

RESEARCH ARTICLE

Open access

New faunistic records of Chironomidae (Diptera: Insecta) from Iran

Armin Namayandeh¹, Edris Ghaderi^{2,3}, Habibollah Mohammadi^{2,4,*}

¹ Department of Environmental and Life Sciences, Trent University, 1600 West Bank Drive, Peterborough, Ontario, Canada; Email: arminnamayandeh@trentu.ca

² Department of Fisheries Sciences, Faculty of Natural Resources, University of Kurdistan, Sanandaj, Iran; Email: e.ghaderi@uok.ac.ir

³ Department of Fisheries and Aquatic Ecology, Faculty of Fisheries and Environmental Sciences, Gorgan University of Agricultural Sciences and Natural Resources, Gorgan, Iran.

⁴ Zrebar Lake Environmental Research, Kurdistan Studies Institute, University of Kurdistan, Sanandaj, Iran; Email: ha.mohammadi@uok.ac.ir

(Received: 20 February 2021; Accepted: 14 May 2021)

Abstract

Ongoing investigation into Chironomidae specimens collected from the Sirwan River watershed in 2020 resulted in two new faunistic records for Iran, and new range extensions for the Palearctic region. Two species, *Paramerina divisa* (Walker, 1856) and *Xenochironomus xenolabis* (Kieffer, 1916) are diagnosed and reported for the first time from Iran. This contributes to establishing baseline data about the diversity and distribution of freshwater flora and fauna of this region.

Key words: Chironomidae, Iran, faunistic records, Palearctic, Middle East, Kurdistan.

INTRODUCTION

As part of an effort to acquire a baseline data on the diversity and distribution of the Kurdistan's freshwater flora and fauna, Mohammadi *et al.* (2020) provided a detail taxonomic diagnoses and description of specie of Chironomidae from Sirwan River watershed, the largest watershed in the province. Further investigation into materials obtained during this study indicated the presence of two other species which are new faunistic records for Iran and are considered range extension for the Palearctic. In this paper we provide a detail taxonomic diagnoses and description of *Paramerina divisa* (Walker, 1856) and *Xenochironomus xenolabis* (Kieffer, 1916) from Iran for the first time.

MATERIAL AND METHODS

A detailed description of Sirwan River watershed is provided by Mohammadi *et al.* (2020). A detailed description of the sampling procedure is provided by Mohammadi *et al.* (2020). The immature specimens were slide-mounted following the procedures outlined in Epler (2001) for immatures. Voucher specimens of chironomid species described and diagnosed in this study have been deposited in the Entomology Collection of the Royal Ontario Museum, Toronto, Ontario, Canada.

Images of the larval and pupal Chironomidae were produced using an OMAX A3550U Camera mounted on AMScope compound microscope. Morphological terminology, abbreviations, and measurements follow those used by Sæther (1980) for immature stages of Chironomidae.

