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A New Species of the Medically Important Scorpion Genus, *Hemiscorpius* Peters, 1861 (Hemiscorpiidae), from Southern Iran

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Abstract: Seven species of *Hemiscorpius* Peters, 1861 have been recorded in Iran. Due to the medical importance of this genus, the scorpion populations of southern Kerman Province, in the south of Iran, were studied. Scorpion specimens were collected in 2023 and 2024 from mountainous areas in Bam and Jiroft counties. Morphological, morphometric, and molecular data revealed a new species, described herein as *Hemiscorpius jiroftensis* sp. n. The genetic distances between the new species and other species of *Hemiscorpius* varied from 0.105 with samples of *H. lepturus* from Iran to 0.138 with samples of *H. enischnochela*. The Jebal Barez Mountains appear to have provided a geographical barrier, separating the new species from its closest relative, *Hemiscorpius acanthocercus* Monod & Lourenço, 2005. It is important to understand the geographical distributions and morphological differences among the species of *Hemiscorpius* to implement appropriate medical responses to envenomation by these scorpions.

Keywords: Cytochrome *c* Oxidase I; Jebal Barez; Jiroft; morphology; systematics; taxonomy

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1. Introduction

Genus *Hemiscorpius* Peters, 1861, currently comprising 18 described species distributed from northeastern Africa, through the Arabian Peninsula, to Iran [1], is the sole representative of family Hemiscorpiidae Pocock, 1893, the sister group of Hormuridae Laurie, 1896 (2,3). Diagnostic characters of this genus include a pentagonal sternum, pedipalps with Type C trichobothrial pattern, lateroapical margins of the leg telotarsi straight, a single ventromedian carina on metasomal segments I–IV, and a double hook on the male hemispermatophore [2–4].

Seven species of *Hemiscorpius* have been recorded in Iran: *Hemiscorpius acanthocercus* Monod & Lourenço, 2005; *Hemiscorpius enischnochela* Monod & Lourenço, 2005; *Hemiscorpius gaillardi* (Vachon, 1974); *Hemiscorpius kashkayi* Karataş & Moradi-Gharkheloo, 2013; *Hemiscorpius lepturus* Peters, 1861; *Hemiscorpius persicus* (Birula, 1903); and *Hemiscorpius shahii* Kovařík et al., 2017 [4,5].

Due to the medical importance of members of this genus, including the report of a death due to envenomation by *H. acanthocercus* in Hormozgan Province [6], and the broad distribution of *Hemiscorpius* in southern Iran [5], populations of this genus were studied in Bam and Jiroft counties of Kerman Province. Kerman Province is situated southwest of Kavir-e Lut, in southern Iran. The lowest point in Kerman Province is 143 m at the southern margin of the Jazmourian lowland and its highest point is at 3884 m in the Bahr-e-Asman and Jebal Barez mountains. The climate of the area is cold and dry in the highlands, and hot and humid to dry in the plains [7].

Hemiscorpius acanthocercus and *H. enischnochela* were previously reported from Manujan, in southern Kerman [8], whereas only *H. acanthocercus* was reported from Jiroft County [9].

Morphological, morphometric, and molecular data obtained from scorpion specimens collected in mountainous areas of Bam and Jiroft counties revealed a new species, described herein as *Hemiscorpius jiroftensis* sp. n.

2. Material and Methods

2.1. Morphology

Scorpions were collected in 2023 and 2024 by searching at night with portable ultraviolet lights [10] at Dehbakri (Bam County) as well as Hishin and Mohammad Abad (Jiroft County) in the Jebal Barez Mountains of Kerman Province (Figure 1). Material was deposited in the Medical Entomology Collection of Jiroft University of Medical Science, Iran (JMU), and the Research Institute of Zabol, Iran (RIZ).

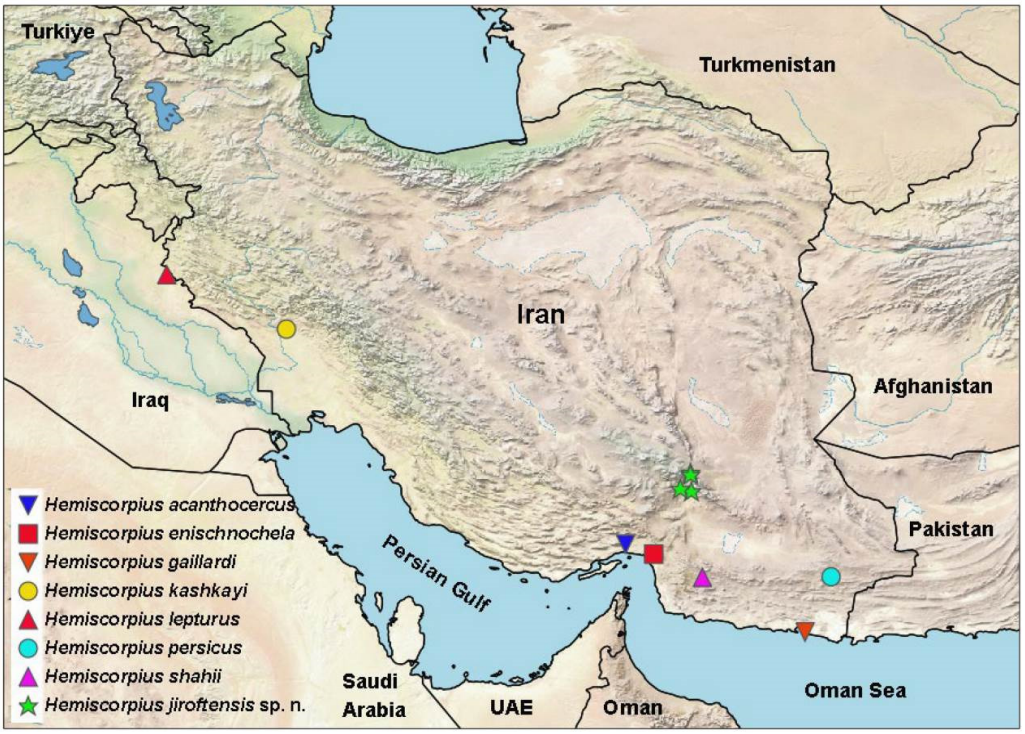


Figure 1. Geographical distribution of *Hemiscorpius jiroftensis* sp. n. and type localities of other species of *Hemiscorpius* Peters, 1861 recorded in Iran.

