

Background

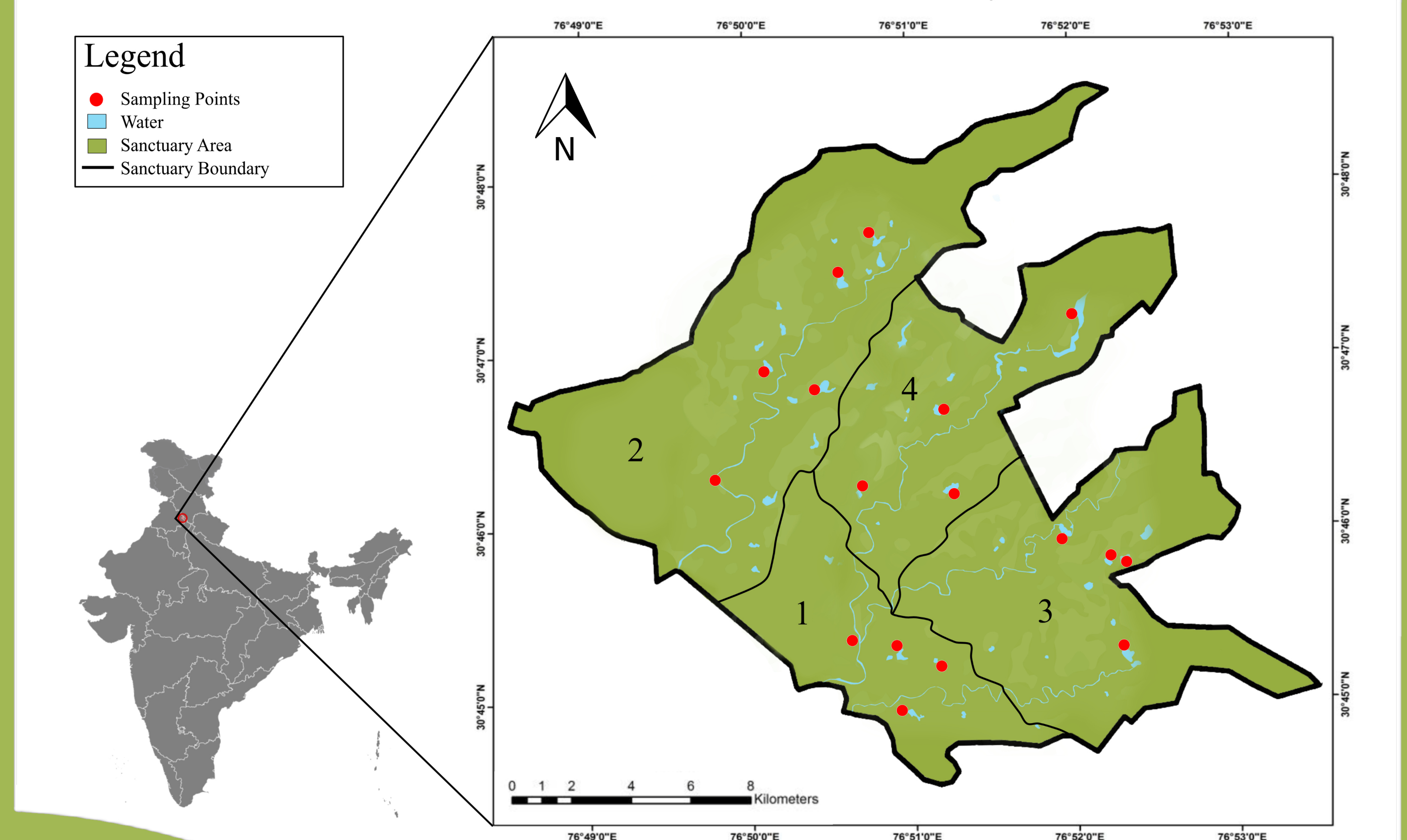
India has an impressive 776 species of aquatic beetles^[1], highlighting the country's exceptional biodiversity. Previous studies on Indian aquatic beetles have predominantly concentrated on taxonomic characteristics, offering little understanding of their habitats and ecology^[2].

- This study explores the population dynamics and spatial dispersion of aquatic beetles.
- It also sheds light on the species of water beetles and is the first ever taxonomic exploration of the Adepaga of this region.

Why water beetles and why the Shivaliks ?

