Iranian Journal of Animal Biosystematics (IJAB)
Vol.12, No.1, 51-56, 2016
ISSN: 1735-434X (print); 2423-4222 (online)

Description of *Protracheoniscus faramarzi* n. sp., the first troglophilic terrestrial isopod (Isopoda: Oniscidea) from Iran

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(Received: *8 Agust 2015*; Accepted: *3 May 2016*)

The present study reports on the first troglophilic terrestrial isopod from Iran. *Protracheoniscus faramarzi* **n. sp.** was found in Shafagh Cave, southern Iran. The new species is described and its diagnostic characters are figured. This species is distinguished by the long and narrow antennae, the reduced body pigmentation and the number of ommatidia.

Key words: Oniscidea, cavernicolous, troglophile, new species, Iran.

INTRODUCTION

Cave-dwelling terrestrial isopod fauna of Iran is poorly investigated. Recently, Kashani et al. (2013) reported the first cavernicolous terrestrial isopods from Iran including one troglobitic (*Protracheoniscus gakalicus*) and three accidental species (for terminology, see Romero 2009). During a survey on the cavernicolous species of the province of Fars, southern Iran (Fig. 1), the second author found several troglophilic terrestrial isopods in Shafagh cave. Troglophiles are those showing a tendency in reduction of eyes and pigmentation, not missing these characters completely (Romero 2009). The aim of this study, therefore, is to report on, describe and illustrate the fist troglophilic terrestrial isopod, *Protracheoniscus faramarzi* **n. sp.** from Iran.

MATERIAL AND METHODS

The material examined herein was collected from Shafagh cave in the province of Fars, Southern Iran (Fig. 1 A, B). Shafagh cave is located in a mountainous region near the village of Kooshaksar, 75 km northwest of Jahrom, 28°40'08" N, 52°56'34" E; altitude, 1500 m. This 335-meter-length cave includes two halls, the right one narrower and smaller than the left (Fig. 1C). The cave nests for an enormous number of fruit bats, *Rousettus aegyptiacus*, their guano maintains a good cavernicole diversity including a variety of beetles, centipeds and pseudoscorpions.

The specimens were collected by hand and preserved in 70% ethanol. Type material of the new species was deposited in the Collection of Biology Department of Shiraz University (CBSU); the Zoological Museum, University of Tehran (ZUTC), the Iranian Research Institute of Plant Protection (IRIPP) and in the personal collection of the first author (PCGMK).

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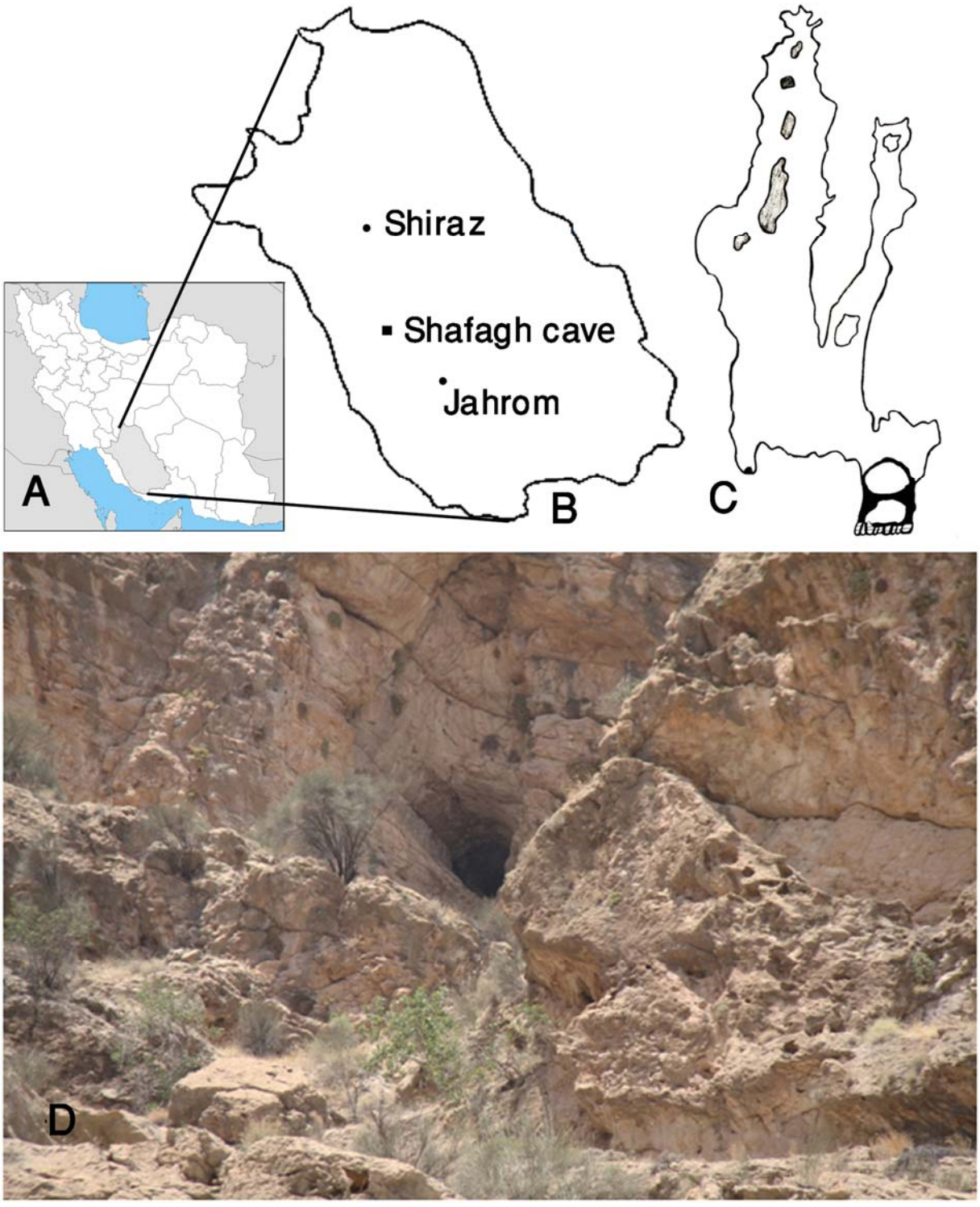

