



Scorpions between Death and Ecstasy with Interest in Scorpions in Egypt

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Abstract

Scorpions represent very dangerous arachnids of the order Scorpiones (Phylum: Arthropoda, Kingdom: Animalia). Scorpion envenomation is a life-threatening health issue in tropical and subtropical regions. The Egyptian map can reveal many of these night-crawling creatures in different parts of the country. Scorpion venom has special characteristics that must be more studied to get the mysterious treasure inside. Also, the management of an envenomated person must have a widespread up-to-date protocol around the world.

Keywords: Scorpion; Ecstasy; Night-Crawling

Abbreviations: AED: Anti Epileptic Drug; KP: Khyber Pakhtunkhwa.

Introduction

Envenomation by scorpion stings (scorpionism) is a major public health issue in many tropical nations because of its frequency and potential severity, particularly among children, who suffer the most severe instances. There are roughly 1900 documented scorpion species worldwide, with just about 30 regarded as potentially harmful to humans [1-3].

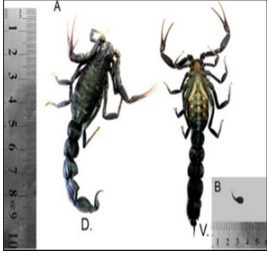
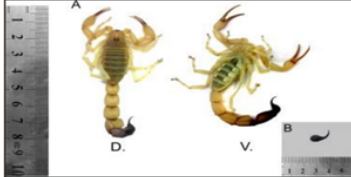
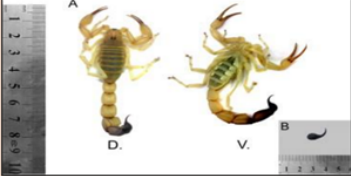


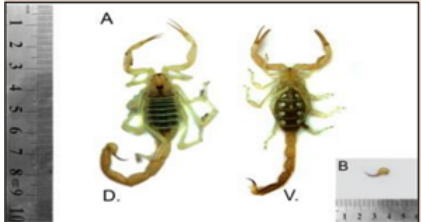
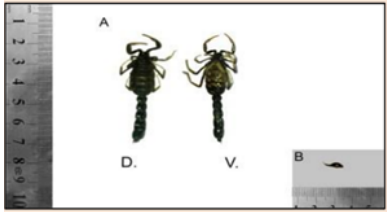
Previous literature on scorpion taxonomy recognizes 16 scorpion families, and all scorpions hazardous to humans belong to the Buthidae family. However, among this family,

the species belonging to the genera *Androctonus* and *Leiurus* are considered the most significant to humans, causing many envenomations in Africa and the Middle East [4].

"*Leirus Quinquestriatus*, known as the Egyptian scorpion, or 'Deathstalker,' has been isolated from upper Egypt [3].

Types of Scorpions in Egypt and their Geographical Distribution

Random samples were taken from different regions in Egypt, and it was found that there are 8 species of scorpions in Egypt that were classified into two families: Buthidae: its members are abundant in Egypt and Scorpionidae.

Family	Species	Picture
Buthidae	Androctonus bicolor Present in Marsa-Matrough	
	Androctonus australis Present in borg EL-Arab, Present in Marsa-Matrough Sinai	
	Androctonus amoreuxi Present in Baltim	
	Androctonus crassicauda Present in east of sinai	
	Leiurus quinquestriatus Present in Aswan	
	Buthacusa arenicola Present in sinai	
	Othochirus innesi Present in middle of sinai	

Scorpionidae	Scorpio maurus palmatus Present in borg EL-Arab and south of Sinai	
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Figure 1: 8 Species of Scorpions in Egypt that were Classified into Two Families: Buthidae: Its Members are Abundant in Egypt and Scorpionidae.

The Injectable Lethal Dose of 50% (LD50)

Vary according to the species and the affected human according to age but, mostly in children about (0.56 µg/kg) and in adults about (0.37 mg/kg) [5].

The Mechanism of Toxicity

Scorpion toxins are divided into two major types based on their target site and size: Short-chain toxins are composed of 30-40 amino acids and confined by 3 or 4 disulfide bridges that block the K⁺ channels, whereas long-chain toxins are composed of 60-75 amino acids and cross-linked by 4 disulfide bridges that impact exclusively Na⁺ channels [6,7].

Scorpion poisons trigger massive release of neurotransmitters such as catecholamines, resulting in a cascade of events that can escalate to heart failure, pulmonary edema, arterial hypotension or hypertension, arrhythmia, tachycardia or bradycardia, unconsciousness, and death [8].

Abroug's classification for grading Signs and Symptoms of scorpion sting cases [9,10] Grade I: Pain and/or paresthesia at the scorpion sting site, tingling, numbness, and minor swelling in the skin area encompassing the sting (local symptoms); Grade II: Fever, chills, tremor, excessive sweating, nausea, vomiting, diarrhea, hypertension, and priapism (systemic symptoms ± local symptoms); Grade III: Cardiovascular, respiratory, and/or neurologic distresses (complications).

Scorpion Venom Applications in Medicine

Medically significant species belong to the genera Buthus, Androctonus, and Tityus Leiurus, and from the Buthidae family [11,12].

Scorpion venom is used as an analgesic, antiepileptic drug (AED), antimalarial, positive inotropic, immunosuppressant in autoimmune diseases, anticancer in prostate and breast cancers, antidiabetic and antimicrobial [13].

