Punctures*.—Clypeus coarsely, densely punctate; punctures less deep than in ? *A. viridis* (F.) remaining portion of head less coarsely punctate. Pronotum sparsely, finely punctate except towards sides where the punctures are coarse, deep and dense. Scutellum finely, sparsely punctate. Elytron with coarse punctures towards sutural margin.

*Thorax*.—Mesosternal process posterior to meso-coxae broadly emarginate with arms Y-shaped at apex.

Rest as in ? *A. viridis* (F.) (Vide Abdullah & Roohi, 1968).

Total length 19 mm; maximum width 12 mm.

The species has been named in honour of the collector.

It is fairly certain that *A. anwari* is specifically distinct from the specimen already described as probably belonging to *A. viridis* (F.). The differences have been noted in the key as well as the description (*vide supra*).

In the key of Arrow (1917:241) our specimen comes to *A. isolata* Arrow, 1917 from which it differs in being less strongly punctate dorsally, in not having the pygidium and ventral surface pale, etc. *A. isolata* has been recorded from Andaman Island.

2. *Anomala yunusi*, **new species**: (Fig. 2)

*Holotype*. Female, West Pakistan (? Lyallpur), '8-12-50', at the West Pakistan Agricultural University, Lyallpur.

*Shape* as in fig. 2; body narrow.

*Colour*.—Dorsal and ventral surface dark brown with the following exceptions: vertex and frons black; eyes with black patches; raised margin of clypeus, margins of mandibles, lobes of maxilla, teeth of front tibiae, ctinidia, portions of tarsi and claws fuscous to black.

*Vestiture*.—Mesotibia with two rows and indication of a third row of ctinidia; metatibia with three rows and indication of a fourth row of ctinidia. Pygidium not hairy except for a few hairs at apex. Rest of dorsal surface essentially smooth; ventral surface only sparsely hairy.

*Punctures*.—Frons and clypeus coarsely, densely punctate. Pronotum sparsely, finely punctate; punctures only a little coarser on sides. Scutellum finely, sparsely punctate. Elytron sparsely punctate; punctures only a little coarser towards lateral margins than towards sutural margins.

*Thorax*.—Pronotum finely medially sulcate. Elytra only weakly costate. Mesosternal process as in *A. anwari*. Hind tibiae appreciably emarginate beyond middle on outer side.

Total length 15 mm; maximum width 8 mm.

The species has been named in honour of Dr. Muhammad Yunus of the University at Lyallpur.

Apart from the differences noted under the microscope from *A. qadrii* Abdullah and Roohi, this species even looks very different to the naked eye, being much narrower in shape (Fig. 2).

In the key of Arrow (1917:241) our specimen comes to couplet 51-54 where it differs from *A. festiva* Arrow, 1917 in being larger and from *A. isolata* Arrow and *A. pyroscelis* (Hope, 1841) Arrow, 1917 in not being green, in size and punctuation, etc.

3. *Anomala lyallpurensis*, **new species** (Fig. 3).

*Holotype*.—Female, West Pakistan, Lyallpur (Akbar), September 1, 1964, at the University of the Panjab.

*Shape* as in Fig. 3.

*Colour*.—Brown with the following portions black: vertex, frons, clypeus, labium; pronotum with most of the disc except sides and median longitudinal line (which is not visible to naked eye and thus the spot appears as one), scutellum at base and along margins, longitudinal bands on elytra along sutural and lateral margins, apices of femora, apices and bases of tibiae, tarsi, claws, metasternum (in part); apices of abdominal sternites three to six, propygidium (at base).

*Vestiture*.—Meso—and metatibiae each with two rows of ctinidia. Longish hairs prominent on apical margin of labrum, base of labium, apical and basal margins of prosternum, apices of procoxae and inner margins of femorae. Rest of dorsal surface essentially smooth; ventral surface only sparsely hairy.

*Punctures*.—As in *A. yunusi*, except that the punctures on elytra are essentially arranged in longitudinal rows.