Material was examined using a Labomed Luxeo 6Z stereomicroscope and measured with Accud (d = 0.01 mm) digital point calipers. Species were identified using keys by Shahi and Barahoei [4] and Barahoei et al. [5]. Morphological terminology follows Vachon [11] for trichobothria, Loria and Prendini [12] for lateral ocelli, González-Santillán and Prendini [13]

for pedipalpal and metasomal carinae, and Stahnke [14], Sissom [15], and Prendini [2] for general nomenclature.

2.2. Molecular Systematics

DNA was extracted from up to 25 mg of pedipalp muscle tissue using a FavorPrep™ Tissue Genomic DNA Extraction Mini Kit. The mitochondrial Cytochrome *c* Oxidase I (COI) gene was PCR amplified using the HCO2198 and LCO1490 primers [16] at a specific temperature cycle [17,18]. PCR products were sent to Niagen Noor Company (Tehran, Iran) for sequencing. The five newly generated COI sequences were analyzed together with eleven sequences—ten *Hemiscorpius* sequences representing three species, and *Scorpio palmatus* (Ehrenberg, 1828) as an outgroup—retrieved from GenBank. Maximum Likelihood analysis was conducted with PhyML 3.0 [19] using the TN93+G substitution model, under the Akaike Information Criterion (4823,39612), for 10,000 iterations. Bayesian inference was conducted with MrBayes 3.2.7a [20] on the CIPRES Science Gateway (https://phylo.org accessed on 4 April 2025) for 50,000,000 generations and 5000 burn in. The phylogenetic trees obtained were visualized with FigTree 1.4.4 (https://tree.bio.ed.ac.uk/software/figtree accessed on 4 April 2025), and the final editing conducted using Photoshop 15.2.3.

3. Results

3.1. Molecular Systematics

The new COI gene sequences were 624 bp long, containing 438 conserved (70.19%), 186 variable (29.81%), and 117 parsimony informative (18.75%) sites. The phylogenetic tree obtained from analysis of the sequences (Figure 2) placed *H. enischnochela* (clade A) as the basalmost species, sister to the other species (clade B). *Hemiscorpius lepturus* was placed sister to a group comprising *H. acanthocercus* and *H. jiroftensis* sp. n. The low bootstrap support for clade B and the group comprising *H. acanthocercus* and *H. jiroftensis* sp. n. may be attributed to the relatively small sample of sequences from a single gene locus.

The genetic distances between the new species and other species of *Hemiscorpius* varied from 0.105 with *H. lepturus* from Iran to 0.138 with *H. enischnochela* (Table 1). The genetic distance between the new species and its closest relative, *H. acanthocercus*, was 0.130.

Table 1. Genetic distances (average Kimura 2-parameter) in the Cytochrome Oxidase *c* Subunit I gene among and within (bold) four species of *Hemiscorpius* Peters, 1861.

Species	Country	*H. acanth.*	*H. enisch.*	*H. leptur.*	*H. leptur.*	*H. jirof.*
H. acanthocercus	Iran	**0.029**				
H. enischnochela	Iran	0.126	**0.036**			
H. lepturus	Iran	0.147	0.136	-		
H. lepturus	Iraq	0.139	0.129	0.089	-	
H. jiroftensis	Iran	0.130	0.105	0.138	0.115	**0.013**

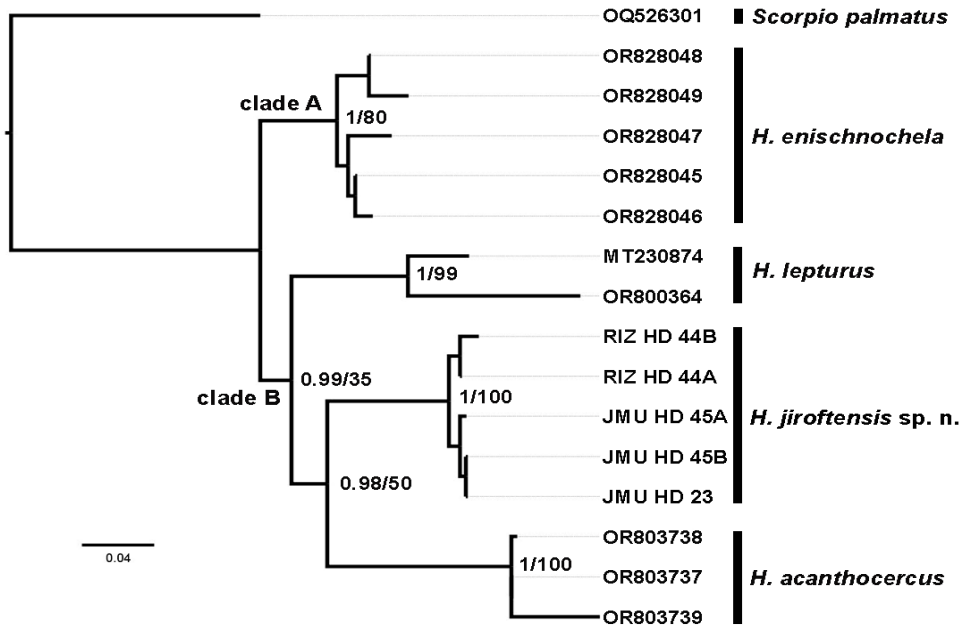


Figure 2. Phylogeny of four species of *Hemiscorpius* Peters, 1861 with *Scorpio palmatus* (Ehrenberg, 1828) as outgroup, based on Maximum Likelihood and Bayesian inference of the Cytochrome Oxidase *c* Subunit I gene. Posterior probabilities and bootstrap values at nodes.

