

## *Pseudocentroptiloides*, a New Baetid Genus of Palaearctic and Oriental Distribution (Ephemeroptera)

by

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JACOB, U. & A. GLAZACZOW: *Pseudocentroptiloides*, a New Baetid Genus of Palaearctic and Oriental Distribution (Ephemeroptera). Aquatic Insects 8, 1986, No. 4, pp. 197-206.

The genus *Pseudocentroptiloides* Jacob is proposed for *Pseudocentroptilum* (?) *shadini* Kazlauskas (NE-Europe), the only species of the subgenus *Pseudocentroptiloides* s. str. The subgenus *Psammonella* Glazaczow is proposed for a new species from Sri Lanka, *Pseudocentroptiloides* (*Psammonella*) *ceylonica* Glazaczow. The two subgenera agree in a number of apotypic character states but differ in the presence (*Pseudocentroptiloides* s.str.) or absence (*Psammonella*) of hindwings. The authors feel that the latter character is of subordinate importance but has in some cases been over-emphasised by other authors. There appears to be a general risk that phyletic affinities between members of the Baetidae are obscured by assigning generic status to the most apotypic members of a given monophyletic group.

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### INTRODUCTION

In the Baetidae as a whole, generic limits remain largely artificial. Instead of reflecting evolutionary lines, phyletic groupings have been destroyed by removing their most apotypic taxa to separate genera. An example is provided by *Raptobaetopus* Müller-Liebenau, 1978, members of which are simply *Baetopus*-species which have progressed particularly far towards carnivory, leaving a plesiotypic assemblage of *Baetopus* Keffermüller, without their own apotypy. At present, the genera *Centroptilum* Eaton and *Pseudocloeon* Klapalek are heterogeneous assemblages of polyphyletic origin. The most obvious example of such an unnatural generic concept in the Baetidae is probably a genus referred to by Edmunds, Jensen and Berner (1976), where males and females of the same species, with and without hindwings, respectively, would be placed in different genera.

A trend towards reduction and eventual loss of hindwings occurs several times within the Baetidae. To recognize the phyletic affinities and adequately reflect them in the system, one must look for the closest relatives of species without hindwings among species which still have hindwings. Considering all

the characters exhibited by the various semaphoronts (egg, nymph, adult) of *Procloeon* Bengtsson, it is clear that this must be the (hindwingless) sister group of a species group presently assigned to *Centroptilum* (*pennulatum-pulchrum-nanum*-group). This group is placed in *Centroptilum* because it has hindwings and single intercalary veins, but in fact it does not agree very well with the type species of the genus, *C. luteolum* Müller. Sowa (personal communication) found an elegant answer to the question of availability of a generic name for *pennulatum-pulchrum-nanum* (Jacob, 1984). He considers the type species of *Pseudocentroptilum* Bogoescu, 1947, a member of this group and will publish on this separately. When we use this name here in the same sense, we do so because this is necessary for delimitation and naming of the taxa here discussed, and we fully acknowledge Sowa's priority in this matter.

One of the species to be discussed here has been named *Pseudocentroptilum ? shadini* Kazlauskas, 1964, from nymphal material. The author's question mark underlines his doubts about the generic placement. Nor could Puthz (1978) provide a definitive solution, placing the species in *Centroptilum*, again with a question mark.

Through the kindness of Dr. Keffermüller, Poznan, the first author obtained two specimens of this rare taxon and was able to examine additional characters not described by Kazlauskas. As inferred from his description and illustrations, *P. shadini* possesses characters unique among the European Baetidae. Furthermore, when compared to all adequately known Baetidae genera of the world, it has a unique character combination. Clearly, it represents a new genus which the first author here describes and names *Pseudocentroptiloides*.

The second author found a congeneric species in material from Sri Lanka. This, however, differs from *Pseudocentroptiloides* s.str. in the absence of hindwings. As explained above, we regard this as a subgeneric difference only. The second author establishes the subgenus *Psammonella*, and describes its new species, *ceylonica* (see below).

