

Immature stages and bionomics of *Amalorrhynchus melanarius*
(STEPHENS, 1831)
(Coleoptera: Curculionidae: Ceutorrhynchinae)

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ABSTRACT. Detailed descriptions of larva and pupa of *Amalorrhynchus melanarius* are given. Beetles were reared from fruits of *Roripa amphibia*; only one individual was found in each fruit.

Key words: entomology, bionomics, immature stages, Coleoptera, Curculionidae, *Amalorrhynchus*, Palaearctic Region.

INTRODUCTION

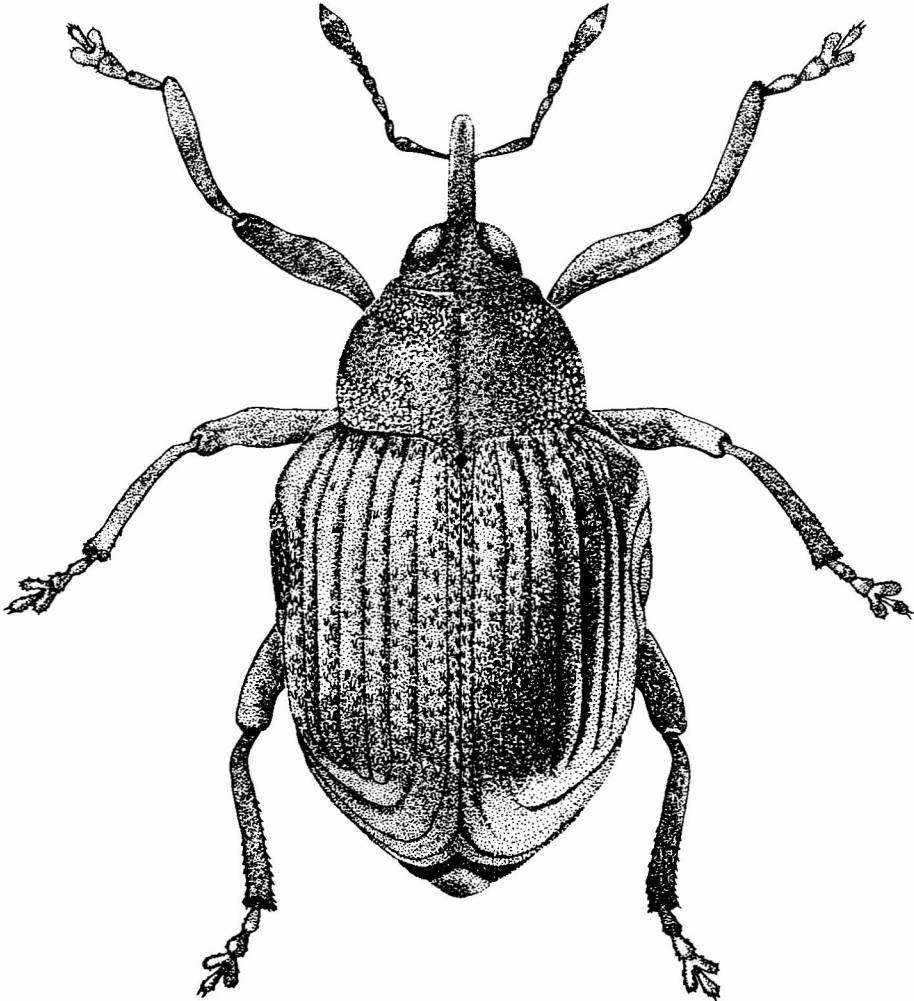
Amalorrhynchus melanarius is a member of the tribe *Ceutorrhynchini* REITTER 1913, which comprises 52 genera with about 900 species: ca. 630 of them occur in the Palearctic Region, ca. 115 in the Nearctic Region, not more than 55 in both the Ethiopian and Neotropical Regions, and only one species in the Australian Region (SMRECZYŃSKI 1974). The genus *Amalorrhynchus* REITTER comprises one European species - *A. melanarius* (STEPH.) occurring in southern, central and western Europe.

