Nota lepid. 23 (1): 26–39; 01.IV.2000 ISSN 0342–7536

A new bagworm species of the genus *Dahlica* (Psychidae) from southeastern Ukraine

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Summary. A new bagworm species, *Dahlica karatyshica* sp. nov., is described from the steppe of Ukraine. It is characterised by its small size, the reduction of some veins, an average genitalic index equal to 1.1 and a habitat preference for xerophytic vegetation, which is not typical for other known species of the genus.

Zusammenfassung. Eine neue Sacktragerart, *Dahlica karatyshica* sp. nov., wird aus der ukrainischen Steppe beschrieben. Charakteristisch für diese Art sind eine geringe Korpergröße, die Reduktion einiger Adern, ein durchschnittlicher Genitalindex von 1.1 sowie die Anpassung an xerophytische Vegetation, welche in dieser Gattung außergewöhnlich ist.

Résumé. Une nouvelle espèce de psychide, *Dahlica karatyshica* sp. nov., est décrite de la steppe d'Ukraine. Elle est caractérisée par une taille réduite, la réduction de certaines veines, un indice génitalique de 1.1 et une adaptation à une végétation xérophytique, qui est atypique dans ce genre.

Key words: Lepidoptera, Psychidae, *Dahlica*, new species, steppe, Ukraine.

During two collecting trips in May 1997 and in April 1998 to the virgin steppe of Kamennye Mogily Nature Reserve (SE Ukraine, Donetsk oblast' [province]), 38 males and 6 females (only two female specimens are included in the type series — see below) of a new bagworm species were found. One more male was captured in May 1998 in the neighbouring Lugansk oblast' (Proval'ska Steppe Nature Reserve). By an aggregate of characteristics (lack of epiphysis, lack of medial cells on both fore- and hindwing, female pupal antennae equal to legs), the new species is conditionally assigned to the genus *Dahlica* Enderlein, 1912 (type species: *Tinea triquetrella* Hübner, [1812]), to which it looks much more closely related than to the representatives of other Dahlicini genera like *Siederia* Meier, 1953, *Brevantennia* Sieder, 1953, *Eosolenobia* Filipjev, 1924 and *Praesolenobia* Sieder, 1954. The new species

rather occupies an intermediate position between *Postsolenobia* Meier, 1958 and *Dahlica* (cf. Meier, 1958); its generic position still requires clarification.

Terminology and principles of diagnosis are accepted herewith according to Sauter (1956), Galliker (1958) and Arnscheid (1985) unless stated otherwise; the taxonomic structure of the genus according to Sauter & Hättenschwiler (1991, 1996).

Fig. 1. *Dahlica karatyshica* sp. nov. holotype ♂.

Dahlica karatyshica sp. nov.

Holotype ♂, "Ukraina, distr.[ictus] Donetsk, res.[ervatum] Kamennye Mogily, 26. IV. 1998, leg. E. Rutjan, ex pupa 28.IV.1998"; designated with label on printed form "Holotypus" (in italics) with handwritten insertion: "*Dahlica karatyshica Rutjan, sp. n.,* ♂*, Ukraina, res. Kamennye Mogily* (recto) and "*Coll. Schmalhausen Inst. Zool., Kiev*" (verso). Paratypes: 35♂, 2♀, "Ukraina, distr. Donetsk, res. Kamennye Mogily, 26.IV.1998, leg. E. Rutjan, ex pupa 26.IV–3.V.1998"; ♂, "Ukraina, distr. Donetsk, res. Kamennye Mogily, 9.V.1997, leg. E. Rutjan"; ♂, "Ukraina, distr. Lugansk, prope Sverdlovsk, pag.[us] Provalje, 10.V.1998". — Holotype and a part of the paratypes are deposited in the Lepidoptera collection, Schmalhausen Institute of Zoology (Kiev), a part of the paratype series is forwarded to Zoological Museum, Taras Shevchenko National University (Kiev) and Zoological Institute, Russian Academy of Sciences (St.-Petersburg).