### ***Pseudocentroptiloides* Jacob, gen.n.**

Type species: *Pseudocentroptilum ? shadini* Kazlauskas, 1964, Trudi zool. Inst. Akad. Nauk. SSSR 32: 170 ff.

Relationships: a member of those Baetidae whose larvae have long thin tarsal claws which are usually biserially dentate or finely setate (with a tendency to reduction!), i.e., *Cloeon* Leach, *Centroptilum* Eaton (s.str.), *Pseudocentroptilum* Bogoescu, *Procloeon* Bengtsson, *Baetopus* Keffermüller (s.l.), as opposed to those taxa whose larvae have stout, uniserially dentate tarsal claws, i.e., *Baetis* Leach, *Pseudocloeon* Klapálek and *Acentrella* Bengtsson. The tergite sculpturing of *Pseudocentroptiloides* (Fig. 7) resembles *Cloeon*, *Pseudocentroptilum* and *Procloeon*, and the mouth parts also suggest that it is the sister group of these three taxa.

Diagnostic characters of the nymphs:

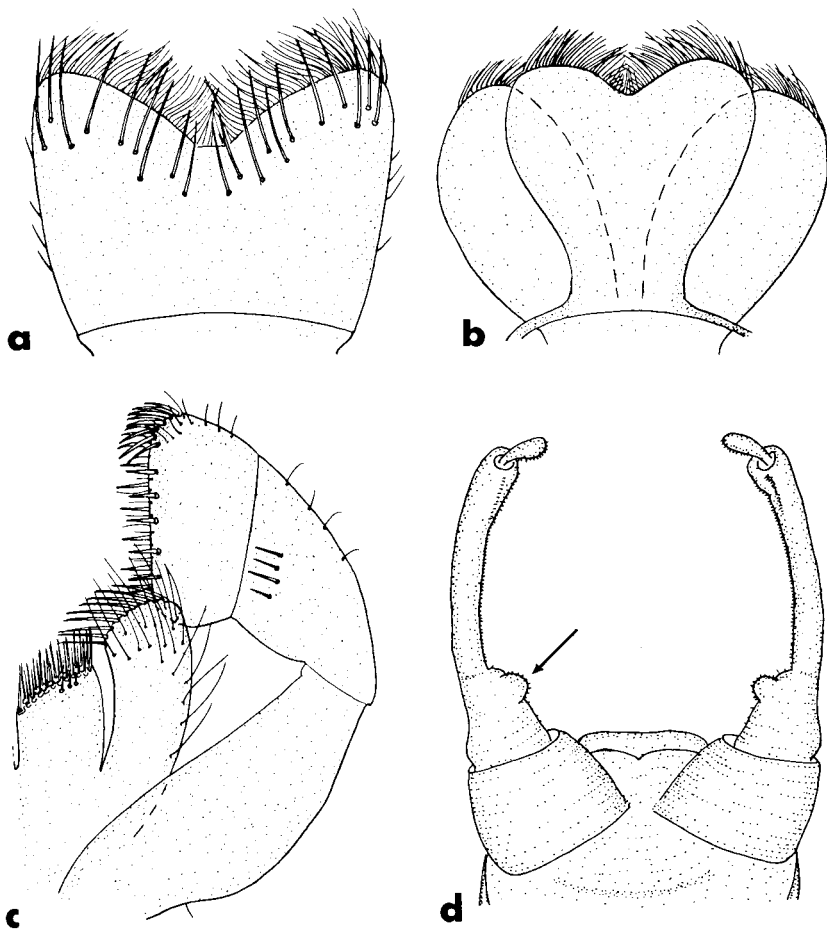


Fig. 1 *Pseudocentroptiloides* (s.str.) *shadini*: nymphal mouthparts (a, labrum; b, hypopharynx; c, left half of labium) and male genitalia (d, after Keffermüller & Sowa, 1984).

