First Records Species of Hottentotta Genus (Scorpiones:Buthidae) from Kerman Province, Southeast of Iran

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ABSTRACT---- ***Investigations indicated that the scorpions are scattered in all parts of Iran. Few researches have been carried out to identify and study morphology of the scorpions of Iran. In the present investigations, several species of scorpions from Kerman Province (Iran) have been identified. The scorpions usually live under the stones. To obtain the scorpions, heavy materials including stones, clod and so on, were moved by crow bar and woods. The specimens were captured with a tongs. To study the morphological characters and identify the scorpions, Olympus Lica 2000 stereo microscope and key identify to scorpions, were used. In the present research a species of scorpions belonged to Hottentotta genus and Buthidae family, is reported for the first time from Kerman Province (Iran). This species is called Hottentotta schach and has been collected from Manoujan area, situated in the south and southwest of Kerman Province. The H. schach is a rare species, it is shaggy and some parts of it'sbody are dark. This species lives in height over 1000 meter and also is found in mountainous areas. Beside of this species, 6 other species called: Compsobuthus matthiesseni,Androctonus crassicauda, Odontobuthus doriae, Mesobuthus eupeus, Sassanidotus gracilis, Orthochirus farzanpayi, from this family, are found in the mentioned area. In taxonomy, the scorpions are order belonging to arachnida class, phylum arthropoda, super phylum invertebrate sub kingdom of metazoan and kingdom of animal. The weather in south of Kerman Province is warm and relatively humid.***

Keywords--- Scorpions, Buthidae, *Hottentotta schach*, Manoujan, Kerman Province, Iran

1. INTRODUCTION

The scorpions are order belonging to class arachnida, phylum arthropoda, super phylum invertebrate sub kingdom of metazoan and kingdom of animals. The first study of Iranian scorpions, performed by Olivier (1807), identified black scorpion Crassicauda in Kashan. Although it has been carried out a long time ago, due to various climate, broadness of the country and lack of studying on some areas of Iran, to complete the scorpions fauna of Iran.

This investigation was carried out on three towns, including Manoujan, Qaleh ganj and Roodbar, situated in the south and southwest of Kerman Province, where is situated in the southeast of Iran. The exact areas of these regions are 4437,10235 and 6296 square kilometers respectively. The average rainfall in Manoujan is 209 mm annually, while the minimum average temperature throughout the year is 19.2°C, and the maximum average is 33° C. Regional characteristics of two other cities are almost as same as Manoujan. The area in South of Kerman Province is warm and relatively humid (Jalalifar,et al.,2013). According to Fet (2000), during the last 40 years, the scorpions of Iran have been check-listed several times by some workers. Some papers have published the name of scorpions species as belonging to Buthidae family. These papers are provided by researchers, including Vachon, 1966; Habibi,1971; Farzanpay & Pertizen, 1974; Perize & Minosi, 1974; Farzanpay, 1988; Kinzelbech, 1985; and Kovarick,1977. Sampour et al, 2011, studied on morphological and biometrical characters of two genus of scorpions *Androctonus* and *Odontobuthus* from Markezy Province of Iran. Morphological studies of sensitive seta of scorpions and distribution of scorpions in Lorestan have been carried out by Sampour (2012). The systematic studies on scorpion of Iran have been carried out by Predini (2000), who distinguished and identified hemiscorpiidae family from Iran. Scorpionidae family was a sub family of scorpionidae, called scorpioninae, then it proceed to a family, that mentioned above. A check list of scorpions throughout Iran and four families, including Buthidae (Koch, 1837), Scorpionidae (Latreille,1802), Hemiscorpioiidae (Pocock, 1893) and Diplocentridae (Karsch, 1880) has been reported by Mirshamsi et al (2011), and also they performed studies on species of *Mesobuthus eupeus*. They reviewed and studied on sub species of the mentioned species. The species of *Hemiscorpius lepturus*, *H. acanthocercus* ,and *H. enischnochela* are reported from Kerman Province by Salari & Sampour (2017).