Male (Fig. 1). Smallest among *Dahlica* species: wingspan 7–9 mm. Head (Fig. 2) covered with grey ruffled hairs. Labial palpi

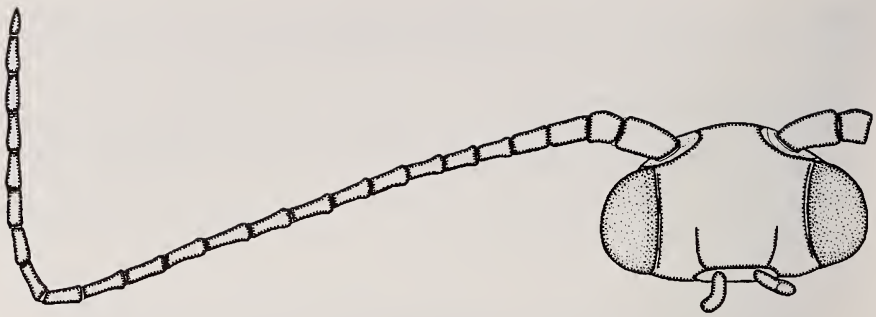

Fig. 2. *Dahlica karatyshica* sp. nov. paratype ♂: head structures (antennal scales and bristles removed).

approximately $2^1/_2$ shorter than eye diameter. Antenna with 24–26 segments, ca. 0.6 of forewing length. Each antennal segment bearing a belt of light-coloured scales at its top and bristles equal or somewhat longer than the length of the bearing segment. Space between eyes exceeding 0.33 of their diameter. Ocelli lacking. Thorax and tegulae light grey. Wings (Figs 3, 4) narrow: forewing length $3^1/_2$ times, and that of hindwing 4 times exceeding its width. Hindwings $^1/_4$ narrower than forewings. Fringes wide, more than half of wing width; on forewing, along external and anal margins paler than the wing ground-colour, on hindwing and along costal margin of forewings the fringes are grey. They consist of long thin two- and three-dentate scales of various length and ciliae (Fig. 3, *f–i*; Fig. 4, *c–f*). Forewing pattern consisting of grey-brown lace-like reticulation, darker in basal area. Pale spots grey-yellow. Cloaking scales of forewing (Fig. 3, *a*) classified into classes IV–V according to Sauter (1956), whereas according to Solyanikov (1990) they comply with nos. 4–4.5. Underlying two-dentate cuneiform scales (Fig. 3, *b*) of various length. Area between subcostal vein and costal margin covered with short two-dentate cuneiform scales only (Fig. 3, *c*). Area between veins A_{2+3} and anal margin covered with scales with rounded tip (Fig. 3, *d*). Hindwings covered exclusively with cuneiform two-dentate scales (Fig. 4, *a*). Forewing with 10 veins going out to the margin, of which A_1 is less well expressed (n = 4; Fig. 3). Radial accessory cell

developed only in part of the examined specimens. Veins R_2 and R_3, R_4 and R_5, and M_2 and M_3 merged pairwise. External margin of discal cell slight. Hindwing with 9 veins (Fig. 4). Intercalar cells lacking. Vein branching not observed. Veins M_2 and M_3 completely merged. Legs dark. Foretibia (Fig. 5, *a*) without epiphysis. Midtibia (Fig. 5, *b*) with one, and hindtibia (Fig. 5, *c*) with two pairs of spurs. Abdomen dark, covered with sparse light scales. Genital segments densely covered with long light-coloured scales.

Male genitalia (Fig. 6). Length of valve exceeding 3 times its width in middle part, and 5 times exceeding saccus with vinculum. Base of sacculus situated at the middle of inferior margin of valve. Cucullus length 2.5 times its width. Tegumen with uncus 3.2 times longer than vinculum with sacculus. Genitalic index approx. 1.1 (n = 3). Androconial scales two times shorter than total length of sacculus and vinculum.

Male pupa structure as shown in Fig. 7.

Female (Fig. 8). It was impossible to describe the female alive. Of 6 available female specimens only 2 could be kept intact. Body length with protruded ovipositor 3.7 mm. Eyes small, diameter 2.6 times less than the space between them and approximately equal to antenna scape length (Fig. 9). Labial palpi well distinctive. We did not manage to determine the exact number of antennal segments, but their number certainly exceeds 8. Tarsi of all legs with 4 segments (Fig. 10). Foretibia without epiphysis (Fig. 10, *a*). Mid- and hindtibia bearing one pair of spurs (Fig. 10, *b, c*).

Female genitalia (Fig. 11). Ovipositor long and sclerotized. Apophyses thin and long. Free ends of posterior apophyses (when ovipositor protruded) reaching the ostium (Fig. 11, *b*). Postvaginal plate heart-shaped (Fig. 11, *b*). Thorns of intersegmental membrane single and pointed, both long and short (Fig. 11, *c*). Postvaginal plate membraneous area with merged and singular thorns, short and wide (Fig. 11, *d*). Hairs of 7th segment normal.

Female pupa. Length of antennae covers exceeding length of forelegs covers (Fig. 12).

