

Leiurus quinquestriatus (Ehrenberg, 1828)

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History:

This species was originally described as *Androctonus (Leiurus) quinquestriatus* by Ehrenberg, in Hemprich & Ehrenberg, 1828. Several subsequent authors considered *Leiurus* to be a synonym of the genus *Buthus* Leach, 1815. However, in 1949, Max Vachon established *Leiurus* as a monotypic genus comprised of the single species *Leiurus quinquestriatus* (Ehrenberg, 1828), containing the subspecies *Leiurus quinquestriatus quinquestriatus* (Ehrenberg, 1828) and *Leiurus quinquestriatus hebraeus* (Birula, 1908). African populations of this species correspond largely to the subspecies *L. q. quinquestriatus* while those of Asian populations to *L. q. hebraeus* (Lourenco, Qi & Cloudsley-Thompson, 2006). Originally considered a monotypic genus, three additional species have been described since 2002. As of 2007, the genus *Leiurus* (Ehrenberg, 1828) is comprised of the following species and subspecies:

Leiurus quinquestriatus (Ehrenberg, 1828)

L. quinquestriatus quinquestriatus (Ehrenberg, 1828)

L. quinquestriatus hebraeus (Birula, 1908)

Leiurus jordanensis Lourenco, Modry & Amr, 2002

Leiurus savanicola Lourenco, Qi & Cloudsley-Thompson, 2006

Leiurus nasheri Kovarik, 2007



Distribution Range:

Africa (Algeria, Chad, Egypt, Ethiopia, Libya, Mali, Niger, Somalia, Sudan, Tunisia) and Asia (Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sinai, Syria, Turkey, United Arab Emirates, Yemen).

Habitat:

This species is found upon a wide variety of substrates in arid, semi-arid and mesic regions; primarily in deserts exclusive of sand dune systems (Levy & Amitai 1980). In the deserts around Khartoum, Sudan (Africa), this species occupies climatically harsh thermoxeric regions that may experience surface temperatures as high as 43.5°C, with ambient %RH as low as 13% (Abushama 1962, 1964). In the Negev Desert of southern Israel, surface temperatures may exceed 37.7°C (Hadley 1974; Warburg, 1997). This species has radiated from arid and semi-arid regions (Annual precipitation rate 50–150 mm) of eastern and southern Israel into the Jordan Valley and the mesic Mediterranean region (Annual precipitation rate 300–525 mm) as far north as the Galil Mountains (Warburg 1997). This species is a retreat generalist and will modify and occupy existing spaces under ground cover and debris. It may also adopt existing burrows of other invertebrates and small vertebrates, as well as excavate shallow burrows under rocks to 20 cm in depth (Abushama 1962, 1964, 1968; Cloudsley-Thompson 1961, 1965; Hadley 1974). This species has also been reported to enter houses (Levy & Amitai 1980).

Venom:

Primarily neurotoxic with abundant cardiotoxins; fatalities primarily the result of cardiovascular and respiratory dysfunction and failure (Gueron, et al 1967, 1992; Gueron & Yaron 1970; Gueron & Ovsyshcher 1987; Sofer & Gueron 1988; Kopeyan et al 1985, 1993; Ismail et al 1993; Ismail 1995; Shalita & Wells 2007). Reported LD50 toxicity levels of 0.16–0.50 mg/kg indicate that this species possesses one of the most toxic venoms described in scorpions. Despite the toxicity of the venom of this species, the majority of envenomations produce only localized effects in up to 97% of victims (Ben-Abraham 2000). Non-systemic reactions are probably due to the average quantity of venom injected (0.225 mg) being rather small. However, the venom of this species may be fatal in infants and children due to the effects being weight-dependent (Gueron & Yaron 1970). Despite anecdotal reports to the contrary, actual fatalities among envenomed adults are uncommon.

**General Information:**

Adult specimens 80–110 mm total length. Coloration typically yellow to orangish-yellow. Metasomal segment V typically with dark coloration restricted to the posterior 2/3 of the segment. Amount and intensity of dark coloration can vary among specimens. Older specimens may be darker in overall coloration and the dark coloration of metasomal segment V faded, reduced or indistinct. Tergites I & II pentacarinata; tergites



III–VII, tricarinate. Chelae elongate and gracile; base of closed fingers approximate in width to the manus.

Pectinal Tooth Counts (PTC): ♂ 31–36; ♀ 26–29. Pectines generally greater in length, with longer, more numerous teeth in males. Basal piece in males narrow allowing the basal pectinal teeth to touch or overlap. Basal piece wider in females, with shorter, less numerous pectinal teeth; basal pectinal teeth do not touch or overlap. Males are typically smaller, thinner and less robust than females.