- Aquatic beetles play crucial roles in freshwater ecosystems by engaging in nutrient cycling and serving as integral components of aquatic food webs^[3]. Furthermore, their sensitivity to environmental changes provides valuable insights into ecosystem health
- The Shivalik hills acts s a way point between the Himalayas and the plains and its biodiversity remains largely unexplored.
- Sukhna WLS is located at the heart of this region and hosts the maximum number of freshwater bodies; around 175 sizeable dams and 4 rain fed rivers.

Study Area

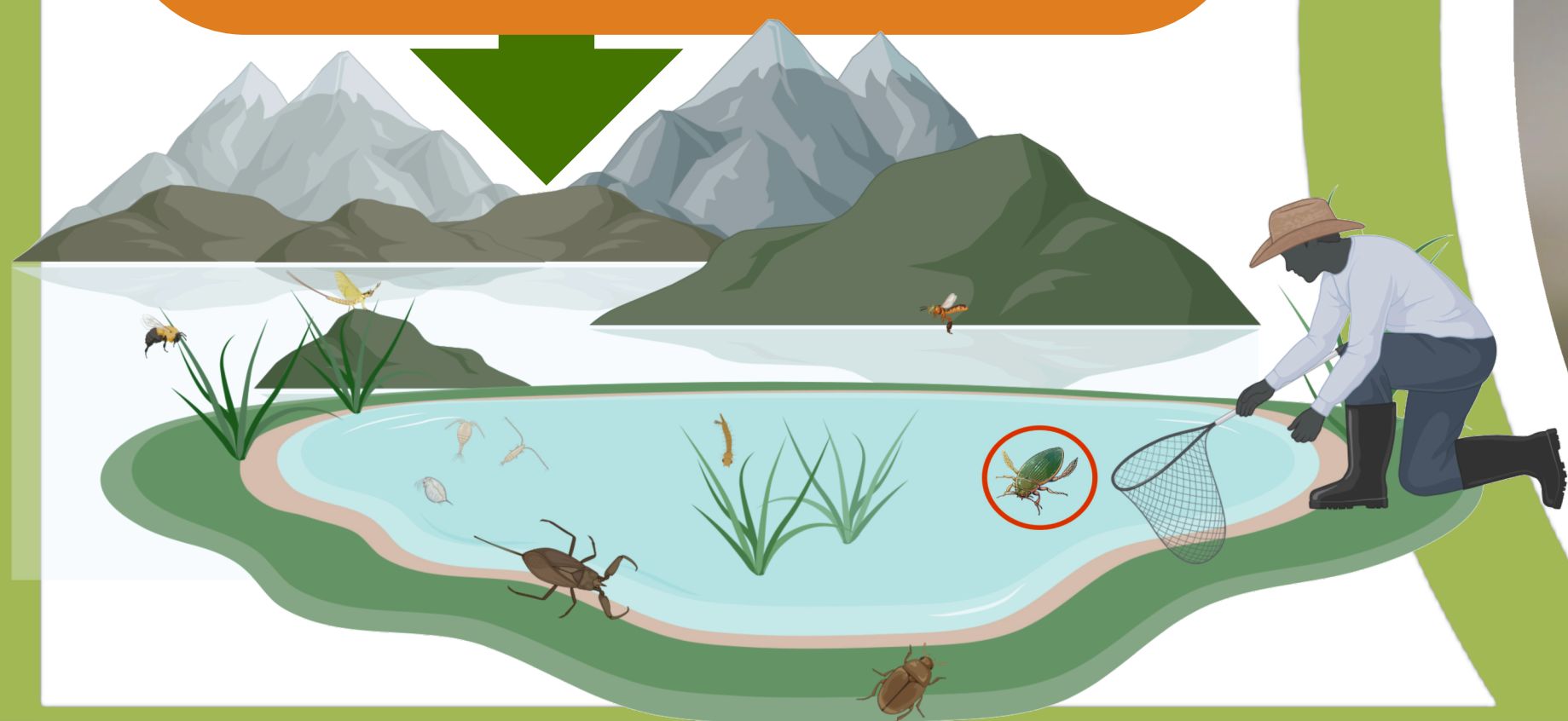


Methodology

Collection of beetles through sweep netting water bodies

Mounting & photographing of specimens

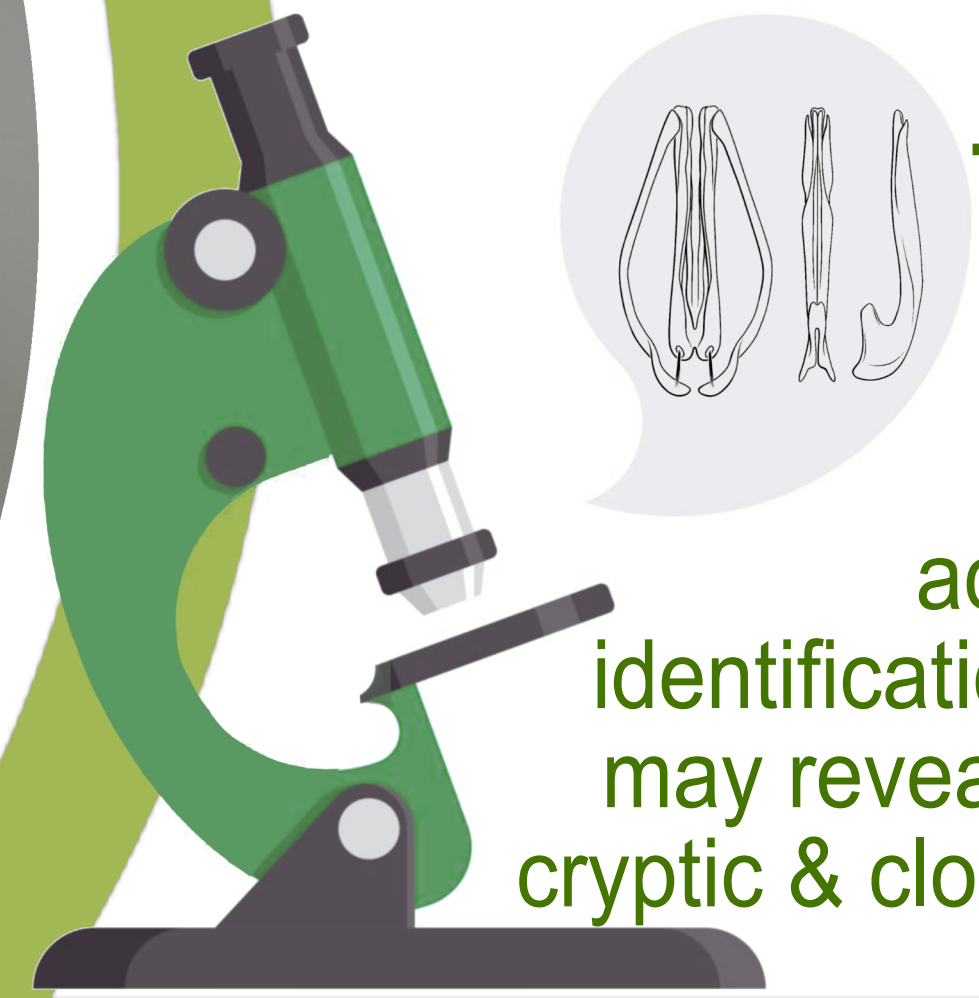
Taxonomic identification & reviewing literature



Future Work

Increase the sampling area: The mountain range extends to over 1200 km and may home to new, un-described species due to its high local endemism.

Long term Monitoring: Conduct extensive surveys to see temporal variation in beetles.