Distribution. Up to the present, *D. karatyshica* sp. nov. is known only from the type locality (SE Ukraine, Donetsk and Lugansk oblast's [provinces]).

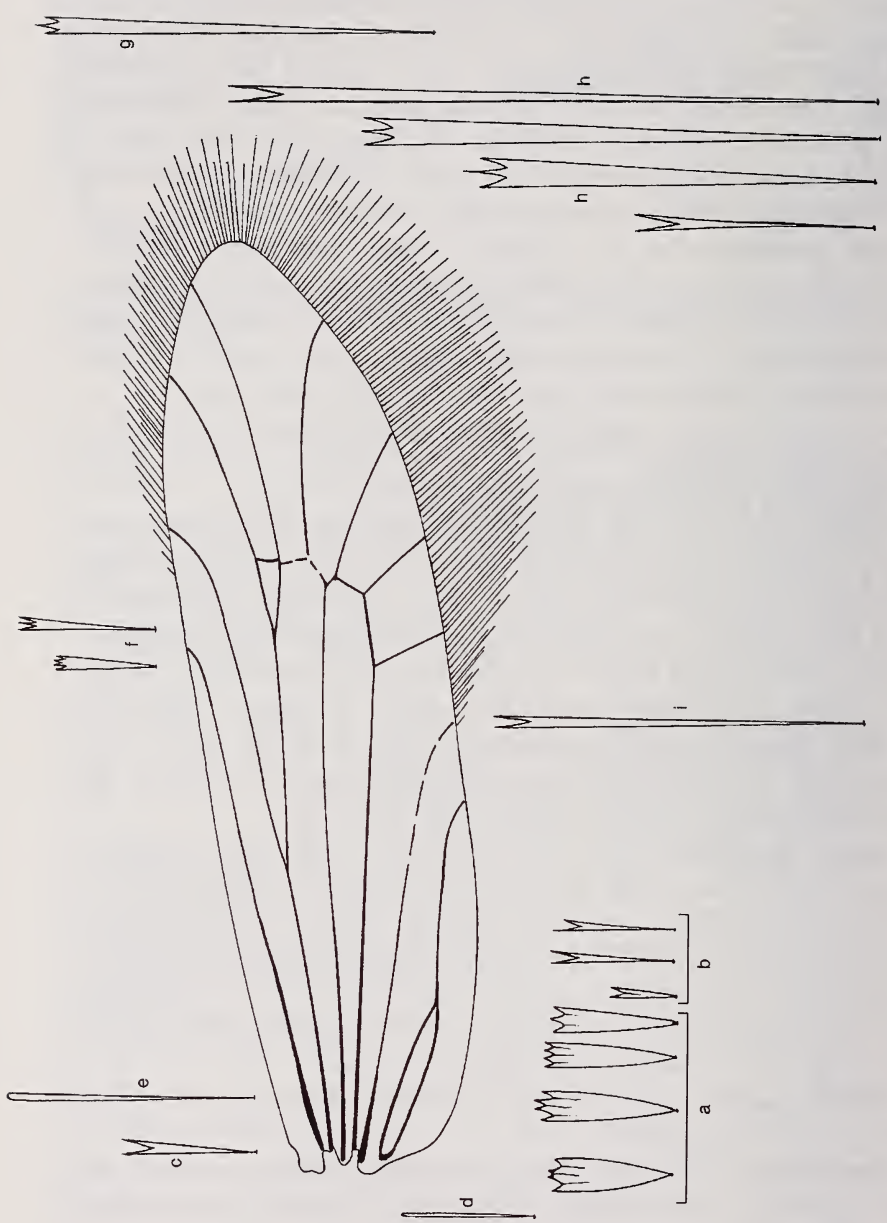

Fig. 3. *Dahlica karatyshica* sp. nov. paratype ♂, forewing venation and upperside scales: *a* – cloaking scales; *b* – underlying scales; *c* – scales between vein Sc and costal margin area; *d* – scales between A_{2+3} and anal margin area; *e* – scales of costal margin; *f* – costal margin fringe scales; *g* – apex fringe scales; *h* – external margin fringe scales; *i* – anal margin fringe scales.