Beetles of the tribe *Ceutorrhynchini* live mostly on plants of the family *Brassicaceae*. *Roripa amphibia* (L.) BESS. and *Nastrium officinale* R. BR. (*Brassicaceae*) were listed as host plants of *A. melanarius* (STEPH.) (SCHERF 1964).

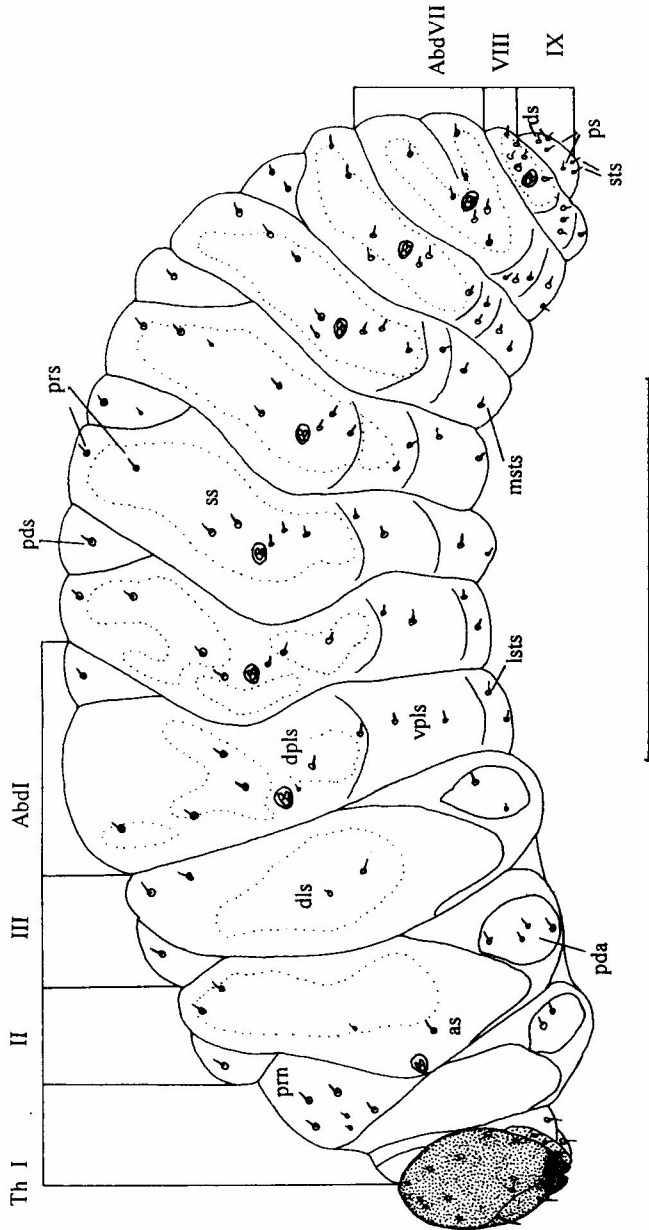
Immature stages and morphophogy of the *Ceutorrhynchini* are little known; there are no data referring to *A. melanarius* (STEPH.), except the information on host plants and development period. Of species closely related to *A. melanarius* (STEPH.),

immature stages were described (SCHERF 1964) for *Tapinotus selatus* F. and *Poophagus hopffgarteni* TOURN. The descriptions show similarities of the biology and morphology of immature stages to those described by me for *A. melanarius* (STEPH.). However, these descriptions are laconic and a detailed comparison is impossible.

The descriptions of biology and morphology of immature stages of *Amalorrhynchus melanarius* (STEPH.) presented below are in accordance with the currently accepted standards, proposed especially in works of MAY (1977).



1. *Amalorrhynchus melanarius*, dorsal view (by P. CHMIELARZ)



2. *Amalorrhynchus melanarius*, larva, lateral view (scale 1 mm)

In the descriptions, numbers of setae refer to one body side and are summarised for larvae in Table 1, and for pupae in Table 2. Methods of preparation used in this study were described by WARCHAŁOWSKI (1977) and POMORSKI and SKARZYŃSKI (1991). The specimens are deposited at the Museum of Natural History, Wrocław University.