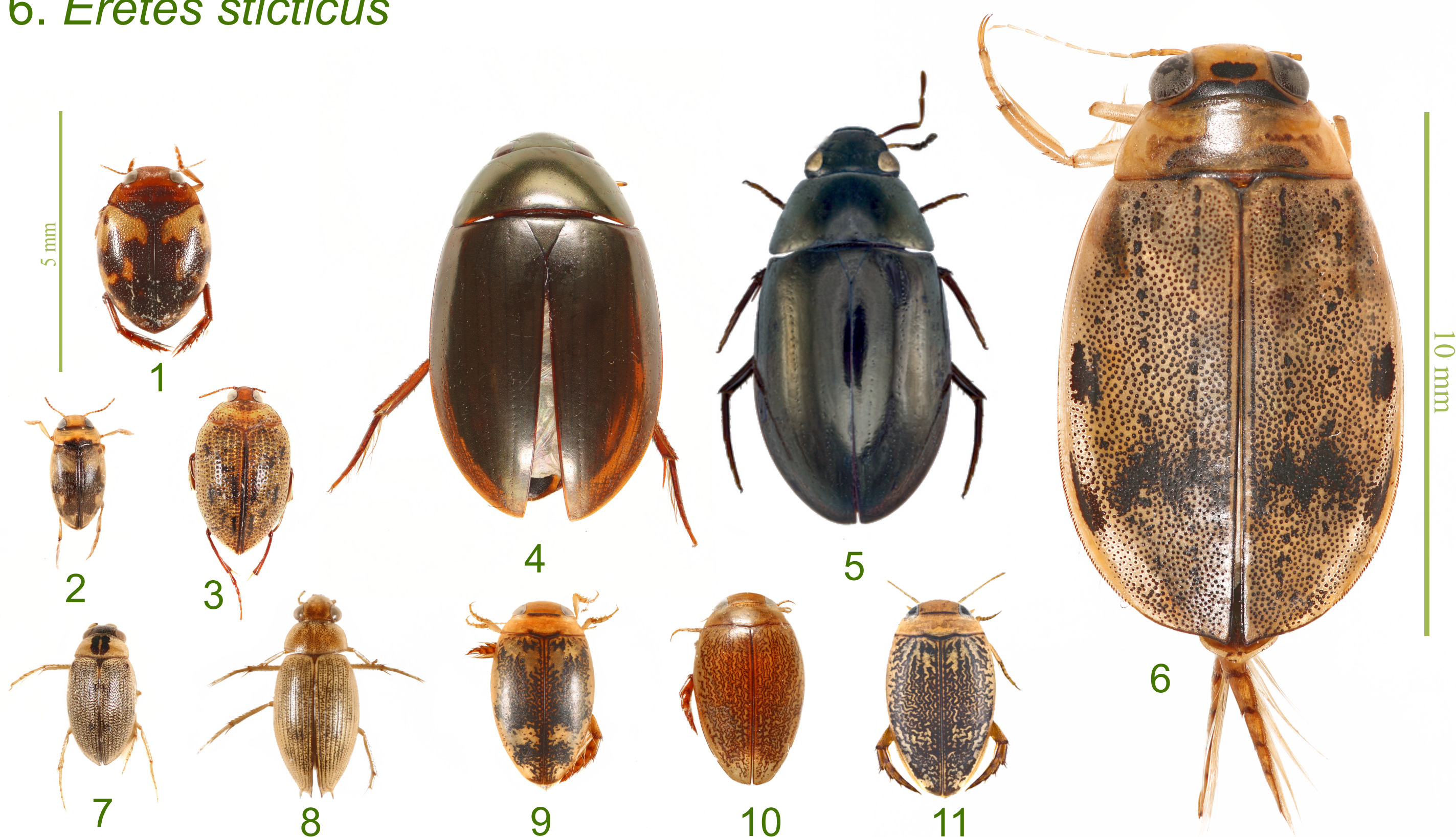


Genetic Based Taxonomy: Employ the use of genetic techniques such as DNA bar coding for accurate and efficient identification of beetles, which may reveal further insights for cryptic & closely related species

Results

11 species across 7 genera and 3 families were found.

1. *Hyphoporus sp.*
2. *Hydroglyphus flammulatus*
3. *Halipilus angustiformis*
4. *Sternolophus rufipes*
5. *Sternolophus inconspicuus*
6. *Eretes sticticus*
7. *Berosus pulchellus*
8. *Berosus incretus*
9. *Laccophilus parvullus*
10. *Laccophilus flexuosus*
11. *Laccophilus sharpi*



• *Laccophilus* was the most widespread and abundant species followed by *Hydroglyphus*.