*Thorax* as in *A. yunusi* but without pronotal sulcus.

Total length 13 mm; maximum width 7 mm.

The species resembles *A. shafqati* Abdullah and Roohi closely but differs in colour, shape of the mesosternal intercoxal process, etc.

In the key of Arrow (1917:241) our specimen keys out near *A. erythroptera* (Kraatz, 1892) Arrow, 1917 and *A. dohertyi* Arrow, 1917 but differs from both of them in not being green or blue-green, in distribution, etc.

4. *Anomala akbari*, **new species** (Fig. 4).

*Holotype*.—Female, West Pakistan, Lahore (Akbar), August 12, 1964, at the University of the Panjab.

*Shape* as in Fig. 4.

*Colour*.—Yellowish brown with the following parts dark: dorsal surface of head fuscous with raised margin of clypeus black, antenna with segments three to nine fuscous, apices of mandibles and ligula black; pronotum with apical margin fuscous and large, transverse spot on disc black becoming fuscous at extreme lateral margin, scutellum with base and apical margin fuscous,

elytron with all margins and a spot near base and another near apex black, apices and bases of tibiae black, tarsi and claws fuscous.

*Vestiture*. Meso- and metatibiae each with three rows of ctinidia, Rest as in *A. lyallpurensis* (but frons and clypeus rugose).

