

**THE SUBGENUS *EODIROSIS* KWIETON OF THE GENUS *ERODIUS*  
FABRICIUS, WITH TWO NEW SPECIES AND A KEY TO SPECIES  
(COLEOPTERA: TENEBRIONIDAE: PIMELIINAE: ERODIINI)**

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**ABSTRACT**

Descriptions are given of two new species, *Erodiuspavliceki* n. sp. from Israel and *E. matthiasi* n. sp. from Saudi Arabia. *Erodius rothi wohlberedti* Koch is a new synonym of *E. rothi* Koch. *Erodius octocostatus verruculiferus* Kaszab, *E. rothi* Koch, *E. rubalkhalianus* Kaszab, *E. reichei cuiyipes* Kaszab, *E. reichei besnardi* Kaszab, *E. sauditus sauditus* Kaszab, *E. sauditus simplex* Kaszab, *E. sauditus granulans* Kaszab, *E. sauditus occidentalis* Kaszab, *E. sauditus insularis* Kaszab, *E. sauditus boreocentralis* Kaszab, and *E. sauditus costatissimus* Kaszab are transferred from the subgenus *Dirosis* Miller to the subgenus *Eodirosis* Kwieton. A key is given for the species in which the males have a tuft of bristles on the prosternum.

KEY WORDS: Tenebrionidae, *Erodius* Fabricius, *Eodirosis* Kwieton, Israel, Saudi Arabia, new species.

**INTRODUCTION**

Recently I received from Dr. T. Pavlfcek, Institute of Evolution, Haifa University, Israel, a collection of Tenebrionidae from the northern Negev, amongst which was a new species of the genus *Erodius*, subgenus *Eodirosis*. In the course of studying further comparative material, another new species was found, from Saudi Arabia. In order to show more clearly the differences between these and the other related species, an identification key has been constructed. This has been deemed all the more necessary because the numerous descriptions of new species since Reitter's (1914) key, by Kaszab (1981), Koch (1940) and Schuster (1934), have rendered that key completely unusable.

The following acronyms are used in the text: CL = Private collection of M. Lillig, Saarbrücken; MCSNM = Museo Civico di Storia Naturale, Milano; TM = Transvaal Museum, Pretoria; ZSM = Zoologische Staatssammlung, München.

## DESCRIPTIONS OF NEW SPECIES

*Erodus (Eodirosis) pavlicei* n. sp.

(Fig. 1)

*Form*: Length 15 mm, width 8 mm, height 6.5 mm; elongate oval, black, with all body parts densely shagreened.

*Head*: Eye weakly arched; mandible bidentate at tip, upper tooth broader and longer than lower one, right mandible with distinct lobe dorsally at middle, lobe of left mandible more weakly developed; labrum with long, dense, golden-yellow bristles along its almost straight fore margin, dorsal surface with dot-like pits from which long golden-yellow bristles arise; clypeus with dense rugose transverse granules, almost straight in front, anterior angles rounded, with pit-like hollow behind; frons strongly granulose, granules mostly connected by low bridges; vertex alongside eye with rugose punctures, disc smooth, puncturate between lateral rugae and disc, distance between punctures less than diameter of puncture; antennal length 5 mm, segments 1–10 longer than broad.

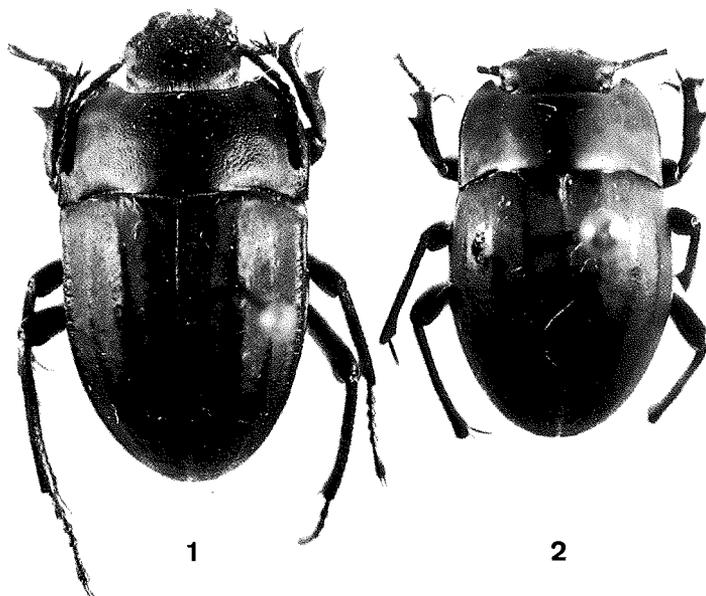
*Pronotum*: Length along middle 3.6 mm, laterally 4.3 mm, width at base and at middle 8 mm, distance between anterior angles 4.7 mm; fore and lateral margins bordered, somewhat swollen just before posterior angle, hind margin not bordered; lateral margin slightly indented just before base, hind margin with two emarginations; with uneven but strong punctures, with indications of non-puncturate mid-line, punctures on disc stronger and denser than at sides.