3.2. Taxonomy

Family Hemiscorpiidae Pocock, 1893
Genus *Hemiscorpius* Peters 1861
Hemiscorpius jiroftensis sp. n.
Figures 1–7
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Type Material. Holotype ♂(RIZ HD 44A), **IRAN:** *Kerman Prov.*: Jiroft Co.: Hishin village, 28°37′48″ N 57°56′24″ E, 10.ix.2024, H. Dehghan and E. Amiri. Paratypes: **IRAN:** *Kerman Prov.*: Bam Co.: Sharik Abad village, 29°04′12″ N 57°55′12″ E, 22.viii.2023, 1 ♂(JMU HD 23), 1 ♀(JMU HD 43), 27.viii.2024, 3 ♂(JMU HD 45A–C). Jiroft Co.: Hishin village, 28°37′48″ N 57°56′24″ E, 10.ix.2024, H. Dehghan and E. Amiri, 1 ♂, 1 ♀(RIZ HD 44B, C).

Diagnosis. *Hemiscorpius jiroftensis* sp. n. differs from other species of *Hemiscorpius* recorded in Iran as follows. The new species differs from *H. enischnochela*, *H. gaillardi*, and *H. shahii* in possessing only three trichobothria on the ventral surface of the pedipalp patella (Figure 5C) unlike the other three species, each of which possess more than ten trichobothria on the ventral surface of the patella. Unlike *H. kashkayi* and *H. persicus*, the new species is markedly sexually dimorphic (Figures 3 and 7), possessing an elongated metasoma and a pair of blunt projections posteriorly on the telson vesicle of the male (Figure 7A). The new species differs from *H. lepturus* in its more granular tegument. For example, the carapace lateral margins bear small spiniform granules ventral to the lateral ocelli (Figure 5A) and the metasomal dorsosubmedian carinae each comprise numerous prominent spiniform granules (Figure 7) in *H. jiroftensis* sp. n. whereas the carapace lateral margins are smooth and the metasomal dorsosubmedian carinae comprise few, small spiniform granules, especially on the anterior segments, in *H. lepturus*.

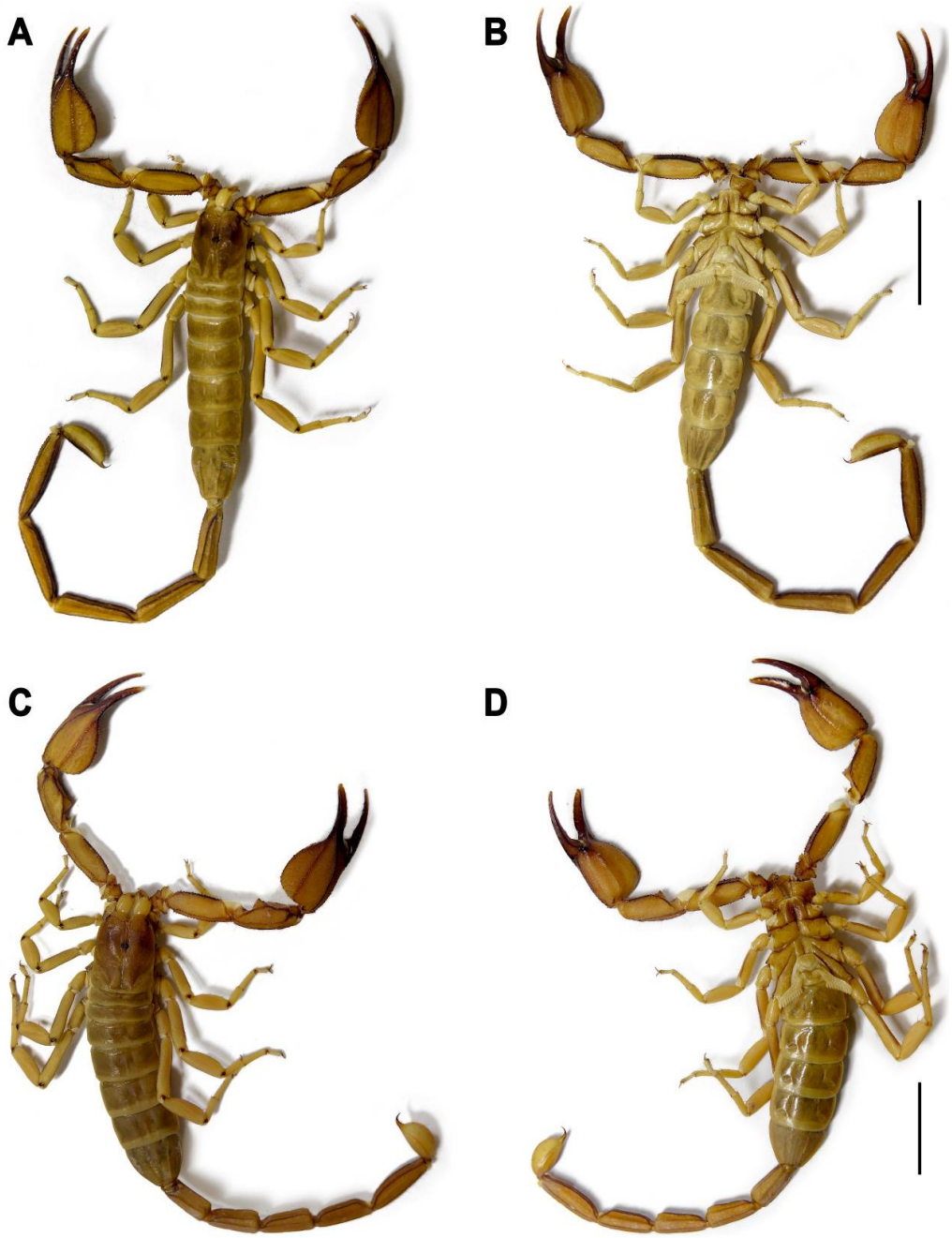


Figure 3. *Hemiscorpius jiroftensis* sp. n., habitus, dorsal (**A**,**C**) and ventral (**B**,**D**) aspects. (**A**,**B**). Holotype ♂(RIZ HD 44A). (**C**,**D**). Paratype ♀(RIZ HD 44C). Scale bars = 10 mm.