FIGURE 1. A, the location of the province of Fars in Iran; B, the position of Shafagh cave in the province; C, map of the cave (after Arefnia 2013); D, the entrance of the cave.

FIGURE 2. *Protracheoniscus faramarzi* n. sp. in Shafagh cave.

RESULTS

Family Agnaridae Schmidt, 2002

Protracheoniscus faramarzi **n. sp.**

Material examined. Holotype: male, 11 mm, Fars, Meymand, Kooshaksar village, Shafagh Cave, 28°40'08" N, 52°56'34" E, alt.1500 m, 7 December 2013, leg. M. Dashan (CBSU-Cr-Is. 3208)

Paratypes: same data as for holotype, one female (ZUTC 5909); the same locality, 23 May 2014, one male (IRIPP 1064); the same locality, 23 May 2014, three males (PCGMK 1718).

Diagnosis. Body with reduced pigmentation. Eyes with 8–12 ommatidia. Antenna long. Pereopod VII ischium stout with a setose area on proximal part of sternal surface. Pleopod I endopodite with a line of spine setae and a row of scale setae at apex.

Description. Maximum length: male 11 mm; female 13 mm. Body pale brown with reduced pigmentation (Fig 2). Eyes with 8–12 ommatidia. Cephalon with short lateral and rounded median lobes (Fig. 3A), no supra-antennal line. Antenna long, surpassing the posterior margin of fourth pereonite; fifth article of peduncle very long, as long as flagellum, with length: width ratio 13:1; flagellum with two articles, proximal article longer than distal one (Fig. 3D). Pereon smooth; posterolateral margins of first pereonite convex (Fig. 3A); noduli laterales on pereonites 1–4 distinctly more distant from the lateral margins than those on pereonite 5–7 (Fig. 3B). Telson triangular with deeply concave sides and rather pointed apex, almost twice as wide as long, slightly surpassing uropod protopodites. Uropod protopodites with conspicuous incision on lateral margins; exopodites conical, two times as long as telson (Fig. 3C). Pleon smooth, narrower than pereon. Pleopod exopodites I-V with monospiracular covered lungs (Fig. 4 B-G).

