

Kazimierz GALEWSKI

The Description of Pupae of *Colymbetes paykulli* ER. and *C. dolabratus* (PAYK.) with a Key to the Identification of Pupae of the European Species of *Colymbetes* CLAIRV. (Coleoptera, Dytiscidae)

Opis poczwerek *Colymbetes paykulli* ER. i *C. dolabratus* (PAYK.) wraz z kluczem do oznaczania poczwerek europejskich gatunków z rodzaju *Colymbetes* CLAIRV. (Coleoptera, Dytiscidae)

Описание куколок *Colymbetes paykulli* ER. и *C. dolabratus* (PAYK.) и определитель куколок европейских видов рода *Colymbetes* CLAIRV. (Coleoptera, Dytiscidae)

[With 18 text-figures]

The present paper is a supplement to my work on the immature stages of European species of *Colymbetes* CLAIRV. (GALEWSKI, 1964), in which, unfortunately, due to lack of material, the descriptions of pupae of *C. paykulli* ER. and *C. dolabratus* (PAYK.) were not included¹.

During my brief stay at the Zoological Museum in Kopenhagen in 1965 I found several pupae of *C. dolabratus* (PAYK.) among a rich material of larvae of this species, collected on a Greenland expedition in 1893. I was very happy, too, to find peculiar, unknown to me pupae, accompanied by exuviae of larvae, in the former FALKENSTRÖM collection at the Zoological Institute in Lund, which upon a close examination of moults turned out to be those of *C. paykulli* ER. Neither pupa of *C. paykulli* ER., nor that of *C. dolabratus* (PAYK.) have been described heretofore.

I take this opportunity to express my warmest thanks to the keeper of the Coleoptera Laboratory of the Zoological Museum in Kopenhagen Dr. T. LARSSON, as well as to Mr. Hugo ANDERSSON — the Conservator in the Zoological Institute in Lund, for lending me the material mentioned.

¹ The description of larvae of the latter species, together with a key to the identification of larvae of the European species of *Colymbetes* CLAIRV. will be given in a separate paper.

Description of Pupa of *Colymbetes paykulli* ERICHSON, 1837

Body (figs. 1, 5, 9) length 17.8–19.2 mm. Cephalic prominences well developed, strongly protruding, groove between them deep and with steep, nearly perpendicular walls (this groove is definitely broader and has more gently sloped walls in other species); setation well developed, denser than in either *C. fuscus* (L.) or *C. striatus* (L.) (figs. 11, 12), each prominence with 26–38 setae. Preocular setae very numerous, too, 11–16 in number at each side of head. Setae near clypeus margin 4–10 in total number, located more anteriorly than in the species mentioned on labrum anterior edge.

Pronotum with numerous setae: 44–76 in number along anterior edge, 3–5 in the middle part, 45–80 in groups near posterior angles, and 7–11 in the remaining part of posterior edge; posterior setae distinctly more numerous than in *C. fuscus* (L.) and *C. striatus* (L.) (figs. 3, 4).

Meso- and metanotum with setae noticeably more numerous than in the two species mentioned (figs. 3, 4): there are 7–13 setae on each half of mesonotum, and 11–17 setae on that of metanotum; each wing process of mesonotum with 8–15 setae, that of metanotum with 7–10 setae.

Abdominal terga also with more numerous setae than in the species mentioned (figs. 3, 4, 7, 8): each half of tergum with 11–21 mediotergal setae, and with 3–7 laterotergal setae. Setae broadly scattered along dorsal ridges.

Last abdominal tergum provided with 50–63 setae, their number exceeding that of both *C. fuscus* (L.) and *C. striatus* (L.).