- Labrum distinctly wider apically than basally, apicomediaally broadly notched, bilobed (Fig. 1a) (in all other genera, labrum not enlarged apically and/or medioapically only narrowly incised, not bilobed).
- Glossae and paraglossae apically wide and blunt, glossae shorter than paraglossae and obliquely truncate (Fig. 1c) (in the remaining genera with long nymphal claws, glossae and paraglossae are of similar length and at least the glossae, sometimes also the paraglossae, are pointed).
- Lingua of hypopharynx approximately heart-shaped (Fig. 1b) (in the other long-clawed genera rather oval).

Constituent characters of the nymph:

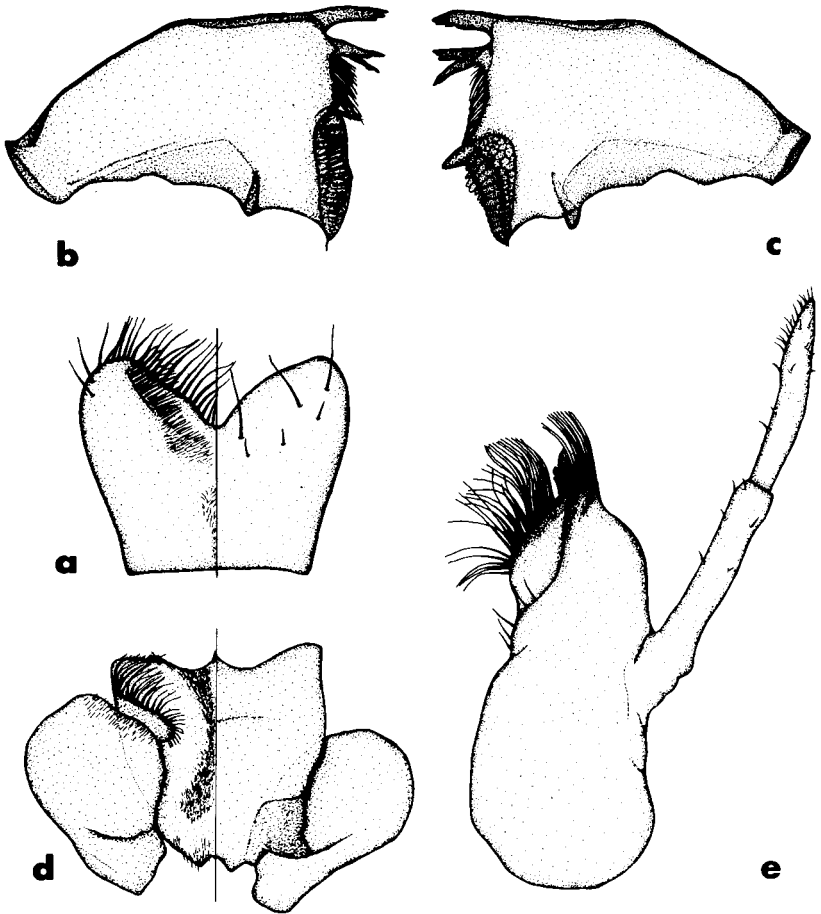


Fig. 2 *Pseudocentropiloides (Psammonella) ceylonica*, nymphal mouthparts (a, labrum, dorsal aspect to the left, ventral to the right; b, c right and left manible; d, hypopharynx, dorsal aspect to the left, ventral to the right; e, maxilla).

- Maxillary palpus bisegmented (a third segment is suggested but not demarcated by an articulation).
- Mandibular canini deeply divided.
- Prosthecae well developed.
- Rear margins of tergites with long and intercalated short pointed teeth.
- Hind corners of tergites forming a sharp spine.
- Lateral margins of tergites 8 and 9 with a few spines.
- 7 pairs of single tracheal gills, asymmetrical (the possible existence of species with bilamellate gills cannot be excluded!)
- Double row of teeth or setae on tarsal claws invisible under the light

