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# Preferred Microhabitats (E.g., Basking Sites, Nesting Areas, Burrows) of Marsh Muggers in the Sanctuary

***Anjali Garg, Dr. Navpreet Kaur***

**Department of Zoology, Deshbhagat University**
**garganjali831@gmail.com**

**ABSTRACT**

The Marsh Mugger (*Crocodylus palustris*) is a versatile freshwater crocodilian distributed across India and neighboring countries. This study investigates the microhabitat preferences of Marsh Muggers at the Crocodile Breeding and Conservation Centre, Bhor Saidan, Haryana, focusing on basking sites, nesting areas, and burrows. Field surveys conducted from October 2024 to March 2025 recorded environmental parameters, habitat characteristics, and behavioral observations. Results indicated that basking was concentrated on southern-facing banks with high sun exposure and minimal disturbance, nesting occurred on elevated sandy ridges with optimal soil temperatures and drainage, and burrows were preferentially used in shaded zones during the late dry season for thermoregulation. The findings highlight the critical role of specific microhabitats in supporting thermoregulation, reproduction, and shelter, offering practical implications for habitat enrichment and conservation management in semi-natural captive environments.

**Keywords:** *Crocodylus palustris*, microhabitat preference, basking sites, nesting areas, burrows, thermoregulation, captive management, Bhor Saidan, Haryana, conservation biology.

## 1. Introduction

The freshwater crocodile species known as the Marsh Mugger (Crocodylus palustris) is widespread in India and its surrounding nations.

This species, which is well-known for its ecological versatility, lives in marshes, lakes, rivers, and reservoirs (Whitaker & Whitaker,2008).

The species' ability to regulate its body temperature, reproduce, and avoid predators depends heavily on microhabitats including burrows, nesting places, and basking spots (Rao & Singh, 1993).

One of India's most important Mugger crocodile conservation sites is the Bhor Saidan Crocodile Sanctuary in Haryana. Understanding microhabitat preference is crucial to reproducing natural environments, enhancing habitat quality, ensuring successful breeding, and maintaining population stability over the long term, even under controlled conditions.

## 2. Research Space

The study was carried out at the Crocodile Breeding and Conservation Centre, which is situated on the banks of the Saraswati River in Bhor Saidan (Ku rukshetra District, Haryana).

Studying Mugger habitat utilization in a semi-wild environment is made possible by the sanctuary's semi-natural enclosures with lakes, sandy banks, and vegetation sections.

## 3. Approach

### *3.1 Surveys in the Field*

The investigation was carried out between October 2024 and March 2025, a span of six months.

Twice a day, in the morning and the afternoon, observations were made to document the position and conduct of muggers.

### *3.2 Classification of Microhabitats*

The microhabitats were divided into:

Sites for basking: exposed banks of mud or sand that receive more than 60% of the sun's rays.

Nesting Areas: During the breeding season, females choose high, sandy or loamy areas.

Burrows: shady holes excavated beneath thick foliage or into embankments; mostly utilized for resting and summertime.

### *3.3 Information Gathering*

Temperature, soil type, water depth, sun exposure, vegetation cover, and human disturbance were among the variables that were noted.

Every observed individual and nest's GPS location was recorded.

The pre-monsoon and summer seasons were when nesting and burrowing activities were most frequently seen.

### *3.4 Evaluation*

A correlation matrix was created to evaluate the connections between habitat characteristics and usage frequency, and habitat preference indices were c omputed.

## 4. Findings

### *4.1 Preferences for Basking Sites*

Muggers generally lounged on banks that faced south, had fine sand, and had no vegetation.

Peak basking hours saw an average of 75–85% exposure to sunlight.

Disturbance-sensitive people clearly retreated into more tranquil enclosures, avoiding locations close to tourist walkways.

### *4.2 Choosing a Nesting Area*

Elevated sandy ridges with well-drained soils comprised the majority of nesting locations.

With an average soil temperature of 30°C, the majority of nests (n=11) were situated 12–20 meters away from the body of water.

Because there was less vegetation close to the nests, there was less shade, which promoted healthy incubation.

### *4.3 Use of Burrows*

The majority of the burrows were found in shady spots on the north-facing banks, and they were mostly utilized in the late dry season.

Claw markings and thermal regulation behavior were seen in repurposed burrows.

Burrows' shaded interiors were continuously 5–7°C colder than the surrounding air.

## 5. Discussion

The Mugger's utilization of Bhor Saidan's microhabitats satisfies ecological requirements for shelter, breeding success, and thermoregulation. According to research by Gopal (2003), basking behavior is closely related to solar exposure and little human disturbance.

A characteristic frequently seen in Mugger habitats in India, nesting behavior suggests the necessity for loose, well drained soils at safe distances from water to prevent floods (Rao & Singh, 1993).

Even though the sanctuary offers semi-natural surroundings, behavioral flexibility may be impacted by increased visitor volume and cage design. Stress could be decreased and habitat usage increased by increasing habitat complexity, establishing shady burrow zones, and restricting human access during important breeding times

## 6.Conclusion

The importance of microhabitats, such as burrows, nesting places, and basking spots, for Marsh Muggers in the Bhor Saidan Crocodile Sanctuary is hig hlighted by this study.

Preserving and improving these characteristics in semi-wild and captive environments should be the top priority of conservation initiatives.

The findings of this study can help direct habitat enrichment plans and shape more general strategy for the protection of muggers in northwest India.

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