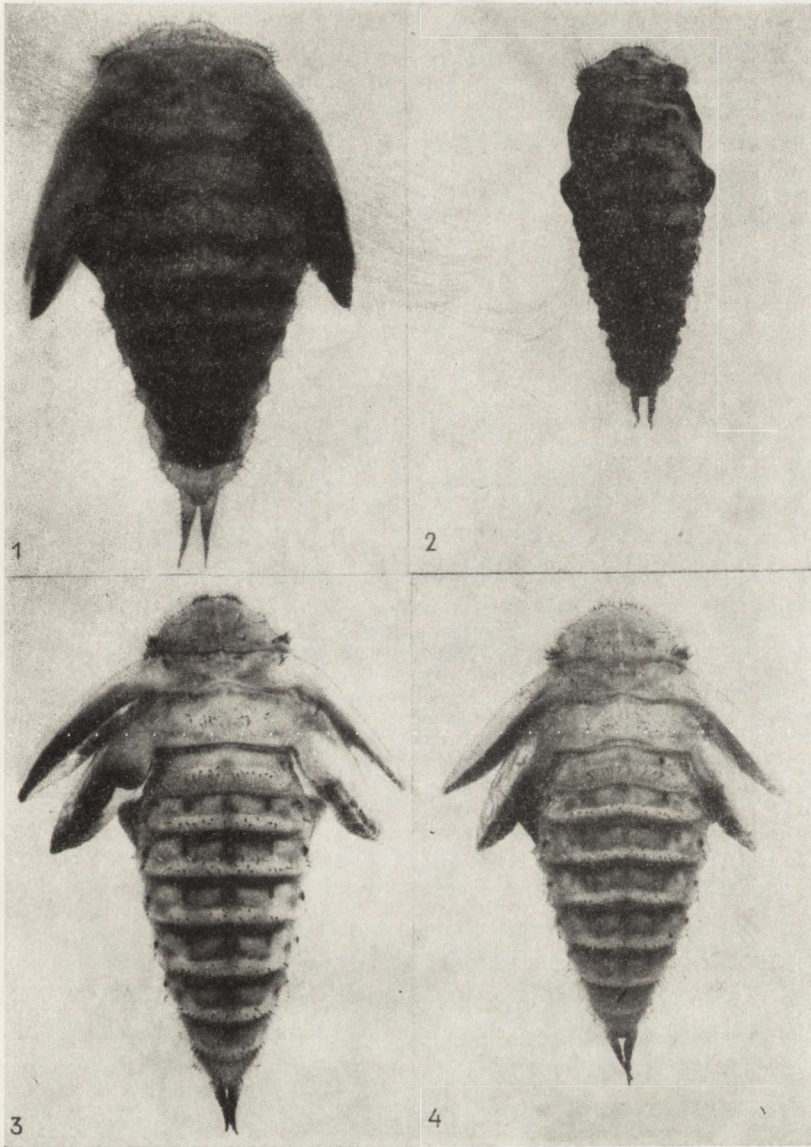
Last abdominal sternum bearing 4–5 setae at each posterior angle — an easy diagnostic character to separate the pupa from those of other *Colymbetes* species provided with two setae at most. VII-th abdominal sternum bearing 3–4 setae at each side [there are only 2 respective setae in *C. fuscus* (L.) and 1–3 setae in *C. striatus* (L.)]. Other abdominal sterna provided with usual 2 setae (lateral setae) at each side.

Male gonopods (fig. 13) unlike those in *C. fuscus* (L.) and *C. striatus* (L.), with apices distinctly rounded.

Female gonopods similar as in *C. fuscus* (L.).

Cerci (fig. 13) very peculiar, strikingly long, slender, twice or more longer than last abdominal sternum, with a very profuse setation: number of setae on each cercus varying from 28 to 48 including 4–11 setae along the inner edge. A considerable length of cerci, together with numerous, scattered on both edges, setae, tells the pupa readily from those of other European species.

Material. 3 pupae with larval moults, without locality and date label, taken most probably in Sweden (ex FALKENSTRÖM coll.) wrongly identified as *C. striatus* (L.). 1 pupa, without larval moult, with same characters as the preceding one, no locality and date, presumably from Sweden, too (ex FALKENSTRÖM coll.), wrongly identified as *C. striatus* (L.). All kept in the collection of the Zoological Institute in Lund.



Figs. 1-4. Pupae, dorsal view. 1 - *Colymbetes paykulli* ER., 2 - *C. dolabratus* (PAYK.) *C. striatus* (L.), 4 - *C. fuscus* (L.).

(Józef Pawłowski '40)

(T. PŁODOWSKI phot.)