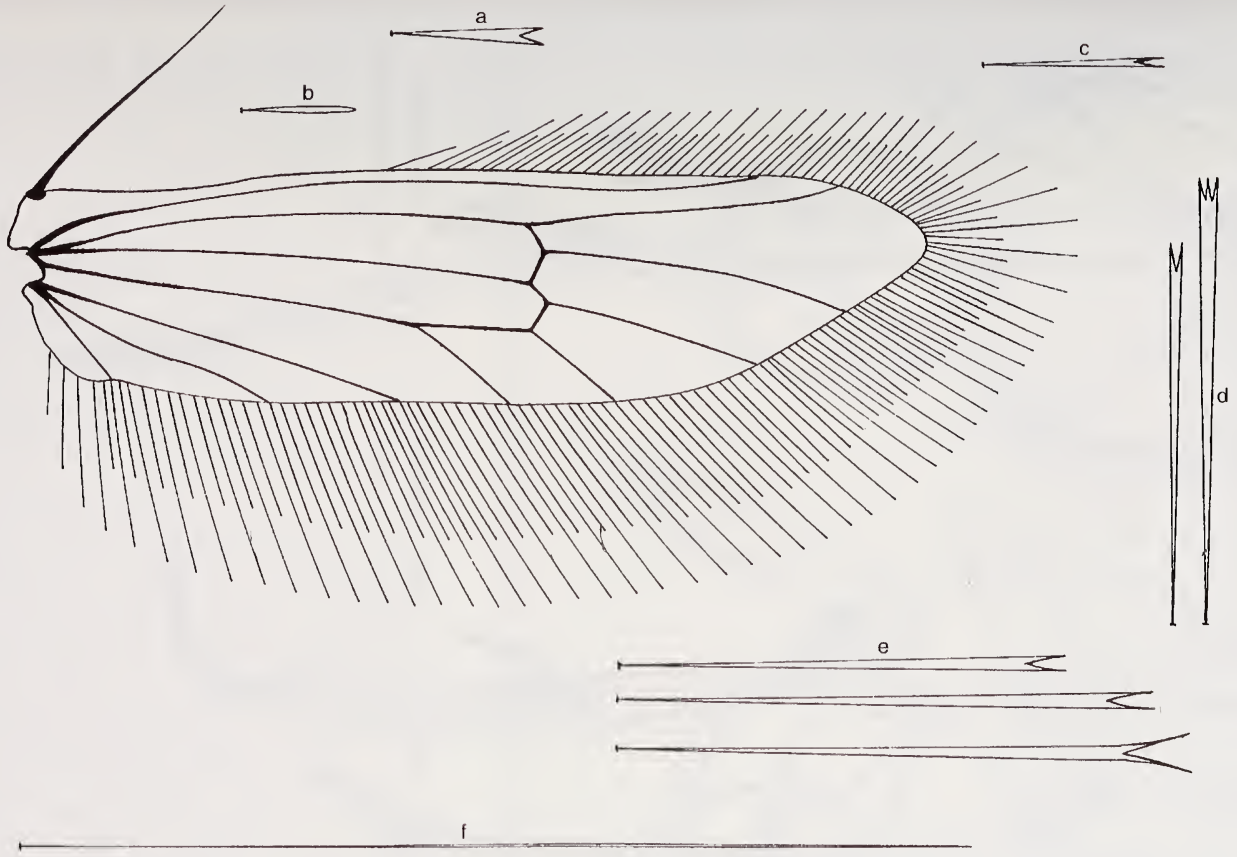

Fig. 4. *Dahlica karatyshica* sp. nov. paratype ♂, hindwing venation and upperside scales: *a* – cloaking scales; *b* – scales of costal margin; *c* – costal margin fringe scales; *d* – external margin fringe scales; *e* – anal angle fringe scales; *f* – anal margin fringe scales.