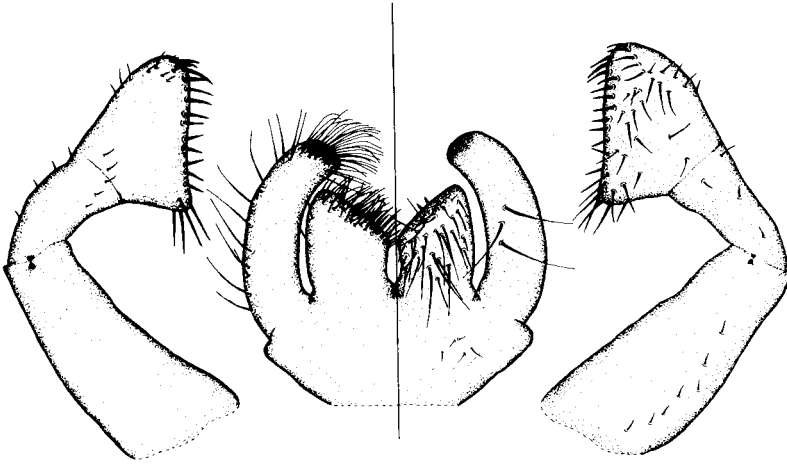


Fig. 3 *Pseudocentropiloides (Psammonella) ceylonica*, nymphal labium, dorsal aspect to the left, ventral to the right.

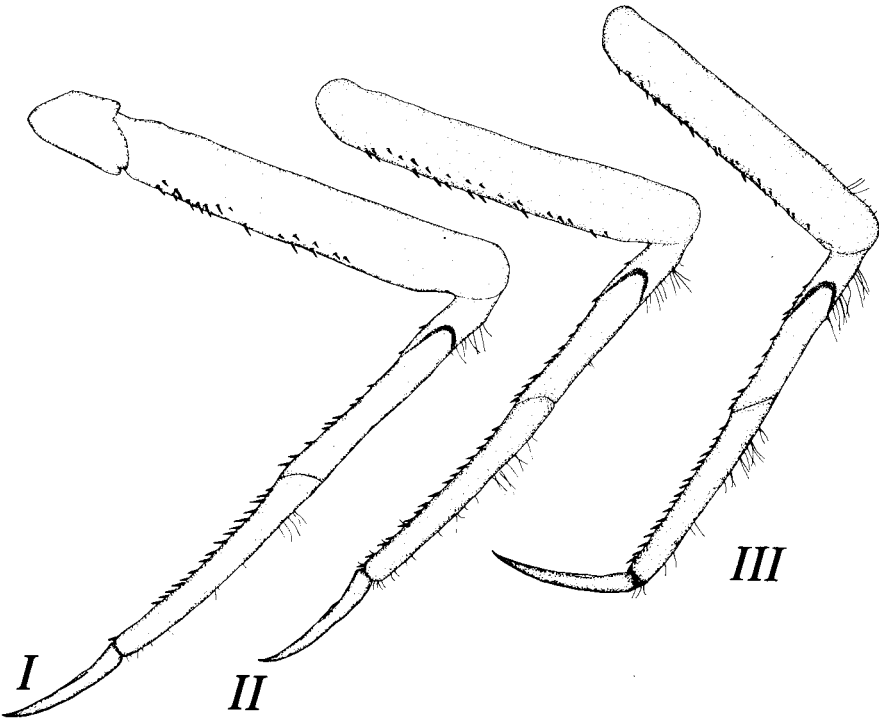


Fig. 4 *Pseudocentropiloides (Psammonella) ceylonica*, legs of nymph.