Hemiscorpius jiroftensis sp. n. is most closely related to *H. acanthocercus*, from which it differs as follows. The new species is larger (more than 65 mm in total length in the male and 60 mm in total length in the female; Table 2) than *H. acanthocercus* (less than 65 mm in total length in the male and 55 mm in total length in the female [4]). Its pedipalp patella is 2.7–2.9 times longer than wide in the male and its pedipalp chela movable finger is longer than the chela manus (Table 2) whereas the pedipalp patella is 2.4–2.6 times longer than wide, and the movable finger shorter than the manus in *H. acanthocercus*. The new species is also darker in color, with the dorsal surface of the telson vesicle infuscate (Figure 7A) rather than immaculate, as in *H. acanthocercus*. Whereas metasomal segment V is immaculate in the female of the new species (Figure 3), it is infuscate in the female of *H. acanthocercus*.

Table 2. Morphometric data (measurements in mm) for type material of *Hemiscorpius jiroftensis* sp. n., deposited in the Medical Entomology Collection of Jiroft University of Medical Science, Iran (JMU), and the Research Institute of Zabol, Iran (RIZ).

Characters	Specimen Code and Sex							
	JMU HD 23 ♂	**RIZ HD 44A** ♂	**RIZ HD 44B** ♂	**JMU HD 45A** ♂	**JMU HD 45B** ♂	**JMU HD 45C** ♂	**JMU HD 43** ♀	**RIZ HD 44C** ♀
Total body length	75.08	80.94	79.95	65.41	84.01	90.39	60.14	69.16
Carapace length	6.58	7.7	7.6	6.4	7.72	7.83	7.14	8.67
Carapace anterior width	4.41	5	4.9	4.42	4.59	4.97	4.47	5.39
Carapace posterior width	5.11	5.48	5.76	5.12	5.32	5.95	6.09	6.64
Pedipalp femur length	5.83	7.32	7.66	5.15	7.53	8.06	6.05	8
Pedipalp femur width	2.22	2.56	2.46	2.16	2.36	2.63	2.4	2.83
Pedipalp patella length	5.9	7.31	7.34	6.28	6.78	7.21	6.44	7.41
Pedipalp patella width	2.13	2.45	2.51	2.34	2.39	2.43	2.55	2.95
Pedipalp chela manus length	5.67	7.15	6.92	6.04	6.43	7.06	6.11	7.23
Pedipalp chela manus width	3.83	5.54	5	3.82	4.91	5.23	4.61	5.91
Pedipalp chela manus depth	2.39	2.54	2.8	2.16	2.22	2.43	2.95	3.2
Pedipalp chela movable finger length	5.82	7.74	7.34	6.49	7.22	7.5	6.47	8.11
Pedipalp chela fixed/ movable finger denticles	7/7	7/7	7/7	7/7	7/7	7/7	6/6	7/7
Mesosoma length	20.98	22.06	21.69	15.67	23.27	22.23	21.72	22.29
Metasomal segment I length	7.23	7.91	7.79	6.35	8.16	8.96	4.23	5.61
Metasomal segment I width	1.77	2.05	2.13	1.91	1.78	2.02	2.4	2.43
Metasomal segment I depth	1.79	1.95	2	1.58	1.54	1.85	2.13	2.18
Metasomal segment II length	7.9	8.48	8.55	7.1	8.75	9.74	4.58	5.94
Metasomal segment II width	1.6	1.79	1.85	1.64	1.5	1.7	2.1	2.3
Metasomal segment II depth	1.77	1.85	1.9	1.59	1.55	1.85	2.09	2.32
Metasomal segment III length	8.14	8.95	8.72	7.38	9.04	10.71	5.03	6.09
Metasomal segment III width	1.47	1.67	1.74	1.5	1.45	1.49	1.99	1.97
Metasomal segment III depth	1.88	1.92	1.79	1.56	1.64	1.74	2.15	2.26
Metasomal segment IV length	8.2	9.14	9.1	8.09	9.61	11.07	5.21	6.41
Metasomal segment IV width	1.33	1.56	1.5	1.42	1.28	1.38	1.91	1.86
Metasomal segment IV depth	1.6	1.89	1.8	1.75	1.67	2.88	2.08	2.17
Metasomal segment V length	9.57	10.09	9.79	8.38	10.99	11.65	6.49	7.91
Metasomal segment V width	1.32	1.66	1.48	1.42	1.51	1.38	1.96	1.92
Metasomal segment V depth	1.67	2.3	2.06	1.66	1.77	1.95	2.22	2.18
Telson length	6.48	6.61	6.51	6.04	7.07	8.2	5.74	6.24
Telson vesicle width	1.65	1.84	1.88	1.6	1.61	1.5	2.58	2.6
Telson vesicle depth	2.01	2.19	2.1	1.72	1.91	1.98	2.59	2.62
Pectinal teeth (sinistral/dextral)	12/13	13/13	13/13	13/14	13/13	13/13	10/10	9/10

Etymology. The new species is named after Jiroft County where the type locality is situated. Jiroft (noun) comprises two words, *jeer*, meaning low, and *oft*, meaning fallen, and refers to a lowland alluvial plain.

Description. The following description is based on the holotype ♂(RIZ HD 44A) and paratype ♀(RIZ HD 44C) (Figures 3–7, Table 2).

Total length: Total length 80.94 mm (♂) or 69.16 mm (♀).

Colour: Base color brown (Figure 3); chelicerae yellow, teeth of fingers light brown; carapace brown, median and lateral ocular tubercles black; pedipalp dark brown, carinae darker, chela brown with reddish brown fingers; legs yellow; tergites light brown; sternites dark yellow; metasomal segments brown, segments IV and V darker than I–III, carinae dark brown to black; dorsal surface of telson vesicle and aculeus black, ventral and lateral surfaces yellow (Figure 3).

Chelicerae: Fixed finger, median and basal teeth bifurcate; movable finger with one subdistal tooth and one basal tooth in external series; distal external tooth smaller than distal internal tooth; cheliceral teeth without secondary serrations.