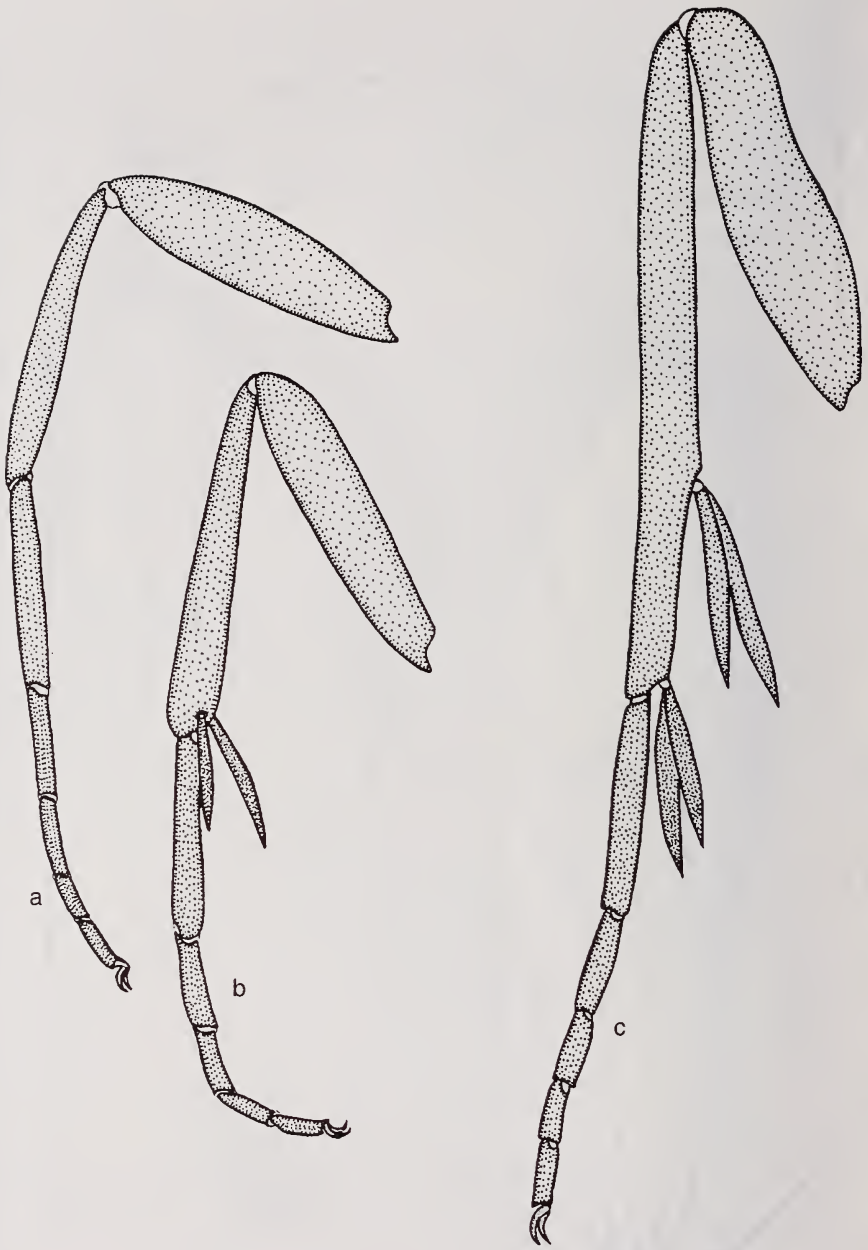

Fig. 5. *Dahlica karatyshica* sp. nov. paratype ♂: *a* – foreleg; *b* – midleg; *c* – hindleg.

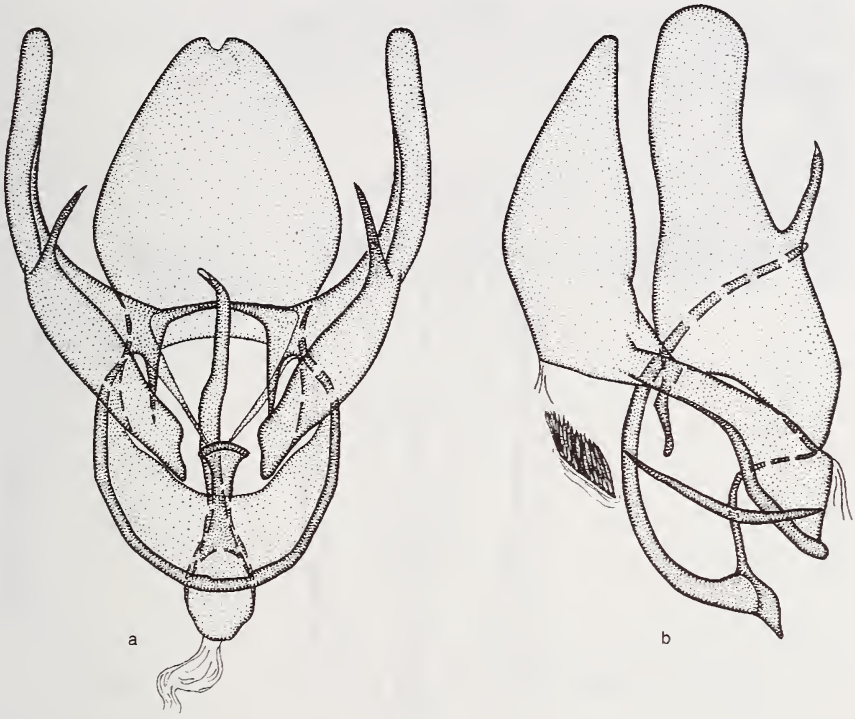

Fig. 6. Male genitalia *Dahlica karatyshica* sp. nov. paratype ♂: *a* – ventral view; *b* – lateral view.

