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ORIGINAL ARTICLE

NEW RECORD OF SPECIES *LITHOBIUS FERGANENSIS* (TROTZINA, 1894) (CHILOPODA, LITHOBIOMORPHA, LITHOBIIDAE) FROM THE MIDDLE OF IRAQ

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ABSTRACT

The present study provides the first record species of the genus *Lithobius* Leach, 1814, *L. ferganensis* (Trotzina, 1894) which was collected from the middle of Iraq. A detailed explanation of the morphology and the diagnostic characters of specimens of both sexes is provided.

Keywords: Centipede, Chilopoda, Iraq, *Lithobius*, Lithobiomorpha.

INTRODUCTION

The class of Chilopoda Latreille belongs to the subphylum Myriapoda which belongs to the phylum of Arthropoda; Lithobiidae family is a member of the order Lithobiomorpha, which includes terrestrial, predatory animals like centipedes. The forcipules in the front of the body are the key distinguishing feature; the body consists of head and a trunk with 15-21 segments, whereas it has 15 in Lithobiomorpha. The second-most varied class of Chilopoda after Geophilomorpha Pocock, 1895, is the Order Lithobiomorpha, which has more than 1500 species (Muralewitsch, 1906; Edgecombe and Giribet 2007).

The exception of Antarctica and a couple of spots in the tropical and subtropical, this order is tracked down on all mainlands (Zapparoli, 2003; Lewis, 2007; Bonato and Zapparoli, 2011). It comprises two families: Henicopidae Pocock, 1901, which is primarily found on the Southern side of the equator and displays less variety as just 120 species are at present known (Edgecombe and Hollington, 2002; Bonato and Zapparoli, 2011), and Lithobiidae Newport, 1844, which has almost 1000 species and subspecies having a place with 44 genera and is essentially conveyed in the Northern Half of the globe's calm districts. Lithobiomorpha mostly lives in the soil surface, litter, under stones, or in rotting vegetation, routinely in fertilizer stores, arising around evening time to chase, and is a valuable hunter of soil bothers (Chao *et al.*, 2018).

From the whole class Chilopoda, *Lithobius* Drain, 1814 is considered the most species-rich, and the most troublesome taxon of the Lithobiinae, with around 500 species and subspecies (Bonato *et al*., 2016). This genus is generally from the Palaearctic Region; *Lithobius* is classified into several subgenera including, *Lithobius* Filter, 1814; *Monotarsobius* Verhoeff, 1905; *Sigibius* Chamberlin, 1913; *Ezembius* Chamberlin, 1919; *Dacolithobius* Matic, 1961; *Tracolithobius* Matic, 1962; *Chinobius* Verhoeff, 1934; *Porobius* Attems, 1926 and large depending on demonstrative blends of a similar restricted set of characters (Zapparoli and Edgecombe, 2011).

The most significant of these characteristics are the antennal articles number (18- 25), number and distribution of ocelli, forcipular teeth number dental edge (front margin of forcipular coxo-sternite), type of the porodonts (seta surrounding the forcipular teeth), the presence of projections on some tergites, articulation distinctness of legs 1–12 and spurs number on the female gonopod. While these blends of characters are systematically functional, their extremities has not been checked, to the such an extent that some plesiomorphies are utilized in diagnoses (Ganske *et al.*, 2021)

In Iraq, there are three recorded species *Lithobius microps* Meinert, 1868; *L. aeruginosus* (L. Koch, 1862), and *L. fossipes* Brölemann, 1922 from this genus (Aldoori, 2020; Dyachkovi *et al*., 2023). In the present study, a new record species of *Lithobius ferganensis* (Trotzina, 1894) is added as a new record for centipede's fauna of Iraq.

MATERIALS AND METHODS

Specimens' collection: The studied materials were collected during the surveys in the middle of Iraq. The specimens were collected directly by hand during the period from October 2022 to May 2023 from the soil surface and under stones in Baghdad and Saladin Provinces. The collected centipede specimens were kept in plastic container. At the laboratory, specimens were in sterile tubes containing alcohol ethanol 70%, each specimen was labelled with labels that contain the date and localities of collection. The photographs were taken with a Xiaomi Miui 14 and used a binocular dissecting microscope to magnify the morphological features.

Specimens' identification: The collected centipede specimens were identified by different taxonomical keys (Pei *et al.*, 2011; Dányi and Tuf, 2012; Ma *et al.*, 2012, 2014), and by the remarks notes of this species by Dányi (2008) and Zuev (2016). Terminology for morphology follows Bonato *et al.* (2010).

