

— SHORT COMMUNICATION —

## On the occurrence of *Lepidurus apus* (Linnaeus, 1758) (Crustacea, Notostraca) from Iran

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The occurrence of *Lepidurus apus* in Iran is reported for the first time. This species was found in Aigher Goli located in the mountains area, East Azerbaijan province (North East, Iran). Details on biogeography, ecology and morphology of this species are provided.

**Key words:** *Lepidurus apus*, Aigher Goli, East Azerbaijan, Iran.

### INTRODUCTION

Notostracan records date back to the Carboniferous and possibly up to the Devonian period (Wallosek, 1993, 1995; Kelber, 1998). In fact, there are Upper Triassic *Triops* fossils from Germany which are almost indistinguishable from the extant *Triops cancriformis* (Tröger *et al.*, 1984; Kelber, 1999) and thus *Triops* is considered to be one of the best examples of evolutionary stasis or 'living fossils' (Fisher, 1990; King & Hanner, 1998; Kleesattel, 2001). The Notostraca exhibit plasticity in external morphology, making the demarcation of species on this basis a difficult task (Rogers, 2001). The absence of well-defined criteria allowed taxonomists to describe many "new species" in such a way that the nominal species of *Triops* and *Lepidurus* amounted to more than 70 in the 1950s (Longhurst, 1955; Brendonck *et al.*, 2008). The most salient distinguishing character between the two genera is the large supra-anal plate seen in species of *Lepidurus* (Longhurst, 1955; Rogers, 2001). Recently, two new genera, *Chenops* and *Jeholops* have been described through the fossil studies from the north-eastern of China (Hegna & Dong, 2010).

Their world-wide distribution is due to their antiquity, but possibly also to their passive transport: geographical barriers are more effective for non-passively distributed animals. From an ecological point of view, notostracans, like most branchiopods, are restricted to temporary pools (Longhurst, 1955; Kerfoot & Lynch, 1987). Their ability to adapt to the temporary habitats has enabled their drought-resistant eggs to become efficient agents of passive dispersal, so that populations occur on remote oceanic islands and are apparently found wherever there are suitable pools (Longhurst, 1955).

Brendonck *et al.* (2008) reported about 500 species of large branchiopods world-wide, 351 species from Palaearctic zoogeographic region including Iran. The Middle East Notostracans are represented by four species from two genera and one family; *Triops granarius* from Iraq (Longhurst, 1955), *Triops cancriformis* from Yemen, *Triops numidicus* from Saudi Arabia and Oman, *Lepidurus couesii* from Syria (Thiéry, 1996), *Triops cancriformis* and *Lepidurus apus lubbocki* from Israel (Kuller & Gasith, 1996). Lately, *Triops cancriformis* is the only species that has been reported from Iranian territory (Golzari *et al.*, 2009).

*Lepidurus apus* has one of the greatest ranges of distribution than any of the *Triops* species being found

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throughout continental Europe, Northern Africa, Asia, Australia (Longhurst, 1955).

In this paper we report for the first time the occurrence of *Lepidurus apus* from Iran and provide morphometrical characteristics of the Iranian population.

## MATERIALS AND METHODS

### Study site

Aigher Goli is a fresh water pool situated in the highlands of Sahand mountain (N 37°46', E 46° 35') in North West of Iran. A plain of 2560 m above sea level, surrounded by mountains of varying heights, about 43 km from Tabriz city at East Azerbaijan province, close to the borders of three neighboring countries, Turkey, Armenia and Azerbaijan Republic (Fig. 1).

It sets in steppic and cultivated hills with its bottom composed of clay and volcanic stone and ashes. The northern air current carrying cold and dry winds arrives in the country from heavy pressure centers in Armenia, resulting in very cold winters in this mountainous area. This cold northern wind severely affects the upland areas in North Western provinces of Iran from late October to late March, reducing the temperature to as low as  $-30^{\circ}\text{C}$  causing heavy snowfalls. Local rainfall ( $300\text{ mm y}^{-1}$ ) and melting snow during

the spring, continually supply the pool until early summer. The pool is generally frozen from late December, often remaining under deep snow cover throughout the winter. Most of the aquatic animals emerge after the long cold period. The pool is dominated by some typical algal genera such as *Scenedesmus*, *Nitzschia*, *Anabaena*, *Chlorella* and *Oocystis* throughout spring. This biotope is important primarily as a breeding area for waterfowl including *Tadorna tadorna* and *Tadorna ferruginea*.