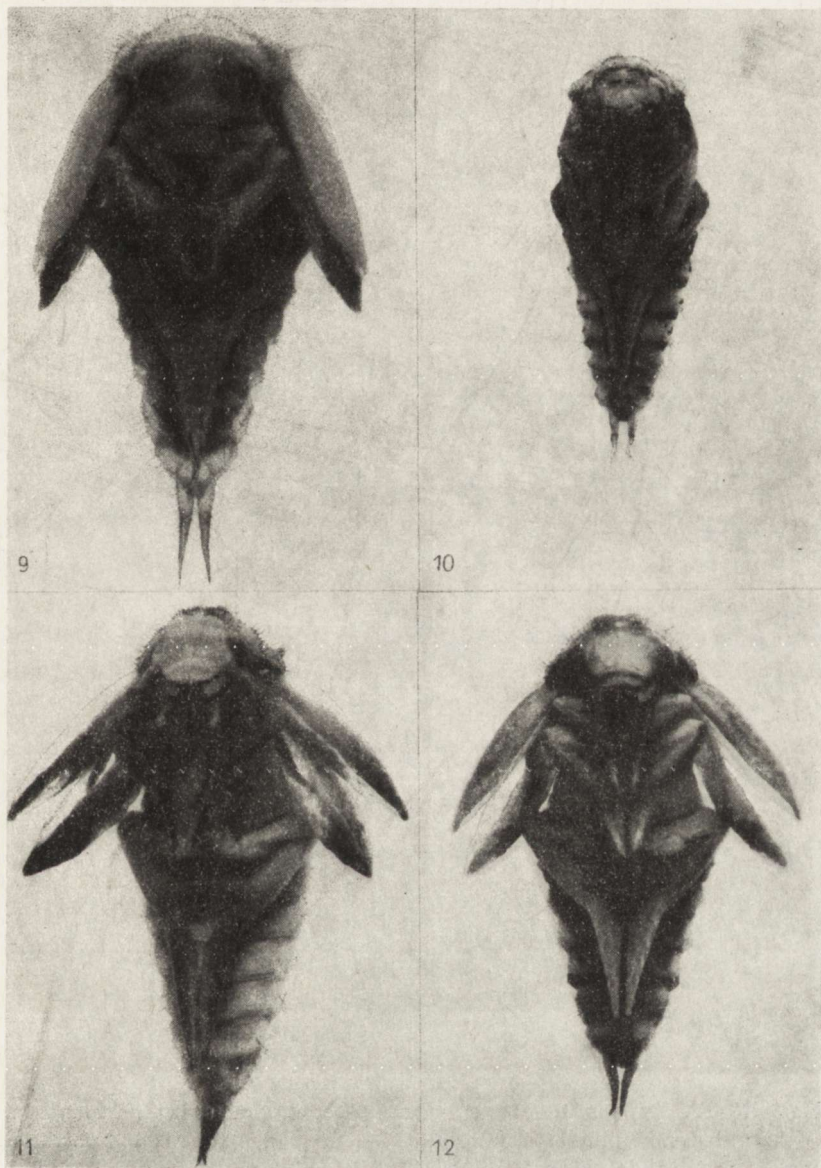
Figs. 5-8. Pupae, lateral view. 5 - *Colymbetes paykulli* ER., 6 - *C. dolabratus* (PAYK.), 7 - *C. striatus* (L.), 8 - *C. fuscus* (L.).

(T. PŁODOWSKI phot.)

Description of Pupa of *Colymbetes dolabratus* (PAYKULL, 1798)

