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DEADLY SCORPION HABITATS OF IRAN

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ABSTRACT

Scorpions are among the most dangerous arthropods in Iran. These animals bite a large number of people in all over the country every year, especially in warm and humid regions of South and South-west, resulting in clinical complications and death. This study is to introduce deadly scorpions' habitats of Iran such as *Hemiscorpiuslepturus*, *Odontobuthusdoriae* and *Androctonuscrassicauda*. There search is descriptive and tacking samples lasted 20 years, during 1992 to 2012, from some provinces; *Khuzestan*, *Kerman*, *Isfahan*, *Qom*, *Markazi*, and *Chaharmahal and bakhtiari*. Utilizing Black Light, Rock-rolling, excavation, and Digging were the methods used for sampling. The habitats of those perilous scorpions that do not dig, such as *Hemiscorpiuslepturus* and *Androctonuscrassicauda*, are in cities and villages, splits and holes of muddy walls, cellar sand basements, splits of streetkerbs, under the construction materials, outside the habitations, under the stones beneath the trees bark, through the holes in damp old muddy walls, and inside the other animals' nests. But the scorpions called Diggers, such as *Odontobuthusdoriae*, live in the hills lopes, embankments beside the roads or railways, and inside the dugout nests. Survey results show that deadly scorpions, except *Odontobuthusdoriae*, as opportunist animals live in the holes or under the stones in habitats or the regions pertaining to the deserts. Although, the way you build a house or different kinds of materials you use to construct are effective in exceeding these arthropods.

Keywords: Deadly, Scorpion, Habitats, Iran

BACKGROUND

Today, about 2000 scorpions are described in the world, scattered in different continents, although they're abundant in torrid or semi-torrid zones (Angsanakul and Sitprija, 2013). Junqua and Vachon (1968) have published a list of 79 kinds of scorpions with medical importance, which bite seriously resulting in death (Bawaskar and Bawaskar, 2012). However, Polis has pointed out existence of 25 scorpions with medical importance (Chippaux and Goyffon, 2008). Bawaskar *et al.*, have reported 30 kinds of scorpions with medical significance (Dehghani and Bigdelli, 2007). Their toxicity harms different organs of the body resulting in various disorders (Dehghani and Fathi, 2007). And, Chippaux and colleagues have showed that 1.23 millions of biting by scorpions happens yearly in the world which 32250 of them are fatal (Dehghani and Valaie, 2005). The situation varied in different countries and regions regarding life- style, social-economic condition, dwelling, health services, and different species occurring in each geographical zone (Bawaskar and Bawaskar, 2012). Considering the climate, Iran is very rich in having different arthropods, especially scorpions. Based on reports, there are at least 52 species of scorpions in Iran. Annually, there are reports of scorpion biting from different parts of Iran and based on them, 42500 people are bitten to death by scorpions every year (Dehghani *et al.*, 2009) *Hemiscorpiuslepturus*, *Androctonuscrassicauda*, and *Mesobuthuseupeus* are the main ones and *Buthotussaulcyi*, *Odontobuthusdoriae*, *Olivieruscaucasicus*, *Buthotussaulcyi* and *Apistobuthus pterygosercus* are of secondary importance, biting sporadically (Dehghani *et al.*, 2008). By now there are two species of scorpions that, based on reports, their biting often result in death; *Hemiscorpiuslepturus* and *Androctonuscrassicauda*. So, they are the most deadly perilous species of scorpions in Iran, especially in warm central and southern provinces (Dehghani *et al.*, 1995; Dehghani, 2006) *Hemiscorpiuslepturus* is the most dangerous scorpion, especially in Khuzestan. It's found in south and south-west plentifully and its biting causes grave troubles particularly in children (Dupre, 2012; Gefen and Amos, 2006). We

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recognized new species of scorpions every year (Karami *et al.*, 2013). Their habitats are various from inside the houses to outside and in the border towns or villages. There are various species of scorpions in different regions, so their habitats differ from one place to another. To recognize scorpions' habitats, whether man-made or natural, is the first step in order to strive them and to demolish their place of procreation (Karataş *et al.*, 2012; Kassari *et al.*, 2012) Subsequently, habitats' recognition makes it possible for us to control them easily. The aim is habitats' exploration of deadly dangerous scorpions of Iran in convinces which are in high risks during a period of 20 years, during 1992 to 2012.

