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Description of male of *Otiorhynchus raucus* (FABRICIUS, 1777) with some remarks on the geographical origin of the species (Coleoptera: Curculionidae)

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ABSTRACT. This paper describes the hitherto unknown males of *O. raucus,* from Albania. On the basis of the geographical distribution of the bisexual and parthenogenetic populations and their morphological variability, the dispersal centre of the species has been placed in the south-western part of the Balkan Peninsula.

Key words: entomology, taxonomy, Coleoptera, Curculionidae, *Otiorhynchus raucus*, Albania, description of male, dispersal centre.

INTRODUCTION

The genus *Otiorhynchus* GERMAR comprises many parthenogenetic species, the males of which remain unknown. These species pose many difficulties not only for taxonomists but also for zoogeographers who want to establish the history of their ranges. It is therefore of great importance to both kinds of specialists to find bisexual populations of these species. On the one hand it makes it possible to resolve many taxonomic problems, and on the other it indicates the possible dispersal centre of a species and makes it easier to determine its migration routes.

A study of the weevils of France (HOFFMANN 1950) contains a brief mention of male *Otiorhynchus raucus*. However, the abovementioned author did not indicate where the bisexual population was found, which does not make his information very credible, all the more so since the description of sexual dimorphism, limited to two sentences, is not quite accurate. It may be that HOFFMANN had at his disposal an atypically developed female specimen, which he took to be a male. For this

reason I have decided to describe the differences between the sexes which I observed in the investigated material from Albania. The finds of male *O. raucus* also allow me to propose a hypothesis concerning some aspects of the development of the range of this species.

Two subspecies have hitherto been distinguished within *O. raucus*: *raucus raucus* (F.) and *raucus silvicola* MAZUR. The former occurs mainly in lowlands and is widely distributed (the greater part of Europe, western Kazakhstan), while the range of the latter is limited to a couple of mountain ranges of the Balkan Peninsula (MAZUR 1993).

In this paper, a few new terms are used to describe certain morphological features Their detailed characterisation is the subject of a separate paper (Mazur, in print). At this point only a brief explanation of these terms is presented in the form of a glossary, which will make the descriptions below fully comprehensible.

Coxal area - sides of pronotum above the forecoxa.
Cranium – head (caput) + rostrum.
Discal area – upper surface of pronotum.
Dorsal area – upper surface of elytra.
Epistomal area – the frontal, dorsal part of the procranium; usually clearly demarcated from the rest of the procranium (Fig. 2).
Epistomal processes – cuticular processes or just the thickenings in the frontal corners of the epistomal area in the males of some species (Fig. 1).
Mesocranium – middle part of the cranium or the basal part of the rostrum (Fig. 2).
Metacranium – posterior part of cranium, ie. the head *sensu stricto* (Fig. 2).
Procranium – anterior part of cranium which is also the anterior part of the rostrum (Fig. 2).
Sternal depression – depression of the first abdominal sternite in the males of some species.
Subfrontal area – dorsal part of mesocranium, usually limited laterally by margins (Fig. 1).

DESCRIPTION OF MALES

Material examined: Albania (Mirditë, "Bulschari"), 2 males in V. Apfelbeck«s collection (Instituteof Systematics and Evolution of Animals, Polish Academy of Science, Krakow).

Body length (without rostrum): 6.2-6.5 mm.