BIOLOGY AND HABITAT

Roripa amphibia (L.) BESS. and *Nastrium officinale* R. BR. (*Brassicaceae*) were observed as host plants in Poland. The beetles usually appear on plants growing in swampy areas. Adults of *A. melanarius* (STEPH.) feed on leaves, eating their margins. Reared specimens, especially females, were observed eating also nectar. Copulation takes place at the end of blooming period the host plant (May/June). Eggs are laid into the fruit (one per fruit) through a small hole. The larva lives inside the fruit, feeding on seeds. At first it lives in one chamber, than, after struggling through septum, in the second one. The larvae pupate inside the fruit. Adults leave the fruits when they break up, or they struggle through the wall. In the studied area the larvae infested ca. 70-80% fruits of *R. amphibia* (L.) BESS.

I have reared no parasites of *A. melanarius* (STEPH.), but two such species are mentioned in the literature - *Trichomalus fulgidus* FRST. (*Pteromalinae*) and *Eulopus viridarius* DE GAULE (*Eulophinae*), both of the family *Chalcididae* (Entomophaga) (HOFFMANN, 1954). They attack both larvae and pupae, fastening to the dorsal side of their body.

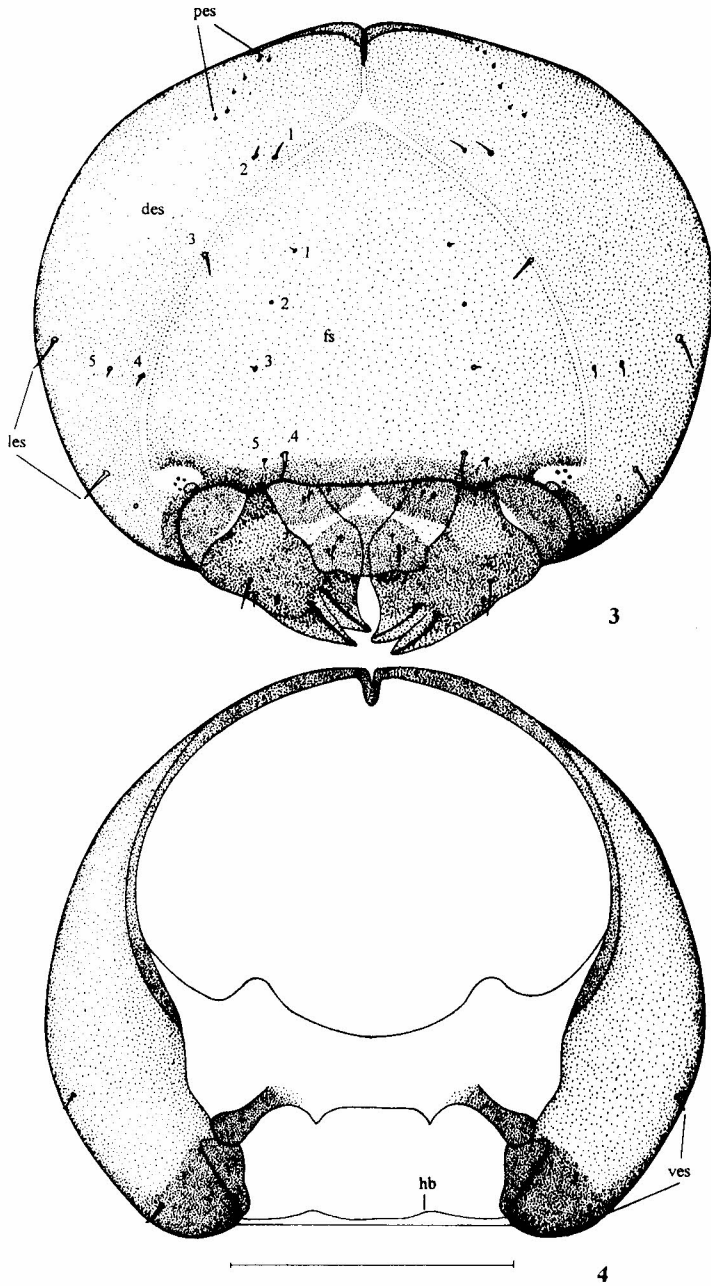
TECHNIQUES

REARING:

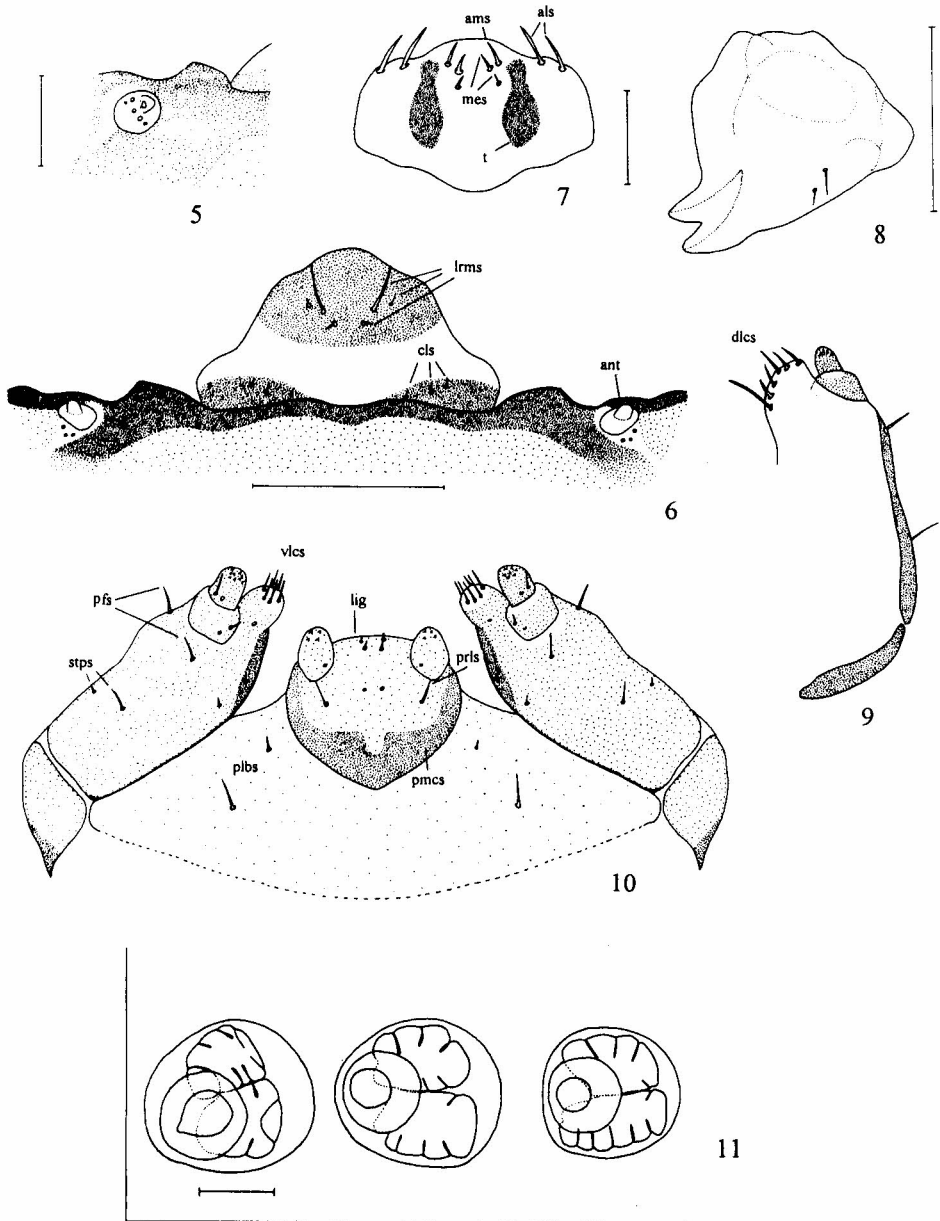
I collected adults in the first half of June, with an entomological net. In the laboratory, they were placed on the host plant *Roripa amphibia* (L.) Bess. in special cages consisting of a jar, three cylindrical sticks and a fine-meshed net. Three copulating pairs were placed on one plant. Reared specimens developed for about three weeks.