Carapace: Carapace subrectangular, lateral sides almost parallel; surfaces finely granular with two smooth areas above the lateral eyes, longer than wide; small median ocular tubercle located in anterior half of carapace (Figure 6A), with finely granular superciliary carinae; three pairs of lateral ocelli, posterior ocellus (PDMi) smaller than others (Type 3A);

frontal notch semicircular; lateral margins with large spiniform granules ventral to lateral ocular tubercles; anteromedian longitudinal sulcus narrow, suturiform, bifurcated anteriorly, continuous from anterior margin to ocular tubercle; posteromedian sulcus forming deep depression; posterolateral sulcus deep (Figure 6A).

Pedipalps: Femur elongate, 2.86 times longer than wide (Table 2); pentacarinate, with four distinct carinae; prodorsal, retrodorsal, proventral, and retroventral carinae each comprising prominent spiniform granules; ventromedian carina reduced to few granules proximally (Figure 5); dorsal surface finely and densely granular (Figure 5A); prolateral surface with few prominent spiniform granules (Figure 5B); retrolateral surface shagreened; ventral surface shagreened to sparsely granular, becoming smooth distally (Figure 5B).

Patella elongate, 2.98 times longer than wide (Table 2); seven carinae, six distinct (Figure 5); prodorsal carina comprising prominent spiniform granules; retrodorsal carina obsolete, granular; proventral, retroventral, and retromedian carinae granular; dorsal and ventral surfaces sparsely granular (Figure 5); prolateral process pronounced, separated into prodorsal and proventral tubercles, prodorsal tubercle with single spiniform granule.

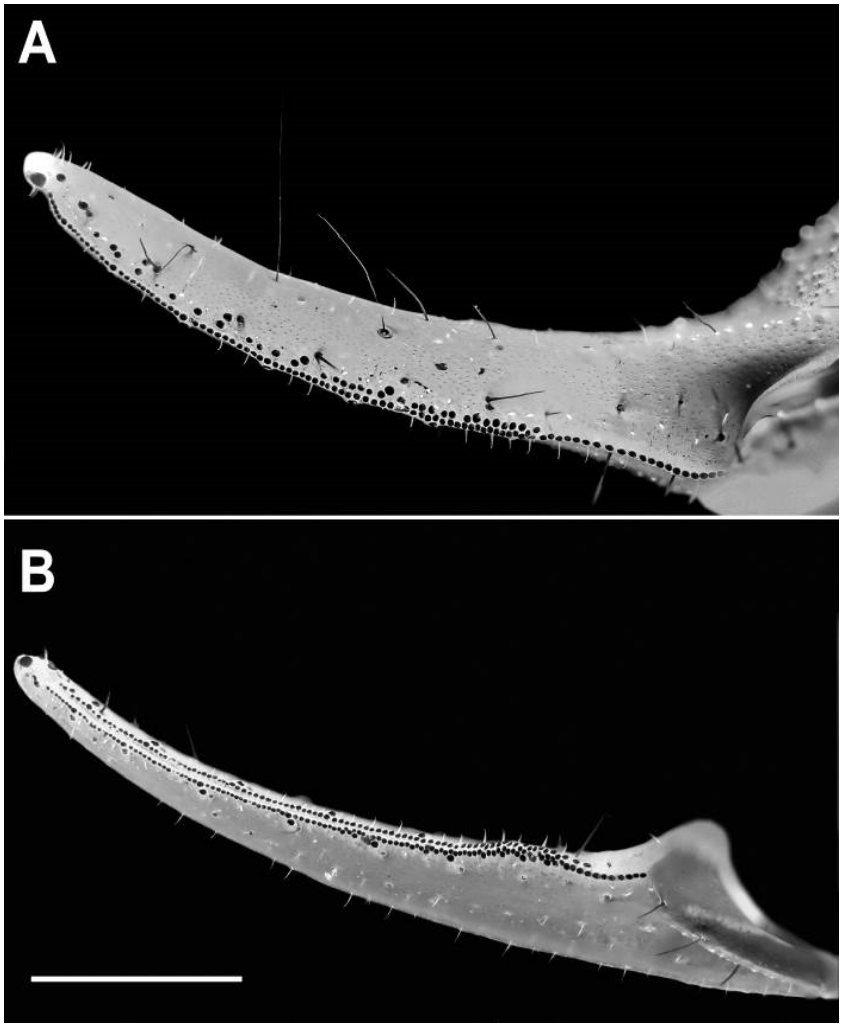


Figure 4. *Hemiscorpius jiroftensis* sp. n., holotype ♂(RIZ HD 44A), pedipalp chela fixed finger, proventral aspect (**A**) and movable finger, dorsal aspect (**B**). Scale bar = 2.5 mm.

