



Taxonomic review of Eurasian *Paradelia* Ringdahl (Diptera: Anthomyiidae) with descriptions of two new species

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Abstract

Paradelia Ringdahl is a modest-sized, anthomyiid genus found in cool-temperate to arctic situations in northern and elevated parts of Eurasia and North America. A high percentage of the known Eurasian species are more widespread, Holarctic in distribution. The monophyly of the genus is well supported, though it is less easy to place unambiguously in a phylogeny. Most species are rarely collected and there exists no substantial information on the biology of immatures and adults even for the only common species, *P. intersecta* (Meigen). The Eurasian species are reviewed with illustrated

descriptions and an identification key to males and females. Two new species are described: *P. uleforsi* sp. nov. from Europe and Mongolia and *P. manni* sp. nov. from northern Pakistan, making a total of 15 named, recognized species in Eurasia. Known distributions are substantially widened for several species.

Key words: Diptera, Anthomyiidae, *Paradelia*, new species, Eurasia

Introduction

Paradelia Ringdahl — in a wide sense embracing the former genera *Pegomyiella* Ringdahl and *Pseudonupedia* Ringdahl — is a modest-sized genus of anthomyiid flies found under cool-temperate to arctic conditions in the northern and elevated parts of Eurasia and North America. It is currently known from 15 species in North America (Griffiths 1987), while 11 species were listed from Europe by Michelsen (2004). Remarkably, all these European species except *P. hedgreni* (Ringdahl) and *P. ignotaeformis* (Schnabl) also occur in North America. Expectedly, *Paradelia* is well represented in the eastern parts of the Palaearctic Region and the northern, elevated parts of the Oriental Region, but this still needs to be further documented. The anthomyiid fauna of Japan is reasonably well-known, yet includes only two Holarctic species of *Paradelia*, *P. brunneonigra* (Schnabl) and *P. lunatifrons* (Zetterstedt), according to Suwa (1999). Two other widespread species, *Paradelia intersecta* (Meigen) and *P. palpata* (Stein), and one East Asian species, *P. nototrigona* Ge & Fan, are known from China according to Wei *et al.* (1999).

Practically nothing is known about the life history of any species of *Paradelia* including the reasonably common *P. intersecta*. The absence of information on the immatures strongly suggests that the larvae do not feed on fresh tissues of fungi or plants, but rather depend on specific kinds of organic debris for their development.

Despite the generally wide distributions of species of *Paradelia*, most of them are notoriously rarely collected. Accordingly, the taxonomic knowledge about this taxon is currently highly inadequate even within Europe. For several species the female sex remains unidentified, and for others the right combination of the sexes remains tentative. The present paper attempts to give an up-to-date taxonomic treatment of the Eurasian species, richly illustrated and with an identification key to both males and females.

Methods

Illustrations. Photographic illustrations were made with a Leica DC300 digital camera mounted on a Leica MZ16A stereomicroscope. Auto-Montage Pro software from Syncroscopy was used for image-stacking and 3D focus expansion. The resulting pictures were processed further in Adobe Photoshop and Microsoft Publisher. The upside down orientation of male genital structures on the plates is for purely practical reasons, as this is the orientation allowing optimal illumination under the microscope.

Abbreviations. FMNH — Finnish Museum of Natural History, Helsinki; HNHM — Hungarian Natural History Museum, Budapest; MHNG — Muséum d'histoire naturelle de la Ville de Genève; MNHU — Museum für Naturkunde, Humboldt-Universität zu Berlin; MZLU — Museum of Zoology, Lund University; MZUB — Museum of Zoology, University of Bergen; SIZK — Schmallhausen Institute of Zoology, Kiev; UMNH — University Museum of Natural History, Oxford; ZMMU — Zoological Museum of Moscow University; ZMUC — Zoological Museum, University of Copenhagen; *a* — anterior; *av* — antero-ventral; *p* — posterior; *p_v* — postero-ventral; *v* — ventral; WL — wing length.