Abbrevations: Below are the abbreviations used in the text and tables:

T, **TT:** tergite, tergites	**a:** anterior
F: femur	**t:** trochanter
S, SS: sternite, sternites	**m:** median
T: tibia	**P:** prefemur
C: coxa	**p:** posterior

RESULTS AND DISCUSSION

Classification

Order: Lithobiomorpha.

Family: Lithobiidae.

Genus: *Lithobius* Leach, 1814.

Species: *L. ferganensis* (Trotzina, 1894)

Basionym: *Monotarsobius ferganensis* Trotzina, 1894

Synonyms: *Lithobius (Monotarsobius) ballidagus* Chamberlin, 1952
L. (Monotarsobius) curtipes subsp. *taurica*
L. (Monotarsobius) curtipes subsp. *turkestanicus*
L. (Monotarsobius) nodonotatus Verhoeff, 1943
L. pusillus Sseliwanoff, 1880
L. (Monotarsobius) schizus Chamberlin, 1952
L. sseliwanoffi Garbowski, 1897
L. taurica Ellingsen, 1910
L. turkestanicus Attems, 1904
Monotarsobius ballidagus Chamberlin, 1952
M. ferganensis Trotzina, 1894
M. nodonotatus Verhoeff, 1943

Description

Body length (Pl. 1): 22 mm long in male and 24-26 mm in female, cephalic plate 2.5 mm long, 2.0 mm wide in male and 2.2mm, 18mm in female. Colour: Russet brown to brown.

Head: Smooth, raised, color concentrated as a nearby netlike vein, inadequately and weakly punctate; more extensive than lengthy, lateral peripheral interruptions distinct.

Antennae: (Pl. 2A) Pale yellow-brown to chocolate antennal articles, about third of body-length, usually of 20 antennal articles; basal article long about equivalent to wide, second article particularly longer than wide, following articles shortening gradually, the terminal antennal article much longer than wide or about two times the length wide; male with 21+ 19 articles, while female with 20 + 19.

Ocelli: pale-dim; oval to rounded; with six ocelli organized into two random columns; the two back ocelli moderately large; posterior one bigger than poster superior somewhat; ocelli domed, clear, for the most part hazily pigmented, Tömösváry's organ normally smaller than greatest ocellus.

Forcipular segment (Pl. 2B) with narrow anterior margin, outside of forcipular segment longer than inner side slightly. Cephalic plate smooth, convex, and pigment focussed as near netlike vein, with 2+2 coxosternal teeth, with straight or slightly recurved line of their apices; short lateral spine, blunt and setiform, regularly directed medially; sidelong to spine, free border grades indirectly backwards.

Plate (1): *L. ferganensis*; Left, female, Dorsal view, Right, Male, dorsal view.

Tergites: smooth, without wrinkles, somewhat hunched on behind; T 1 postero-laterally narrower than antero-laterally, narrower than T3 and the cephalic plate, T3 slightly narrower than the cephalic plate; posterior margin of T3 somewhat straight, posterior margin of TT5,8,10,12 and T14 slightly concave, ridge of posterior margin of TT3,5,8,10 and T12 continuous. A wart-like process on T15

Legs: strong, tarsi fused on legs 1–13, separate on legs 14 and 15; all legs with curved ventral claws; legs 14 and 15 more thick and stouter than other legs specially in male; coxal pores: (Pl. 2C) two to four on each coxa, frequently 2224 or 1224 circular; on both the left and right sides, separated from one another by their own diameter or less. Arrangement of spurs on the legs (Plectrotaxy) as in Table (1).

Table (1): Plectrotaxy of *L. ferganensis* legs.

Legs	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	--	mp	am	P	P	-	-	p	p	-
2	-	mp	am	P	P	-	-	p	p	-
3	-	p	-	p	P	-	-	p	ap	-
4	-	P	-	p	P	-	-	p	ap	-
5	-	P	m	ap	P	-	-	mp	ap	-
6	-	-	m	ap	p	-	-	mp	ap	-
7	-	-	m	ap	p	-	-	amp	ap	-
8	-	-	mp	ap	P	-	-	amp	ap	-
9	-	-	mp	ap	P	-	-	amp	ap	-
10	-	-	mp	ap	P	-	-	amp	ap	-
11	-	-	mp	ap	P	-	-	amp	ap	-
12	-	-	mp	ap	P	-	-	amp	ap	-
13	-	m	mp	ap	P	-	-	amp	ap	-
14	-	m	ap	amp	-	a	-	ap	p	-
15	-	m	ap	amp		a	-	ap	-	-

Material examined: 1♂ 22.ii.2023 Al-Hamra Village (34°45′15″N43°36′22″E), 1♀ Al-Muhazam Village (34°43′40″N43°38′36″E), Saladin province; 1♀ 27.iii.2023 Al-Jaderia, (33°17′17″N 44°23′35″E), Baghdad Province.