Most *Hottenttota* species have been found in west of Iran. Dehghani et al, (2007) have reported *H. saulcyi* species from Kerman Province. *Hottonttota schach*, which is reported for the first time, is reported in this investigation from

Kerman province. Researchers have reported *Hottenttota* species from Iran so far as follow: *Hottentotta jayakari* (Pocock 1895), *Hottentotta saulcyi* (Simon 1880), *Hottentotta schach* (Birula 1905), *Hottentotta zagrosensis* (Kovařík 1997), *Hottentotta khoozestanus* (Navidpouret al2008), *Hottentotta lorestanus* (Navidpouret al2010). From genus *Androctonus*, species Androctonus *crassicauda*, found in many provinces of Iran and abundant in Kerman province.

In some cases, scorpions are found in pengeonry ants, in few numbers or usually in single. It may be happened, because scorpions use the ants and their larva as food. Scorpions are found in warm and moderate climate. They are active in warm weather. They rest in their husting during the day, and are activated at night, and hunt their prey. The scorpions are insectivorous.

The scorpions of Iran, are originated from Africa, because most of Iran scorpions genus found in Africa (Farzanpay, 1988). But some of them, including genera Razianus and Mesobuthus, originated from Iran. Three types of sensitive hair (seta) are found on the body of scorpions (Sampour, 2012) Scorpions possess two middle eyes on middle dorsal surface of carapace and lateral eyes. The number of lateral eyes are between 3-5 pairs. They are situated in lateral margin in front of carapace on each side of head. Some of scorpions like *Scorpio maurus* and *Odontobuthus doriae* are digger.

2. MATERIALS AND METHODS

Field researches on scorpions of Manoujan (27° 24′ 22″ N 57°30′ 03″E), Galeh ganj (27°31′ 25″ N 57°52′ 51″E) and Roudbar (28° 01′ 45″ N 57° 59 ′ 34″E) cities, in south of Kerman Province (Kerman 30° 17′ 00″ N and 57° 05′ 00″E), south east of Iran (Fig. 1), were carried out during 2013-2014 years. Scorpions were collected from different localities and different parts of the mentioned region, including urban and rural areas. The scorpions were gathered in different seasons of the year. The specimens were collected under stones, stones cleft, clod and holes underground. For moving the stones and other heavy things, wood and crow-bar were used. The samples were captured with a tong. The specimens were fixed in 70% ethanol, and deposited in the scorpion place in Department of Zoology, Loretan University. Identification of scorpion was performed by using identifying key to scorpions. The morphological studies were carried out under an Olympus Lica 2000 stereo microscope. The photographs were taken by a Nikon camera; Coolpix p6000 model. The sizes were measured with an Electronic Digital Caliper. The environment temperatures were noted by means of a thermometer. All measurements are given in millimeters.

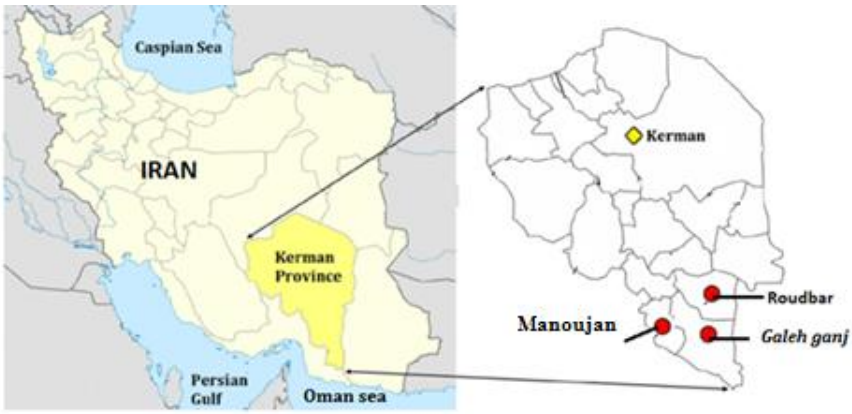

Figure 1: Geographical position of Manoujan, Galehganj and Roudbar cities in the south of Kerman Province.

