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## Review article

# Scorpion sting prevention and treatment in ancient Iran

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## ABSTRACT

Due to the medical and therapeutic importance of scorpions in Iranian traditional medicine, this review was conducted on the treatment of scorpion sting as performed by traditional healers in order to realize complications, clinical manifestations, diversities, and deficiencies in the prevention, control, and treatment as mentioned in the pertained literatures. This study tried to make known and investigate attitudes of the Iranian national and traditional medicine towards controlling these venomous animals. Keywords and articles were searched through relevant sites on the Internet. We investigated different journals and references for the Iranian traditional medicine. Based on the articles and books found, we tried to find suitable solutions to problems from the viewpoint of traditional medicine. Scorpion sting dates back to ancient Iran and has been widely reflected in the resources of Iranian traditional medicine. The traditional medicine offers various guidelines that can be beneficial in this respect. New attitude towards scorpion sting with regard to traditional medicine resources can enhance control and prevention of scorpion stings. Consequently, this attitude leads authorities and researchers to a decreased level of scorpion stings or related consequences.

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## 1. Introduction

Scorpions are fascinating animals. Their venom with various potentialities has made them look both scary and fascinating.<sup>1</sup> The venom of some species of scorpion has a remarkable impact on religious attitudes, concepts, and views of different societies in the east and west. These beliefs and conceptions were very common in old societies. Also, they are believed by a few traditional groups in some parts of the world.<sup>2</sup> Ancient Egyptians believed that scorpions were created through decomposed corpses, crocodiles, and lizards.<sup>3</sup> According to an Algerian legend, a king built a palace for his son. Astrologists had foretold that the son would die one day by a scorpion sting. Therefore, they built the palace using totally smooth and flattened stones to be impenetrable by scorpions. One day, a basket of grapes with a scorpion hidden in it was brought to the prince. The prince was then stung by the scorpion while eating the grapes. Such legends describe to some extent the story of how the

human is stung by scorpions.<sup>4</sup> The same story has been repeated in the province of Khuzestan, Iran. Relatives of an authority in Ahvaz Jundishapur University of Medical Sciences (AJUMS) took some vegetables for him. His spouse was stung by a scorpion while cleaning them, and lost her life some days later. This story confirms that most of the legends originate from reality.<sup>5</sup>

Treatment of those stung by venomous animals and their safety in ancient Iran has contributed to the formation of various stories and legends. Mithridates VI was a cautious man and because he was afraid of being poisoned by his soldiers, he was accustomed to use some poison in his food every day. The king was coincidentally defeated by the Romans; then, he decided to commit suicide. However, whatever poison he ate he did not succeed, so he ordered one of his soldiers to stab him. It seems that getting accustomed to a little and then gradually more amounts of poison has been common in ancient Iran. On this occasion, Mithridates VI is known as the first immunologist in Iran. Mithradatism is the practice of protecting oneself against a poison by gradually self-administrating nonlethal amounts for the body to become accustomed to the poison. Later, Galen made an antidote and named it Therikos Mithridatus.<sup>6</sup> In countries such as Sudan, scorpions are put in sesame oil to make medicine for those stung by scorpions. This oil is rubbed on the site of sting.<sup>1</sup>

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Scorpion sting is one of the main health problems in developing, tropical, and subtropical countries causing immense clinical consequences and sometimes death.<sup>7</sup> The status of scorpion sting varies in different regions and countries due to lifestyle, economic–social status, residential status, way of providing health services, and species present in every geographical area.

Scorpion sting is one of the main medical concerns of some African, Middle Eastern, Eastern, and Central American countries.<sup>8</sup> Mexico has the highest rate of scorpion sting and mortalities.<sup>9</sup> A total of 300,000 cases of scorpion sting are reported annually in Mexico.<sup>10</sup> In 1995, 7000 cases of scorpion stings occurred in Brazil, and 1% were fatal despite receiving antivenom serum.<sup>11</sup> Scorpion stings constitute 40,000 cases of medical problems in Tunisia every year. No evidence has been found regarding efficacy of antivenom serums in treating scorpion sting.<sup>12</sup> Morocco is faced with 40,000 cases of scorpion stings annually.<sup>13</sup> More than 20 species of scorpion exist in the Arabian Peninsula and their stings result in death in some cases,<sup>14</sup> and 86 species of scorpions has been found in India. The mortality rate of scorpion stings has been 3–22% for children.<sup>15</sup>

Iran, due to its climate and weather, is very rich in arthropods especially scorpions.<sup>5</sup> Iran is one of the countries with a vast variety of scorpions, especially dangerous species. Reports of scorpion stings are obviously notable in the old Iranian sources. To treat stings, different drugs under the name of antidotes, applying medicines, and ointments have been introduced. These varieties of medicines prove that scorpion sting has always been a main medical concern in the previous historical eras.<sup>16</sup> In a manuscript dated 1908 AD, cities such as Tehran, Ghazvin, Ghom, Kashan, Tafresh, Khoramshahr, Ahvaz, Soleymanieh, Korestan, Kerman, Bampour, Shoushtar, and Shahroud have been mentioned as the cities with the most scorpion stings and related problems.<sup>4</sup> This confirms the deep-rooted dominance of scorpions in Iran.<sup>5</sup> Also, in recent decades, cases of scorpion stings and related mortalities are being reported annually in Iran.<sup>17</sup> Thus, it can be said that arthropods are the most dangerous venomous animals in Iran.

