

The effect of different pitfall trap designs on catch size and species composition of scorpions (Arachnida, Scorpiones), towards an optimized trap

Yasser Bakhshy¹, Reza Sadeghi², Ali Daneshnia³, and Mehdi Khoobdel¹

¹Baqiyatallah University of Medical Sciences

²Islamic Azad University of Borujerd

³Shiraz University

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Abstract

Pitfall trapping is one of the widely used methods in ecological studies to assess epigeal arthropods' diversity and density. Our work is the first study to evaluate the capture efficiency of different pitfall traps for collecting scorpions. We examined the impact of trap diameter, trap cover, and use of funnels, and designed eight different trap types by combining these factors. A total of 64 traps were tested in an arid plain in Khuzestan Province, southwest Iran, during winter and spring over a 24-day period, and a total of 772 scorpions were trapped. The results indicate that pitfall traps are most productive for capturing burrowing scorpions. In addition, most scorpions were captured with covered traps, which can be explained by the cryptic lifestyle of scorpions, which tend to use spaces under rocks and other objects for shelter or to search for their prey. It is also noted that larger traps catch more scorpions, and the use of funnels does not significantly affect the number of scorpions caught. However, using funnels is recommended because it can reduce the number of unwanted bycatch samples. Based on our results, an optimized trap design for collecting scorpions is proposed, namely a funnel trap with an opening diameter of ca. 15 cm equipped with a plastic cover.