3. RESULTS

In the present investigation seven species from Buthidae family were found in Manoujan, Galeh gange and Roodbar in south of Kerman Province.One species of them, called *Hottenttota schach* ,is reported for the first time from Kerman Province. This species live in hot and relatively wet areas. Some of them are abundant and some are rare. The geographical map of their distribution indicated in Figures 2 and 3.

List of scorpions of south of Kerman Province in the present research, as follow:

Family Buthidae (C. L. Koch, 1837)

Androctonus crassicauda (Olivier, 1807)

Hottentotta schach (Birula, 1905) (first report)

Odontobuthus doriae (Thorell, 1876)

Compsobuthus matthiesseni (Birula, 1905)

Mesobuthus eupeus (C. L. Koch, 1839)

Sassanidotus gracilis (Birula, 1900)

Orthochirus farzanpayi (Vachon et Farzanpay, 1987)

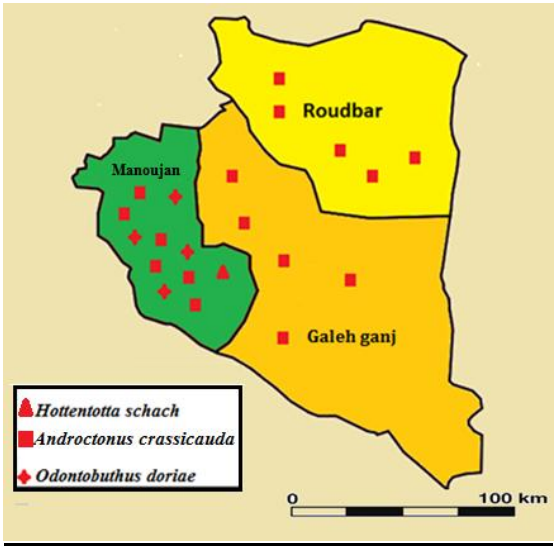

Figure 2: Map of south of Kerman Province, showing distributions of *Androctonus crassicauda* (Olivier, 1807), *Hottentotta schach* (Birula, 1905), *Odontobuthus doriae (Thorell, 1876)* collected in this study.

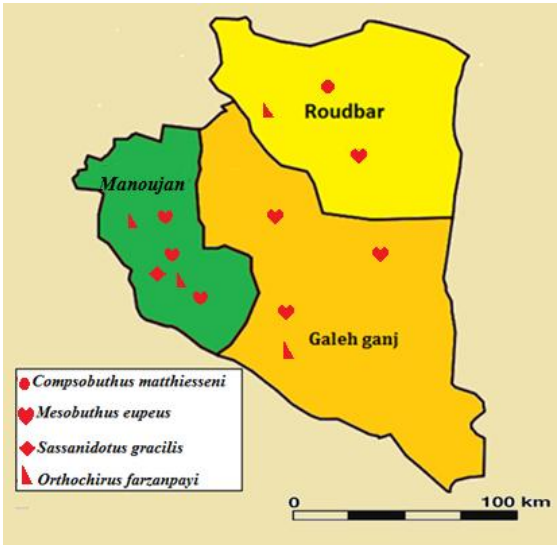

Figure 3: Map of south of Kerman Province showing distributions of *Compsobuthus matthiesseni* (Birula, 1905), *Mesobuthu seupeus* (C. L. Koch, 1839), *Sassanidot s gracilis* (Birula, 1900), *Orthochirus farzanpayi* (Vachon et Farzanpay, 1987), collected in this study.

Hottentotta schach (Birula, 1905)(Fig.4)

Distribution.Iran. Fars (Kovarik, 2007), Lorestan(Sampour, 2012) and Kerman Provinces (2018) first report.

