

Diversity and Status of Non-Marine Molluscs in Papikonda National Park

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ABSTRACT

In the present study, an attempt has been made to investigate the Mollusc assemblages of Papikonda National Park, Andhra Pradesh during the years 2021-2022. Papikonda National Park is located in Andhra Pradesh state covering East Godavari and West Godavari districts and is one of the biodiversity rich regions in Eastern Ghats. Many studies have been conducted on fauna of the park. However, little or no attention is paid to malacofauna. In the current study, the authors recorded 44 species of non-marine molluscs constituting 20 freshwater and 24 terrestrial species. Among the freshwater species, *Tarebia granifera*, *Melanoides tuberculata* and *Radix rufescens*, and among terrestrial species, *Glossularia ubtornensis* and *Macrochlamys indica* were the most frequent species. Unionidae and Ariophantidae were found to be the most speciose families in freshwater and terrestrial habitats respectively.

Key words: Papikonda National Park, Non-marine mollusca, Andhra Pradesh, Eastern Ghats

Introduction

Mollusca is second-biggest and one of the most speciose phyla. The morphology of their representatives is extremely diverse. Mollusca forms an important component of ecosystem and influence the health of the ecosystem they inhabit. According to Benkendorff (2010), they represent 7% of the total fauna. They are well-used as bio-indicators to assess the health of the ecosystem (von Rintelen and Hauser, 2017; Berliana *et al.*, 2024, Doshi *et al.*, 2024). They are also used to interpret the palaeo environment by researchers (Roth and Emberton, 1994; Karrow *et al.*, 1996). Due to their pharmacological activity, their metabolites are used as nutraceuticals and natural medicinal drugs (Ngandjui *et al.*, 2024). 28 freshwater species have been reported to be inva-

sive globally (Mahapatra *et al.*, 2023). The IUCN conservation status of 7% of mollusc species is known (Christensen *et al.*, 2021). Sajan (2018) emphasized Article 7(a) of Convention on Biological Diversity (CBD) that stresses the importance of identifying of biodiversity components for its conservation. The current work is the first attempt to fill the gaps in knowledge of non-marine molluscs in Eastern ghats.

Materials and Methods

Study Location: Papikonda National park is located in Andhra Pradesh state covering East Godavari and West Godavari districts. It was declared as wildlife sanctuary in 1978 and amended to National Park in 2008. It lies in northern Eastern Ghats spreading over 18° 49' 20" N to 19° 18' 14" N Latitudinally and 78° 14' 20" E to 78° 14' 20" E Longitude.

tudes and 79° 54' 13" E to 83° 23' 35" E Longitudes with a geographical area of 1,012.86 square kilometer. River Godavari crosses PNP cleaving it into northern and southern halves. It consists of tropical dry deciduous and moist deciduous forest. PNP is one of biodiversity rich region in Eastern Ghats endowed with diverse habitats supporting equally diverse and unique species of flora and fauna. Many studies have been conducted on fauna of the park. However, little or no attention is paid to malacofauna. The current study aims to inventorise malacofaunal species that provides baseline data to the policy makers and is useful in identification of biodiversity rich areas for conservation.

Methodology: Molluscan specimens were collected by visual search method (Cummings et al., 2016) from the probable habitats. Specimens are collected either manually by hand or with the help of forceps. Leaf litter, wood logs, rocks, tree trunk and leaves are searched carefully for collecting land snails and river bank, stream trails, reservoirs for freshwater molluscs. Dip nets to collect gastropods from the aquatic habitat. Benthic sample was analyzed to collect freshwater bivalves. All the live specimens were narcotized and washed to get rid of dirt and excess mucus. They were treated with ascending grades of alcohol (20%, 40%, 60% and 70%) and finally preserved in 75% Ethanol. The dead

shells collected were dry preserved. After due sorting, specimens were identified was done using standard literature (Rao, 1989; Ramakrishna *et al.*, 2007). The specimens were studied and photographed using Leica M205 microscope. The specimens were then labeled, and deposited in the National Zoological Collection in Freshwater Biology Regional Centre, Zoological Survey of India, Hyderabad.

Results and Discussion

Molluscs consist of heterogeneous assemblage of organisms and are used in multitude ways for mankind. The estimated diversity of mollusca varies from 34000 to 120000 described species and 47000-200000 undescribed species (Rosenberg, Gary 2014). 31000 species of non-marine molluscs are estimated globally of which 24000 belongs to terrestrial molluscs and 7000 species belongs to freshwater molluscs (Strong *et al.*, 2008). Extant global diversity of freshwater gastropods is approximately 6000 and that of bivalves is nearing 1000 species (Bogan and Roe, 2008).

A total of 1340 species of non-marine molluscs have been reported from India, of which, 1140 species inhabits terrestrial and 217 species inhabits freshwater which constitute 26% of total malacofauna of India (Subba Rao, 1989;