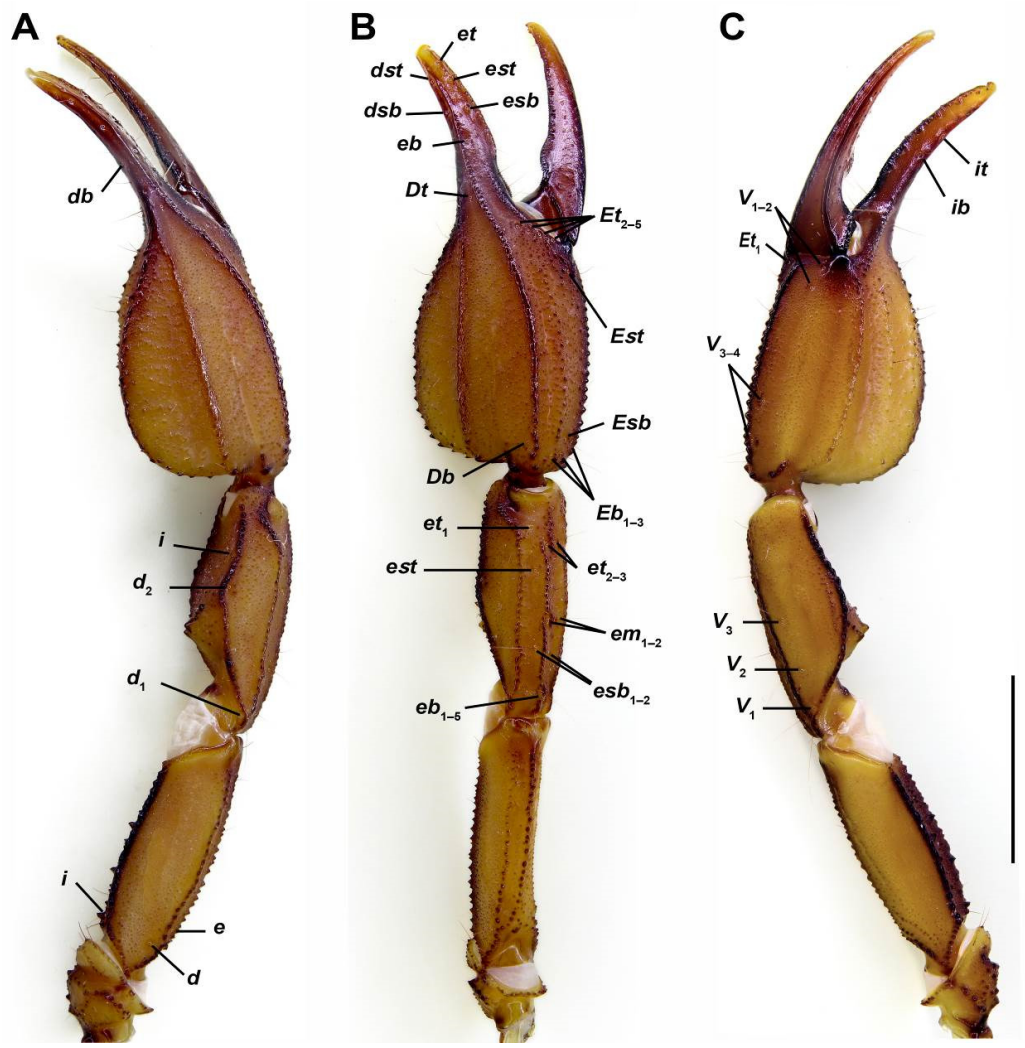


Figure 5. *Hemiscorpius jiroftensis* sp. n., holotype ♂(RIZ HD 44A), pedipalp dorsal (**A**), retrolateral (**B**), and ventral (**C**) aspects, illustrating trichobothria. Scale bar = 5 mm.

Chela stout, 1.29 times longer than wide (Table 2); five distinct carinae (Figure 5); dorsomedian carina granular; prodorsal carina coarsely granular; retrodorsal carina granular, becoming smooth distally; retromedian carina finely granular; proventral carina comprising spiniform granules; manus surfaces finely and densely granular (Figure 5); fingers, dorsal and ventral surfaces predominantly smooth and finely punctate; movable finger longer than manus (Table 2); fixed finger with proximal notch (Figure 4A); movable finger with shallow median lobe (Figure 4B); movable finger with two rows of denticles, interrupted at regular intervals by seven larger denticles, each with accessory denticle (Figure 4B); fixed finger with retrolateral row complete, prolateral row comprising separate granules merging proximally into row near fifth large denticle (Figure 4B); fingertips each with pronounced terminal hook (Figure 4).

Type C trichobothrial pattern (Figure 5). Femur with three trichobothria: *i* retroproximal on prolateral surface; *d* dorsoproximal on dorsal surface; *e* dorsoproximal on retrolateral surface (Figure 5A). Patella with 19 trichobothria: *i* dorsal in distal half of prolateral surface; d_1 retroproximal to prodorsal carina; d_2 situated midway (Figure 5A); five *eb* trichobothria; two *esb* and *em* trichobothria; *est* trichobothrium near *et* series (Figure 5B); three *et* (Figure 5B) and *v* trichobothria (Figure 5C). Chela manus with 15 trichobothria: *Db* proximal on dorsal surface; three *Eb* trichobothria proximal on retrolateral surface; *Esb* near *Eb* series (Figure 5B); *Est* near *Et* series; five *Et* trichobothria, Et_1 on ventral surface

(Figure 5C); four *V* trichobothria, V_3 and V_4 in proximal half of manus, V_1 and V_2 distal (Figure 5C). Fixed finger with 11 trichobothria: *Dt* proximal on dorsal surface; *db* dorsal on prolateral surface (Figure 5A), in proximal half of fixed finger; *dsb*, *dst*, and *dt* on dorsal surface, in distal half of fixed finger; *eb* on retrolateral surface, in basal third of fixed finger, opposite *db*; *esb*, *est*, and *et* in distal half of fixed finger, opposite *dsb*, *dst*, and *dt*, respectively (Figure 5B); *it* and *ib* in median third of fixed finger (Figure 5C).

Legs: Ventral surfaces smooth; trochanter and femur, dorsal surfaces finely and sparsely granular; telotarsus with ventromedian row of spinules and paired ventrosubmedian rows of rigid spiniform macrosetae; tarsal ungues of equal length.

Sternum: Sternum pentagonal, longer than wide (Figure 6C); median sulcus deep, more pronounced in posterior half; posterior pit absent.

Genital operculum: Operculum comprising two subtriangular sclerites (♂) or single, triangular sclerite (♀); genital papillae short, not protruding from beneath operculum (♂; Figure 6C) or absent (♀).

