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Research Article

New Record of *Latrodectus tredecimgutatus* (Family: Theridiidae:) the Most Medically Important Spider Species from Qom Province, Iran

Leila Shirani Bidabadi[1,2], Mulood Mohammadi Bavani[3], Fatemeh Janjani[4], Abedin Sghafipour[5*]

[1]*Department of Vector Biology and Control, Faculty of Public Health, Kerman University of Medical Sciences, Kerman, Iran.*
[2]*Research Center of Tropical and Infectious Diseases, Kerman University of Medical Sciences, Kerman, Iran.*
[3]*Department of Medical Entomology and Vector Control, School of Public Health, Urmia University of Medical Sciences, Urmia, Iran.*
[4]*Student Research Committee, Qom University of Medical Sciences, Qom, Iran.*
[5]*Department of Public Health, Faculty of Health, Qom University of Medical Sciences, Qom, Iran.*

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LSB wrote the manuscript while MM revised it. FJ acquired data. AS presented the concept, designed the study and administered project.

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Abstract | Spiders are one of the most important order of Arachnids that consisting of almost 48,000 species around the world, but about 200 species have medically importance and sometimes can be fatal. The Iranian spider species belongs to 51 families and comprising 763 species. Of these families, Theridiidae and Sicariidae are the most medically important. The genus *Latrodectus* (Theridiidae) is the most dangerous spiders in Iran and it comprising five species. Among which *Latrodectus tredecimguttatus* (black widow spider) is the most poisonous spiders in Iran. Different parts of Qom province were searched for poisonous spiders; captured specimens were identified at species level. Six black widow spiders were collected and identified as *Latrodectus tredecimguttatus*. Samples were collected from under rocks in barley farms in Khalajestan district, Chahak village in Qom province from April 2020 to September 2021.

Novelty Statement | This species of spider caught in this province is medically important and the people of the region should be aware of the risk of being bitten by this poisonous spider.

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Introduction

Spiders are one of the most important order of Arachnids, about 48,000 species of spiders have been reported around the world. About 200 species are dangerous to humans (Mohammadi *et al.*, 2021; Isbister and Fan, 2011; Mirshamsi *et al.*, 2015; Zamani, 2016; Zamani and Marusik, 2021). Except for the families Uloboridae and Holarchaeidae, the rest are classified as venomous spiders. There are 51 families and 763 species of spiders in Iran, the families of Theridiidae and Sicariidae, are dangerous to humans and the former is more common (Dehghani *et al.*, 2017; Dehghani, 2015; Platnick, 2019). *Latrodectus* widow spiders are found all over the world (Graudins *et al.*, 2001). *Latrodectus* is also known in the world as black widow spider and is considered as one of

Corresponding Author: Abedin Saghafipour
abed.saghafi@yahoo.com

the most venomous spiders in the world except Antarctica (Vetter *et al.*, 2012; Rahmani *et al.*, 2014; Sanaei-Zadeh, 2017; Bildik *et al.*, 2021). This genus comprises 32 species in the world (Caruso *et al.*, 2021), which five out of them have been reported in Iran (Platnick, 2019). Spider bites are common worldwide, and the most frequent of spider bites have been reported in countries of Italy, Spain, and the United States (Hahn, 2015). Spiders bites have been reported in some provinces of Iran (Mirshamsi *et al.*, 2015; Zamani *et al.*, 2014a, b). The aim of this study is to survey the presence this dangerous spider species in central of Iran, Qom province.

Materials and Methods

Study area and specimens' collection

Qom Province is bordered by Tehran province to the north, Isfahan province to the south, Semnan province to the east and Markazi province to the west, with an area of approximately 11,240 square kilometres. This has five districts including: Kahak, Markazi, Salafchegan, Jafarieh and Khalajestan.

In order to collect samples and complete coverage of Qom province, villages and parts of the north, south, east and west of the province (Figure 1) were selected from April 2020 to September 2021.

Spider specimens were collected from climatic regions using method of moving rocks (rock rolling) in various habitats, including under-rocks, tree foliage, inside beetle and rodent nests using pliers forceps. The collected samples are preserved in tubes containing 70 % alcohol and transferred to the entomology laboratory of Qom School of Health.