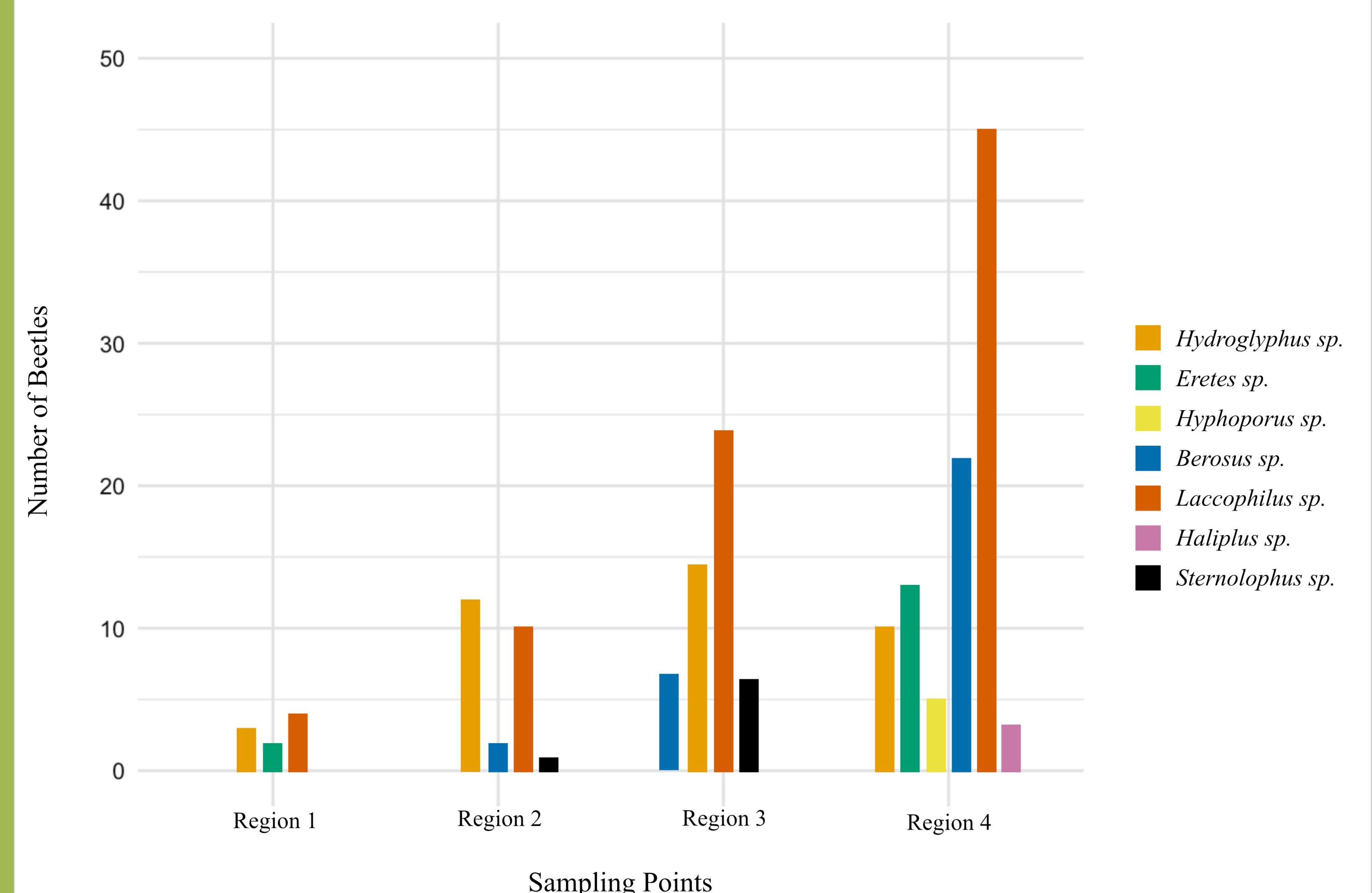
• Species richness and population exhibited an upward trend with increasing altitude and deeper penetration into the sanctuary.

Discussion

Habitat Generalists: The uniform distribution of species like *Laccophilus* and *Hydroglyphus* implies adaptability to diverse conditions, highlighting potential habitat generalism^[4].

Altitudinal influence: Altitude may have a substantial influence on the composition of beetles through influencing the distribution of species^[5], coupled with anthropogenic and habitat quality, since diversity and populations were greater in the sanctuary's deeper, untouched regions.

Biogeographic Insights: It was been observed that seven out of the eleven aquatic beetle species found in Chandigarh have not yet been reported in the north west region of India^[6]. Further exploration may reveal additional endemic or rare species, necessitating targeted conservation efforts.



References

1. Chandra et al (2017), ZSI, 379-400.
2. Sheth et al (2018), Zootaxa, 4459 (2), 235-260.
3. Sharma et al (2019), Acta Zoologica Lituanaica 14(1), 31-37.
4. Lundqvist et al (2003), Ecography, 26(3), 355-364.
5. Taher et al (2018), Iranian Journal of Animal Biosystematics, 15, 10.22067
6. Ghosh et al (2012), Catalogue of the Diving Beetles of India

Acknowledgements: The author is grateful to Mr. Max Barclay for his encouragement and assistance, director of Zoological Survey India and the Chandigarh Forest Department for providing access to the Sukhna Wildlife Sanctuary. The author is also grateful to Mr. Narbir Kahlon, Mr. Pragyee Om Chaudhary, Mr. Navjit Singh, Mrs. Rima Dhillon, R.F.O Devender Chauhan and Forester Sanjay Yadav for their assistance in the field work and collection of specimens.