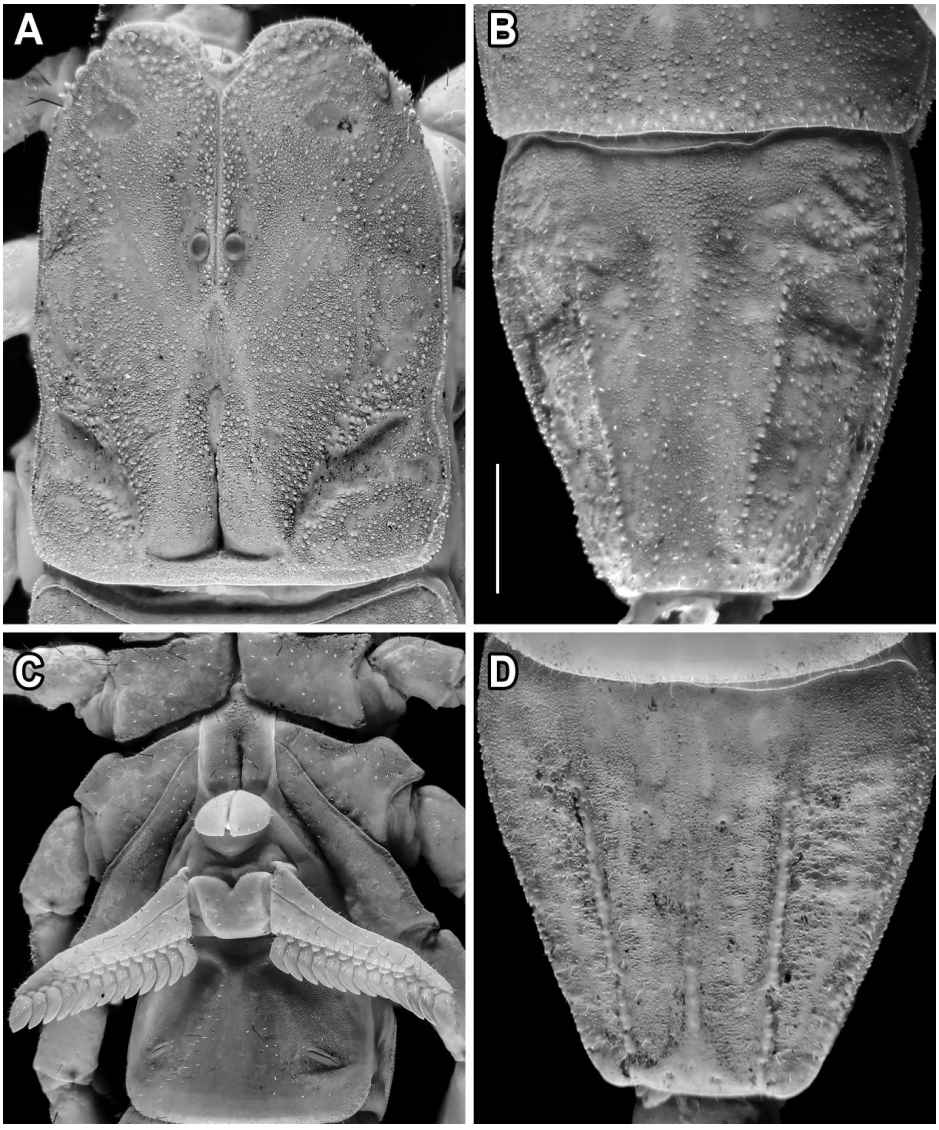


Figure 6. *Hemiscorpius jiroftensis* sp. n., holotype ♂(RIZ HD 44A), carapace (**A**), tergite VII (**B**), sternum and pectines (**C**), sternite VII (**D**). Scale bar = 2.5 mm.

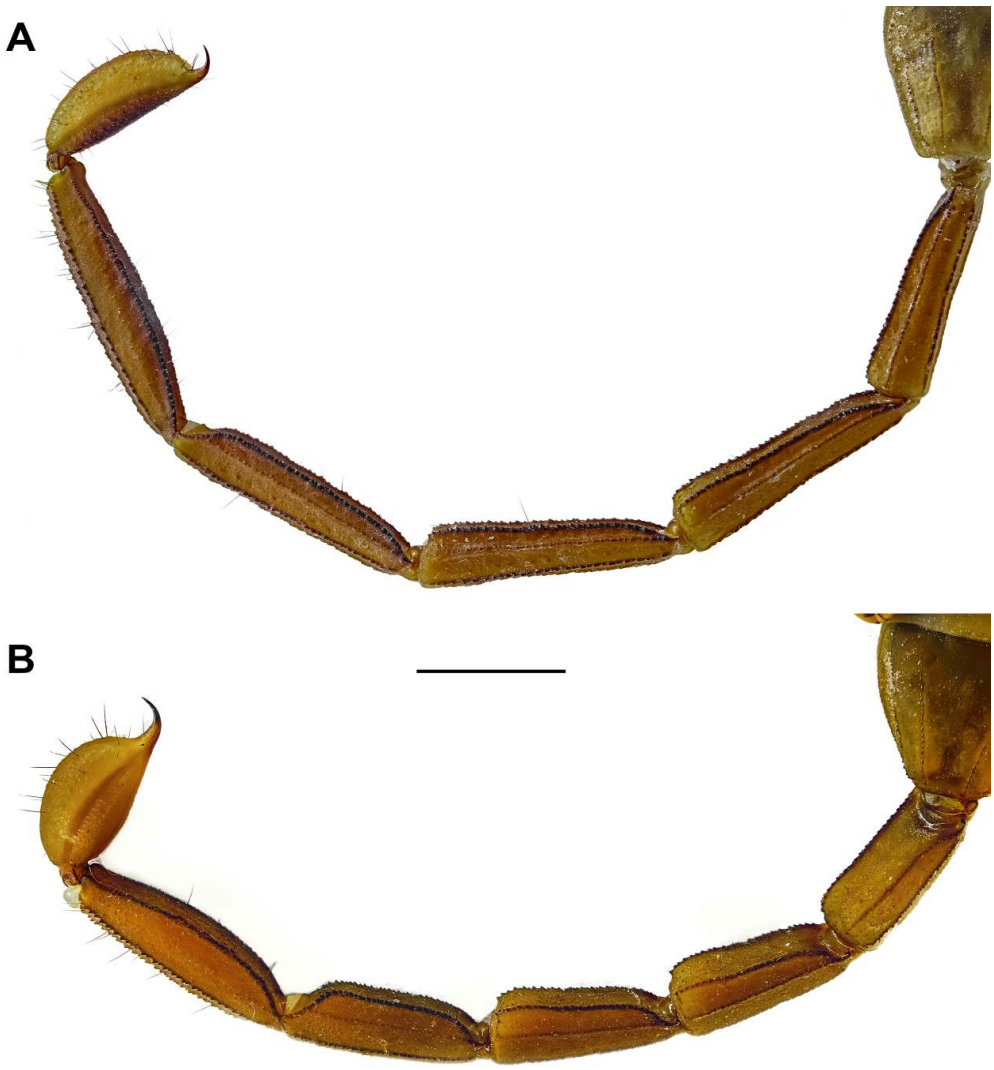


Figure 7. *Hemiscorpius jiroftensis* sp. n., metasoma and telson, lateral aspect. (**A**) Holotype ♂(RIZ HD 44A). (**B**) Paratype ♀(RIZ HD 44C). Scale bar = 5 mm.