Objective of the Study

The purpose of this project was to conduct a retrospective study to describe of the habitats of scorpions dangerous in Iran and to assess magnitude of the problem in order to optimize prevention and treatment.

MATERIALS AND METHODS

This research is descriptive and the aim is to recognize the dangerous scorpions' habitats during 20 years of travelling, in spring, summer, autumn, and winter in these cities and villages; These probable habitats are in residential areas or out of them, in cities or suburbs such as cemeteries, beside the farms and gardens, and in deserts. During the day, scorpions are hunted through: rock-rolling, digging, pouring water, demolishing ancient walls, digging dried at the bottom of brooks, digging and displacing dried mud on the stream parapets, seeking splits of border garden in houses, displacing fence of stones in the groundwork of buildings, displacing fence of stones in farms, and examining lower parts of tree trunks and skins. During the night, scorpions are found utilizing Black Light, keeping it at a distance of 15-20 cm from the ground or brick walls. They are hunted using a forceps, and then they were transferred to lidded pots on which number and some main information such as date and place had been recorded. Assembled species were sent to laboratory for a subtle recognition and an exact confirmation, considering morphologic parameters, by use of stereo microscope. Furthermore, examined region, its specifications, and other information were accumulated and recorded, presenting with statistics and descriptive tables.

RESULTS

Research outcomes indicated that 2172 species of poisonous scorpions were hunted. *Mesobuthus* was the most and *Buthotusschach* the least. These are hunting results; *Mesobuthus*: 34.5 %, *Odontobuthus*: 26.2%, *Androctonus*: 21%, *Hemiscorpius*: 11%, *Orthochirus*: 3.5%, *Compsobuthus*: 1.7%, *Olivierus*: 1.6%, *Buthotussaulcyi*: 0.3%, and *Buthotus schach*: 0.2%. Figure 1 indicates *Androctonus*, *Hemiscorpius*, and *Odontobuthus* are perilous since they bite to death.

Table 1: Area sampling, methods, species captured string agent of Area variety in Iran

Specie	Number	Percent	Sampling method and capture	Residential site with area sampling	Non-residential site
<i>Mesobuthuseupeus</i>	749	34.5	Black light, objects and rocks rolling	Urban, rural, desert	Rocky and mountainous and stream of water
<i>Odontobuthus</i>	570	26.2	Digging burrows and pouring water into holes	-	Soil small hill out of the Area of unborn rural
<i>Androctonus</i>	449	21	Black light, Rock rolling and under building materials	Area break muddy residential	Grave yard and deserts
<i>Hemiscorpius</i>	247	11	Black light, Rock rolling and under building materials	Cracks and holes in the walls	Marginal farms dates gardens
<i>Orthochirus</i>	75	3.5	Rock rolling, into holes	Area marginal urban and rural residential	Area rocky mountainous and deserts
<i>Compsobuthus</i>	36	1.7	Rock rolling	Rural residential sites	Marginal farms
<i>Olivierus</i>	35	1.6	Rock rolling		-Area rocky mountainous
<i>Buthotussaulcyi</i>	7	0.3	Rock rolling		-Area rocky mountainous
<i>Buthotusschach</i>	4	0.2	Rock rolling		-Area rocky mountainous
Total	272	100			

