ABSTRACT

Every year, more than 1 million cases of scorpion envenomation are reported worldwide. Scorpions are thermophilic organisms. They are sensitive to weather and climate conditions, in such a way the ongoing trends of increasing temperature and more variable weather could lead to scorpionism spreading. There has been considerable debate as to whether global envenomation will be impacted by climate change which has focused on snake and spider envenomation risk. This debate didn’t give enough interest to scorpion stings and its burden risks, in spite their widespread potential effects in many regions. Here, the authors review how climate and climate change may impact scorpion activity as well as scorpion envenomation. They contrast ecological and behavioral characteristics of these arthropods, and how weather, climate, climate change, and socioeconomic factors may have very different impacts on the spatiotemporal occurrence and abundance of scorpions, and the resulting scorpion envenomation.
INTRODUCTION

Scorpion envenoming is one of the leading causes of deaths in many parts of the world. With an estimated almost two and half billion people at risk of scorpion envenomation. Additionally, it is expected that the real extent of the scorpion envenoming is more elevated than the hospital-based approximation, as confirmed by several studies (El hidan et al., 2015). Scorpion stings it’s a result of human and scorpions interaction. In fact, from an ecological point of view, scorpion envenomations mostly take place in scorpions’ natural habitats invaded, disrupted, or destructed by humans. Scorpions are generally nocturnal animals and mostly active in warm season, thus, scorpion stings occur in summer, mainly during the night and at home. The risk also exists in city downtowns, even if it is definitely higher in rural areas (Celis et al., 2007).

Scorpions live in dry and hot areas but some species can be adapted to manmade environment. As an ectothermic organism, scorpions’ distribution, foraging patterns, activity and life history strategies vary according to weather fluctuations. Under a warming climate, an increased envenomation incidence has been noticed, supporting climate change effects on scorpion stings. In parallel to the modification of scorpion distribution, climate change could increase the occurrence of scorpion stings and aggravate poor population vulnerability exposed to scorpions because of the absence of suitable shelter in the face of extreme weather events. Underlining the importance of socioeconomic aspects to appreciate changes in venomous scorpions’ stings models related to weather, climate change, and variability, according raising the need for understanding the interaction of both factors given the observations and expectations: of more frequent extreme weather events with climate change.

Several aspects of climate change and socioeconomic factors may drive changes in scorpion envenomation distribution. In this chapter, authors will focus on how climate and climate change may impact scorpion activity as well as scorpion envenomation. They contrast ecological and behavioral characteristics of these arthropods, and how weather, climate, climate change and socioeconomic factors may have very different impacts on the spatiotemporal occurrence and abundance of scorpions, and the resulting scorpion envenomation.

SCORPION ENVENOMATION: AN OVERVIEW

Epidemiology of Scorpion Envenomation

Scorpionism, the pathology of scorpion envenomation, is a problem that occurs across five continents. Because of its frequency and severity, it represents a serious concern for public health on a worrying scale in many countries of North Africa, the Middle East, India and South America (Lourenço, 1988). Epidemiological studies report that more than 5,000 people worldwide die each year (Stockmann and Ythier, 2010). According to Chippaux (2009), the incidence of scorpion envenomation is essentially limited to four highly endemic regions: Mexico, South America to the East of the Andes, North Africa, Near and Middle East.

In North Africa, A. australis, Leiurus quinquestriatus and Androctonus mauritanicus (last endemic in Morocco) are considered the most dangerous. However, Androctonus aeneas, Buthus occitanus and Hottentota gentili, especially in the Saharan zone (Goyffon and Guette, 2005), can also cause serious,