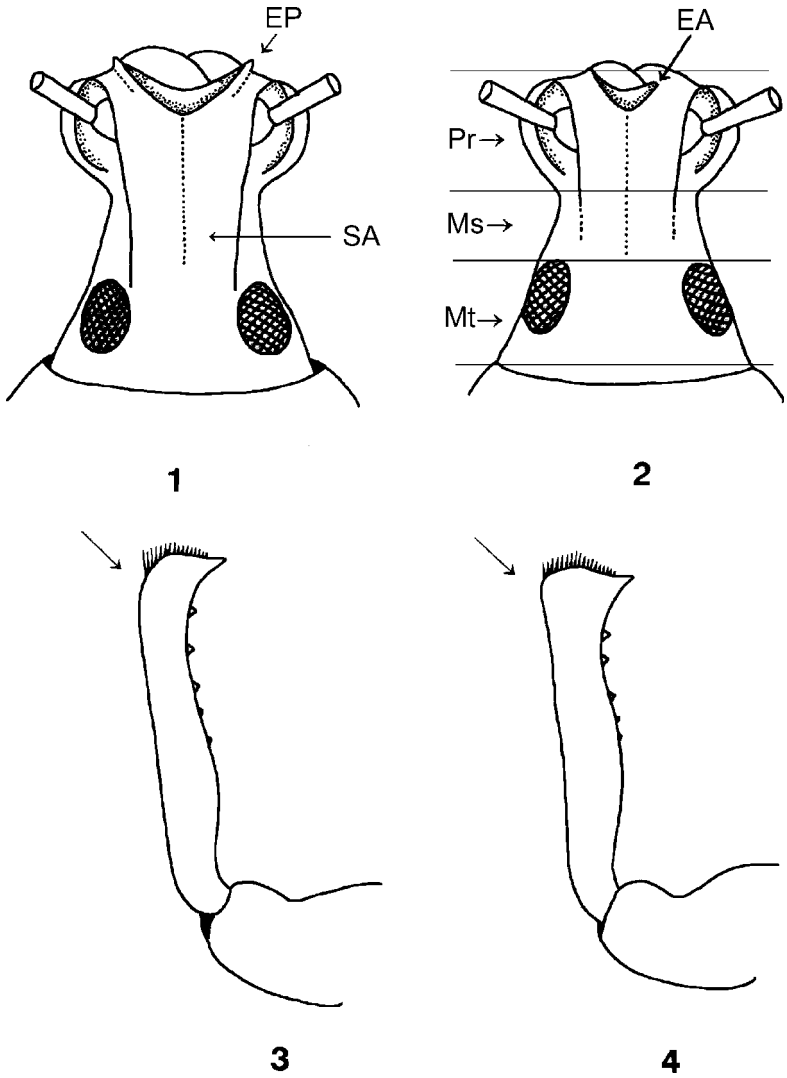
Pigmentation: cuticle brown to dark brown.

Vestiture: elytra densely squamose; scales elongate, light (grey-yellow) and dark (grey-brown), with faint metallic sheen; lighter-coloured scales maculate; maculae fine, numerous, especially in the posterior portion of elytra; pronotum with recumbent hairs and scales; the latter elongate, hair-like, maculate.

Head (Fig. 1): rostrum isodiametric; procranium about as wide as metacranium at eye level; epistomal area of rostrum with two small but distinct epistomal

processes; subfrontal area flat, parallel-sided; its lateral margin slightly elevated, bluntly carinate over entire length; procranium 1.6x wider than apical part of mesocranium; eyes oval, weakly convex, not prominent in dorsal view.

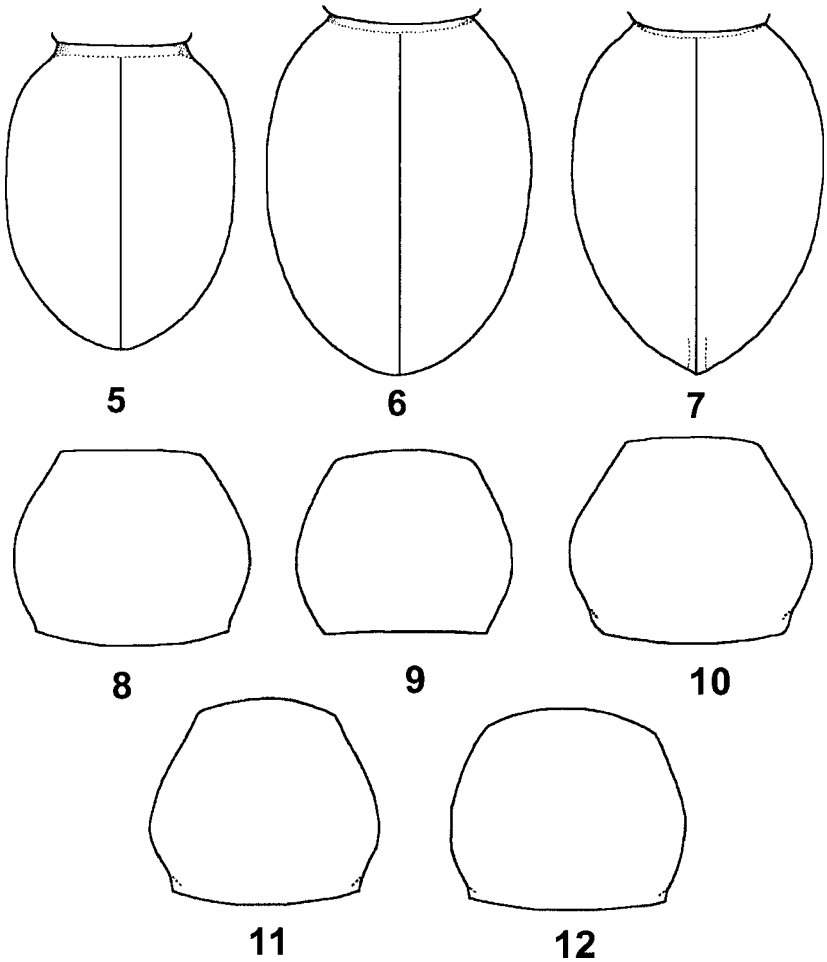
Pronotum (Fig. 8-9): ca. 1.2-1.4x wider than long, regularly rounded at sides; discal area with dense crater-like granules and short median carina; coxal area with large scrobicular punctures and granulate interspaces.



