

Supplementary information on the structure of *Baetopus wartensis* KEFFERMÜLLER and *Raptobaetopus tenellus* (ALBARDA) (Ephemeroptera, Baetidae)

Uzupełnienie wiadomości o budowie *Baetopus wartensis* KEFFERMÜLLER i *Raptobaetopus tenellus* (ALBARDA) (Ephemeroptera, Baetidae)

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**ABSTRACT.** The paper contains a description of the surface mould and the base of the unpaired genital outgrowth of *Baetopus wartensis* and *Raptobaetopus tenellus* as well as of the egg and the veins of the hind wings of *B. wartensis*.

In males of some representatives of *Baetidae* between the bases of forcepses there is a small, strongly sclerotized outgrowth which is able to retract behind the hind edge IX abdominal sternite. Among the European species it was found in ~~the~~ species of the genus *Baetis* LEACH of the group *Vrebatinus* as well as in *Baetopus wartensis* KEFF. and in closely related to it *Raptobaetopus tenellus* (ALB.).

In 1978, MÜLLER-LIEBENAU isolated the genus *Raptobaetopus* from the genus *Baetopus* KEFF. and among others compared the shape of the male genital sclerite of *R. tenellus* (ALB.) (the second species of the genus: *R. orientalis* MÜLLER-LIEBENAU is actually known only in larval stadium) and of *B. wartensis* KEFF. which was then the only known representative of the genus. For this comparison she used a dry specimen of *R. tenellus* (ALB.) borrowed from the British Museum, London, and my hand draw-

ing of the investigated form made at her request from the only complete specimen male of *B. wartensis* KEFF. that I possessed.

In the meantime I came into possession of some more males of *B. wartensis* and could use two specimens for a preparation of the investigated sclerite together with its base. At the same time, thanks to Dr. Silverberg (Zoological Museum of the University in Helsinki), I could borrow a set containing, among others, 14 male imagines of *R. tenellus* (ALB.) and use 3 of them for the same purpose. The investigated outgrowth is set on a plate which, in *R. tenellus* (fig. 8) as well as in *Baetis tricolor* ČERNOVA and in *Baetis calcaratus* KEFFERMÜLLER (both species belonging to the group *atrebatinus*), is stretched between the so called penial arms which are also built similarly to those in the genus *Baetis* LEACH (KEFFERMÜLLER, 1972). In *Baetopus wartensis* this plate is narrower and seems more sclerotized than in *R. tenellus* (the comparison is rather difficult because of a great softening of the specimens of *R. tenellus* caused by their long conservation). This plate corresponds to the hind part of the plate in the above mentioned species of the genus *Baetis* LEACH, and during preparation it splits, letting the penial arms inside the segment. In normal position (fig. 6) the crooked ends of the arms are situated beside two sorts of tentacles growing up from the middle of the ventral edge of the plate. In both my old preparations in Faure's solution from the segment IX of the abdomen of the male of *B. wartensis*, the arms were visible more distinctly after a long time as a result of the overexposure of the preparation (fig. 4).

It was proved (KEFFERMÜLLER, 1972) that in males of *Baetis tricolor* ČER. and in *B. calcaratus* KEFF. the function of the penis is not performed by the middle sclerite but by a filmy eversible bag. The presence of a similar sclerite in the genus *Baetopus* KEFF. and *Raptobaetopus* MÜLL.-LIEB. allows a supposition that also here the thing is similar.

MÜLLER-LIEBENAU (1978) has stated and illustrated the difference in the shape of the investigated sclerite between *Baetopus wartensis* and *Raptobaetopus tenellus*. I tried to get to know its structure. On the surface of the outgrowth in *B. wartensis* there is a sort of sculpture resembling scales, set by several in one row, with their arcs directed towards the base of the outgrowth. In the place where two adjacent scales touch each other, there grows up a spine whose top is turned towards the top of the outgrowth (figs 5, 7). In *R. tenellus* the scales are much smaller but the sculpture seems to be similar; at any rate the spines are present for certain (fig. 9). The outgrowth of both species has a two-laminal structure (figs 1, 7).

In 1978, basing on imagines found in Mongolia, SOLDAN described

two new species of the genus *Baetopus* KEFF.: *B. montanus* and *B. asiaticus*. Illustrations of the genitalia ♂ of both species, though schematic, confirm the same type of structure as in *B. wartensis* KEFF., only their middle sclerite has a flattened top edge whereas in *B. wartensis* it is rounded. The remaining differences, except a notable width of this sclerite in *B. asiaticus*, may derive from a somewhat different setting of the object.

Not numerous cross veins in hind wings, present in both Asiatic species, occur also in *B. wartensis*.