In Captivity:

This species is exported from Egypt in large numbers for the pet-trades in the U.S.A. and Europe, and is currently one of the most common buthid scorpions in captivity. While it is certainly true that much of the information regarding this species has been embellished and exaggerated to varying degrees, this species does possess one of the most toxic venoms identified in invertebrates and specimens are behaviorally unpredictable in their defensive reactions and responses to varying stimuli. It is strongly recommended that the novice keeper avoid this species and that this species should only be kept and maintained in captivity by those keepers that have gained at least a moderate degree of experience and knowledge in working with a diverse range of scorpion species.

References:

- Abushama, F. T. 1962.** Bioclimate, diurnal rhythms and water-loss in the scorpion, *Leius quinquestratus* (H. & E.). *Entomologist's Monthly Magazine* 98: 216–224.
- Abushama, F. T. 1964.** On the behaviour and sensory physiology of the scorpion *Leius quinquestratus* (H. & E.). *Animal Behaviour* 12: 140–153.
- Abushama, F. T. 1968.** Observations on the mating behaviour and birth of *Leius quinquestratus* (H. & E.), a common scorpion species in the Central Sudan. *Revue de Zoologie et de Botanique Africaines* 77: 37–43.



- Ben-Abraham, R., G. Eschel, E. Winkler, A. A. Weinbroum, Z. Barzilay & G. Paret. 2000.** Triage for *Leiurus quinquestriatus* scorpion envenomation in children—is routine ICU hospitalization necessary? *Human and Experimental Toxicology* 19: 663–666.
- Cloudsley-Thompson, J. L. 1961.** Observations on the biology of the scorpion, *Leiurus quinquestriatus* (H. & E.), in the Sudan. *Entomologist's Monthly Magazine* 97: 153–155.
- Cloudsley-Thompson, J. L. 1965.** The scorpion. *Science Journal* 1: 35–41.
- Gueron, M., J. Stern & W. Cohen. 1967.** Severe myocardial damage and heart failure in scorpion sting. *American Journal of Cardiology* 19: 719–725.
- Gueron, M. & R. Yaron. 1970.** Cardiovascular manifestations of severe scorpion sting: Clinicopathologic correlations. *Chest* 57: 156–162.
- Gueron, M. & I. Ovsyshcher. 1987.** What is the treatment for cardiovascular manifestations of scorpion envenomation? *Toxicon* 25: 121–124.
- Gueron, M., R. Ilia & S. Sofer. 1992.** The cardiovascular system after scorpion envenomation. A review. *Journal of Toxicology; Clinical Toxicology* 30: 245–258.
- Hadley, N. F. 1974.** Adaptional biology of desert scorpions. *Journal of Arachnology* 2: 11–23.
- Ismail, M. 1995.** The scorpion envenoming syndrome. *Toxicon* 33: 825–858.
- Ismail, M., A. J. Fatani & T. T. Dabees. 1993.** Experimental treatment protocols for scorpion envenomation: A review of common therapies and an effect of kallikrein-kinin inhibitors. *Toxicon* 30: 1257–1279.
- Kopeyan, C., G. Martinez & H. Rochat. 1985.** Primary structure of toxin IV of *Leiurus quinquestriatus quinquestriatus*: Characterization of a new group of scorpion toxins. *FEBS Letters* 181: 211–217.
- Kopeyan, C., P. Mansuelle, M. F. Martin-Eauclaire, H. Rochat & F. Miranda. 1993.** Characterization of toxin III of the scorpion *Leiurus quinquestriatus quinquestriatus*: A new type of alpha-toxin highly toxic to both mammals and insects. *Natural toxins* 1: 308–312.
- Kovarik, F. 2007.** *Leiurus nasheri* sp. nov. from Yemen (Scorpiones, Buthidae). *Acta Societas Zoologicae Bohemicae* 71: 137–141.
- Levy, G. & P. Amitai. 1980.** Fauna Palaestina. Arachnida I. Scorpiones. Israel Academy of Sciences and Humanities, Jerusalem. Pp. 130.
- Lourenco, W. R., D. Modry & Z. Amr. 2002.** Description of a new species of *Leiurus* Ehrenberg, 1828 (Scorpiones, Buthidae) from the south of Jordan. *Revue Suisse de Zoologie* 109(3): 635–642.
- Lourenco, W. R., J.-X. Qi & J. L. Cloudsley-Thompson. 2006.** The African species of the genus *Leiurus* Ehrenberg, 1828 (Scorpiones: Buthidae) with the description of a new species. *Boletín Sociedad Entomológica Aragonesa* 39: 97–101.
- Shalita, E. A. & R. D. Wells. 2007.** Treatment of yellow scorpion (*Leiurus quinquestriatus*) sting: A case report. *Journal of the American Pharmacists Association* 47: 616–619.
- Sofer, S. & M. Gueron. 1988.** Respiratory failure in children following envenomation by the scorpion, *Leiurus quinquestriatus*: hemodynamics and neurological aspects. *Toxicon* 26: 931–939.
- Warburg, M. R. 1997.** Biogeographic and demographic changes in the distribution and abundance of scorpions inhabiting the Mediterranean region in northern Israel. *Biodiversity and Conservation* 6: 1377–1389.

