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[Short Communication]

First report of a mermithid nematode (Enoplea: Mermithida) parasitizing the crab spider *Heriaeus spinipalpus* (Araneae: Thomisidae)

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Abstract — In this short paper, details about the observation of a juvenile mermithid roundworm parasitizing the crab spider *Heriaeus spinipalpus* are presented. The morphology of both organisms is briefly discussed. This is the first record of nematode parasitism in spiders of the genus *Heriaeus*.

Key words — endoparasitism, host, Iran, parasitoid, roundworm

The crab spider *Heriaeus spinipalpus* Loerbroks 1983, is a plant dwelling species, with an Eastern Mediterranean distribution covering Anatolia, Caucasus, Syria, Turkmenistan and Iran (Loerbroks 1983, Platnick 2014); The first occurrence of this species in Iran was reported from Tehran, on the basis of a single female specimen collected in Alborz Mountains in 1978 (Ono & Martens 2005). The average body length of this species is 6–6.9 mm in females, and 5–6 mm in males, and it can be diagnosed from other species of the genus *Heriaeus* by the unique conformation of male's pedipalp and by the presence of a large central hood in the female's epigyne (Loerbroks 1983, Ono & Martens 2005). The only other species of this genus known from Iran is *H. graminicola* (Doleschall 1852), recorded from Almeh, Golestan (Komposch 2002). To date, there are no records of endoparasitism by nematodes in spiders of this genus.

In a faunistic spider collecting survey conducted in July 2014 in southern portion of Alborz Mountains, in an area known as Golāb Darreh (northern Tehran) (35.8216 N, 51.4343 E), as a result of examining the foliage, a single adult female specimen of *H. spinipalpus* was collected from shady, humid, dense vegetation. No external morphological abnormality was observed (Fig. A). The specimen was fixed in 75% ethanol, and examined using a Nikon SMZ-1 stereomicroscope. While dissecting the epigyne, a nematode was extracted from the ventral side of the abdomen and later preserved in a separate vial. The materials are deposited in Jalal Afshar Zoological Museum of University of Tehran (curator Dr. Alireza Sabouri).

The nematode was yellowish white in color, 215 mm long and 0.4 mm wide (Fig. B). Based on the presence of six cephalic papillae, the lack of lateral lip papillae and the pointed appendage located in end of the tail, this worm is considered as a member of the family Mermithidae (Iida & Hasegawa 2003). The nematode was a nearly fully developed juvenile and without adult specimens, it is difficult to

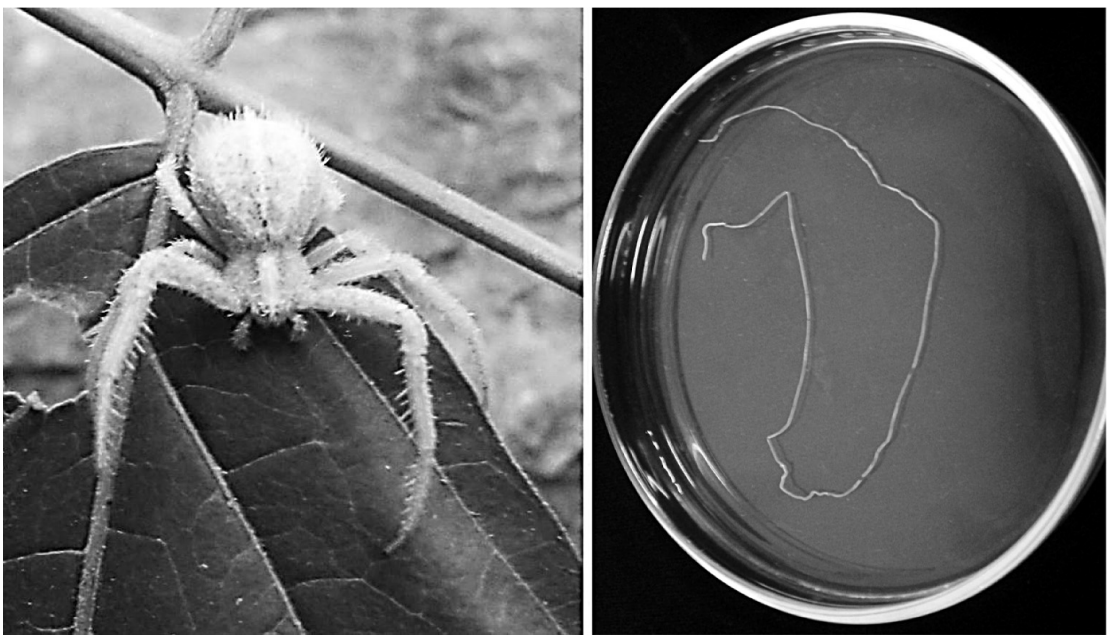

Fig. A (left). *Heriaeus spinipalpus*, live specimen in natural habitat (Photo by P. Beyhaghi). **Fig. B** (right). Mermithid nematode extracted from the spider's abdomen (Photo by K. Darabi).

assign mermithids to a particular genus.

Based upon the literature, natural parasitism of spiders by nematodes is restricted to the family Mermithidae, however, nematodes of the family Steinernematidae and Heterorhabditidae, which are common parasites of soil insects, are also known to infect spiders, but only in the laboratory situation (Poinar & Thomas 1985, Allard & Robertson 2003). Two different types of life style are known in mermithids that parasitize spiders: the direct life cycle, which includes the direct penetration of the integument of their host, and the indirect life cycle in which the worm enters the body of the spider by first infesting the aquatic stages of their insect prey (Poinar & Early 1990, Iida & Hasegawa 2003). Nematodes are known to kill their spider host upon emergence as postparasitic juveniles, and mature later in soil, mud or freshwater (Poinar & Early 1990). After their final molt, the non-feeding adults will mate and the females continue to live upon their stored food supply until oviposition is finished, which can vary from a week to months (Barnes 1980, Poinar 2010). Mermithid-thomisid parasite-host associations are poorly studied; reports of spiders of the family Thomisidae infected by mermithid nematodes date back some 30 years ago with the discovery of infected species in the genera *Tmarus*, *Misumenops*, and *Xysticus* (Poinar 1985, Poinar & Benton 1986, Poinar 1987); but no documentation has been made for the genus *Heriaeus* so far (Penny & Bennett 2006).

It is hoped that further studies on the parasite-host associations between nematodes and spiders will reveal novel findings regarding the biology of both groups, especially pertaining to the taxonomy of mermithids, as many individuals are undoubtedly still undescribed.

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