PREPARATION:

The specimens for total drawings were stained with orceine (1g/100mg 70% ethanol) during ca. 1-2 hours. They were first heated in 70% ethanol, then placed in 10% KOH until cleared (c. 1-2 hrs), transferred to chloramphenol for c. 1-2 hrs, and then mounted on slides in Swan's liquid (20 g distilled water, 60 g chloralhydrate, 15 g gum arabic, 2 g pure acetic acid, 3 g glucose). Decapitation and preparation of lower mouth parts were made after removing the specimen from chloramphenol, using a pointed scalpel and pin vise.



3-4. *Amalorrhynchus melanarius*, head: 3 - dorsal, 4 - ventral (scale 0.2 mm)

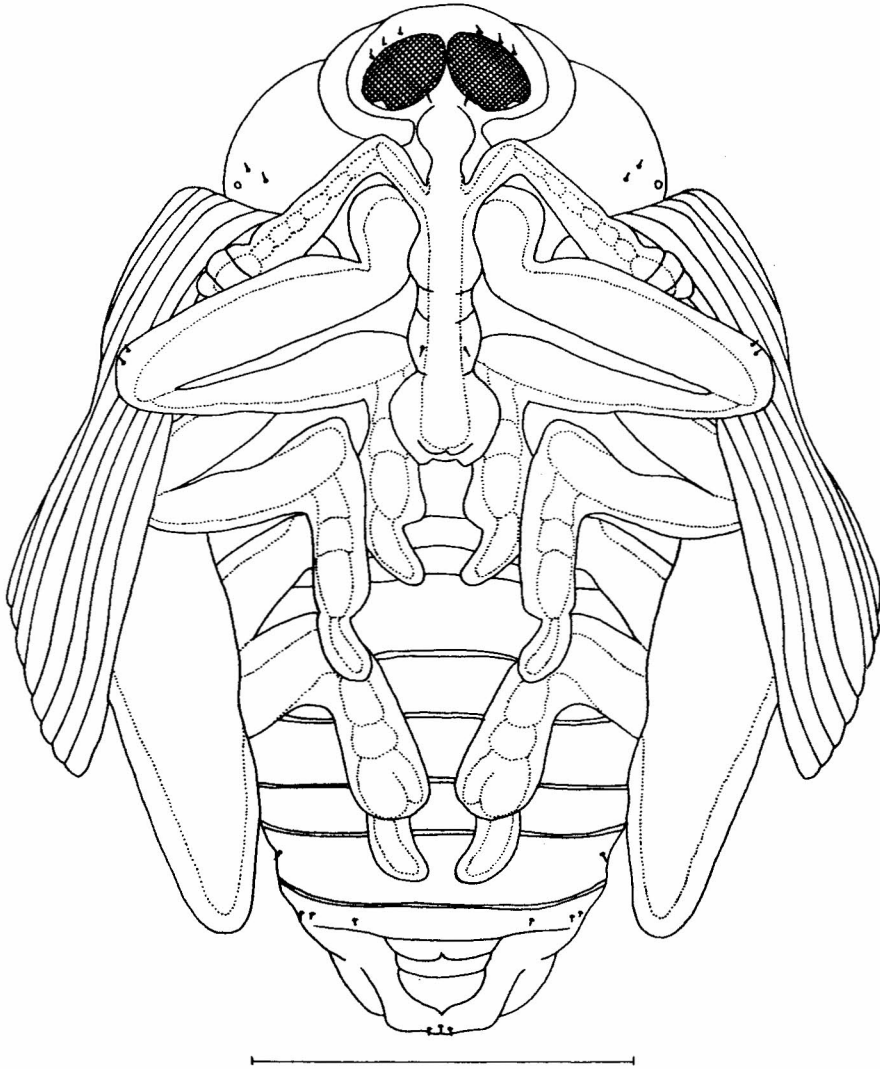


5-11. *Amalorrhynchus melanarius*: 5 - antenna, 6 - labrum, 7 - epipharynx, 8 - mandible, 9 - maxilla, dorsal, 10 - labium and maxillae, ventral, 11 - spiracles (scale: 5 - 0.005 mm, 6, 9, 10 - 0.01 mm, 7 - 0.005 mm, 11 - 0,02 mm)