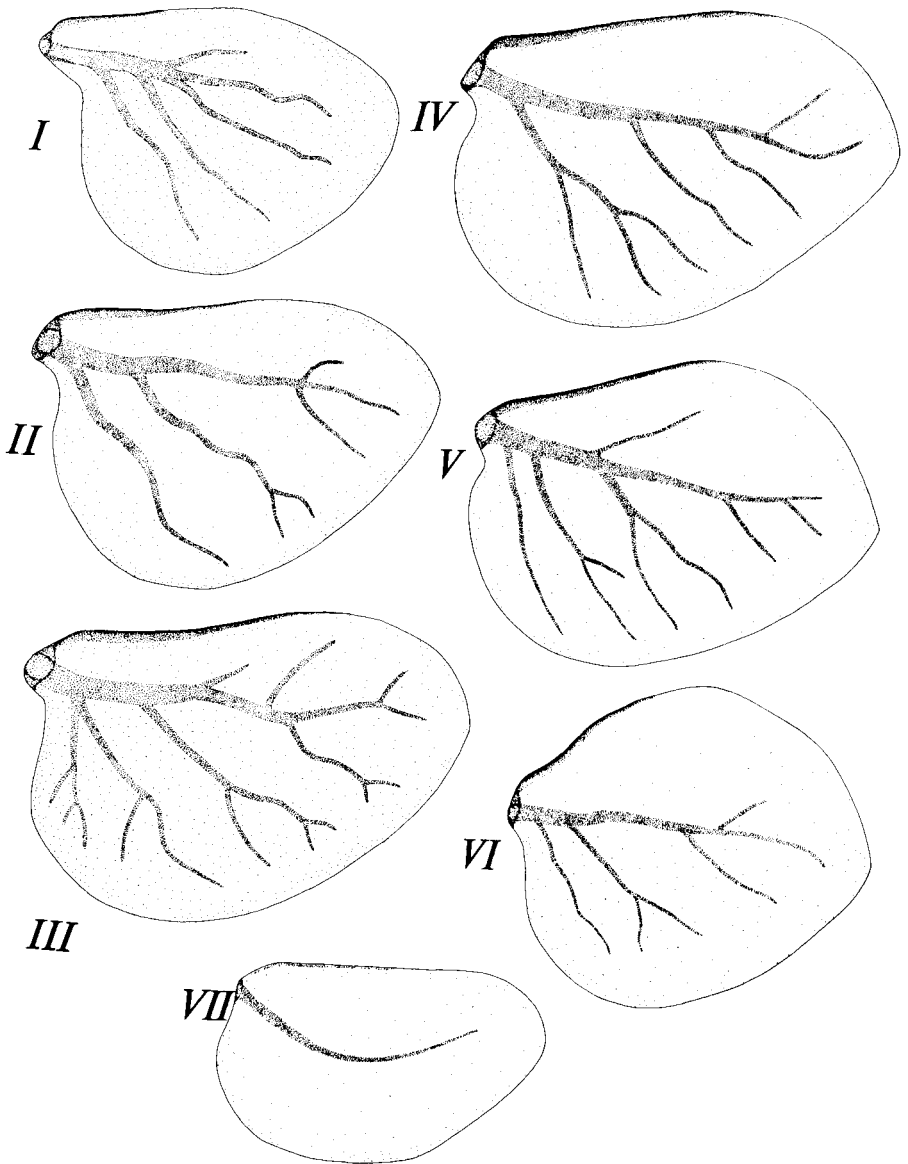


Fig. 5 *Pseudocentropiloides (Psammonella) ceylonica*, nymphal gills.

microscope, i.e., very fine or completely reduced.

Adults resemble *Pseudocentropilum*, most diagnostic characters are the same:

- Front wing with single intercalary veins.

- Hindwing (if present) with at most two longitudinal veins, with *processus costalis*.
- Bases of forceps closed adjacent.
- Penis cover present.

However, other than *Pseudocentropilum*, the type species of *Pseudocentropiloides* possesses a big subapical tubercle on the inside of forceps segment 1 (Fig. 1d).

Eggs have a differentiated chorion, with attachment papillae. In the type species, the chorion is densely reticulate, single small papillae occur in the meshes. A band of big attachment papillae in 11-12 rows extends around the equator of the egg (Keffermüller & Sowa, 1984).

Etymology: *Pseudocentropil..o..ides*, because of the similarity to *Pseudocentropilum* (incl. *Procloeon*) in some larval characters (tergal structure and pattern, shape of labial palp, shape of tarsal claws).

Gender of name: feminine.

The genus is polytypic.