*Corresponding Author: ha.mohammadi@uok.ac.ir



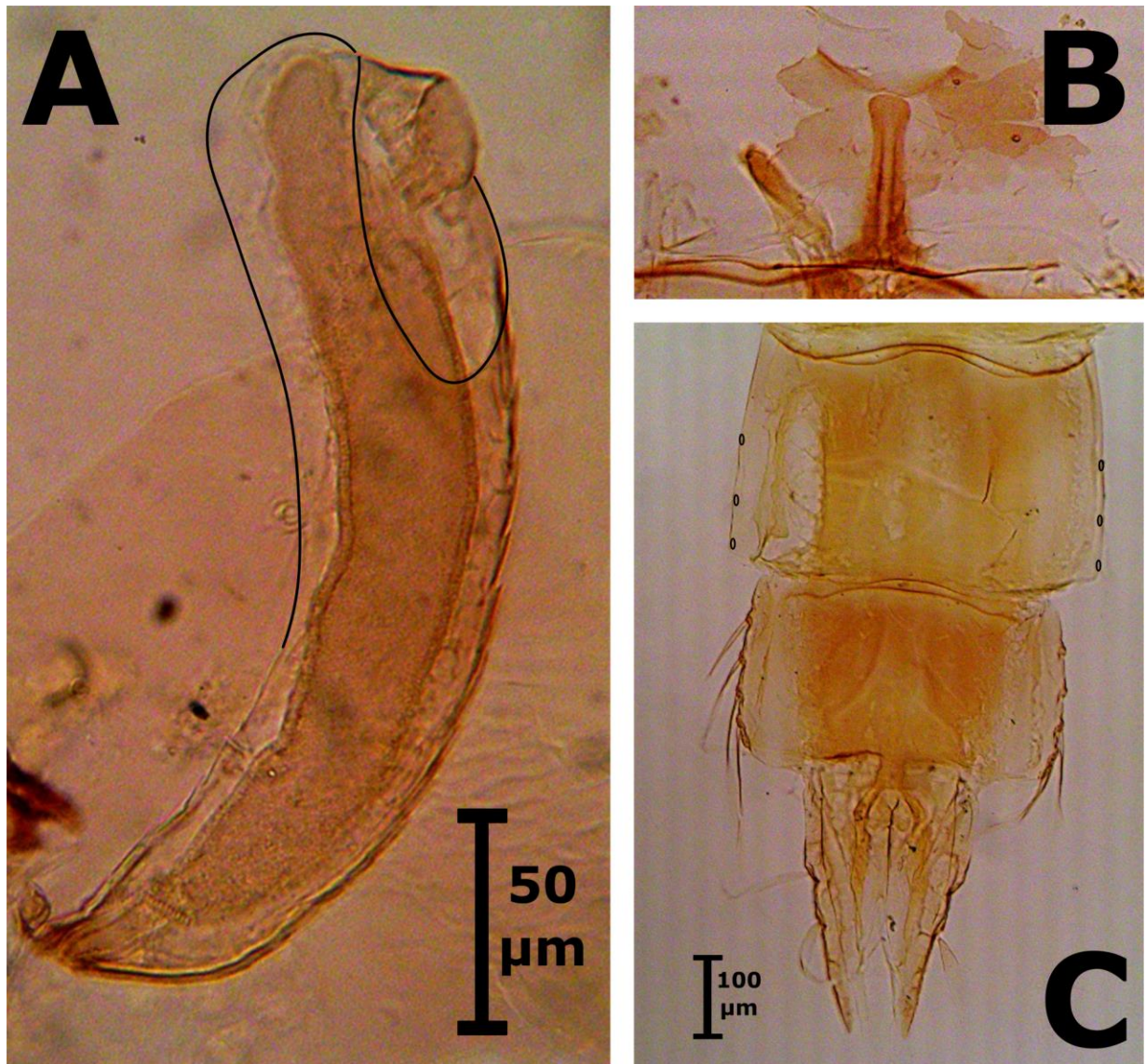


FIGURE 1. *Paramerina divisa* (Walker, 1856), A-C pupa. Thoracic horn (A); Tergite I scar (mark) (B); Tergites VII-IX (C).

The primary species geographical records were obtained from Ashe and O'Connor (2009) with additional records obtained from various taxonomic literature related to genera and species described in this study.

RESULTS

Faunistic records

The following species are recorded for the first time in Iran and are considered range extension for the Palearctic region: *Paramerina divisa* (Walker, 1856) and *Xenochironomus xenolabis* (Kieffer, 1916).

Review of the species

Subfamily Tanypodinae

Paramerina divisa (Walker, 1856)