DESCRIPTIONS

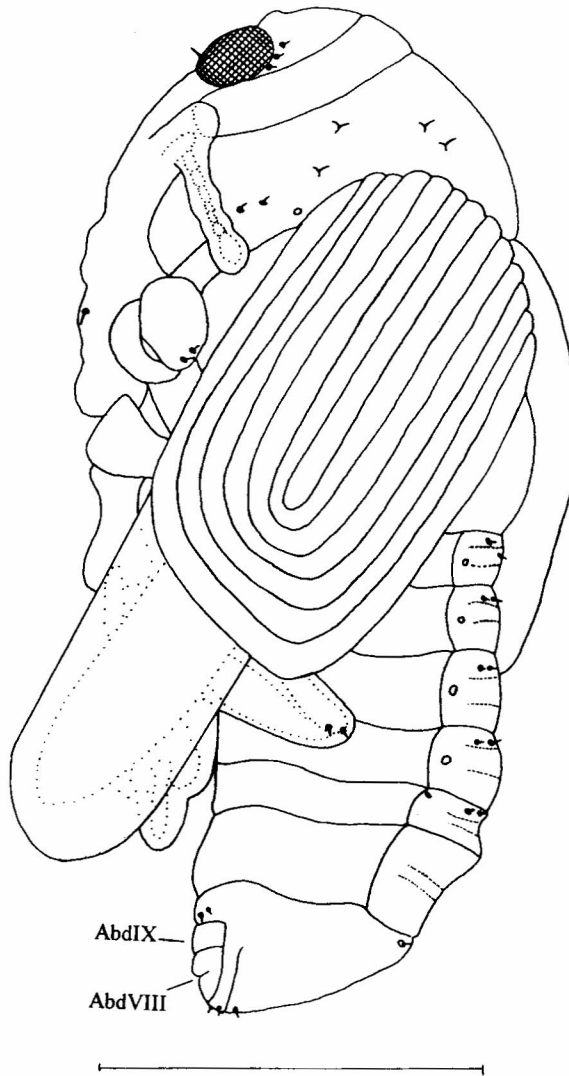
LARVA (FIGS 2-11):

Maximum length 3.20 mm, width 1.44 mm. Head width 0.44 mm. Setal numbers as in Table 1. Body robust, creamy white, pleural lobes subdivided, cuticle glabrous. Setae unpigmented, short, fine, sharp, placed at chaetofores. Head free, light- to dark-brown with clear setal bases, slightly wider than long, rounded on