Bionomics. Flight period from late April to the middle of May, with peak in late April–early May, in a single brood. It is known to occur in a *Stipa capillata+Festuca sulcata+Festuca varia* steppe association of the *solum petrosum* variant, where together with *Reisseronia staudingeri* (Heylaerts, 1879), it inhabits granite outcrops on river banks (see Rutjan, 1998). Cases were collected on slopes with a north-east exposure, attached to the sides of large stones, with the caudal end freely hanging down. The pupal stage lasts no less than 10 days. Under laboratory conditions males emerged during the evening hours (20:00–22:00), but started flying only the next morning (ca. 7:00). Females emerged in the morning (5:30–8:00). Life span of males (as observed in captivity) was 2, and that of females about 3 days and nights. The larvae most prob-

ably feed on lichens. According to field observations, *D. karatyshica* sp. nov. is a stenotopic species, occurring in places with a xerophytic vegetation.

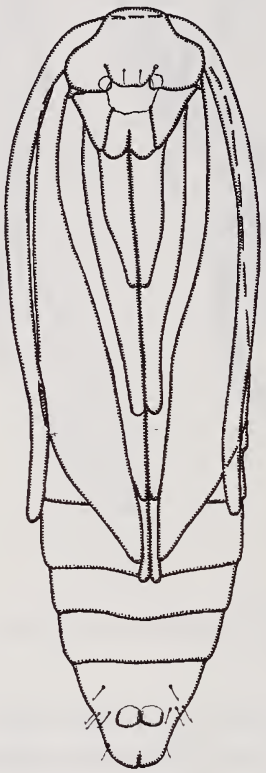

Fig. 7. *Dahlica karatyshica* sp. nov. male pupa exuvium.

Type locality. SE Ukraine, Donetsk oblast' (province), Kamennye Mogily Nature Reserve.

Etymology. The name is derived from Karatysh, a small river at the type locality.

Similar species. By size and genitalic index the new species is close to *Postsolenobia thomanni* (Rebel, 1936), *Dahlica* (?) *pallidella* (Zagulajev, 1997) and *Siederia transsilvanica* Herrmann & Weidlich, 1999, but differs from these by a number of characters.

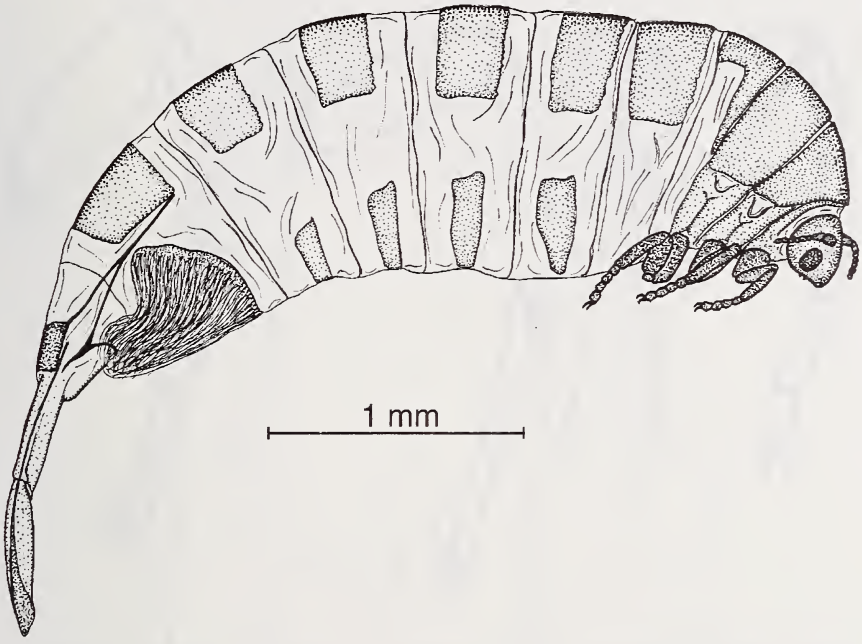

Fig. 8. *Dahlica karatyshica* sp. nov. paratype ♀ (reference bar 1 mm).