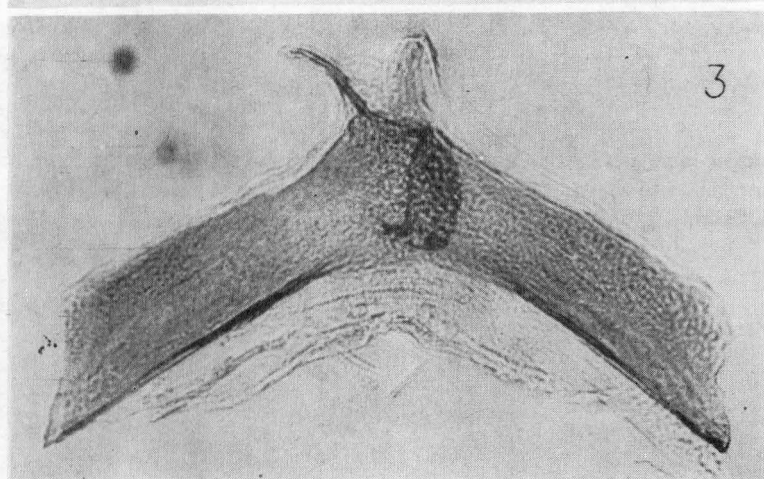
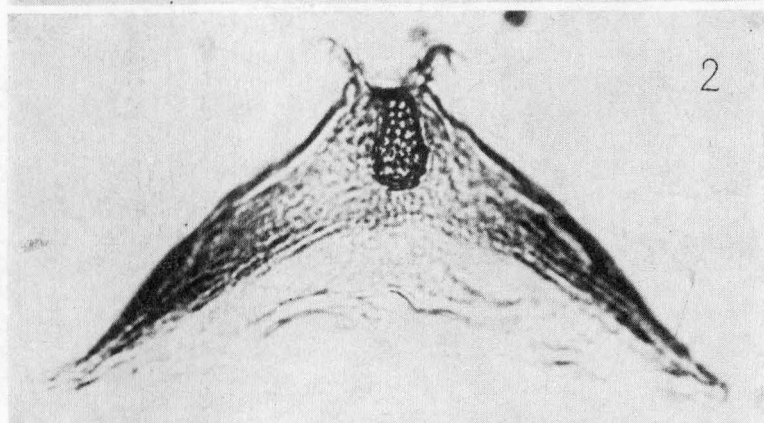
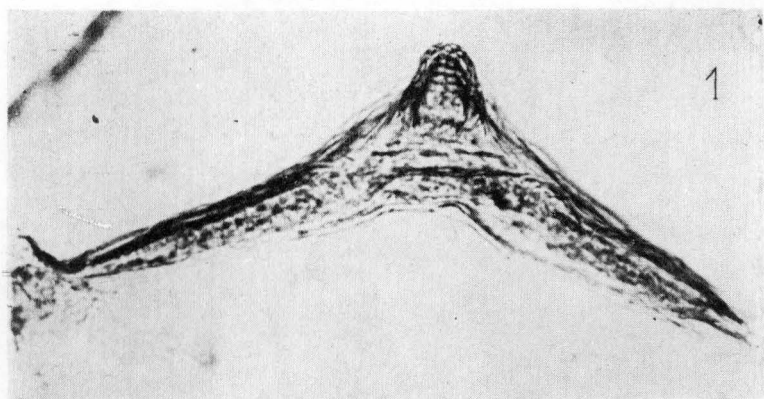
To complete the data of this species I join a description of its egg performed on the basis of some specimens taken out from two females conserved in 75% alcohol.

Dimensions:  $190 \times 95 \mu\text{m}$ . On the surface there is a sculpture resembling a net with small, irregular, mostly pentagonal mesh, resembling scales on the circumference of the egg; in the middle of these scales small single warts are present (fig. 10). Deeper, the structure resembles a loose twist of thick fibers (figs 11-13).

