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Macropelopia nebulosa group (Diptera, Chironomidae, Tanypodinae)—karyotype and morphology of larvae and pupae

PARASKEVA MICHAILOVA[1,5], ANDRZEJ KOWNACKI[2], OLGA WOŹNICKA[3], KEITH WHITE[4], ANDREW DEAN[4] & EWA SZAREK-GWIAZDA[2]

[1]*Institute of Biodiversity and Ecosystem Research, BAS, Sofia 1000, boulv. Tzar Osvoboditel 1, Bulgaria. E-mail: michailova@zoology.bas.bg*

[2]*K. Starmach Department of Freshwater Biology, Institute of Nature Conservation, Polish Academy of Sciences, Mickiewicza Ave. 33, 31-120, Krakow, Poland, e-mail: szarek@iop.krakow.pl*

[3]*Department of Cell Biology and Imaging, Institute of Zoology, Faculty of Biology and Earth Sciences, Jagiellonian Univeristy, ul. Gronostajowa 9, 30-387 Kraków, e-mail: olga.woznicka@uj.edu.pl*

[4]*Faculty of Life Sciences, University of Manchester, Oxford Road, Manchester, M13 9PT, UK*

[5]*Corresponding author*

Abstract

The karyotype, larval and pupal morphology of *Macropelopia nebulosa* group (Tanypodinae) is described. The species is generally identified on the basis of pupal morphology as it is not possible to distinguish the larvae of different *Macropelopia* species. However, the species has species-specific markers in the salivary gland chromosomes which allow identification at the larval stage. *M. nebulosa* (Meigen) has a chromosome set 2n = 8, with chromosomes AB CD EF G. Chromosomes AB CD EF are metacentric with large heterochromatin centromeres while chromosome G is acrocentric. For the first time a chromosome map of *M. nebulosa* has been produced which revealed the divergence of this species from its sibling species *M. paranebulosa* Fittkau on the basis of fixed homozygous inversions. Specific banding patterns of arms B and E are distinguished from that of *M. paranebulosa* by two steps of homozygous inversions; arm D—by three steps of homozygous inversions, while arms C and G—by one step of inversion. The significance of the morphology of the salivary gland chromosomes for species identification of subfamily Tanypodinae is emphasized. The first SEM images of pupa are also given.

Key words: *Macropelopia nebulosa,* polytene chromosomes, larvae, pupae, morphology

Introduction

The genus *Macropelopia* (Tanypodinae) is widespread and various species are found in Europe, Asia, Africa, North and South America, Atlantic Ocean islands, New Zealand and Australia (Fittkau 1962; Roback 1978, 1982; Harrison 1971; Armitage *et al.* 1994; Fauna Europea 2013). Species of genus *Macropelopia* Meigen from Eurasia belong to two groups: *nebulosa* and *notata*. This grouping was originally erected on the basis of pupal characters (Fittkau 1962; Fittkau & Murray 1986). The differentiating factor is the number of lateral taeniae of the segment VII: *nebulosa* group has 6 taeniate L setae while the *notata* group has 5 L setae. Fittkau & Roback (1983) attempted to differentiate these groups on the basis of larval morphology, however larval characteristics are hardly visible and difficult to use in practice, it must be added also that most species of *Macropelopia* are undescribed at larval stage. The *Macropelopia nebulosa* group includes *M. nebulosa* Meigen, *M. rossaroi* Lencioni & Marziali, *M. paranebulosa* Fittkau, *M. fehlmanni* Kieffer and *Macropelopia* sp. Kownacki, Wojtusiak & Żurek (1976) from Afghanistan. The identification of these species is possible on the basis of male imago and pupae. *Macropelopia* sp. (Afghanistan) was described only as pupa.