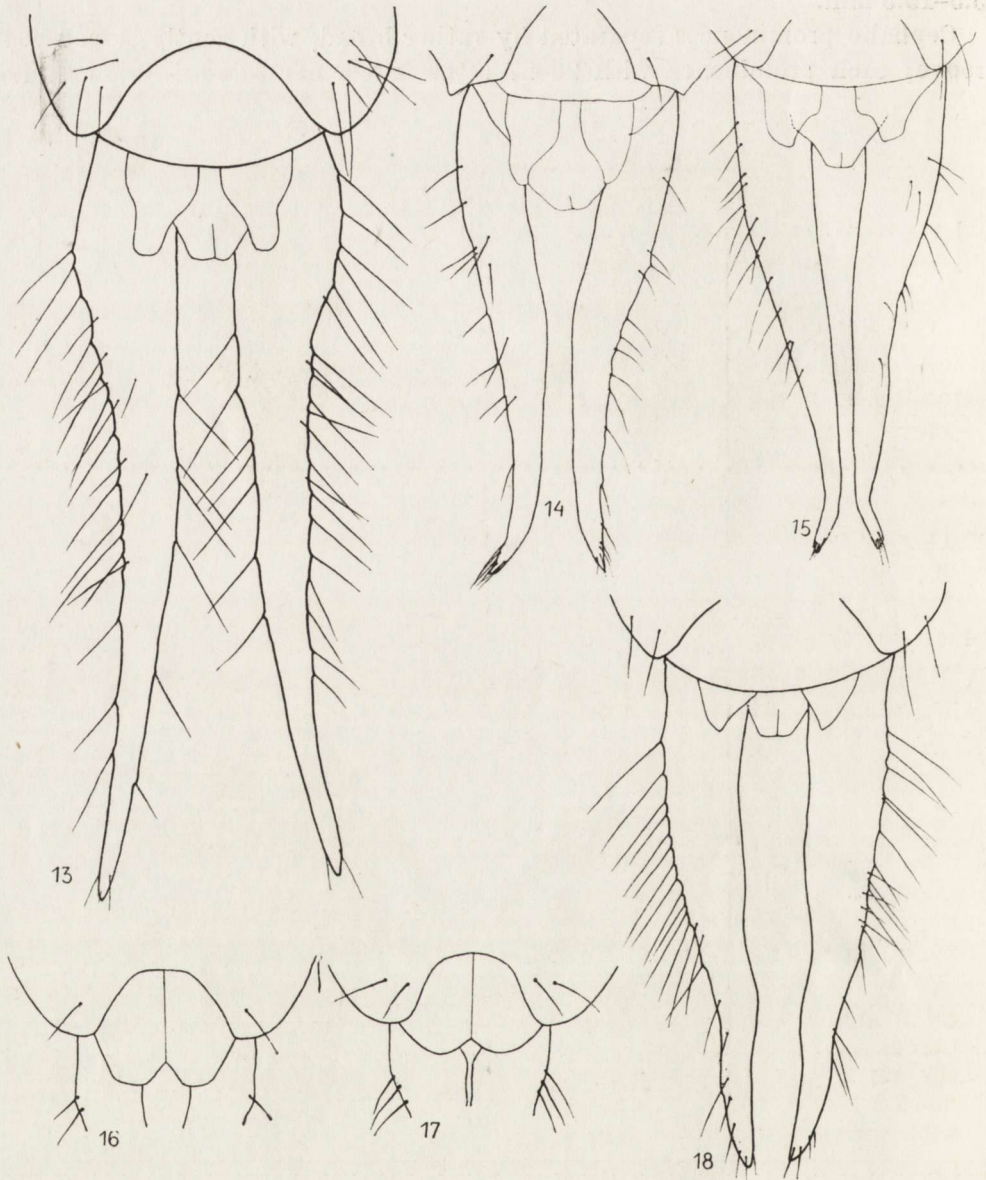
Markedly smaller than other *Colymbetes* pupae; body (figs. 2, 6, 10) length 13.5–15.5 mm.

Cephalic prominences separated by rather broad, with gently sloped walls, groove; each prominence with 20–27 setae. Preocular setae 4–11 in number



Figs. 9–12. Pupae, ventral view. 9 — *Colymbetes paykulli* ER., 10 — *C. dolabratus* (PAYK.), 11 — *C. striatus* (L.), 12. — *C. fuscus* (L.).

(T. PŁODOWSKI phot.)



Figs. 13-18. Pupae, 13-15, 18 - male, cerci, gonopods and posterior angles of last abdominal sternum; 16, 17 - female, gonopods and posterior angles of last abdominal sternum; 13 - *Colymbetes paykulli* ER., 14-16 - *C. fuscus* (L.), 15, 17 - *C. striatus* (L.), 18 - *C. dolabratus* (PAYK.). (Anctor del.).

at each side of head. Clypeus with 6–16 setae (total number) situated along its anterior edge.

Pronotum with 37–50 setae along anterior edge, with 2–6 setae in the middle part, with 45–60 setae at posterior angles and 2–4 setae in the median part of its posterior edge (at each half of tergum).

Each half of mesonotum with 4–8 setae, its wing process with 4–10 setae. Each half of metanotum with 7–10 setae, and with 2–7 setae on its wing process.

Abdominal terga with 6–12 mediotergal, and 2–7 laterotergal setae (at each side). Setae concentrated rather along one single line.

Last abdominal tergum with 22–43 setae.

Last abdominal sternum bearing 2 setae at each posterior angle. VII-th abdominal sternum with 3–4 lateral setae at each side. Other abdominal sterna with 1–2 lateral setae at each side.

