

SCORPIONS in URBAN AREAS in IRAN, and RECENT PROGRESS of LABORATORY RESEARCH (SCORPIONIDA: SCORPIONIDAE, BUTHIDAE)

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Abstract Scorpions are common in urban and rural areas of Iran. The Iranian species are classified in Buthidae and Scorpionidae; there are 16 genera and 25 species, and a species in the family Diplocentridae occurs on Kish Island. The most common species are: *Mesobuthus eupeus*, *Odontobuthus doriae*, *Scorpio maurus*, and *Hemiscorpius lepturus*. Laboratory rearing methods for scorpions have been improved with the use of a 3 cm by 10 cm cardboard tunnel. The venom of *Hemiscorpius lepturus* is obtained from amputated telsons, which are dried and ground to obtain the venom. Nocturnal activity and movement of scorpions is influenced by a variety of factors, including biological rhythms, humidity, and temperature. The night promenade of *Odontobuthus doriae* includes considerable time searching for food and shelter.

Key Words Scorpions scorpion courtship scorpion venom Iran scorpions

INTRODUCTION

Scorpions are most common in warm climates, particularly in areas considered to be semi-arid. Despite their occurrence in dry environments, they require access to water. Their daily activity and foraging habits are linked to water conservation; they remain in protected harborage during the day, and forage for food and water at night. Their prey include ground-inhabiting insects and small vertebrates.

Biological and taxonomic studies of scorpions are limited. Vachon (1954) provided keys and detailed descriptions of the Saharan scorpions. Lamoral and Reynders (1975) provided an annotated, alphabetical list of scorpions from sub-Saharan Africa and adjacent islands. Vachon (1979) described scorpions from Saudi Arabia. The presence of scorpions has long been known in the Iranian Plateau. Avicenna (Ebn Sinna), the famous Iranian physician, more than 10 centuries ago discussed scorpions. He presented a treatment for patients envenomated by scorpion stings in two chapters of the fifth volume of his book, *The Canon of Medicine*.

After so many centuries, the scorpions are still taking high casualties in Iranian cities and villages, particularly in the central and southern parts of the country. The most common species are: *Mesobuthus eupeus*, *Odontobuthus doriae*, *Scorpio maurus*, and *Hemiscorpius lepturus*. About 15,000 vials of polyvalent scorpion antivenom from the species are produced every year for the treatment of patients.

Studies have been conducted on scorpions in Iran in the past several years, including faunistic studies on different parts of the country, and islands in the Persian Gulf; laboratory rearing methods; studies on the amputation effects of telson on the longevity, courtship, and reproduction of common scorpions used to collect poison; and courtship dance behavior (Promenade a deux), spermatophore production, and fecundity.

FAUNISTIC STUDIES in IRAN

Dr. Mrs. Habibi and Dr. Farzanpay have classified Iranian scorpions into two major families: Buthidae and Scorpionidae, with 16 genera and 25 species. The family Diplocentridae has a single species that occurs on an island in the Persian Gulf.

A faunistic study of Kish Island was conducted. This island is visited annually by thousands of Iranian and foreign tourists. A total of 371 scorpions were collected between 1999 and 2001. The most common species collected were *Buthotus jayakari* and *Buthacus cleptochelys*, but *B. jayakari* is the dominant.

LABORATORY REARING

Scorpions are difficult to rear in the laboratory because they live for three years or more. A variety of rearing containers can be used, including glass and plastic aquariums. Small containers are unacceptable for large species, and large containers occupy considerable laboratory space. Large containers may be suitable for some species, but scorpions often have difficulty in capturing prey in these containers, and having many species in containers encourages cannibalism. Small containers may save laboratory space, but may influence behavior.

A cardboard tunnel, 3 cm wide by 10 cm long, with impressions of sand inside, has been developed for rearing scorpions. These containers are preferred by scorpions in the laboratory, and they can be provisioned with water and food play.

COURTSHIP BEHAVIOR

In this research the prerequisites for the courtship dance (Promenade a deux) were studied. Males and females, after being confined separately for at least three weeks, initiated courtship within minutes of being placed together in a large container. Difficulties in the courtship included the presence of a spermatocleutrum in the genital chamber of the female.

TELSON AMPUTATION

The scorpion venom used for the production of antivenom is obtained from live scorpions by delivering an electric shock to the telson. The venom of the most dangerous species, *Hemiscorpius lepturus*, is obtained from amputated telsons, which are later dried and ground to obtain the venom.

Scorpions with amputated telsons remained alive, molted regularly, and successfully engaged in courtship and mating behavior. However, most species had a reduced life span, and it is expected that infection from bacteria is the cause of the shortened life.

NIGHT PROMENADE

The nocturnal activity and movement of scorpions is influenced by several factors, including biological rhythms, humidity, temperature, sex, age, season, courtship behavior, prey-seeking activities, and home range. The night promenade of *Odontobuthus doriae* has been studied in large plexiglass arenas. This species demonstrated considerable night-time activity in search of food and shelter.

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