Most species of Tanypodinae are difficult to be identified on the basis of external larval morphology and are combined in group of species (Pankratova 1977), for this reason Makarchenko & Petrova (1988) suggested

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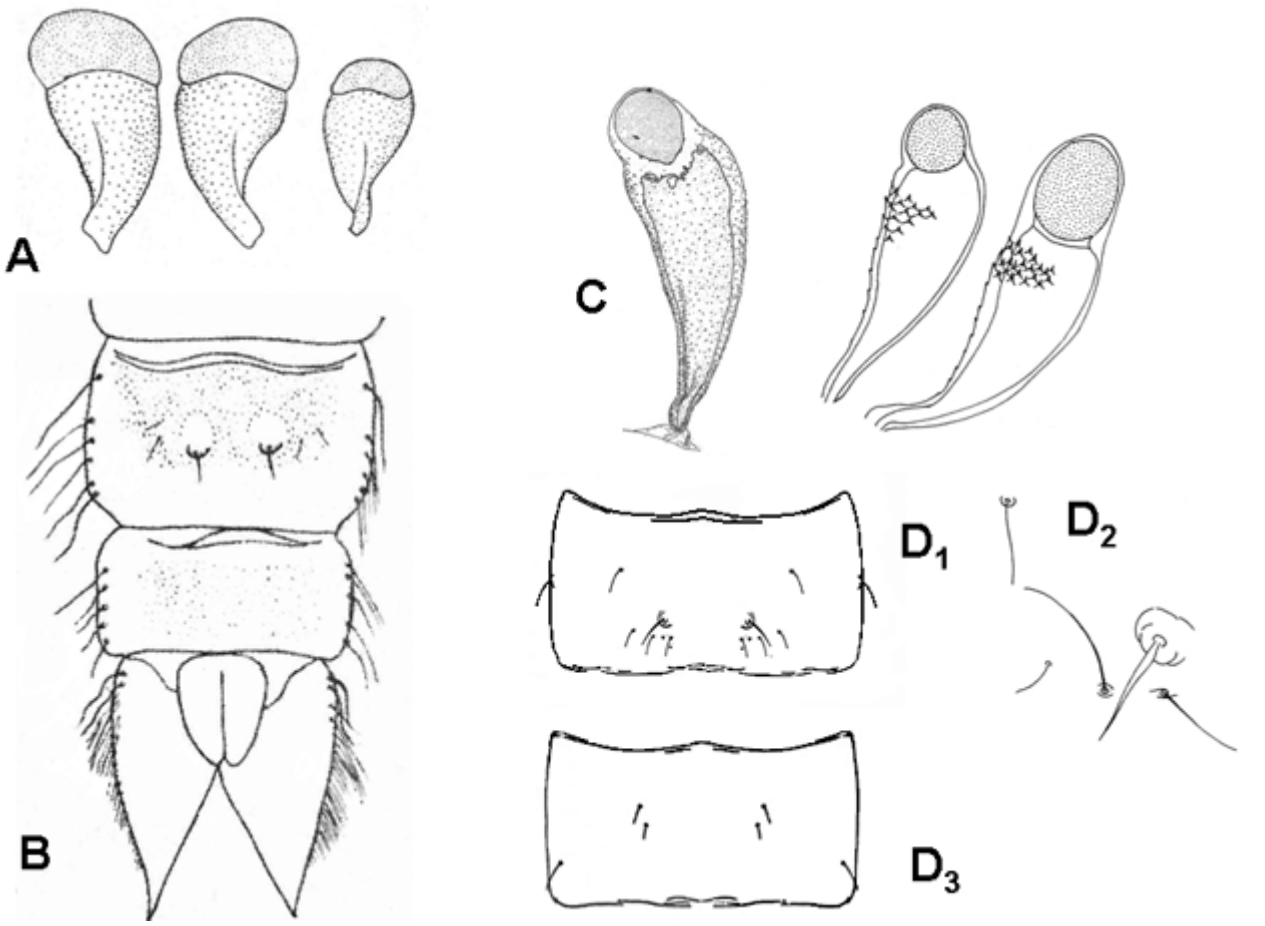

FIGURE 15. *Macropelopia paranebulosa* Fittkau; A—thoracic horn from different locality; B—segment VII–IX dorsal (according to Makarchenko, Petrova 1988); *Macropelopia fehlmanni* (Kieffer) C—different type of thoracic horn; D1—segment IV dorsal; D2—dorsal setae 1–5 of tergite IV; D3—segment IV ventral (according to Fittkau 1962 and Langton 1991).

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