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# First recorded cave-dwelling terrestrial isopods (Isopoda: Oniscidea) in Iran with a description of a new species

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## Abstract

Cave-dwelling terrestrial isopods from the province of Kohgiluyeh and Boyerahmad, southwestern Iran, are reported here. These include three accidental and one troglobitic species namely *Protracheoniscus gakalicus* **n. sp.**, which is also the first recorded troglobitic species from the genus *Protracheoniscus*. The new species is readily distinguished by the lack of eyes and pigmentation.

**Key words:** Oniscidea, cavernicolous, *Protracheoniscus,* new species, Iran

## Introduction

The Zagros and Alborz mountains are the two main mountain chains in western and northern Iran, respectively. They constitute nearly one third of the surface area of Iran and have many caves. Despite the high number of known caves in Iran (www.irancaves.com), the cave-dwelling fauna of Iran has been poorly investigated. Almost all recorded species are those categorized as trogloxenes (for terminology, see Romero 2009).

Previous studies have reported only four troglobitic (blind and depigmented) organisms from Iran: the Iran cave barb *Iranocypris typhlops* Bruun & Kaiser, 1944 and the blind loach *Paracobitis smithi* Smith, 1976 (Cypriniformes), *Niphargus alisadri* Esmaili & Sari, 2013 and *N. daniali* Esmaili & Sari, 2013 (Amphipoda).

No record of cave-dwelling terrestrial isopods has been reported in Iran until now. During a survey of cavernicolous species in the province of Kohgiluyeh and Boyerahmad, a mountainous region southwestern Iran (Fig. 1), the second author discovered four species of terrestrial isopods in two caves. They comprised three accidental and one troglobitic species. The latter is described here as a new species, *Protracheoniscus gakalicus* **n.sp.** The other three species were *Porcellionides pruinosus* (Brandt, 1833), *Agabiformius lentus* (Budde-Lund, 1855), two cosmopolitan species from Gakal cave, and *Proporcellio* sp. from Neyneh cave. The new species is also the first from the genus *Protracheoniscus* to truly adapt to inhabiting caves.

## Material and methods

The material examined herein was collected from Gakal and Neyneh caves in the province of Kohgiluyeh and Boyerahmad (Fig. 1b), a mountainous province in Zagross Mountains, southwest of Iran.

Gakal cave is in a mountainous region near the village of Sartipabad, 40 km east of Gachsaran, 30°18'44" N, 51°09'28" E; altitude, 1100 m. This cave is relatively small, but has an enormous central hall and good cavernicole diversity. Humidity is very high and the cave floor is covered with bat guano in most places. The cavernicoles include millipedes, centipedes, mites, pseudoscorpions, cockroaches, beetles, collembolans, and a number of toads. This cave was surveyed twice on 18 May 2012 and 2 October 2012. Other characteristics of the cave included: humidity 97–99.9%; $CO_2$: 715–3040 ppm; air temperature 23°C; water temperature 23°C , with little and low speed water flow which gathered in stone depressions and small pools in different parts; pH: 7.15.

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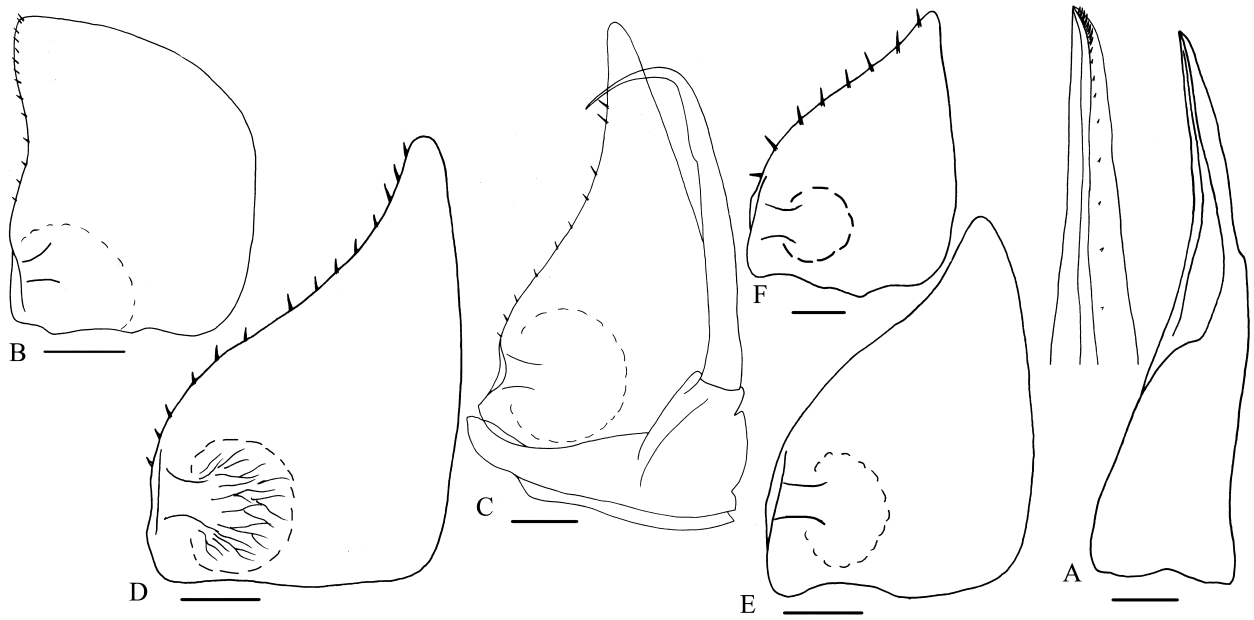


**FIGURE 5.** *Protracheoniscus gakalicus* **n.sp.**, male paratype, 9 mm. A, pleopod endopodite 1; B, pleopod exopodite 1; C, pleopod exopodite 2; D, pleopod exopodite 3; E, pleopod exopodite 4; F, pleopod exopodite 5. Scale = 0.2 mm.

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