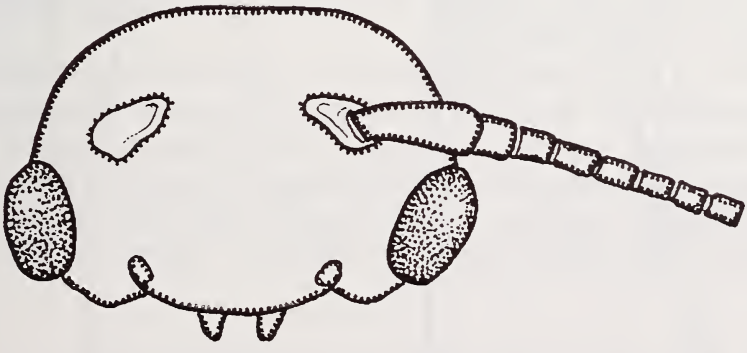

Fig. 9. *Dahlica karatyshica* sp. nov. paratype ♀: head structures.

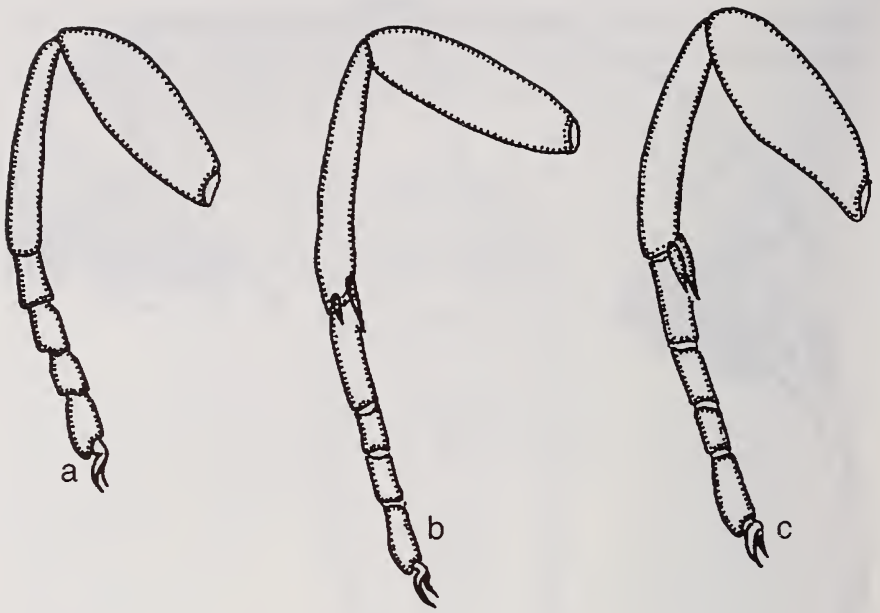

Fig. 10. *Dahlica karatyshica* sp. nov. paratype ♀: *a* – foreleg; *b* – midleg; *c* – hindleg.

From *P. thomanni* it differs by (1) lack of discal and anal dark spots on the forewing; (2) presence of only three radial veins on the forewing; (3) development of radial accessory cell on forewing in some individuals; (4) absence of more than four-dentate scales; (5) habitat: steppe xerophyte places, in contrast to mesophyte mountain woods (cf. Sauter, 1956).

From *D.* (?) *pallidella* it differs by (1) only three radial veins and two medial veins developed on forewing; (2) lack of intercalar cell on hindwings and only two medial veins being developed; (3) antennae exceeding half of forewing length; (4) space between eyes exceeding eye diameter; (5) labial palpi 2 times shorter than eye diameter; (6) tegumen with uncus domed (cf. Zagulajev, 1997).