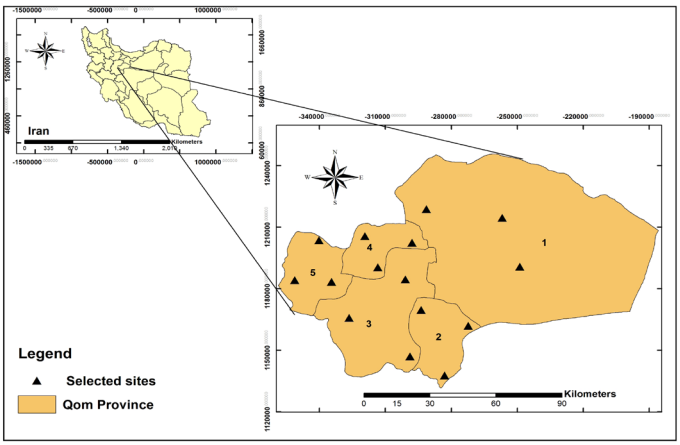

Figure 1: The study area and collection sites; 1: Markazi, 2: Kahak district, 3: Salafchegan district, 4: Jafarieh district and 5: Khalajestan district.

Samples were transferred to the plastic tubes containing 70˚ alcohol. Then specimens sent to the Entomology Laboratory of School of Public Health, Qom University of Medical Sciences, Qom, Iran. Due to the lack of identification key for Iranian spiders, the collected samples were identified based on a valid identification key in the world. Then species distribution map was introduced using GIS software version 10.6.1.

Results and Discussion

Totally, six black widow spiders (*Latrodectus tredecimguttatus*) were captured. These specimens were collected from sub-rocks in barley farms in Khalajestan district, Chahak village in Qom province (Figure 2).

Figure 2: *Latrodectus tredecimguttatus* (from central of Iran) Qom Province, 2020-2021. (Photo by: Abedin Saghafipour)

Family theriididae

The members of this family have eight eyes, eyes are not integrated and in two rows and at a distance from each other, the eyes of the front row are located in a nearly straight line in the forehead area. In the members of this family the toe has three nails, the middle toe is smaller, also the comb is made of thick and sawn hair.

The most important medical genus of this family is *Latrodectus*, which has two rows of eyes on the front of the head, separate lateral eyes from the rest of the eyes. In this genus a row of coarse comb-like hair on the underside of the fourth toe, the first legs usually longer than the fourth legs, spider abdomen the material is spherical, bulky and usually has a colored spot with an hourglass design on the abdominal surface.

Latrodectus tredecimgutatus

This species of genus latrodectus has a black belly with bright appearance and two types of thorns. Long, thick, curved thorns with unique short conical thorns with a lateral branch and it is called black widow spider. Males are much smaller than females so that males have a maximum body length of 3 mm and females have a body length of 8 to 13 mm.

Toxic spider bites are very important issue in medicine in Iran (Dehghani, 2015). *Latrodectus* widow spiders are globally distributed (Graudins *et al.*, 2001).

Latrodectus bites are often painful at first (Bonnet, 1999). Neurotoxins and alpha-latrotoxins in spider venom are produced in 50% of people who are hospitalized for excruciating pain for one to three days (Bonnet, 1999). The genus *Latrodectus* is widespread in tropical and temperate regions of the world near human settlements (Levi, 1959). The bites of these spiders can cause cramps and abdominal pain, vomiting, nausea and muscle cramps (Bonnet, 1999). Mohammadi *et al*. (2020) reported new data on *Latrodectus tredecimguttatus* (Araneae: Theridiidae) from North West of Iran. This genus has five species in Iran. *Latrodectus tredecimguttatus* (black widow spider or "Dolmak") is one of the most poisonous spiders in Iran (Mohammadi *et al*., 2021). Mohammadi *et al*. (2020) have reported this species in northwestern Iran (collected five adult female spiders from Germi and Ardabil cities (Ardabil Province), Ahar County (East Azerbaijan province), and Urmia city (West Azerbaijan province), Iran (Mohammadi *et al*., 2021). In 1997, Rafinejad reported four species including *L. tredecimgottatus*, *L. dahli*, *L. geometricus* and *L. pallidus* from Khorasan province, northeastern Iran (Rafinejad, 1997). In addition to the venom of this spider has neurotoxin properties, it also has cytotoxic properties (Zamani and Rafinejad, 2014).

Conclusions and Recommendations

This species of spider identified in this province has medical significance and the people of the region should be aware of the danger of being bitten by this poisonous spider.

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Conflict of interest

The authors have declared no conflict of interest.

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