*Elytron*: Elongate ovoid; strongly arched, somewhat indented in distal half along suture; suture and costae shining, interspaces matt; interspaces sparsely micro-granulose as far as apex, granules obsolete basally at suture, becoming suddenly larger and very dense just before apex, almost touching; costae 1–3 low, not reaching base of elytra; costa 1 narrow and very low, hardly granulose, obsolete at middle of elytron; costa 2 broader basally, becoming narrower towards apex, rather higher, visible as far as its apical quarter, area around it with rather higher granules than interspaces; costa 3 very narrow and low, with single row of granules that are higher than those on interspaces, visible to apex as row of granules; lateral costa (costa 4) from base to apex with high micro-granules and strongly shining, very broad basally, becoming narrower towards apex; inner margin of epipleura behind humeri strongly curved ventrally and then running almost straight to apex; epipleura smooth.

*Underside of thorax*: Sternum with long golden-yellow hairs; prosternum rugose, tuft of bristles broader than long, as broad as prosternal apophysis between coxae; prosternal apophysis truncated straight at apex; meso- and metasternum leathery rugose; propleura broad, shining, longitudinal folds almost reaching coxa.

*Underside of abdomen*: Sternites strongly micro-granulose, 1st sternite between coxae with longitudinal folds; 1st and 5th sternites with golden-yellow hairs arising from large dot-like pits some 0.1 mm in diameter; sides of anal segment without hairs but with same punctures.

*Legs*: Fore tibia posteriorly with two large pointed teeth; anterior margin slightly curved, S-shaped; tibia rather narrower between the two teeth than behind lateral tooth; longer apical spur strongly curved at middle in ♂; mid tibia expanded dorsally at apex; longer apical spur reaching base of 3rd tarsal segment; hind tibia almost straight; the longer apical spur almost reaching 3rd tarsal segment.



Figs. 1–2. *Erodius* spp., habitus. 1. *E. pavliceki* n. sp. 2. *E. matthiasi* n. sp.

MATERIAL EXAMINED. Holotype ♂, ISRAEL: Dimona (N. Negev), 31°02'N 35°01'E, 5.iv.1992, T. Pavlíček (ZSM).

The specimen was found under a stone among growing and flowering plants (Pavlíček, pers. comm.).

*Erodius (Eodirosis) matthiasi* n. sp.

(Fig. 2)

*Form*: Length 12–15 mm, width 7–8 mm, height 6–8 mm; ♀ broader than ♂, elongate oval, black, all body parts densely shagreened.

*Head*: Eye arched; mandible bidentate at tip, upper tooth broader and longer than lower one, with small lobe dorsally; fore margin of labrum variable, from almost straight to bearing deep V-shaped excision, with long, dense, golden-yellow bristles, dorsal surface with dot-like pits from which long golden-yellow bristles arise; clypeus strongly transversely rugose, almost straight in front, anterior angles rounded, with pit-like hollow behind; frons strongly granular as far as broadest point of head, granules frequently connected, almost non-granular behind; vertex weakly granular alongside eye, disc smooth, only rarely with few weak granules, non-puncturate; antennae 4–5 mm in length, long, slender, segments 1–10 longer than broad.

*Pronotum*: Length along middle 2.5–3 mm, laterally 3.6–4 mm, width at base and at middle 6.5–8.5 mm, distance between anterior angles 3.7–5 mm; fore and lateral margins bordered,

somewhat swollen just before posterior angle, hind margin not bordered; lateral margins slightly indented just before base, hind margin with two emarginations; disc with very fine punctures, appearing smooth at  $\times 10$  magnification, narrower lines of punctures sometimes distinct along lateral and hind margins.