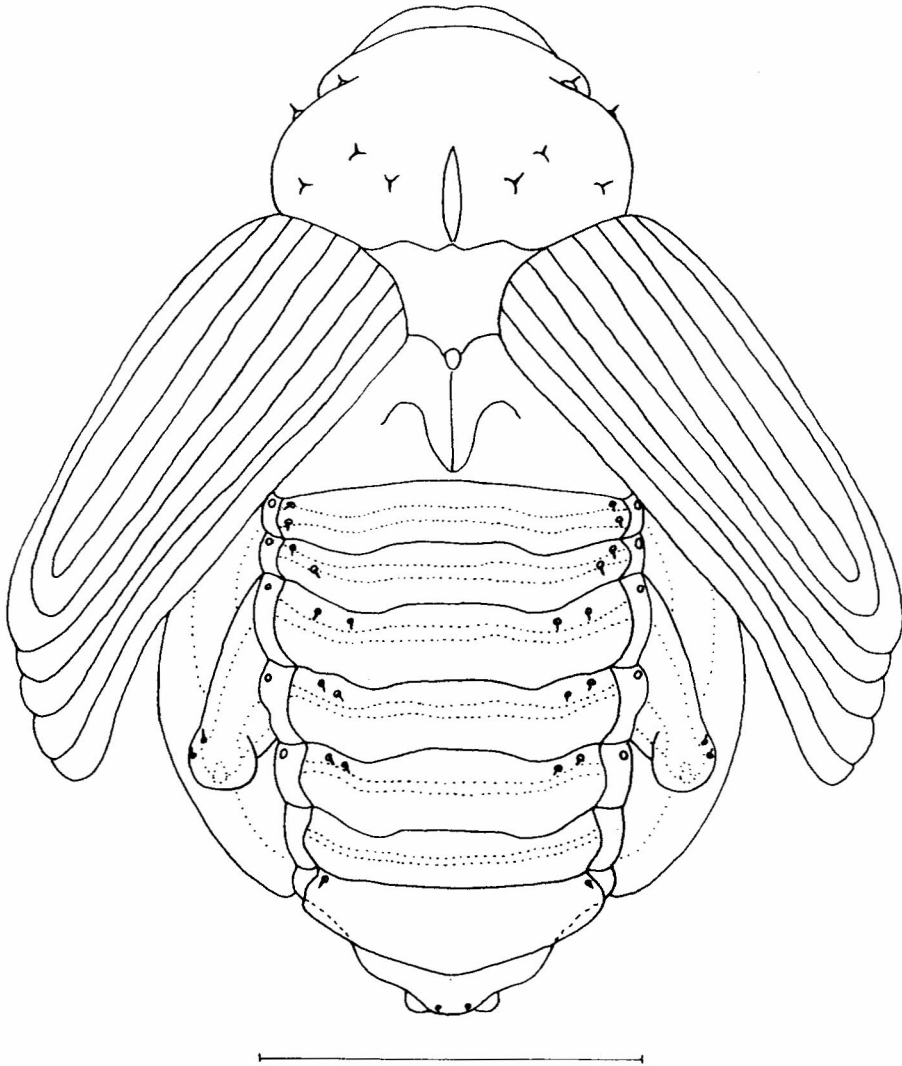
12. *Amalorrhynchus melanarius*, pupa, ventral (scale 1 mm)

sides with distinct hind margin, epistoma and mandibles darker. Frontal suture distinct, narrow, slightly angled before apex, ecdysial line darker, shorter than coronal suture; ratio 2:3, des3 situated within frontal suture, des1, 2, 4, 5 shorter, paired, fs1, 2, 3 placed in the center of frons, minute, fs4 and fs5 near to epistoma, fs4 subequal to des3, fs5 minute. There is one small, distinct pair of ocelli (figs 3, 4). Antennae small, conical, not overhung by frontal projection (fig. 5). Clypeus



13. *Amalorrhynchus melanarius*, pupa, lateral (scale 1 mm)

transverse, unpigmented, except at base. Labrum trilobate, regularly pigmented, setal bases clear, middle lrms longer than others (fig. 6). Hypopharyngeal bracon narrow, clear. Epipharynx slight with two strong als, one ams and two mes, second pair of mes shorter than the first, placed more laterally, tormae parallel, broader at base (fig. 7). Mandibles triangular with two visible setae, anterior shorter than the posterior (fig. 8). Maxilla with lacinia bearing on dorsal side 6 setae, of which seta



14. *Amalorrhynchus melanarius*, pupa, dorsal (scale 1 mm)

placed nearest to base two times longer than the others, the remaining subequal (fig. 9), stipes regularly, slightly pigmented. Maxillary and labial palpi short. Premental sclerite strong, rounded at base (fig. 10). Thoracal segments slightly bigger than abdominal. Spiracles bicameral, linear, set within a small oval peritreme, slightly depressed, unpigmented, airtubes conspicuous 5-6 annulate (fig. 11), all caudad. Anus ventral, 4-lobed, lateral lobes small.