Male gonopods (fig. 18) short, broad, with triangular apical part slightly resembling that in *C. fuscus* (L.).

Cerci (fig. 18) rather short, not longer than last abdominal sternum, distinctly bent inward about the middle and at apex, with angulate edges; base of cerci noticeably broadened in lateral view, distinctly bulging ventrally and passing abruptly into narrow, cylindrical apical part. Each cercus with 10–25 setae arranged along its outer edge.

Material. 3 pupae, Greenland, Jan. 19, 1893, accompanied by over 90 larvae and a dozen imagines, all identified as "*Cymatopterus dolabratus* PAYK.". 1 pupa, South Greenland („Syd Groenland”), without date, leg. E. LUNDHOLM. All kept in the collection of the Zoological Museum in Kopenhagen.

Key to Pupae of European Species of *Colymbetes* CLAIRV.

1. Cerci long, twice, or more, as long as last abdominal sternum (figs. 5,9). Cercal setae numerous, 28–48 in number on each cercus, scattered on both inner and outer edge (fig. 13). Last abdominal sternum with posterior angles bearing 5–6 setae in males and 3 setae in females. Male gonopods distinctly rounded apically (fig. 13) *C. paykulli* ER.
- Cerci short, not longer than last abdominal sternum (figs. 6–8, 10–12). Cercal setae less numerous, 10–25 in number on each cercus; setae only on the outer edge of cerci (figs. 14, 15, 18). Last abdominal sternum with at most 2 setae at posterior angles in both sexes (figs. 14–18). Male gonopods with apex either pointed or angular (figs. 14, 15, 18) 2.
2. Cerci distinctly sinuous, „twisted”, their inner edge markedly emarginated (fig. 18); apices of cerci bent inward. Posterior angles of pronotum bearing more numerous (45–68) setae. Smaller pupa (length 13.5–14.5 mm) *C. dolabratus* PAYK.
- Cerci not sinuous, their inner edge not emarginated; apices of cerci turned outward (figs. 14, 15). Posterior angles of pronotum with less numerous (25–40) setae. Larger pupa (length 17.0–19.2 mm) 3.

3. Cerci narrower in the basal part, their inner edges distinctly diverging in anterior part, leaving a large triangular space between (fig. 14). Last abdominal sternum with only one seta at posterior angles (fig. 14). Male gonopods (fig. 14) with narrow, triangular apices. Female gonopods elongated (fig. 16) *C. fuscus* (L.)
- Cerci broader in the basal part, their inner edges diverging only at extreme base, this divergence sometimes hidden completely by gonopods, otherwise fairly straight in anterior part (fig. 15). Last abdominal sternum with two setae at posterior angles (fig. 15). Male gonopods with broad, somehow truncate apices (fig. 15). Female gonopods short (fig. 17) *C. striatus* (L.)

REFERENCES

- GALEWSKI K. 1964. Immature Stages of the Central European Species of *Colymbetes* CLAIRVILLE (Coleoptera, Dytiscidae). Ann. Zool., Warszawa, 22: 23–55, 57 ff.

STRESZCZENIE

Praca jest uzupełnieniem poprzedniego opracowania (GALEWSKI, 1964) młodszych postaci rozwojowych europejskich gatunków z rodzaju *Colymbetes* CLAIRV. Autor opisuje poczwarki dwóch gatunków — *C. paykulli* ER. oraz *C. dolabratus* (PAYK.), z braku materiału nie uwzględnionych w poprzedniej pracy, jak również podaje klucz do poczwarek wszystkich czterech europejskich gatunków z rodzaju *Colymbetes* CLAIRV.: *C. fuscus* (L.), *C. striatus* (L.), *C. paykulli* ER. i *C. dolabratus* (PAYK.).

РЕЗЮМЕ

Работа является дополнением прежней обработки ювенальных стадий развития европейских видов рода *Colymbetes* CLAIRV.

Автор описывает куколки двух видов — *C. paykulli* ER. и *C. dolabratus* (PAYK.) за отсутствием материалов не учтенных в прежней обработке и дает тоже определитель куколок всех четырех европейских видов рода *Colymbetes* CLAIRV.: *C. fuscus* (L.), *C. striatus* (L.), *C. paykulli* ER. и *C. dolabratus* (PAYK.).

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