*Elytron*: Elongate ovoid; matt, costae weakly and suture more strongly shining; strongly arched, somewhat indented in distal half along suture; interspaces sparsely micro-granulose as far as apex, granules becoming denser and stronger from base to apex, almost obsolete basally at suture on inner interspace. Costae: costae 1–3 very low and micro-granulose; costa 1 parallel to suture, obsolete behind middle of elytron, sometimes visible as far as apex; costa 2 as high as, but longer than, costa 1; costa 3 narrower than costae 1 and 2; lateral costa (costa 4) hardly visible; inner margin of epipleura behind humeri strongly curved ventrally and then running almost straight to apex; epipleura smooth or very finely micro-granulose.

*Underside of thorax*: Sternum with long golden-yellow hairs; prosternum rugose; tuft of bristles in  $\sigma$  broader than long and broader than prosternal apophysis between coxae, with very dense bristles; prosternal apophysis truncated straight at apex; meso- and metasternum leathery rugose; propleura broad, shining, longitudinal folds almost reaching coxa.

*Underside of abdomen*: Sternites strongly micro-granulose, 1st sternite between coxae with narrow longitudinal folds.

*Legs*: Fore tibia posteriorly with two teeth; anterior margin straight in both sexes; tibia rather narrower between the two teeth than behind median tooth; longer apical spur strongly curved at middle in  $\sigma$ ; mid tibia expanded dorsally at apex; longer apical spur reaching base of 4th tarsal segment; hind tibia distinctly curved; longer apical spur reaching base of apical tarsal segment.

MATERIAL EXAMINED. Holotype  $\sigma$ , SAUDI ARABIA: Hail, iii.1962, Popov (TM). Paratypes: 6, same data as holotype (2 $\sigma$ , 1 $\sigma$ , 1 $\sigma$ , TM; 1 $\sigma$ , 1 $\sigma$ , 1 $\sigma$ , MCSNM; 1 $\sigma$ , CL).

NOTES. This new species was recorded by Koch (1965) as *Erodius reichei* Allard. Kaszab (1981) did not see the specimens in question, but suggested that they could belong to his *E. reichei curvipes*. However, the new species differs from both of these by the straight fore tibiae and the large tuft of bristles of the  $\sigma$ .

### *Erodius rothi* Koch

*Erodius (Dirosis) rothi* Koch, 1940:90.

*Erodius (Dirosis) rothi wohlberedti* Koch, 1940:93, n. syn.

According to Koch (1940), *Erodius rothi wohlberedti* Koch differs from the nominate form "by the consistently finely puncturate pronotum, rather narrower form, and longer pronotum." In this species, however, both the puncturation and the form of the pronotum are very variable. In a series now before me from Dimona, Negev, Israel, all these variations are represented. In some specimens from Dimona the puncturation of the pronotum is weaker, and the pronotum longer, than in the holotype of *E. rothi wohlberedti* Koch. Even the shape of *E. rothi wohlberedti* falls within the range of variability of *E. rothi*. No constant differences between the two could be found and they are synonymized here.

## SYSTEMATIC POSITION

Kwieton (1980:25) assigned the species of *Dirosis* Miller (sensu Reitter, 1914:58) with three dorsal costae to a new subgenus, *Eodirosis*, to which the two new species described here also belong. In addition to the species listed by Kwieton (1980), the following species should also be assigned to *Erodium* sngen. *Eodirosis*: *Erodium octocostatus verruculiferus* Kaszab, *E. rothi* Koch, *E. reichei curvipes* Kaszab, *E. reichei besnardi* Kaszab, *E. rubalkhalianus* Kaszab, *E. sauditus sauditus* Kaszab, *E. sauditus simplex* Kaszab, *E. sauditus granularis* Kaszab, *E. sauditus occidentalis* Kaszab, *E. sauditus insularis* Kaszab, *E. sauditus boreocentralis* Kaszab, and *E. sauditus costatissimus* Kaszab.

KEY TO THE SPECIES OF THE SUBGENUS *EODIROSIS* KWIETON

This key covers those species of the subgenus *Eodirosis* Kwieton in which the males have a tuft of bristles on prosternum. I have seen all the taxa and most of the holotypes and paratypes, except for *Erodium acutangulus* Bogachov from southern Iran (Bogachov, 1957) which probably also belongs to that subgenus. For this reason, *E. acutangulus* could not be included in the key.