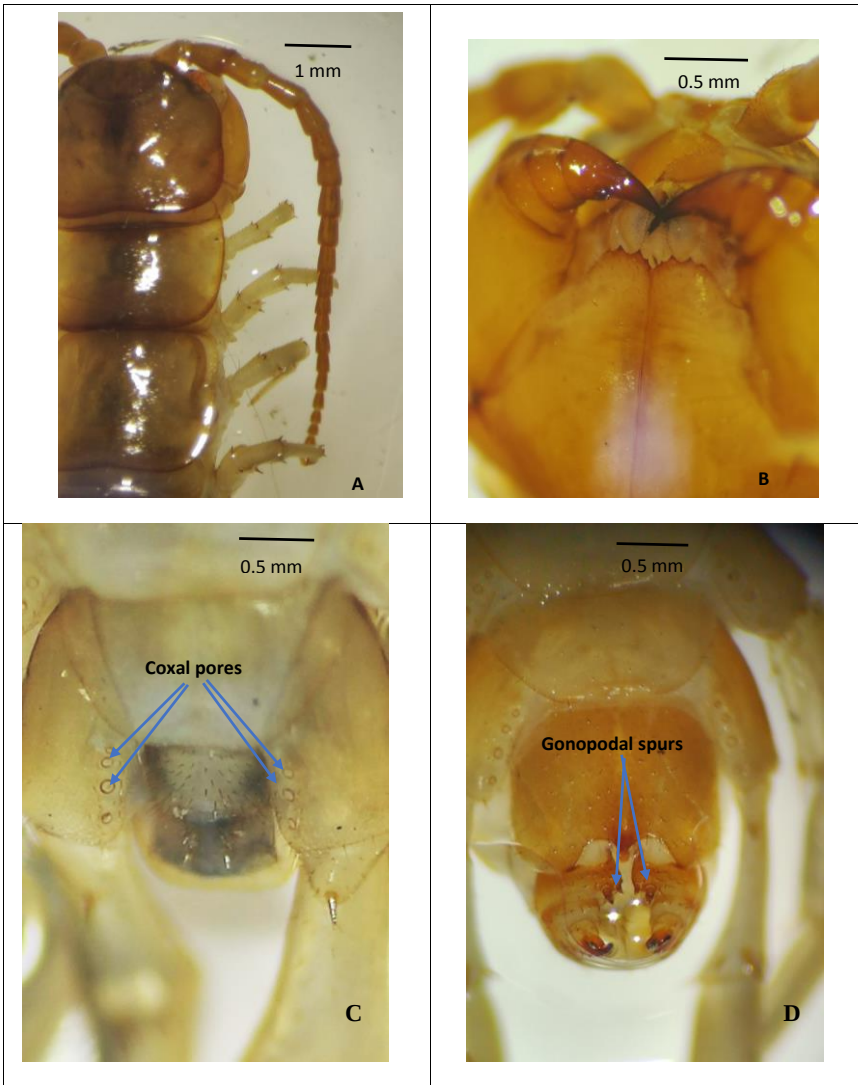

Plate (2): A-D *L. ferganensis*; (A) Antennae: composed of 20 articles, (B) Forcipular segment, ventral view show tooth-plate of forcipular coxosternite,(C) Terminal part of body (♂): posterior segments and gonopods, ventral view, (D) Terminal part of body (♀): posterior segments and gonopods, ventral view.

CONCLUSIONS

The present study is the first confirmed record of the species *Lithobius ferganensis* (Trotzina, 1894) this study supported the knowledge of the centipede's fauna in Iraq, the need to the morphological study to confirm the identification of centipedes, because of the difficulty of this group in diagnosis. The centipedes were identified and documented based on

an examination of morphological characteristics by using deferent world taxonomical keys and terminology for morphology.

CONFLICT OF INTEREST STATEMENT

The results of the present study are part of the requirements of M.Sc. in Zoology, Department of Biology, College of Science, Baghdad University

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تسجل جديد للنوع *Lithobius ferganensis* (Trotzina, 1894) (Chilopoda, Lithobiomorpha, Lithobiidae) وسط العراق

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تأريخ الاستلام: 2023/6/2، تأريخ القبول: 2023/8/18، تأريخ النشر: 2023/12/20

الخلاصة

تناول البحث الحالي تسجيل جديد لاحد أنواع الجنس *Lithobius* Leach, 1814، متمثلا بالنوع *L. ferganensis* (Trotzina,1894) (Chilopoda, Lithobiomorpha, Lithobiidae) التي جمعت عيناته من وسط العراق.

زودت النتائج بشرح مفصل للتركيب المظهري والصفات التشخيصية للنوع من كلا الجنسين.