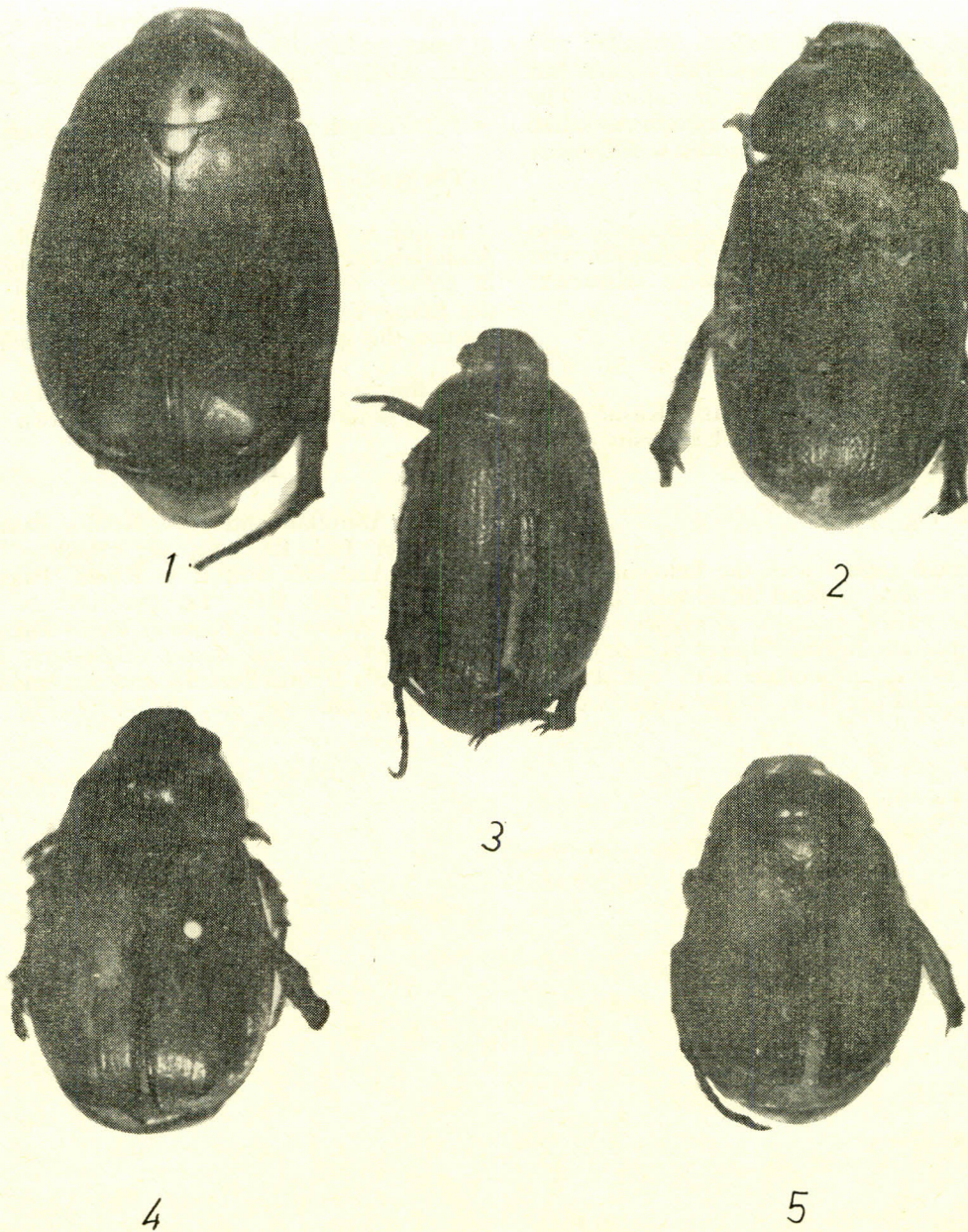


Fig. 1.—*Anomala anwari* sp. n., holotype, female, dorsal view. Fig. 2.—*A. yunusi* sp. n., holotype, female, dorsal view. Fig. 3.—*A. lyallpurensis* sp. n., holotype, female, dorsal view. Fig. 4.—*A. akbari* sp. n., holotype, female, dorsal view. Fig. 5.—*A. ikrami* sp. n. holotype, male, dorsal view.

*Punctures.* As in *A. lyallpurensis*.

*Thorax* as in *A. lyallpurensis* but mesosternal process with their arms straightened out becoming roughly T-shaped.

Total length 14 mm; maximum width 8 mm.

The species has been named after the collector.

The species resembles *A. shafqati* Abdullah and Roohi in the shape of the mesosternal process but differs in being much lighter in colour. The general coloration approaches *A. ashrafii* Abdullah and Roohi but the mesosternal process is differently shaped.

In the key of Arrow (1917:241) this species also comes to the same species as *A. lyallpurensis* and also differs from them in the same characters mentioned there (*vide supra*).

5. *Anomala ikrami*, **new species** (Fig. 5).

*Holotype.* Male, West Pakistan, Kasur (M. Ikram), October 23, 1964, at the University of the Punjab.

*Shape* as in Fig. 5.

*Colour.* Brown (light) with the following parts dark: dorsal surface of head all around margins including the raised margin of clypeus black, surrounding portion fuscous, apices of mandibles and ligula fuscous; pronotum with apical and basal margins, and two spots on disc black, scutel-

um with margins fuscous, apices and bases of tibiae black, tarsi and claws fuscous. Elytron black with two brown spots.

*Vestiture.* As in *A. lyallpurensis*.

*Punctures.* As in *A. lyallpurensis*.

*Thorax* as in *A. akbari*.

*Abdomen.*—Aedeagus with lateral lobes separated at apex, each with a subapical process on inner side. Median lobe obliquely truncate at apex.

Total length 11 mm; maximum width 6.5 mm.

The species has been named after the collector.

In our key, this species comes near *A. ashrafii* Abdullah and Roohi but differs in being lighter in colour, in the mesosternal intercoxal process not being Y-shaped, etc. In the last-mentioned feature, this species also differs from *A. lyallpurensis*.

In the key of Arrow (1917:241) this species has the same fate as the preceding two species.

#### References

1. M. Abdullah and R.A. Roohi, Pakistan J. Sci. Ind. Res., **11**, 427 (1968).
2. M. Abdullah and R.A. Roohi, Pakistan J. Sci. Ind. Res., **11**, 441 (1968).
3. G. J. Arrow, *The Fauna of British India including Ceylon and Burma. (Coleoptera, Lamellicornia II: Rutelinae, Desmonycinae and Euchirinae)*. xiii+387 pp., pls. I-V (1917).