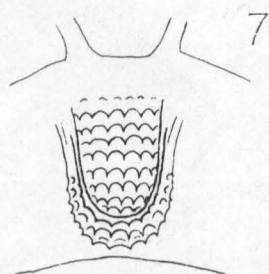
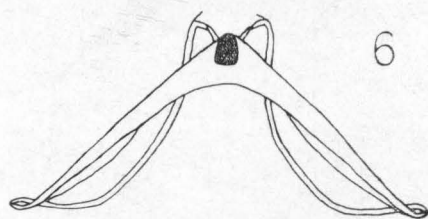
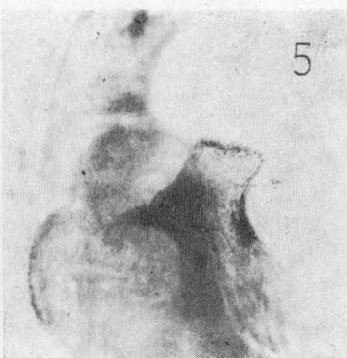
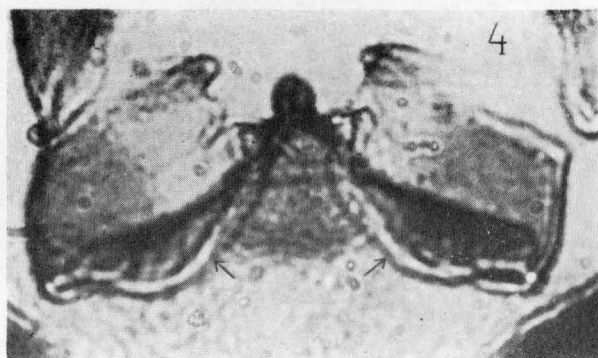
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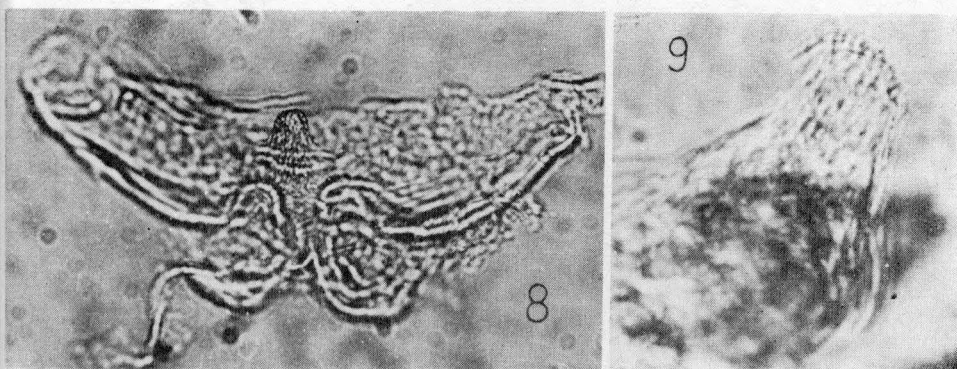
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1-3. *Baetopus wartensis* KEFF., imago ♂: genital outgrowth with its base (phot. J. Ski-  
biński). 1 — dorsal view, 2 — hind dorsal view, 3 — flattened under a glass cover

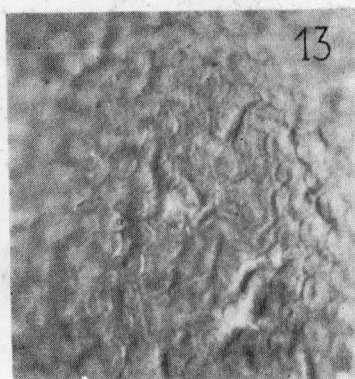
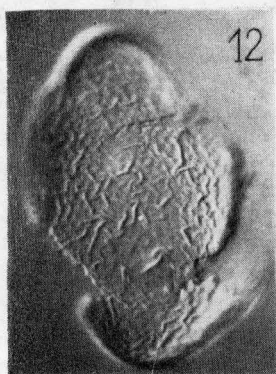
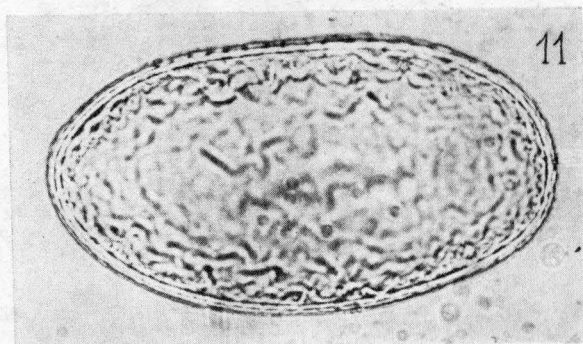
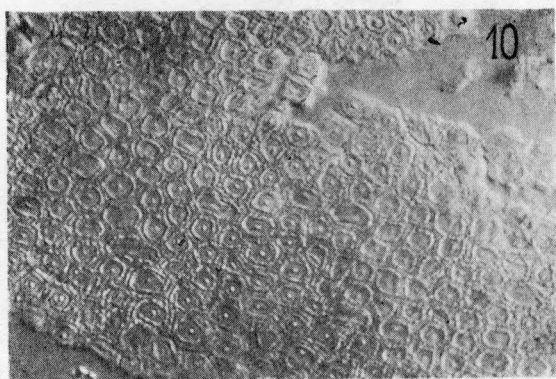


4-7. *Baetopus wartensis* KEFF., imago ♂. 4 - genitalia, ventral view (phot. J. Skibiński); the arrow points to the penial arms, 5 - genital outgrowth pushed forward, side view (phot. J. Skibiński), 6 - spacial arrangement of the genital sclerites (scheme), 7 - sculpture of the genital outgrowth, hind view



8, 9. *Raptobaetopus tenellus* (ALB.), imago ♂ (phot. J. Skibiński). 8 — plate stretched between the penial arms with the genital outgrowth set in the middle, 9 — the genital outgrowth, side view





10-13. *Baetopus wartensis* KEFF., egg (phot. J. Skibiński). 10 — fragment of the detached chorion; the sculpture formed by the adhesive layer is visible, 11, 12 — a complete egg, focused on the fibrous layer found under the chorion, 13 — fragment of the surface of an egg seen as above