MATERIAL EXAMINED. Manoujan, Abgel Village.

Explains: The body is yellow, and black. In samples with yellow half infront, carapace, chelicerae and eyes dominance are quite dark. The eye, brow arcs, and also middle eyes are so dominant. There are 3 big lateral eyes in each side of carapace. There are 3 dark tapes on dorsal of mesosoma. Patella (lighter than chelae), telson, fifth segment and the posterior part of forth metasoma segment are ranged from dark brown to dark colors. Mesosoma possesses scattered

sensory hair and in terminal part of each tergit, sensory hair are in sequence. The seventh segment of mesosoma is yellow, having four dominant carina and abundant sensory chatae. The body of this species is shaggy. Metasoma possesses more sensory hair. The dorsal surface of metasoma is smooth. These hair are compactly found in abdominal and lateral of telson. The length of all segments is more than their width. Chela is stretched, so that the length of movable finger is three times more than the manus length. Chelicera are black and reticular. *Hottenttota schach* is very rare in south of Kerman Province. This species mainly live in mountainous areas and at the foot of mountains. In the area under studying, it is not seen in rocky desert and gardens. Movable finger in pedipalp possesses 15 rows of granules and having internal and external granules. Also there are 6 external granules in movable finger. Chela is extended, so the length of movable finger is 3 times longer than manus. The chelicerae are black and reticular. The third and fourth legs possesses a tibia spur,and all legs have two tarsusspur. Pectin possesses 26 dents. Biometry of this species indicated in Table 1.

Figure 4: *Hottentott aschach*

Table 1: Biometrical characters of *Hottentotta schach* (Measurements are in mm)

Characters	Female
Carapace length	9
Carapace posterior wide	10.5
Mesosoma length	18.3
Metasoma length	42.3
Pedipalp, femur length /width	9/2.6
Pedipalp Patella, length / width	10.5/3
Chela length	18.8
Manus, length / width / depth	5/3/3
Pedipalp movable finger Length	14
Pedipalp fixed finger Length	12.8
Metasoma segment I, length / width/ depth	6/5
Metasoma segment II , length / width/ depth	7/4.5
Metasoma segment III, length / width/ depth	7/4.3
Metasoma segment IV, length / width/ depth	8.4/4/15
Metasoma segment V, length / width / depth	10/4.15
Vesicle, length / width /depth	6.2/4/4.3
Aculeus length	4.2
Number of pectnial tooth	26
Total length	79.2

Compsobuthus matthiesseni (Birula, 1905)

Distribution. The species Found in Kerman, Fars, Hamadan, Kermanshah, Azarbaijan, Boshehr, Ilam, Khuzestan, Kordestan, Lorestan, Markazi, Qom (Sissom, &Fet, 1998; Kovarik, 2003; Akbari, 2007; Mirshamsi et al. 2011) Kohgilouyeh & Boyer Ahmad, ChaharMahal & Bakhtiyari, (Pirali-Kheirabadi et al. 2009), provinces of Iran. Iraq, Turkey and Syria (Kovařík, 1996).

MATERIAL EXAMINED**.** Roudbar: Kilometr 15 Road of Roudbar- Jiroft.

Explains: Median-central and median –posterior carina in carapace are separated from each other by small space. These carina made together a line carina. In metasoma 5th and half posterior of 4th segment are black. In tergits of mesosoma each carina possesses a spine like process arose from posterior margin of tergit. Pedipalps possesses very narrow and long chelae. Each of moving and fixed finger of pedipalps possesses 10 oblique rows of granules, but there is no external granules. Their movable finger possesses 5 terminal granules. The pectineal dents in males are 22.

Orthochirus farzanpayi (Vachon et Farzanpay, 1987)

Distribution: Iran. Bushehr, Hormozgan, Kerman, and Khuzestan Provinces (Farzanpay, 1987; Kovařík&Fet,2006; Navidpour*et al*, 2011).