Scorpions have been long known in Iran due to their stings; therefore, there is considerable need for the prevention or treatment of their stings. In the traditional sources and texts, ways of treatment, and getting rid of and destroying scorpions have been discussed in detail. At present, the main way for treating scorpion sting (of any species) in the world and Iran is the use of antivenom serum, which has been under question in the treatment of some cases.<sup>18</sup> Due to the significance of scorpion sting in the world and Iran in particular, study of this matter along with the related therapeutic methods especially in the light of ancient and traditional medicine of Iran is of vital importance. Therefore, our aim is to find applied methods proposed in the traditional medicine to manage and handle the problem, at least in parts of the world.

## 2. Methods

This descriptive review was done by searching keywords such as traditional medicine, scorpion sting, and treatment of scorpion sting through relevant websites, specialized journals, articles, and books. All the articles and sources covering detailed and technical description of scorpion sting and its treatment, traditional medicine, prevention and control of dangerous species were studied; and the rest were excluded. Articles not related directly to the study and those studying other aspects of scorpions such as the biochemical aspect of venom, were omitted. All articles and reference books published in the past 30 years in the Persian scientific journals were studied and finally different points of view of various authors about prevention, control, and treatment of

scorpion sting in the traditional medicine were offered. Out of 85 sources, 47 were selected and analyzed based on their potentiality and usefulness.

## 3. Results

### 3.1. Legend and travellers' reports

Scorpions have always been hated by human being because they have almost always been associated with sin and criminality.<sup>4</sup> Fear of mad dogs, scorpions, and other venomous animals was very common in the Middle Ages and various books were written on preventing or treating related diseases.<sup>1</sup> The same therapeutic perspective is present in the Iranian literature.<sup>2</sup> In some countries, people often carry an image of a scorpion with them to guard themselves against scorpion sting. In Iran, images of scorpions have been discovered carved on silver objects. Also, we can find legendary texts about scorpions' behavior. One of these texts deals with the point that if one scorpion is placed in fire, it stings and kills itself.<sup>1</sup> These types of thought about scorpions are still predominant among Iranian people.

Scorpions have attracted attention due to their venomous, painful, and sometimes deadly stings. Like other nations, the Iranians have had scorpions in their legends since long ago.<sup>5</sup> When Mithras, Iranian god of the sun scarified a sacred cow for its blood to fertilize the world, a mischievous demon sent a scorpion to sting the cow's testicles for destroying its source of life.<sup>1</sup> The ancient Iranians used to hold the women's celebrations on Sepandārmazgān, the 5<sup>th</sup> day of March. They called it good news (Mozd). On this day, in addition to giving presents to women, a ceremony was conducted to prevent scorpion sting.<sup>4</sup> Killing animals, vermin (or destroying Kharfaster) was very common in the ancient Iran so that it was considered as one of the main oblations.<sup>6</sup> Scorpions were also involved in the fate of wars in Iran. In the late Sassanid period, Kashan was so famous and thriving that it sent an army of warriors headed by Shirzad to fight with the Arabs. The army of Abu Musa Ashari, the Arabian commander was encountered with persistence and tenacity. Abu Musa Ashari, who was disappointed to not capture Kashan, distributed pitchers of scorpions throughout the city. The people stung by the scorpions gave up and were soon surrounded. The Arabs soon after killed the people, looted properties and animals, and took the soldiers captive.<sup>19</sup>

A number of Western travellers wrote things about scorpions in their itineraries that often did not match reality. Sir Thomas Herbert, in one of his journeys in 1626 described scorpions of Kashan: "Scorpions are small snakes with long fingers. These animals sting just by their tails and some of them fly exceptionally. Their stings create panic and inflammation which result in death in some cases. There are some scorpions that avoid the maniacs."<sup>1</sup> These reports from the Ancient Iran remained in the religious and historical texts prove the archaism of this issue in Iran.

### 3.2. Sporadic rate of mortality of scorpion sting

Due to the existence of these animals all over Iran, which provides them with a desirable climate for survival, scorpion sting has been a frequent problem in Iran. Therefore, the Iranians should have gathered comprehensive and complete information to control and treat scorpion sting.<sup>20</sup> Despite damage brought to the scientific and cultural body of Iran during wars in different periods, sources available and accessible to the Iranian in the past illuminate like a gem in the ancient scientific world.<sup>21</sup> By contrast, Iran has been a cradle of civilization for centuries and has presented precious scientists to the world of medicine.<sup>22</sup>

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