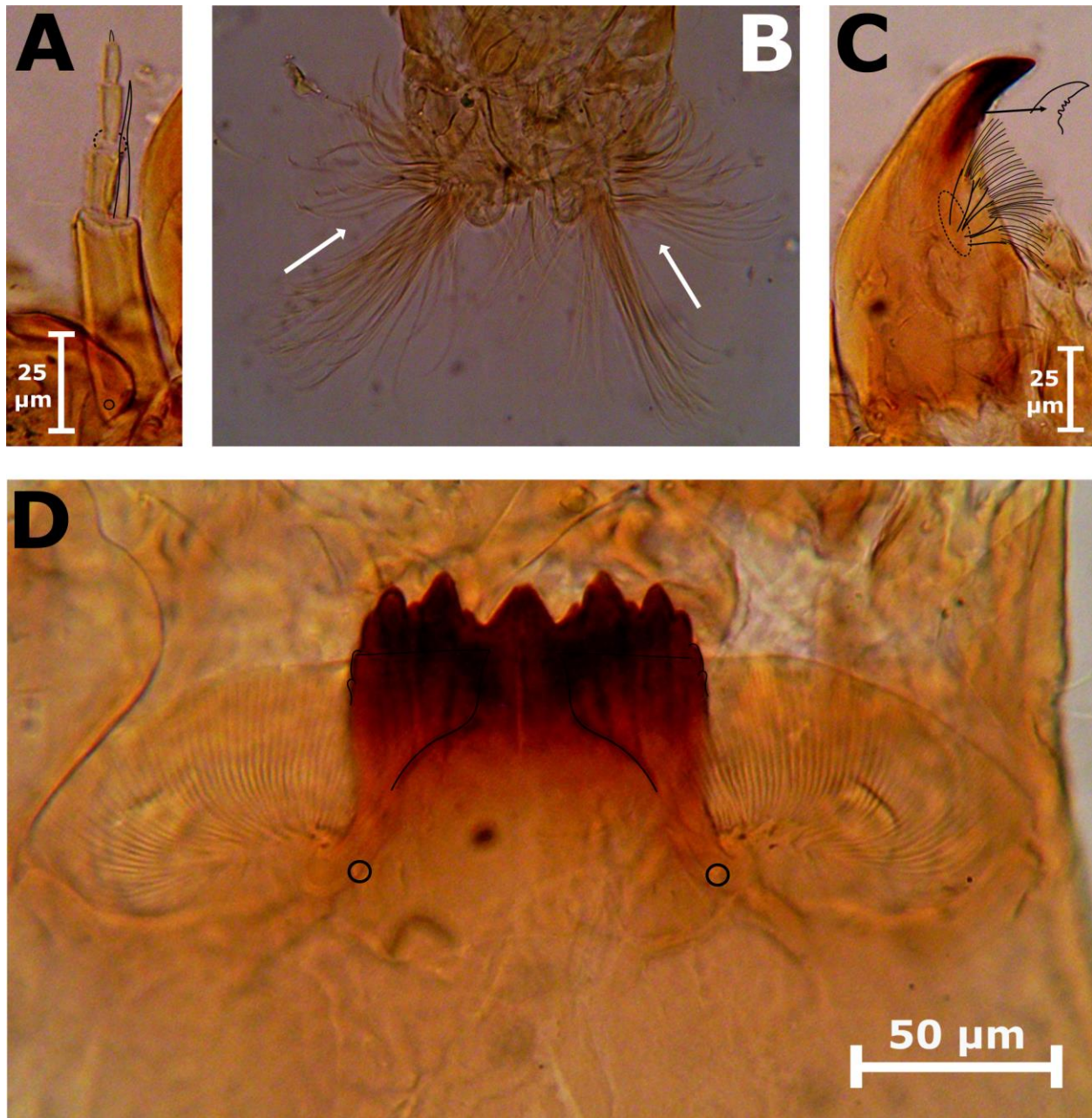


FIGURE 2. *Xenochironomus xenolabis* (Kieffer, 1916), A-D larva. Antenna (A); Labro-epipharyngeal region, arrow indicate the cluster of tick setae (B); Mandible (C); Mentum (D).

Diagnosis-Pupa: Thorax granular. Thoracic horn 277–281 (279) μm long with circular plastron plate, plastron plate about $\frac{1}{3}$ rd of the thoracic horn, atrium of thoracic horn thin-walled, joined with a short neck to the plastron plate, thoracic horn 4.3 x as long as wide (Fig. 1a). Tergite I with conspicuous scar (Fig. 1b). Tergite VII with 3 taeniae lateral setae, tergite VIII with 4 taeniae lateral setae, anal lobe 3 x as long as wide, anterior taeniae of anal lobe at 0.35 of lobe length (Fig. 1c).

Remarks: This species was described by Walker (1856) as *Chironomus divisus*. Adult male is described in key by Langton & Pinder (2007). The pupa is described by Langton & Visser (2003). The larva of this species is probably the *Paramerina* sp. described by Mohammadi *et al.* (2020) from the same watershed.

Mohammdi *et al.* (2020) noted at the time that their larva probably belongs to that of *Paramerina cingulata* (Walker, 1856).

Subfamily Chironominae

Xenochironomus xenolabis (Kieffer, 1916)

Diagnosis-Larva: Total length 7.6–8.3 (8.0) mm. Antenna 5 segmented, segments sequentially decrease in size, blade reaches the base of the 4th segment, LO sitting opposite at the base of 2nd segment (Fig. 2A), AR 1.1. Labro-epipharyngeal region with two lobes, each with cluster of tick setae or brush (Fig. 2B), SI-SIII simple, SIV well-developed. Mandible with a broad and dark apical tooth and 3 small inner teeth, setae subdentalis simple, setae interna consist of 4 branches, each consist of a stalk with cluster of setae (Fig. 2C). Mentum dark, ventromental plates light golden, mentum with trifid median tooth and 7 pair of lateral teeth; 1st lateral teeth stand much higher than remaining teeth, 2nd lateral teeth sits much lower; ventromental plates 1.2–1.3x the width of mentum, Vmp L/W = 2; setae submenta sits just below the mentum aligned with last lateral teeth (Fig. 2D). Posterior parapods and procercus longer than wide. Anal tubules present.