#### **Pseudocentropiloides** Jacob, subgen. n.

The nominate subgenus has larval hindwing pads, subimagines and imagines have hindwings.

Species included: at present only a single species, the west palaeartic type species *P. (Pseudocentropiloides) shadini* (Kazlauskas, 1964), comb.n. (Fig. 1), is known. The type locality is Oka River at Kaluga (European part of Soviet Union). Keffermüller discovered another locality, the Bug River at Mierzvice (Poland), from which two larvae (leg. et det. Keffermüller) are in the collection of the first author. A continental-meridional distribution, with occurrence in the continental type of potamal (i.e., lowland streams very warm in summer), with sandy substrata.

#### **Psammonella** Glazaczow, subgen.n.

The present subgenus lacks hindwings or hindwing-pads completely. Constituent characters as in the nominate subgenus.

Type and only included species: *Pseudntropiloides (Psammonella) ceylonica* Glazaczow, Sri Lanka (Ceylon).

Etymology: psammos (Greek) – sand, the preferred nymphal substratum.

Gender of name: feminine.

#### **Pseudocentropiloides (Psammonella) ceylonica** Glazaczow, *sp.n.* (Figs. 2-8)

Mature nymphs: body 4.1-4.5 mm, caudal filaments 1.4-1.7 mm (cerci and terminal filum equal), antennae 0.8-1.6 mm long.

Mouthparts (Figs. 2, 3): Incisors of mandibles cleft to the base, prostheca of right mandible a little smaller; bisegmented maxillary palpus (3rd segment very slightly suggested, but not articulated, or separated from segment 2); medial

hypopharynx lobe wider and longer than side lobes, widening towards front, its anterior margin concave with median point, sides of medial lobe with two setose protuberances; glossae short, wide, obliquely truncate, paraglossae longer and narrower, but apex blunt.

Legs (Fig. 4): inner margin of femur, tibia and tarsus with short and sharp bristles, only some bristles on femur truncate. Outside of legs with groups of long, thin bristles (not shown in the figures): front claws half the length of the tarsus, middle claws a little longer, hind claws 2/3rd length of the tarsus.

Metanotum with blunt hind corner, without trace of a wing-pad (arrow in Fig. 6a). Posterior edge of abdominal tergites as in Fig. 7.

Gills (Fig. 5): I and VII slightly smaller than the others, II-IV similar, gill VI almost symmetrical.

Paraproct (Fig. 6b) with six large spines and a few smaller spines on its inner margin.

Coloration (Fig. 8) in alcohol: background yellowish, usually brown spots on metanotum and abdominal tergites I and VI; base of legs and claws may be darkened; sternites without pattern, some specimens nearly unpigmented. There are light yellow-green spots on the side of the pronotum caused by interference patterns. Pigment situated in cuticula. Initial compound eyes of male nymphs brick-red, ocelli black.

Subimagines and imagines are unknown.

Material: 28 nymphs, 7 of which were mature, Sri Lanka, Mahaveli Ganga River, Kandy town, near Botanical Garden. The holotype (mature male nymph) and paratypes (all other specimens) are kept in the Department of Systematic Zoology at A. Mickiewicz University, Poznan, Poland.

The nymphs have been collected in slow back-current on sand, near the edge of sandbanks in the generally fast flowing river, which is several dozen meters wide and has a sandy and rocky bottom.