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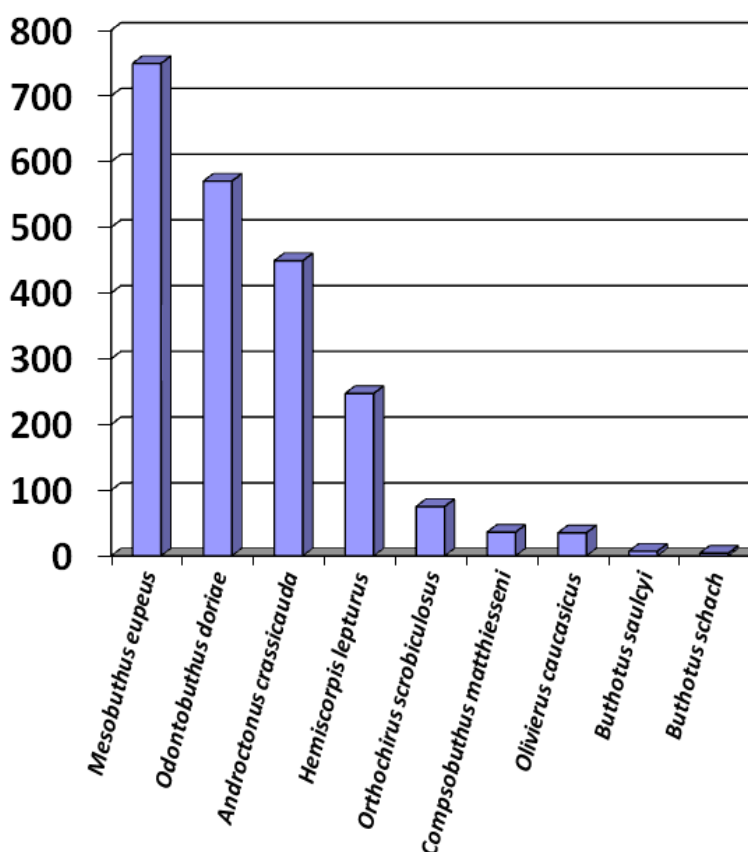


Figure 1: Abundance collected scorpion sting agent's indifferent areas of Iran

Scorpions called *Hemiscorpiuslepturus* were hunted by digging the ground, demolishing ancient walls, excavating, seeking splits of garden parapets, and rock rolling. Their habitats differ from inside the houses to outside and to the border towns and villages of Khuzestan and Kerman. This scorpion exists inside the split or the holes with atypical high humidity. The split in the garden walls made of cement, inside the holes or splits of ancient muddy walls of gardens or houses are some examples. For instance, 59 of the scorpions called *Hemiscorpiuslepturus* were hunted after demolishing an old muddy ruined wall with an altitude of 110 cm and a length of 20ms inside Ramhormoz city. They existed in the holes and splits through the walls' foundation, lower than the ground surface, where there is enough moisture. Another habitat of this scorpion was the fences of stones around the farms separating one field from another or from a brook. The fences were near the houses in rural area, and in addition to *Hemiscorpiuslepturus*, some other scorpions were hunted as well; *Androctonuscrassicauda*, *Compsobuthusmatthiesseni*, and *Mesobuthusupeus*. *Androctonuscrassicauda* exists in diverse habitats from inside the houses to outside and to the border towns and villages of Khuzestan, Isfahan, Qom, Markazi, and Kerman Other than *Androctonuscrassicauda*, there were some other species of scorpions under these fences. *Androctonuscrassicauda* lives in different parts of Iran, but it exists in tropical zones plentifully with a longer period of existence.

Desserts are in habited by this scorpion; under the stones, in the ground holes and splits, and inside the wild animals' dens. Residential areas are in habited by this scorpion as well; in the split of muddy walls, under the wood, lumber or construction materials, in the cemeteries and holes. It is found from the sand in Aran desert in Kashan, under the stones in Dehzireh, and under the stones and inside the holes in Ramhormoz, Iezeh, and Baghamalek. Another poisonous scorpion, *Odontobhusdoriae*, in habits deserts and Non-residential areas; nestling in the side of embankments and dusty hills. This dangerous scorpion rarely encounters human because of its special habitat. There is a particular tumulus or embankment, in

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the opening of its newly-digged nest, demonstrating a new activity season and a nest that is cleaned up. The opening figure differs from other ground nests; a nun symmetrical ellipse with a small diameter of 1/2 to 1/5 cm or a large one of 2/5 to 4/5 cm. The nest' length is in a minimum of 25 cm or a maximum of 67 cm [42.2cm on average]. The nest was digged in the steep surfaces, with a depth of 20.5 cm, without considering bends.