1-4. *Otiorhynchus raucus*: 1 – male head, 2 – female head, 3 – male foretibia, 4 – female foretibia. Legend to abbreviations: EA – epistomal area, EP – epistomal process, Ms – mesocranium, Mt – metacranium, Pr – procranium, SA – subfrontal area

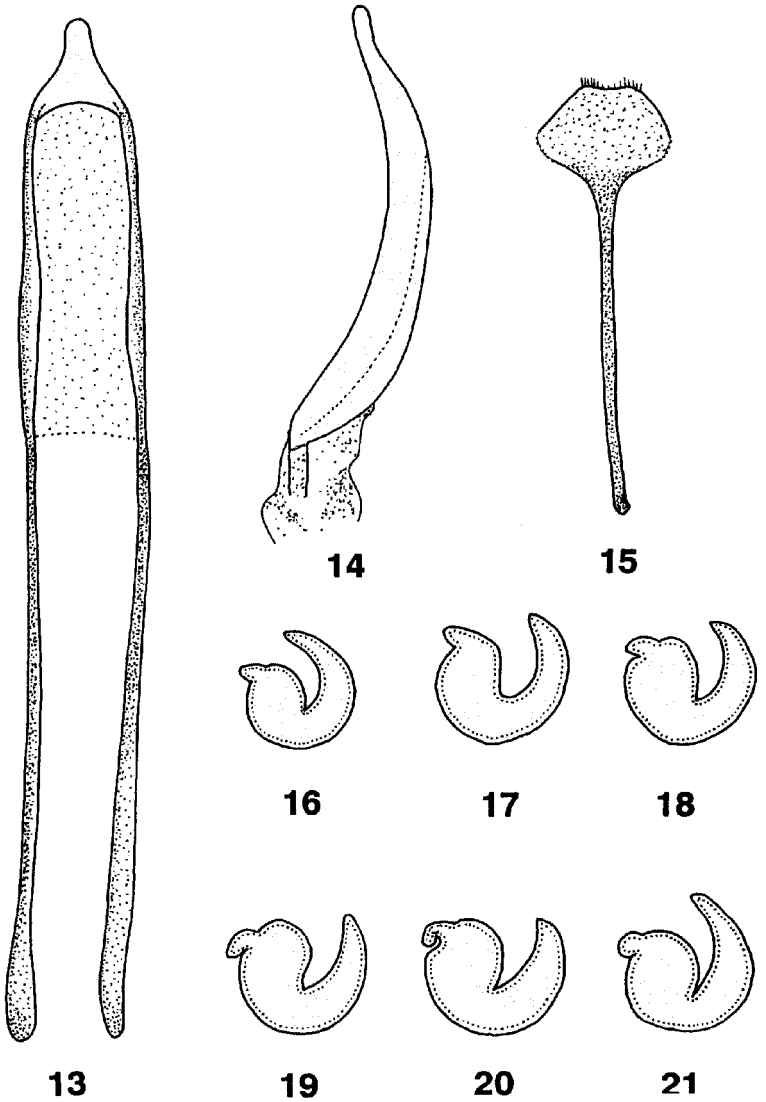
Elytra (Fig. 5): 1.23-1.28x longer than wide, oval, flattened at base, smoothly declivous towards pronotum, with basal margin not raised; posterior declivity not elevated along the suture (as in *O. raucus silvicola* MAZUR); humeri widely rounded; striae in dorsal area with large rotund scrobicular punctures decreasing gradually to elytral apex; intervals distinctly wider than the striae, weakly convex on disc, and entirely flat at elytral sides.