Pectines: Pectines with 13/13 teeth (♂; Figure 6C) or 10/10 teeth (♀; Figure 3D).

Mesosoma: Tergites finely granular, each with shallow median to submedian depressions; median carina absent from tergites I–III, obsolete on IV–VII; VII longer than wide (♂) or wider than long (♀), with lateral and sublateral carinae costate-granular, restricted to posterior three-quarters (Figure 6B). Sternites III–VI smooth and finely punctate; III with pair of large, finely and densely granular depressions, covered by pectines; IV–VI each with pair of deep median sulci; VII longer than wide (♂) or wider than long (♀), with fine granules medially, becoming coarser laterally (♂) or entirely finely and sparsely granular (♀), pair of costate-granular lateral carinae in posterior three-quarters (Figure 6D), median carina restricted to anterior half; spiracles crescent-shaped.

Metasoma: Segments elongated and slender (♂) (Figures 3A,B and 7A) or short and stout (♀) (Figures 3C,D and 7B); surfaces finely and sparsely granular. Segments I–IV each with seven distinct carinae (Figure 7); paired dorsosubmedian carinae each comprising spiniform granules; paired median lateral carinae costate-granular on I and II, granular on III and IV; paired ventrolateral carinae costate, almost smooth on I and II, each comprising spiniform granules on III and IV (Figure 7); ventromedian carina granular on I–IV. Segment V with five distinct carinae; paired dorsosubmedian carinae each comprising spiniform granules; paired median lateral carinae obsolete, each comprising sparse row of fine

granules in anterior two-thirds; ventromedian carina and paired ventrolateral carinae each comprising spiniform granules (Figure 7).

Telson: Vesicle elongate (Figure 7), length/width = 3.6 (♂; Table 2) or oval, length/with = 2.4 (♀; Table 2), with (♂) or without (♀) pair of blunt tubercles posteriorly at base of aculeus (Figure 7B); posterior tubercles (♂) each with small spiniform granules; dorsal surface densely granular with shallow median depression; lateral surfaces granular; ventral surfaces granular with few macrosetae anteriorly, more numerous near base of aculeus; ventrolateral sulci and ventromedian carina absent; aculeus short and stout, strongly curved, becoming narrower midway (Figure 7A).

Intraspecific Variation. The metasomal segments are much longer in males, with the length/width of metasomal segment V greater than 6, than in females, with the length/width of segment V less than 4.1 (Table 2, Figure 7). The pectines of males and females possess 12–14 and 9 or 10 teeth, respectively (Table 2). Unlike adult males, females and immature males do not possess an elongated metasoma nor a pair of blunt tubercles posteriorly on the telson vesicle. These characters only appear in the final instar [2].

Distribution. The new species is currently known only from the Jebal Barez Mountains in the Bam and Jiroft counties of Kerman Province, southern Iran (Figure 1).

4. Discussion

In the present study, morphological and molecular evidence confirmed the presence of a new species of *Hemiscorpius* from Kerman Province in southern Iran, raising the number of *Hemiscorpius* species recorded in Iran to eight (Figure 1). It is important to understand the geographical distributions and morphological differences among the species of *Hemiscorpius* to implement appropriate medical responses to envenomation by these scorpions, which may prove fatal [6].

The *Hemiscorpius* species of Iran may be divided into two groups. The first group, including *H. enischnochela*, *H. gaillardi*, and *H. shahii*, bears more than nine trichobothria on the ventral surface of the pedipalp patella. The second group, including *H. acanthocercus*, *H. kashkayi*, *H. jiroftensis*, *H. lepturus*, and *H. persicus*, bears only three trichobothria on the ventral surface of the patella. Whether or not these groups are monophyletic, however, remains to be tested by phylogenetic analysis with a broader sample of species from across the known distribution of the genus.

Hemiscorpius jiroftensis sp. n. is most closely related to *H. acanthocercus*, from Hormozgan Province [3]. Specimens previously identified as *H. acanthocercus* by Shahi and Barahoei [4] from Jiroft County, Kerman Province, are conspecific with *H. jiroftensis* sp. n.

The altitude of Jebal Barez ranges from 1800 to 2700 m above sea level, and its average annual precipitation reaches 140 mm. Asteraceae with 39 species is the most diverse family of plants in this region [21]. *Hemiscorpius jiroftensis* sp. n. was collected from the highland areas of the Jebal Barez Mountains including Hishin village (southern part) and Sharik Abad village (northern part). This Mountains appear to have provided a geographical barrier, separating the new species from its closest relative, *H. acanthocercus*.

Another four scorpion species have also been reported in Jiroft County [9,22,23]: *Hottentotta navidpouri* Kovarik et al., 2018; *Hottentotta sistanensis* Kovarik et al., 2018; *Mesobuthus kirmanensis* (Birula, 1900); and *Orthochirus kucerai* Kovařík & Navidpour, 2020. In addition to *H. jiroftensis* sp. n., two other species of *Hemiscorpius*, i.e., *H. acanthocercus* and *H. enischnochela*, have also been recorded in Kerman Province.

The large intraspecific genetic distance (0.089) between the Iranian (OR800364) and Iraqi (MT230874) COI sequences of *H. lepturus* suggests that the Iranian sample may represent another new species. This is not particularly surprising, considering the great distance between the localities at which these samples were collected and the presence of

numerous geographical barriers between them, which may have resulted in speciation. The species limits of *H. lepturus* will need to be studied with a more comprehensive sample.

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