PUPA (FIGS 12-14)

Maximum length 3,21 mm. Setal numbers as in Table 2. Cuticle spiculate. Setae unpigmented, sharp, longer on pronotum, those on head and Abd VII two times shorter, others minute. Pronotal setae mounted on small tubercles. Antennal club smooth. Secondary pterotheca longer than primary (wings functional in adult). Spiracles circular, weakly visible. Abd VII in terminal position, Abd VIII and IX in ventral position; pseudocerci absent.

MATERIAL EXAMINED

Poland: Wrocław-Pawłowice, 12 VI 1994, 12 imagines (leg. P. CHMIELARZ);

Poland: Wrocław-Pawłowice, 4 VII 1994, 59 larvae, 3 pupae (leg. P. CHMIELARZ);

Reared specimens: 5 VII 1994, 14 larvae, 40 pupae (leg. P. CHMIELARZ).

REMARKS:

I have not seen immature stages of the species described by SCHERF (1964) so I had to depend on his descriptions. According to them *A. melanarius* (STEPH.) is more similar to *P. hopffgarteni* TOURN. and differs only in the size and number of setae on the pedal area of larva.

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ABBREVIATIONS USED IN TEXT AND FIGURES

Abd, abdominal segment	ds, dorsal setae
als, anteriolateral setae	fs, frontal setae
ams, anteriomedial setae	hb, hypopharyngeal bracon
ant, antenna	les, lateral epipharyngeal setae
as, alar setae	lig, ligula
cls, clypeal setae	lrms, labral setae
des, dorsoepicranial setae	lsts, laterosternal setae
dlds, dorsal lacinial setae	mes, median epipharyngeal setae
dls, dorsolateral setae	msts, mediosternal setae
dpls, dorsopleural setae	pda, pedal area

pds, postdorsal setae	ps, pleural setae
pes, postepicranial setae	ss, spicular setae
pfs, palpiferal setae	stps, stipital setae
plbs, postlabial setae	sts, sternal setae
pmcs, premental sclerite	t, tormae
prls, prelabial setae	ves, ventral epicranial setae
prn, pronotum	vlcs, ventral lacinial setae
prs, prodorsal setae	vpls, ventropleural setae

Table 1. *Amalorrhynchus melanarius* (STEPH.) Setal index for larva together with modal numbers of *Curculionidae*. Italics represent minute setae; v, variable.

	modal numbers			modal numbers	
PROTHORAX			ABDOMEN X:		
pronotal	5+1	v	anal lateral	2	1-3
dorsopleural	0	1-3	HEAD		
ventropleural	0	2	dorsal	5	5
mediosternal	0	1	posterior	6	4
pedal area	2+1	v	lateral	2	2
MESO -METATHORAX			ventral	2	2
prodorsal	1	1	frontal	3+2	5
postdorsal	2	4	clypeal	3	2
dorsolateral	1	1-2	labral	3	3
alar area	1	1-3	mandibular	2	2
dorsopleural	0	1	EPIIPHERYNGEAL LINING		
ventropleural	0	1	anteriolateral	2	3
mediosternal	0	1	anteriomedial	1	1+1
pedal area	1+2+1	v	medial	2	3
ABDOMEN I-VIII:			MAXILLA		
prodorsal I-VII	2+1	1	(dorsal)	6	v
VIII	2	0-1	lacinia		
postdorsal I-VII	1+1	5	(ventral)	4	v+1
VIII	1	v	palpal	1	1
spicular I-VII	2	2	stipital	2	1
VIII	2	1	palpiferal	2	2
dorsopleural	3	2	LABIUM		
ventropleural I-VI	1+1	2	postlabial	2	3
VII, VIII	3	2	prelabial	1	1
laterosternal	1	1	ligular	2	2
mediosternal I-VII	1	2			
VIII	0	2			

ABDOMEN IX:

dorsal	2	v
pleural	2	2
sternal	2	2

Table 2. *Amalorrhynchus melanarius* (STEPH.) Setal index for pupa.

Head + rostrum	5	Abdomen VI	0
mandibles	0	Abdomen VII	
pronotum	7	postdorsal	1
mesonotum	0	pleural	2+1
metanotum	0	ventral	1
Abdomen I-V		terminal	1+1
postdorsal	2	Legs-femoral	2
spicular	0		

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