Scorpion Venom as a Cheap High

In developing countries such as Egypt and India, one of the psychoactive faunas is scorpion venom.

As a substitute for heroin, abusers claimed to experience the distinct pleasurable effect of the scorpion sting that was more potent than heroin, without any report of hallucinations or loss of consciousness, the abuser experiences instantaneous anxiolytic effects that could last for about six hours [14]. Reports shows abusers in the interiors of Khyber Pakhtunkhwa (KP), India, also smoke the fume from dead scorpion for same purpose of 'getting high' where dead scorpion is dried in the sunlight and then burnt on coal to release smokes that is inhaled by the abuser [15].

Management of Scorpionism

A study by Abd El-Aziza, et al. [16] included 110 Scorpion sting cases that attended the General Hospital of Esna, Luxor, Egypt during scorpion activity months (spring and summer) of 2017 in the studied locality, the study revealed that; the incidence in children is high, females are more vulnerable than males, The most frequent local reactions are local pain, then redness, then swelling. Concerning systemic manifestations; vomiting was the most agonizing complaint, followed by headache and disturbed consciousness. About one-fifth of the cases showed abnormalities in ECG. There was a high recovery rate.

More than half of scorpion stings were due to scorpion-type *Leiurus quinquestriatus*. Regarding the occurrence of clinical manifestations and overall mortality; there was a higher occurrence of clinical manifestations among *Leiurus quinquestriatus* sting cases than (*Androctonus crassicauda*) [16].

Laboratory Evaluation: Laboratory tests are not required in individuals with modest (Grade I to II) envenomation. The following must be acquired from severely envenomed patients (grades III to IV): 1. Serum

electrolytes, 2. Liver enzymes (AST and ALT), 3. Blood urea nitrogen and serum creatinine, 4. Serum lipase, 5. Serum creatine kinase, and 6. Urinalysis [17]. The surprising news is that the antivenom is not lifesaving. However, without antivenom, the patient will likely have a prolonged period of distressing symptoms. Most scorpion stings cause moderate envenomation (Grade I or II), with no symptoms. Pain relief with oral drugs (such as Ibuprofen® 10mg/kg; maximum single dosage 800mg), sting site washing, and tetanus prevention are usually sufficient. Patients must be followed for four hours to ensure no further symptom progression. Victims with severe systemic symptoms (e.g., restlessness, muscle fasciculations, hypersalivation, cranial nerve dysfunction, roving eye movements) are more likely to suffer respiratory compromise, myocardial infarction (in adults with ischemic heart disease), hyperthermia, rhabdomyolysis, and multiple organ failure. They require constant monitoring of these problems.

Pregnancy envenomation: Ates et al. (2018) in Turkey reported that Scorpion stings during pregnancy may not have a substantial negative impact on the fetus or mother [18]. The use of anti-venom in pregnant women should be carefully examined when only minimal safety information is available, especially in patients with just local symptoms [19]. Supportive interventions for these patients include frequent suctioning of oral secretions, endotracheal intubation for difficult airway maintenance or pulmonary edema with hypoxemia, and close monitoring for and treatment of myocardial ischemia and/or acute decompensated heart failure in those at risk. d) For pain, provide 1mcg/kg of intravenous fentanyl. Fentanyl was recommended for antivenom administration because, unlike morphine, it did not produce histamine production. If antivenom is not employed, intravenous benzodiazepines (lorazepam® or continuous midazolam infusion) can be titrated to achieve drowsiness and relieve muscle stiffness. When administering antivenom, benzodiazepines should be administered with caution or avoided altogether. Antivenom reverses the excitatory effects of scorpion venom, and children who have taken large doses of long-acting benzodiazepines (such as lorazepam®) may become too sedated, necessitating intubation [20]. To treat increased muscle activity and anxiety in pediatric patients, a short-acting benzodiazepine was selected (Midazolam®, beginning dose: 0.05 to 0.1mg/kg). After administering antivenom, clinicians should watch patients for signs of over-sedation and avoid administering further benzodiazepines. Antivenom caused symptoms to resolve quickly with no immediate or delayed hypersensitivity reactions, and it was advised that antivenom be made more widely available in areas where it is most required.

Before administering scorpion-specific F(ab'), make sure to have two antivenoms, medicines, and anaphylactic

equipment readily available, such as IV fluids, epinephrine, and intubation equipment [21]. Allergic reactions should be treated by discontinuing the intravenous infusion of the antivenom and treating symptoms appropriately. Prompt intramuscular epinephrine injection in the mid-outer thigh. Prazosin blocks alpha receptors, which corrects the inappropriate hemodynamic and metabolic consequences of circulating catecholamines [22]. Prazosin is used in rural areas where antivenom may not be available as it is a very cheap physiological antidote. Prazosin Therapy-Prazosin 30 µg/kg/dose (1mg for adults, 500 µg for children) is given orally and then every 3h till extremities are warm, and dry and peripheral veins are visible [23].

Conclusion

Scorpion envenomation is a risky problem worldwide. The most dangerous clinical types in Egypt are *Leiurus quinquestriatus* and *Androctonus crassicauda*. The antivenom is not lifesaving but is given to neutralize the free venom and its amount is given according to the amount of the injected venom. Scorpion venom has many medical and non-medical uses.

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