Antennae: scape straight, thickened apically; funicular segments 1 and 2 equal in length, each one ca. 2.2x longer than wide; antennal club spindle-shaped, slightly shorter than 3 distal segments jointly.



5-12. *Otiorhynchus raucus*: 5 – elytra of male from Albania; 6 – elytra of female of ssp. *silvicola* from Bulgaria, 7 – elytra of female of ssp. *raucus* from Poland, 8-9 – pronotum of male, 10 – pronotum of female of ssp. *silvicola* from Bulgaria, 11 – pronotum of female of ssp. *raucus* from Poland, 12 – pronotum of intermadiate form of female from Macedonia

Legs (Fig. 3): femora without teeth; outer margin of the foretibiae widely rounded at apex; their inner margin weakly bisinuate, with a few spine-like teeth on the inner surface; inner margin of the midtibiae with distinctly finer denticulation, and the hind tibiae without teeth; tarsomere 2 about 1.5x wider than long.



13-21. *Otiorhynchus raucus*: 13 – median lobe of aedeagus, dorsal view, 14 – median lobe of aedeagus, lateral view 15 - spiculum ventrale, intermediate form from Macedonia; 16-21 - receptaculum seminis: 16-17 - ssp. *raucus*, Kraków (Poland); 18 - ssp. *raucus*, Przemyśl (Poland); 19-20 - ssp. *silvicola*, Čepelare (Bulgaria); 21 – intermediate form, Strumica (Macedonia)

Body underside: abdomen with sternal depression, other characters as in females.

Aedeagus: median lobe as in figures 13-14.

On the basis of the shape and sculpture of the elytra the males described could be considered to be *raucus* ssp. *silvicola*, but the distribution of scales on the elytra makes them resemble the nominate subspecies. Thus the subspecies designation of these males remains an open question.

The main differences between males and parthenogenetic females of both subspecies (females from the bisexual populations are unknown to the author) concern minor features of the structure of different parts of the body. Female *O. raucus* are characterised primarily by:

1) absence of epistomal processes (Fig. 2)
2) rounding of the pronotal sides (Fig. 10-12)
3) sculpture in the coxal area of pronotum (large and shallow punctures transforming in places into scrobes; interspaces without conspicuous granules)
4) shape of the foretibiae (their inner margin subrectangularly curved inwards – Fig. 4)
5) absence of the sternal depression.

Fig. 15 presents the shape of the spiculum ventrale, that of the receptaculum seminis being found in fig. 16-21.

The abovementioned differences are generally typical of sexual dimorphism in the genus *Otiorhynchus*, except for the sculpture of pronotal sides. This might indicate that the described males belong to some species other than *O. raucus*. However, such an assumption does not seem compatible with the occurrence of intermediate forms in Macedonia (3 females from Strumica), in which the sculpture on the coxal area is developed similarly to that in males, though the granules are somewhat smaller. In the females mentioned the elytral declivity is elevated and swollen along the suture (like that in females of the nominative subspecies).

The most important difference between females originating from Macedonia and males from Albania concerns the shape of the elytral apex. I do not think these females represent a bisexual form, especially since they have the same range of variability of characters as do parthenogenetic forms.

It is very likely that the bisexual form of *O. raucus* in question was previously described from northern Albania by APFELBECK (1918) under the name of *O. sphaerosoma*. Unfortuntely, I do not know the latter species and my assumption is based on the original description which is not sufficiently detailed. The minor differences between the two descriptions may result from the variability of local populations and a different style of description. According to APFELBECK, in *O. sphaerosoma* elytral interstriae are clearly vaulted and provided with granules. In the specimens I have examined the interstriae are completely flat and with only a few tiny, inconspicuous granules. Other features mentioned by APFELBECK are the same as in male *O. raucus*. It will not be possible to decide about the synonymy

till the types of *O. sphaerosoma* have been examined. I do not know where these might be kept; I did not find them in the Museum of Natural History in Budapest where the greater part of APFELBECK's collection is housed.