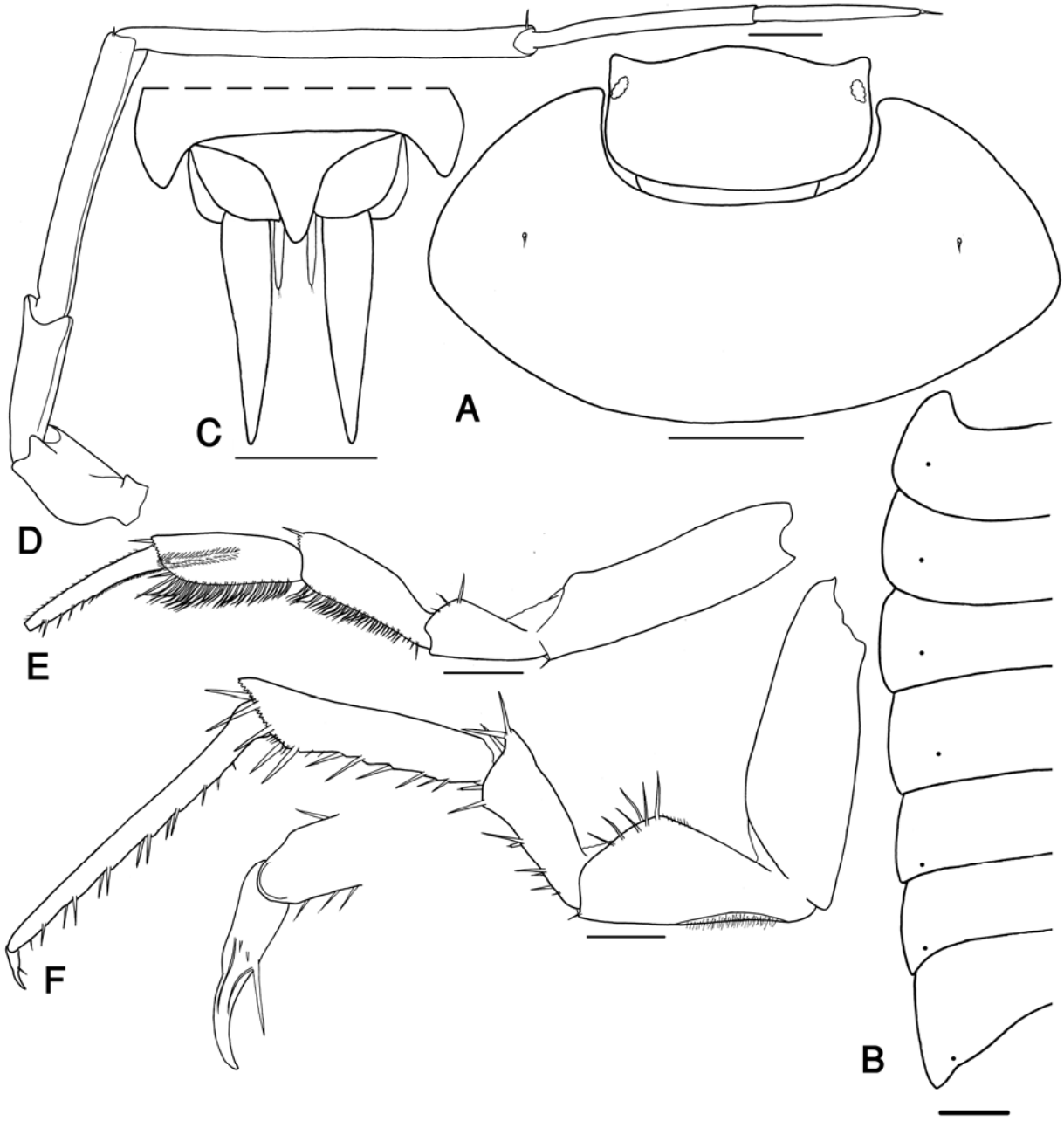

FIGURE 3. *Protracheoniscus faramarzi* n. sp., A-C, female paratype, 13 mm; D-F, male, holotype, 11 mm. A, cephalon and first pereonite; B, left side of pereon showing disposition of noduli laterales; C, telson and uropods; D, antenna; E, pereopod I; F, pereopod VII. Scales = A-C, 1 mm; D-F, 0.5 mm.