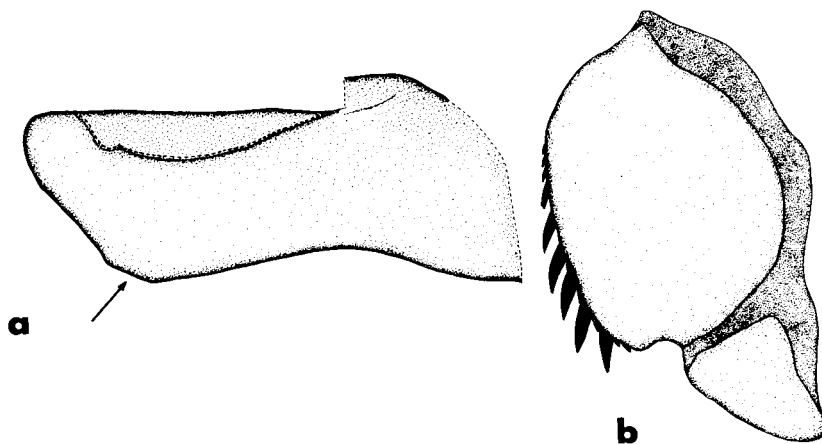


Fig. 6 *Pseudocentropiloides (Psammonella) ceylonica*, nymphal metanotum (a, arrow points at corner where pterotheca would normally be) and paraproct (b).



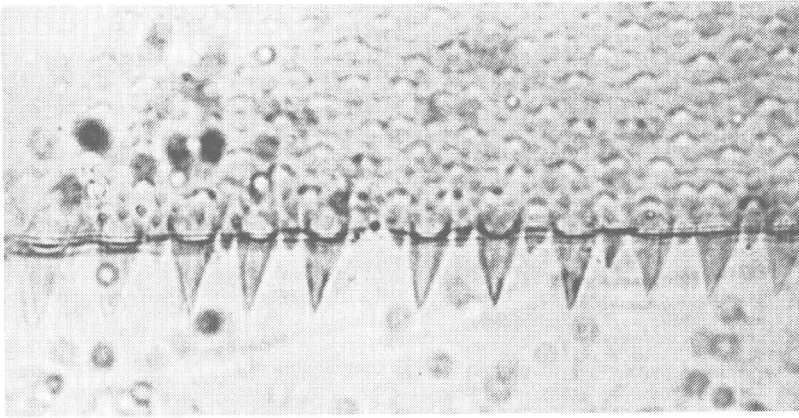


Fig. 7 *Pseudocentroptiloides (Psammonella) ceylonica*, surface and posterior margin of nymphal abdominal tergite.

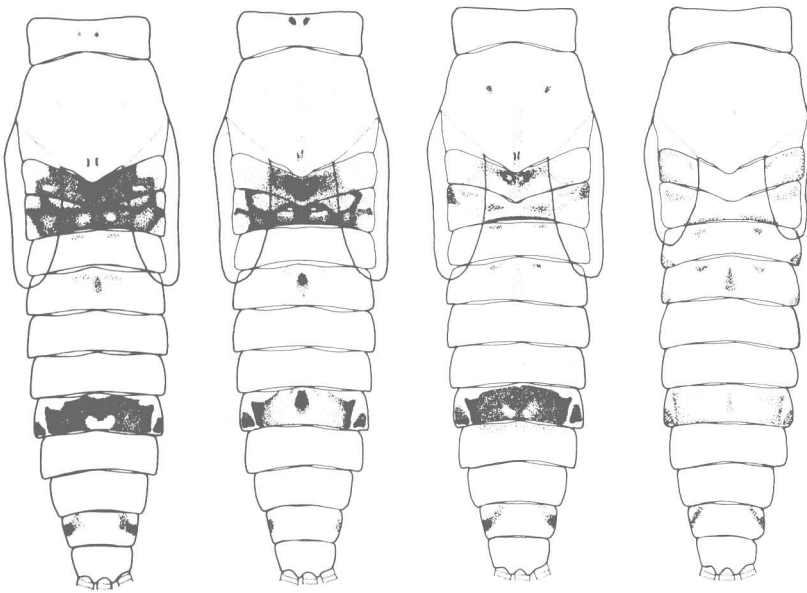


Fig. 8 *Pseudocentroptiloides (Psammonella) ceylonica*, variations of pattern on nymphal thorax and abdomen.

#### ACKNOWLEDGEMENTS

The authors wish to thank Dr. M. Keffermüller (Poznan) and Dr. I. Müller-Liebenau (Plön) for material or valuable advice, and Dr. E. J. Cox (Schlitz) for help with the English text.

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