Remarks: Species was described by Kieffer (1921) as *Chironomus xenolabis*. Adult male is described in key by Langton & Pinder (2007). The pupa is described by Langton & Visser (2003). Partial characteristics of adult male and pupa are also provided by Roback (1962). The larva is described by Roback (1962), and by Epler (2001).

DISCUSSION

Paramerina divisa is a widespread Palearctic species reported from the lotic habitats of many north to southern European countries. It has also been reported from Northern Africa, in the Middle East from Lebanon, and in the Oriental regions of Japan (Ashe & O'connor, 2009). *Xenochironomus xenolabis* inhabits stagnant and flowing waters where larvae make silken tubes and inhabit the outer layer of the freshwater sponges (Roback 1962). The species has a Neotropical and Holarctic distribution (Fusar *et al.* 2013, Langton & Visser, 2003). In the Palearctic, it is widespread in Europe, reported from Middle East and occurs as far east as the Korean Peninsula and Japan. The new faunistic records from Iran are also the first record for their corresponding genera in the country, and they further extend the range of these chironomids in the Palearctic region.

ACKNOWLEDGMENTS

We are grateful for the help and co-operation we received from many dedicated technicians, field, and laboratory assistants from the Faculty of Natural Resources, University of Kurdistan, and express our sincere thanks to all of them, without whom this work would not have been possible. Our sincere thanks to Dr. David Beresford of Trent University, Biology Department for help on the revision of the first draft of this manuscript and Dr. Douglas Currie of Royal Ontario Museum and University of Toronto for housing the voucher specimens.

LITERATURE CITED

Ashe, P., O'connor, J.P., 2009. A world catalogue of Chironomidae (Diptera), Part 1: Buchonomyiinae, Chilenomyiinae, Podonominae, Aphroteniinae, Tanypodinae, Usambaromyiinae, Diamesinae, Prodiamesinae and Telmatogetoninae. Irish Biogeographical Society and National Museum of Ireland, Dublin. 445 p.

Epler, J.H., 2001. Identification manual for the larval Chironomidae (Diptera) of North and South Carolina. A guide to the taxonomy of the midges of the southeastern United States including Florida. North Carolina Department of Environment and Natural Resources Division of Water Quality.

- Fusari, L.M., Roque, F.O., Hamada, N., 2013. Review of *Xenochironomus* Kieffer, 1921 (Diptera: Chironomidae) with description of six new species. *Zootaxa* 3646(2): 101–126.
- Jacobsen, R.E., 2008. A key to the pupal exuviae of the midges (Diptera: Chironomidae) of Everglades National Park, Florida. Fort Lauderdale, FL: U.S. Department of the Interior U.S. Geological Survey Scientific Investigations Report 2008-5082.
- Langton, P.H., Pinder, L.C.V., 2007. Keys to the adult male Chironomidae of Britain and Ireland. Volume 1 and 2. Freshwater Biological Association Scientific Publication 64. Freshwater Biological Association, Cumbria, UK. 239 + 168 p.
- Langton, P.H., Visser, H., 2003. Chironomidae exuviae: a key to pupal exuviae of the West Palearctic Region. Expert Center for Taxonomic Identification, University of Amsterdam CD-ROM Series.
- Mohammadi, H., Ghaderi, E., Ghorbani, F., Mansouri, A. & Namayandeh, A., 2020. Chironomidae (Diptera: Insecta) from Sirwan River watershed of Kurdistan (Iran) with new faunistic records for Iran and range extensions for the Palearctic region. *Biologia* 76(4): 1227–1253
- Roback, S.S., 1962. The genus *Xenochironomus* (Diptera: Tendipedidae) Kieffer, taxonomy and immature stages. *Transaction of the American Entomological Society* (1890) 88(4): 235–245.
- Sæther, O.A., 1980. Glossary of chironomid morphology terminology (Diptera: Chironomidae). *Entomologica Scandinavica* 14: 1–51.
- Thienemann, A., Kieffer, J.J., 1916. Schwedische Chironomiden. *Archiv für Hydrobiologie Supplements* 2: 483–554.
- Walker, F., 1856. *Insecta Britannica: Diptera*, Volume 3. Reeve and Benham, Henrietta Street, Covent Garden, London, UK. 377 p.