MATERIAL EXAMINED. Manoujan: Boneg Village, Zeyaratabolfazl village,Nodej Salarabad village, Khosroabad Village,. Roudbar: Kilometr 15 Road of Roudbar- Jiroft.

Comment: Metasomal segments 4thand 5thventrally punctated and without carinae. Colour of mesosoma and metasoma black, telson reddish brown, femur of pedipalp gray. In adults, legs and pedipalps yellow, in juveniles, femur of legs and pedipalps black. The movable finger in pedipalp possesses 8-9 rows of granules with internal and external granules, and also 3 terminal granules. In different samples. The pectin dents are between 20-21. *Orthochirus farzanpay*, living in warm and dry mountainous areas, specially on mountain feet. In spring, they are found under stone**.**

4. DISCUSSION

South of Kerman Province has different species of scorpions in this province, because of hot weather and suitable conditions. Seven species of scorpions were found from Buthidae family. In the present investigation, the species *Hottonttota schach* was found in Kerman Province for the first time, species *Compsobuthus matthiesseni*, and *Orthochirus farzanpay* are reported for the first time from the Manoujan, Galeh ganj and Roodbar areas, south of Kerman Province. Thes pecies *Compsobuthus matthisseni*, *Sassanidotus gracilis* and *Hottonttota schach* are rare species in the mentioned areas. Some researchers classified genus of *Hottentotta* to different groups. They changed the name of this genus to Buthus genus previously. More investigations indicated that some species of Buthus genus have some differences from each other. So, some researchers divided the genus Buthus into many genera. Vachon (1949), suggested that genus Buthus, as one of this genera. Furthermore, a long time ago, it had been considered, due to variety climate, width of the country and lack of studying on some areas of Iran, more investigation would be necessaryto complete the scorpions fauna of Iran.

The *Hottonttota*,species, are distributed from Asia to Africa. 29 species of Hottentotta have been identified in the world. *Hottentotta* species are found in many parts of Iran, and are important in medicine. 6 species of *Hottonttota* were found in Iran, including *H. jayakari* (Pocock 1895), *H. saulcyi* (Simon 1880), *H. schach* (Birula 1905), *H. zagrosensis* (Kovařík 1997), *H. khoozestanus* (Navidpouret al. 2008), *H. lorestanu* (Navidpouret al.2010), *H. jayakari* (Pocock 1895).

The *H. schach*, species, in Iran, was reported from Khuzestan and Fars provinces by Birula in 1905. In *H. schach* the body is yellow and black. The anterior part of carapace is black ,in metasoma, fifth segment and the posterior part of segments 4th, also telson are black. This colour is distributed to dorsal margin. In species *H. saulcyi*, the another species of *Hottentotta* which has been reported previously, the colour of mesosoma is yellow. In *Composobuthus matthiesseni*, unlike *Mesobuthus eupeus*, the middle central and middle dorsal carina are connected to each other, and make a line. In Species *Sassanidotus gracilis*, the movable finger of pedipalp possesses 3 granules, beneath terminal granule, is different from that of genus *Compsobuthus* and *Mesobuthus*, which possesses 4 granules beneath the terminal granule. *H. schach*, *Orthochirus farzanpay*, *Odentobuthus doriae*, found in mountains and foot a mountains areas, while *A. crassicauda* and *M. eupeus* found almost every where of Iran. In the above mentioned species are harmful, and in some cases fatal. The investigations shows at least 10 people in Manoujan, Ghaleh ganj and Roudbar, died because of scorpions sting between years 2012- 2017. In some species of the genus of *Hottentota*, the length of body is about 115 mm. The number of lateral eyes 3-4 in each side of carapace. Up to species,the body is covered with chaeta. The number of dents pectin is between 30-40 in male, and between 24 -36 in female. Genus of *Hottonttota* possesses distinguishes carina. Movable finger in pedipalp, possesses 11-16 rows of granules and 5-7 terminal granules. There are 2 accessory denticles on ventral surface in fixed finger of chelicerae.

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