

HABITAT OF *HETEROMETRUS XANTHOPUS* (POCOCK) (SCORPIONIDAE) IN PIRANGUT, DIST: PUNE, M/S, INDIA

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Abstract

Heterometrus xanthopus is a large scorpion species widely distributed in the arid and semi-arid zones of India. Known for its robust body and potent venom, it inhabits burrows in open landscapes with loose soil. The present study investigates the habitat features of *H. xanthopus* in and around Pirangut, District Pune, Maharashtra. Systematic field surveys were conducted from June 2023 to May 2024, covering different habitat types such as fallow lands, scrublands, rocky terrain, and plantation edges. Observations included soil texture, vegetation type, burrow dimensions, and environmental parameters. Results indicate that *H. xanthopus* favours loamy soils with moderate vegetation cover and minimal human disturbance. Burrows averaged 4.2 cm in entrance diameter and 32–44 cm in depth. This baseline study contributes to the understanding of the species' microhabitat preferences in the Pirangut region, supporting further ecological and conservation research.

Keywords: *Heterometrus xanthopus*, scorpion, habitat, Pirangut, Maharashtra

1. Introduction

Scorpions are among the most ancient terrestrial arthropods, with fossil evidence tracing their lineage back over 400 million years (Sissom, 1990). All species possess venom, although toxicity varies, and not all are dangerous to humans. The Indian scorpion fauna is diverse, comprising more than 120 species across five families and 19 genera (Tikader & Bastawade, 1983). The genus *Heterometrus* is notable for its large-bodied members adapted to a variety of environments. *H. xanthopus* (Pocock), commonly referred to as the Indian Desert Scorpion, is widely distributed in dry and semi-arid landscapes of India (Bastawade, 1992). It exhibits several physiological and morphological adaptations for survival in xeric conditions, such as a waxy cuticle to minimise water loss, robust pedipalps for excavation, low basal metabolic rates, and excretion of guanine to conserve water (Hadley, 1974; Marples & Shorthouse, 1982).

Pirangut, situated in Mulshi Tehsil of Pune District, is undergoing rapid urbanisation and agricultural expansion, which may affect native arthropod diversity. While *H. xanthopus* has been reported from other parts of Maharashtra (Bastawade, 1992; Tikader & Bastawade, 1983), no detailed account of its habitat in Pirangut exists. This study aims to fill that gap by documenting its occurrence and describing specific habitat features.

2. Materials and Methods

The present study was carried out in Pirangut, located in Mulshi Tehsil, District Pune, Maharashtra, between June 2012 and May 2013. The area experiences a semi-arid tropical climate with hot summers, mild winters, and monsoon rainfall averaging 900–1100 mm annually. Surveys were conducted across four representative habitat types—agricultural fallow lands, scrublands, rocky slopes, and plantation peripheries. Each site was visited monthly during evening hours (19:00–23:00 hrs) using ultraviolet (UV) light detection to locate active scorpions, as their exoskeleton fluoresces under UV illumination. Daytime inspections were also conducted to locate burrows, with observations made on soil type, vegetation, and site characteristics.

For each scorpion or burrow recorded, data on GPS location, soil texture, entrance diameter, burrow depth, and surrounding vegetation cover (within a 1 m radius) were collected. Environmental parameters such as soil moisture, ambient temperature, and relative humidity were measured using portable field instruments. Soil texture was determined by hand texturing, and vegetation cover was visually estimated. Scorpions were handled carefully using soft-tipped forceps, examined for identification, and released at the point of capture to minimise disturbance to the natural population. Data were tabulated and summarised to identify habitat preferences and environmental associations of *H. xanthopus* in the study area.

3. Results

During the year-long survey, a total of 42 individuals of *Heterometrus xanthopus* were recorded from various habitats in Pirangut. The highest number of sightings occurred in scrublands (47.6%), followed by agricultural fallow lands (28.5%), rocky slopes (16.7%), and plantation edges (7.2%). Most burrows (71.4%) were found in well-drained loamy soils, with smaller proportions in sandy loam (19%) and clay-rich soils (9.6%). Burrow entrances averaged 4.2 cm in diameter and were typically inclined, extending 32–44 cm in depth before terminating in a chamber. Vegetation around burrow sites was generally sparse to moderately dense, dominated by grasses and thorny shrubs, with canopy cover

rarely exceeding 40%. Environmental readings taken at occupied sites showed night-time temperatures averaging 26.8°C, relative humidity ranging from 38–56%, and soil moisture generally below 12%.



Fig: Burrow of *H. xanthopus*.

4. Discussion

The findings of this study show that *H. xanthopus* in Pirangut demonstrates a strong preference for loamy soils in scrubland habitats, consistent with previous observations in other semi-arid regions of India (Bastawade, 1992; Kalra et al., 2014). The loose, well-drained soils facilitate burrow construction, which plays a crucial role in thermoregulation, predator avoidance, and maintaining humidity (Hadley, 1974; Polis, 1990).

The predominance of records in scrublands aligns with the species' known ecological tendency to inhabit open, sunlit areas interspersed with sparse vegetation, which support higher prey abundance (Warburg & Polis, 1990). Burrow dimensions in this study (32–44 cm deep) are comparable to those documented for *Heterometrus* species in Rajasthan, where similar soil conditions prevail (Sharma & Bastawade, 2002).

Anthropogenic disturbances, including land clearing, pesticide application, and construction activities, can adversely affect *H. xanthopus* habitats (Polis, 1990; Kalra et al., 2014). Preservation of scrubland areas and sustainable land-use practices in peri-urban zones like Pirangut may therefore be important for maintaining populations.

5. Conclusion

Heterometrus xanthopus is a characteristic scorpion of the semi-arid landscapes of Pirangut. It thrives in loamy soils with moderate vegetation cover, constructing burrows that offer protection and stable microclimates. Understanding its habitat requirements is essential for conservation planning, especially in rapidly developing peri-urban areas.

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