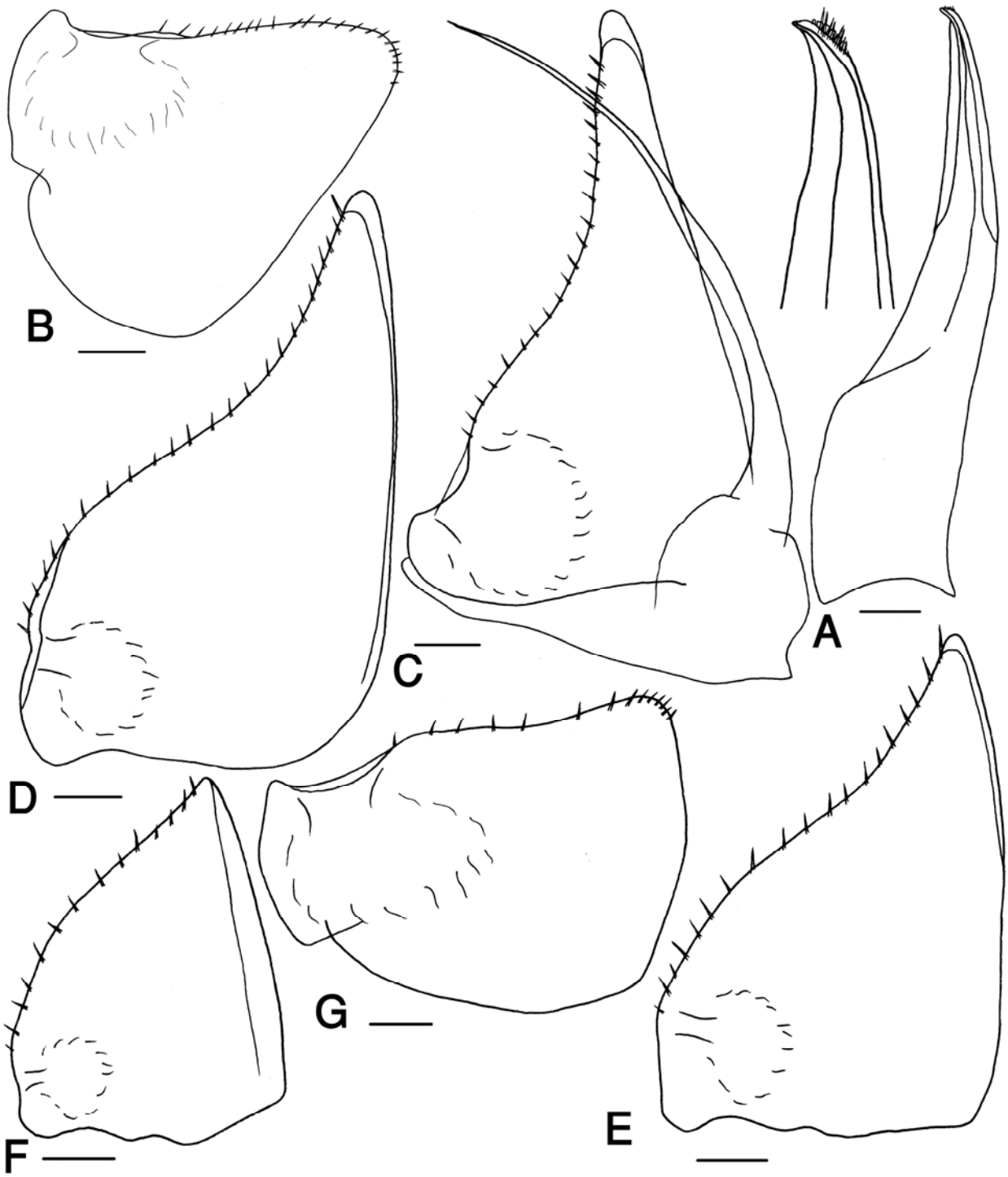

FIGURE 4. *Protracheoniscus faramarzi* n. sp., A-F, male holotype, 11 mm; G, female paratype, 13 mm. A, pleopod endopodite I; B, pleopod exopodite I; C, pleopod II; D, pleopod exopodite III; E, pleopod exopodite IV; F, pleopod exopodite V; G, pleopod exopodite I. Scales = 0.2 mm.

Male: pereopods I-II merus and carpus with brushes of trifid setae (Fig. 3E). Pereopod VII ischium stout with a setose area on proximal portion of sternal margin, propodus narrow and elongated, dactylus with one dactylar and one ungual seta (Fig. 3F). Pleopod exopodite I with rounded hind lobe, outer margin with a row of fine setae (Fig. 4B); endopodite straight; apex slightly bent outward bearing a line of small spine setae and a row of rectangular scale setae (Fig. 4A). Pleopod II endopodite longer than exopodite; the latter triangular with a row of fine setae on outer margin (Fig. 4C). Pleopod exopodites III-V as in Fig. 4 D-F.

Remarks. Similar to *P. gakalicus*, the only other truly cave-dwelling terrestrial isopod known from Iran (Kashani et al. 2013), and the new species has acquired some special traits adapting it for a cavernicolous way of life. Reduction in body pigmentation and the number of ommatidia as well as elongation of appendages are among these adaptations. *Protracheoniscus faramarzi* **n. sp.** is the first troglophilic terrestrial isopod species reported from Iran. This species differs from its epigean relatives by all characters adapting this species to live in caves, and from *P. gakalicus* by possessing some pigmentation and few ommatidia (vs. complete loss of pigmentation and eyes). Moreover, pereopod VII ischium with a setose area on sternal surface and pleopod endopodite I with a row of rectangular scale setae on apex are unique to this species.

Distribution. Southern Iran.

Etymology. The name of species is after Dr. Faramarz Hosseinie, professor in Ecology, Shiraz University, Shiraz.

Acknowledgments

We cordially thank Hamid Darvishnia for his help during field activities. The Iran National Science Foundation (INSF) is thanked for supporting the study.

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