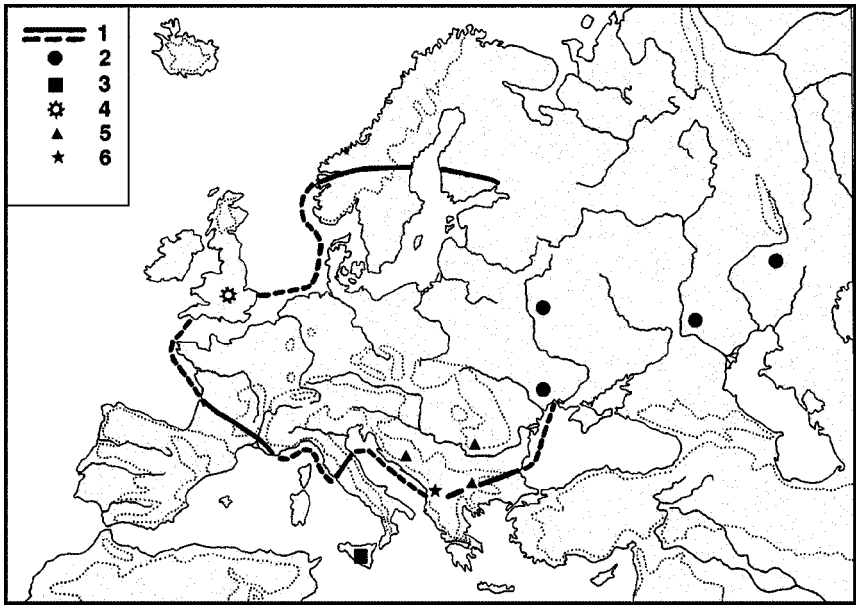
Range (Fig. 22)

The distribution of *O. raucus* ssp. *raucus* and *O. raucus* ssp. *silvicola* has already been discussed by MAZUR (1993). Their joint range comprises the greater part of Europe and Kazakhstan (not to mention Canada where the species has been introduced). In Europe it is known from the following countries: Great Britain, Norway, Sweden, Finland, Denmark, France, Germany, Czech Rep., Slovakia, Poland, Belarus, Latvia, Lithuania, Estonia, Russia, Ukraine, Switzerland, Austria, Hungary, Romania, Italy, Albania, Macedonia, Yugoslavia, Bosna and Herzegovina, Croatia and Bulgaria.

CONCLUSIONS

The discovery of a bisexual population throws new light on problems concerning the origin and development of the range of the species under discussion. The most important conclusions are as follows:

1. Morphological variability of *O. raucus* is much greater than expected and concerns a variety of features used in the systematics of the genus *Otiorhynchus*, especially body sculpture.



22. Distribution of *Otiorhynchus raucus*: 1 – limit of the range; 2 – extreme localities at the eastern range border; 3 - isolated locality in Sicily; 4 – locality without further details; 5 – localities of the subspecies *silvicola*; 6 – locality of the bisexual population

2. The centre of the maximum morphological variability of the species lies in the south-western part of the Balkan Peninsula and comprises the area supporting the bisexual population.

3. The locality of the bisexual form lies at the southern border of the range of the species, while the remaining part of the range is inhabited by parthenogenetic forms.

4. The parthenogenetic form representing the nominate subspecies (MAZUR 1993) has expanded from the Balkan Peninsula in different directions and for different distances. The extreme localities of this species are in the British Isles, Scandinavia and Kazakhstan. It is striking that *O. raucus* has only slightly extended its range to the south and south-east. So far it has not been found in Greece and Turkey, and it is generally rare in the Mediterranean area.

5. The centre of distribution (centre of species diversity) of the group *Otiorhynchus raucus*, to which I have assigned *O. raucus* (F.), *O. balcanicus* STRL., *O. megareus* REITT., *O. megareoides* SMRECZ., *O. leutneri* SMRECZ., *O. arabicus* MAZUR and *O. weisei* REITT., is in Asia Minor. Thus, the range of *Otiorhynchus raucus* lies beyond the borders of this centre.

On the basis on the above findings I am of the opinion that *O. raucus* originates from the southern Balkan dispersal centre. Therefore its range has a similar history as that of *Otiorhynchus perdix* (OL.) (MAZUR 1998). Its territorial success can be safely assumed to result from parthenogenesis. Man has probably played an important role in shaping this range as indicated by the fact that *O. raucus* is a common component of the faunas of anthropogenic habitats and its numerous populations may be found in such places as urban parks, gardens, and roadside verges.

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