1. Costae of elytra deeply grooved and raised; disc of pronotum smooth, sides almost parallel; hind tibia distinctly curved and concave . . . . . 2
- Costae smooth, at most slightly grooved, low or raised . . . . . 3
2. Costae of elytra present as vestiges, costa 3 only visible behind middle; 17–18 mm (Saudi Arabia: Hail Province) . . . . . *Erodium octocostatus verruculiferus* Kaszab
- Costa 3 raised even at base of elytra; 14–18 mm (Sinai, SW Jordan) . . . . .  
. . . . . *Erodium octocostatus octocostatus* Peyerimhoff
3. Pronotum coarsely puncturate also on disc (doubtful cases are included in both sections of the key) . . . . . 4
- Pronotum at least on disc without, with obsolescent or with weak punctures . . . . . 7
4. Side of pronotum, at least in basal half, swollen and not bordered; 10.5–13 mm (Jordan: Dead Sea) . . . . . *Erodium freyi* Schuster
- Side of pronotum not swollen, usually completely bordered . . . . . 5
5. Costae 2 and 3 raised high, reaching base of elytra . . . . . 6
- Costae 1–3 low, not reaching base of elytra; 15 mm (Israel: Negev) . . . . .  
. . . . . *Erodium pavlicei* n. sp.
6. Short oval, greatly arched; punctures on pronotum finely granular, pitted from behind; costa 1 distinct, converging and usually reaching suture, costae 2 and 3 obsolete just before apex; 9–12 mm (N Egypt, Israel: Negev) . . . . . *Erodium quadrilineatus* Kraatz
- Elongate oval, less arched; punctures on pronotum mostly coarse; costa 1 low, sometimes absent, but when present almost parallel and not reaching suture; 10–15 mm (S Jordan, Israel: Negev) . . . . . *Erodium rothi* Koch

7. Mid tibia expanded apically both dorsally and ventrally, S-shaped in ♂ in lateral view; hind tibia of ♂ curved at middle; posterior tibial spur of hind leg longer than the first three tarsal segments together; all costae raised at least in basal half; 12–17.5 mm (Saudi Arabia: Rub'al Khali) . . . . . *Erodius rubalkhalianus* Kaszab  
 — Mid tibia expanded apically only dorsally or more strongly expanded dorsally than ventrally, mid tibia straight in ♂, not S-shaped . . . . . 8
8. Shining dorsally; side of pronotum distinctly puncturate in lateral third, punctures becoming finer and sparser towards disc but still distinctly visible; costae and interspaces strongly micro-granulose even basally; 15 mm (Saudi Arabia: Tabuk Province) . . . . .  
 . . . . . *Erodius sauditus occidentalis* Kaszab  
 — Shining or matt dorsally; pronotum in lateral third with at most traces of punctures, these often becoming stronger at posterior angles, or with only narrow stripe along lateral margin strongly puncturate, or matt dorsally . . . . . 9
9. Fore tibia of ♂ not expanded anteriorly at apex and not strongly emarginated at middle . . . . . 10  
 — Fore tibia of ♂ expanded anteriorly at apex and strongly emarginated at middle . . . . . 21
10. Pronotum at base with two deep emarginations; interspaces and costae on elytra shining; costae low, costa 1 lower than costae 2 and 3; tibiae with very rough punctures, diameter of puncture on upper surface of fore tibia greater than interspaces; 15 mm (Bahrain) . . . . .  
 . . . . . *Erodius sauditus insularis* Kaszab  
 — Not as above . . . . . 11
11. Costae raised, reaching apical quarter, lateral costa also distinct; micro-granules on elytra in inner interspace and on costae becoming sparser but still coarse (diameter at base 0.03–0.06 mm), only slightly weaker than at middle of elytra; antennae strong, segment 1 with almost rugose punctures; 15–17 mm (Saudi Arabia: Hail Province) . . . . .  
 . . . . . *Erodius sauditus boreocentralis* Kaszab  
 — Without this combination of characters . . . . . 12
12. All costae high and shining, not micro-granulose at base; 16–18.5 mm (Saudi Arabia: Eastern and Najran Provinces, Yemen, Oman, United Arab Emirates) . . . . .  
 . . . . . *Erodius sauditus costatissimus* Kaszab  
 — At least costa 1 low, or costae micro-granulose like interspaces . . . . . 13
13. Inner tibial spur of hind leg as long as first two tarsal segments together . . . . . 14  
 — Inner tibial spur of hind leg at least as long as first three tarsal segments together . . . . . 17
14. All costae low, obsolete in apical third; 10–15 mm (Greece, Aegean Islands, Turkey) . . . . .  
 . . . . . *Erodius orientalis oblongus* Solier  
 — At least costae 3 and 4 high . . . . . 15
15. Punctures on pronotum hardly visible at ×20 magnification; costae 3 and 4 raised from base to beyond middle; 11–13 mm (Greece, Aegean Islands, Cyprus, Turkey) . . . . .  
 . . . . . *Erodius fabricii* Solier  
 — Punctures on pronotum distinct at ×20 magnification: costae 2, 3 and 4 high . . . . . 16