### Sampling

*Lepidurus apus* samples were collected from the habitat using a  $250\text{ }\mu\text{m}$  mesh plankton net three times during spring. Some individuals were immediately transferred into 4% formalin and transferred to laboratory. Specimens were identified using appropriate taxonomic references (Longhurst, 1955; Cottarelli & Mura, 1983; Alonso, 1985, 1996; Thiéry, 1987; Kuller & Gasith, 1996). One hundred adult individuals were used for examination of sexuality and only females were found. Twenty five individuals were examined for morphometrical characteristics using a stereomicroscope. Main co-existing animals were identified. A number of physical and chemical parameters (pH, dissolved oxygen, temperature, conductivity, suspended materials, transparency, surface area and average

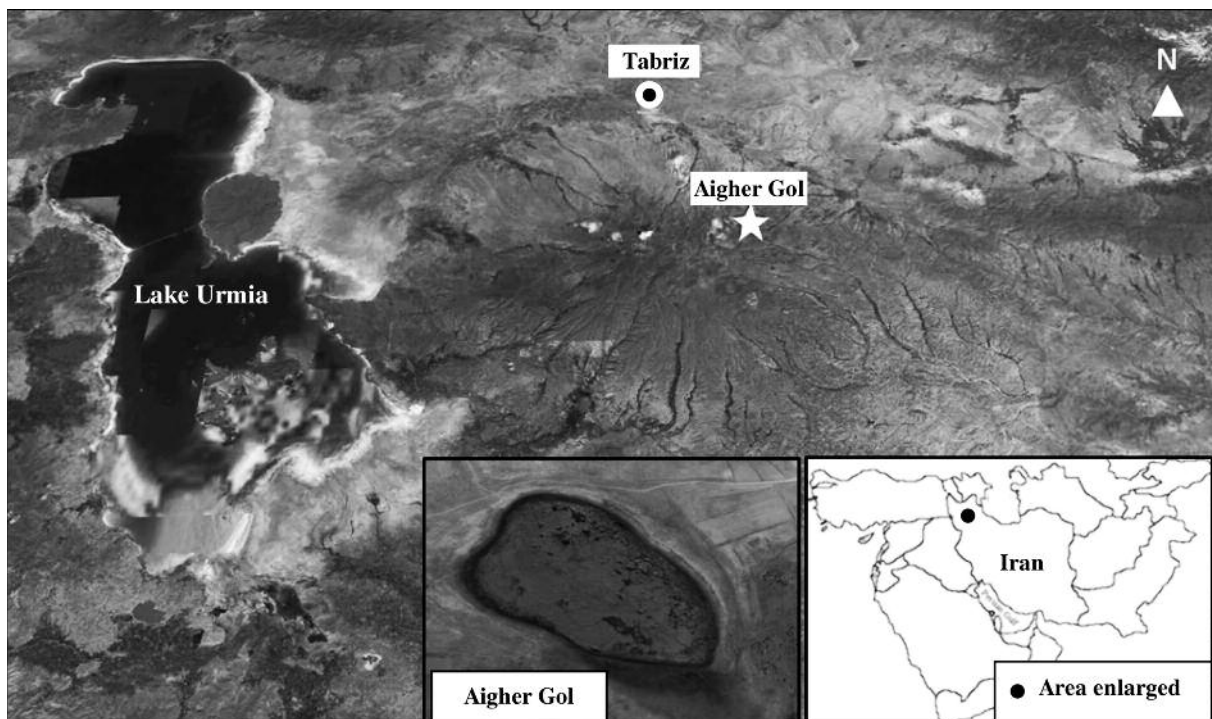


FIG. 1. Geographical location of the Aigher Goli.