Conclusion

Scorpions widely adapt themselves to various environments utilizing nests or shelters. A scorpions' nest may be as simple as a hole under the rocks and tree trunks, or it may be digged skillfully under an invisible surface in depth. Some of them make temporary holes, however there are scorpions that dig permanent nests even to a depth of 42 cm (Keegan, 1980). Selecting nest location, dispersion, and multiplicity in different lands are exclusive. *Odontobuthusdoriae* is a digger making his nest skillfully based on the rigidity of soil and climate, as the most important factors. In the stuffy over-heated atmosphere, they protect themselves from high temperature and lack of humidity using a nest or shelter. Therefore, they keep their bodies away from losing water and reduce their metabolic necessities (Karataş *et al.*, 2012; Sagheb *et al.*, 2012) There is moisture even in a dry land. So, the scorpions existing under the stones utilize it to be living.

Results demonstrated that *Hemiscorpiuslepturus* occupied a wide range of habitats from inside houses to outside and to border towns and villages in Khuzestan.

This scorpion lives usually in the lowest holes and splits of a foundation or ground, with high humidity, where he is protected from a warm dry climate. They have caused many problems in Ramhormoz, so that we can hunt too many of them in the muddy walls' holes and splits (Pipelzade *et al.*, 2007). Consequently, the rate of humidity is studied for scattering of some other scorpions as well (Polis, 1990). A large number of *Hemiscorpiuslepturus* and *Androctonuscrassicauda* were hunted under the fence of stones and farms, made to surround or separate it. The important point in building the rural houses in this area is the use of rough stones. So, this foundation is an appropriate habitat for *Hemiscorpiuslepturus* and some scorpions such as *Androctonuscrassicauda* and *Compsobuthusmatthiesseni*. The above-mentioned tradition, utilizing mountain stones for constructing, exactly happens in Roydar's villages and suburbs in Hormozghan. Therefore, these regions are inhabited by *Hemiscorpiuslepturus* and *Androctonuscrassicauda* abundantly (Williams, 1987). Seemingly, nesting in traditional way supplies enough shelters and also an appropriate environment for these scorpions operating as a self- sustaining ecosystem in which bait and hunter both live in these shelters. It means that human constructions cause more procreation, and so biting by scorpions are increased. Among deadly scorpions of Iran, *Odontobuthusdoriae*'s nests are different. This animal digs himself a nest just two weeks after birth. And, the nest becomes larger as he grows up. This scorpion digs an approximately long, winding nest in natural ground or man-made embankments, living 5 to 10 years. It keeps himself away from light and intense ecological influences, resting at the end of his nest mostly.

On the whole, there is enough necessary moisture in *Hemiscorpiuslepturus*'s habitats; therefore, this scorpion is protected from intolerable dry heat. And, *Hemiscorpiuslepturus* requires a special small limited habitat, rather than other scorpions especially *Androctonuscrassicauda*, considering his thin skin. So, heat is a limiting factor as well humidity. And, this scorpion has an especial geographical spreading. *Androctonuscrassicauda* has a thicker skin and as an opportunist animal live in different kinds of nests from inside houses to deserts. It has a wide spreading in Iran rather than other scorpions, but its frequency varies in different regions due to thermal variations. *Odontobuthusdoriae* nests in deserts and Non-residential areas, in embankment slopes or dusty hills. This special kind of habitat makes him to encounter human rarely. Therefore, we can decrease them in residential areas and the peril of their biting, if we utilize appropriate construction materials and if we avoid their natural habitats.

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