16. Short oval in form, strongly arched; costa 1 rather lower than costa 2, but distinctly visible, costae 2 and 3 equally high to beyond middle and almost reaching apex; 9–12 mm (N Egypt, Israel: Negev) . . . . . *Erodius quadrilineatus* Kraatz  
 — Elongate oval in form, less strongly arched; costa 1 weak or absent; costa 2 weaker than costa 3 even before middle; 10–15 mm (Israel: Negev, S Jordan) . *Erodius rothi* Koch
17. Costa 4 (lateral costa) not visible; 13–14 mm (Saudi Arabia: Gasim Province) . . . . .  
 . . . . . *Erodius sauditus granularis* Kaszab  
 — Traces of costa 4 present at least at base . . . . . 18
18. Elytra matt . . . . . 19  
 — Elytra shining . . . . . 20
19. Posterior angle of pronotum almost right-angled; all costae, including lateral costa, raised in anterior half, costa 1 obsolete behind middle; costae 3 and 4 with much stronger micro-granules than interspaces; 11 mm (Jordan: Dead Sea area) . . . . .  
 . . . . . *Erodius subpuncticollis* Schuster  
 — Posterior angle of pronotum produced posteriorly; all costae low, costa 4 only indicated; costae with less strong micro-granules than interspaces; tuft of bristles in ♂ broader than prosternum between coxae; 12–15 mm (Saudi Arabia: Hail Province) . . . . .  
 . . . . . *Erodius matthiasi* n. sp.
20. Only traces of costae 1–3 visible, hardly projecting above curvature of elytra; 11–17 mm (Saudi Arabia: Riyadh and Eastern Provinces) . . . . . *Erodius sauditus simplex* Kaszab  
 — All costae low but clearly visible, distinctly projecting above curvature of elytra; 11–14 mm (Saudi Arabia: Riyadh and Eastern Provinces) . . . . .  
 . . . . . *Erodius sauditus sauditus* Kaszab
21. Hind tibia of ♂ almost straight at middle; 15–17.5 mm (Saudi Arabia: Eastern Province) . . . . . *Erodius reichei besnardi* Kaszab  
 — Hind tibia of ♂ curved at middle . . . . . 22
22. Fore tibia of ♂ slightly S-shaped along anterior margin; 12–14.5 mm (Saudi Arabia: Riyadh Province) . . . . . *Erodius reichei curvipes* Kaszab  
 — Fore tibia of ♂ straight along anterior margin from base to distal third; 11–15 mm (Israel: Negev, S Jordan) . . . . . *Erodius reichei reichei* Allard

#### ACKNOWLEDGMENTS

I am grateful to Dr. T. Pavlíček for a large collection of Tenebrionidae in which the new species described here was found, and to the following colleagues for the loan of comparative material and for their support: Dr. H.J. Bremer (Heidelberg), Dr. S. Endrödy-Younga (Transvaal Museum, Pretoria), Dr. J. Ferrer (Haninge), Dr. A. Freidberg (Tel-Aviv University), Dr. R. Grimm (Tübingen), Dr. D. Kempster (The Natural History Museum, London), Dr. C. Leonardi (Museo Civico di Storia Naturale, Milano), Dr. O. Merkl (Természettudományi Múzeum, Budapest), A. Rihane Salalah and Dr. G. Scherer (Zoologische Staatssammlung, München).

## ZUSAMMENFASSUNG

*Erodius pavlicei* n. sp. aus Israel und *E. matthiasi* n. sp. aus Saudi-Arabien werden beschrieben. *Erodius rothi wohlberedti* Koch wird als n. syn. zu *E. rothi* Koch betrachtet. *Erodius octocostatus verruculiferus* Kaszab, *E. rothi* Koch, *E. rubalkhalianus* Kaszab, *E. reichei curvipes* Kaszab, *E. reichei besnardi* Kaszab, *E. sauditus sauditus* Kaszab, *E. sauditus simplex* Kaszab, *E. sauditus granularis* Kaszab, *E. sauditus occidentalis* Kaszab, *E. sauditus insularis* Kaszab, *E. sauditus boreocentralis* Kaszab und *E. sauditus costatissimus* Kaszab werden aus der Untergattung *Dirosis* Miller in die Untergattung *Eodirosis* Kwieton transferiert. Die Arten, deren Männchen am Prosternum ein Bärtchen tragen, werden einander in einem Bestimmungsschlüssel gegenübergestellt.

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