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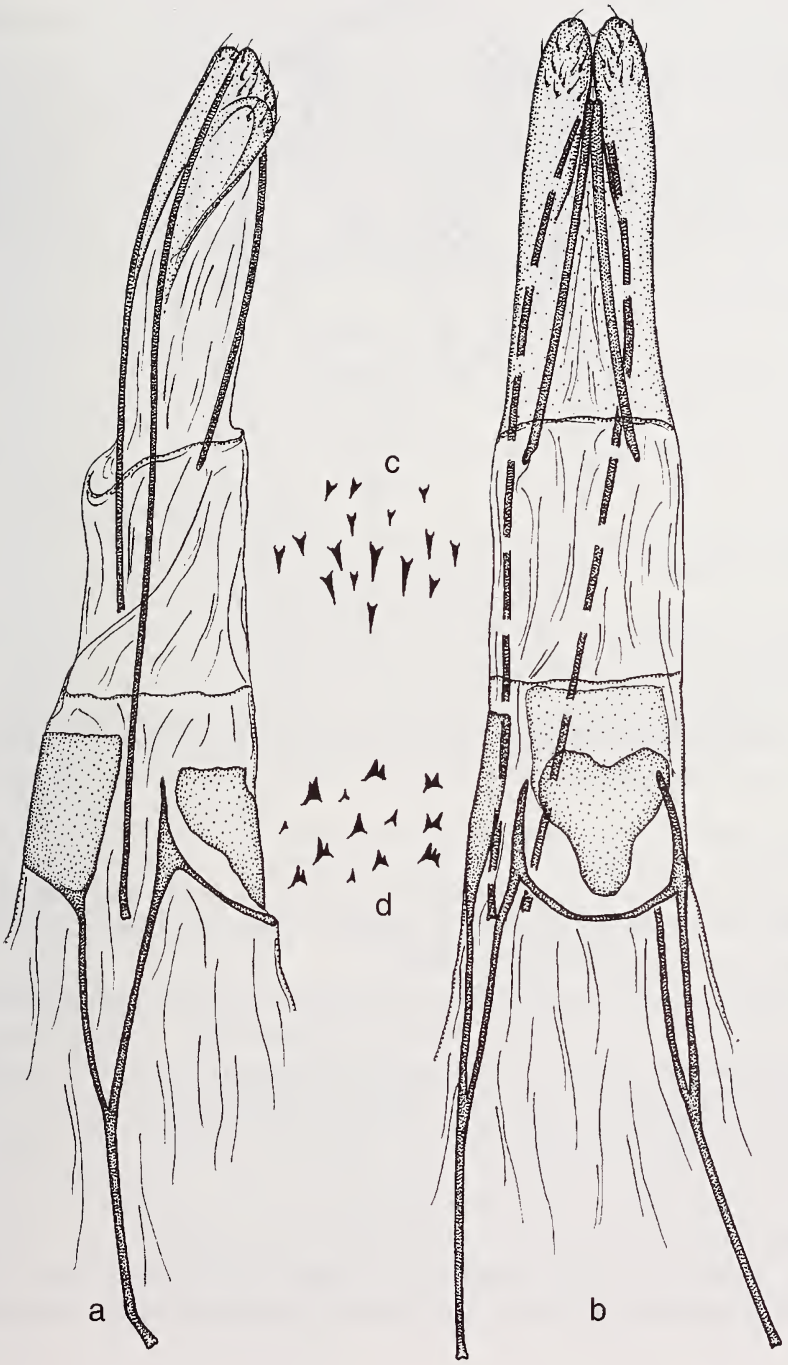
Fig. 11. Female genitalia *Dahlica karatyshica* sp. nov. paratype ♀: *a* – lateral view; *b* – ventral view; *c* – intersegmental membrane thorns; *d* – thorns of postvaginal plate membraneous area.



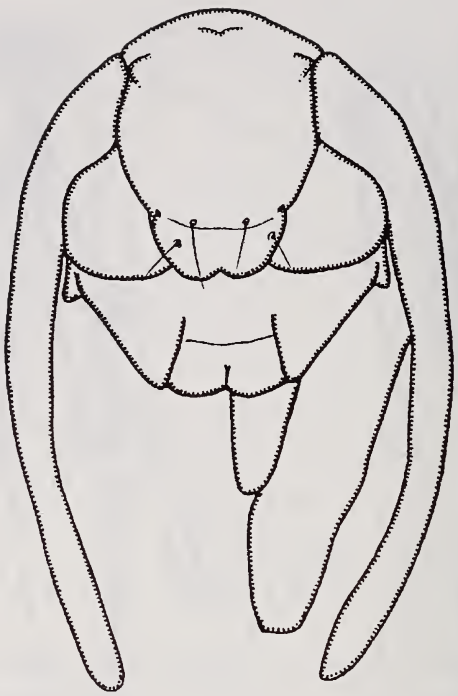


Fig. 12. *Dahlica karatyshica* sp. nov., ♀: pupal skin, anterior part, ventral view.

From *S. transsilvanica* it differs by the lack of the epiphysis and more than four-dentate scales, number of antennal segments 24–26 (cf. Herrmann & Weidlich, 1999).

From species with a genitalic index close to 1 (*Eosolenobia mannii* (Zeller, 1852), *Dahlica fumosella* (Heinemann, 1870), *D. larella* (Chretien, 1906), *D. incospicuella* (Stainton, 1843) (cf. Sauter, 1956; Arnscheid, 1985), *D. sauteri* (Hättenschwiler, 1977), *D. rianella* Hättenschwiler, 1981, *D. achajensis* (Sieder, 1966) and *D. colchica* (Kozlov, 1985) *D. karatyshica* sp. nov. is distinguished by its smaller size and the following characters: (1) venation; (2) number of antennal segments; (3) differences in cloaking scale classes; (4) number of tarsal segments in female; (5) shape of thorns on intersegmental membrane; (6) male and female genitalia structures.

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