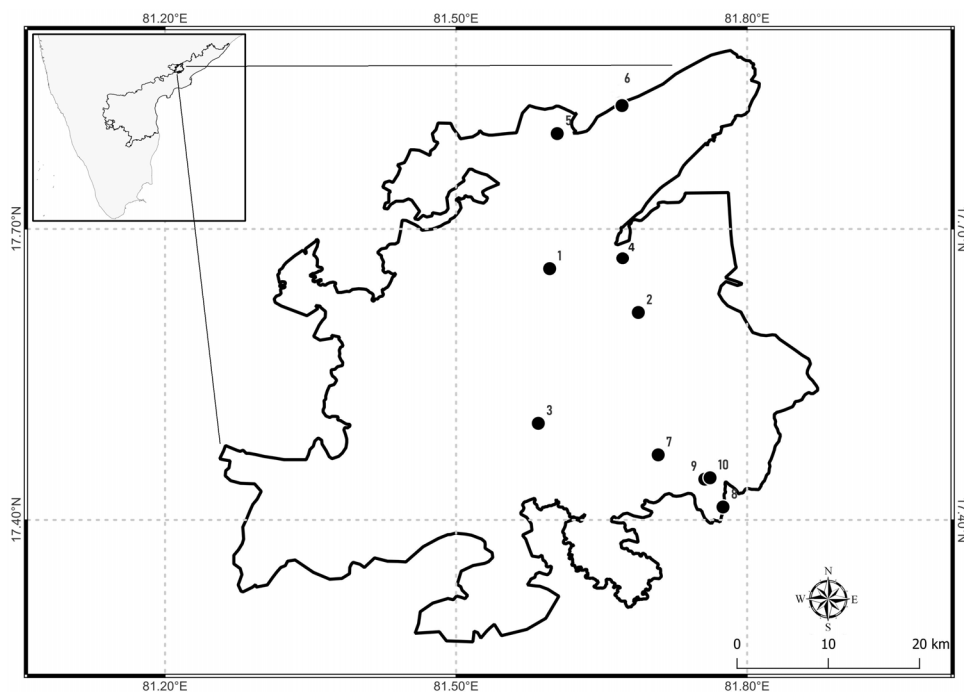


Fig. 1. Sampling stations at Papikonda National Park of Telangana

Ramakrishna *et al.*, 2007; Sajan *et al.*, 2018). 150 species of gastropods and 67 species of bivalves were reported from India (Mukhopadhyay *et al.*, 2017). Authors could record 43 species of non-marine molluscs constituting 20 freshwater species accommodated under 10 families and 24 terrestrial species belonging to 9 families from all the sampling stations. Of 20 freshwater species, 13 gastropods and 7 bivalves were recorded. The checklist of the species along with their status is presented below-

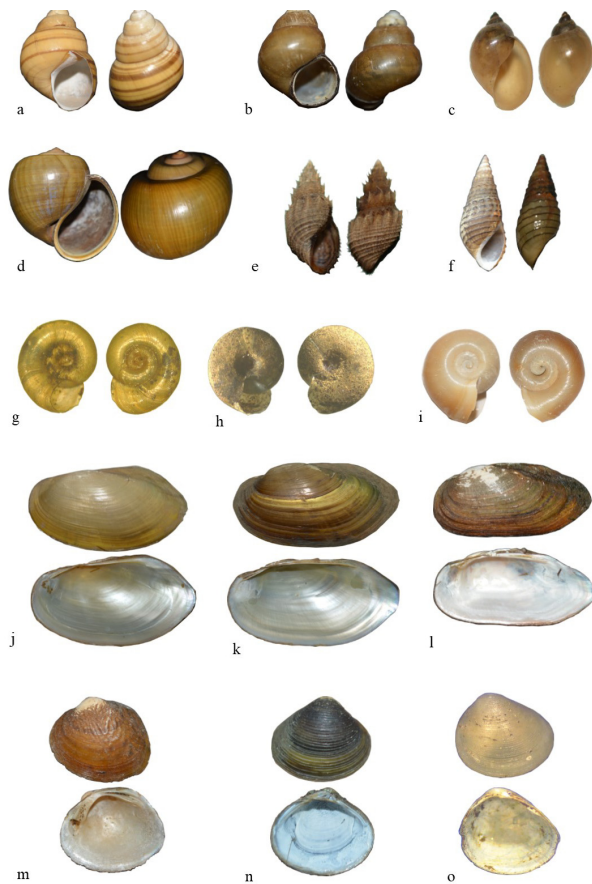


Fig. 2. Shell of freshwater gastropods and bivalves: a- *Filopaludinabengalensis* (Lamarck, 1822); b- *Idiopomadissimilis* (Mueller, 1774); c- *Racesinaluteola* (Lamarck, 1822); d- *Pila virens* (Lamarck, 1822); e- *Meiniploiascabra* (Muller, 1774); f- *Tarebiagranifera* (Lamarck, 1816); g- *Helicorbiscantori* (Benson, 1850); h- *Indoplanorbisxustus* (Deshayes, 1834); i- *Lamellidensgenerosus* (A. Gould, 1847); j- *Lamellidenscorrianus* (Lea, 1834); k- *Parreysiacorrugata* (Muller, 1774); l- *Indonaiacaerulea* (Lea, 1831); m- *Corbicula striatella* Deshayes, 1854; o. *Hindupisidiumclarkeanum* (Nevill and Nevill, 1871)

Table 1. Sampling locations at Papikonda National Park.

Sampling Locations	Latitude	Longitude
Ujjuluru	17.6591	81.5965
Maredumilli	17.6139	81.6879
Kintukuru Base Camp, PNP	17.4996	81.5848
Jalatarangini Waterfall	17.6202	81.6608
Koyalagudem	17.79835	81.6043
Bhupathipalem reservoir	17.8421	81.6651
Near Kondavada stream	17.4671	81.7084
Pond near Pedduru	17.41335	81.7752
Stream near Bhupathipalem	17.44203	81.75644
Musurumilli reservoir	17.44345	81.76185

A total of 44 non-marine molluscs were documented from Papikonda National Park. Among the freshwater species, *Tarebia granifera*, *Melanoidest uberculata* and *Radix rufescens*, and among terrestrial species, *Glessulasubtornensis* and *Macrochlamys indica* were the most frequent species. Of 19 families enu-

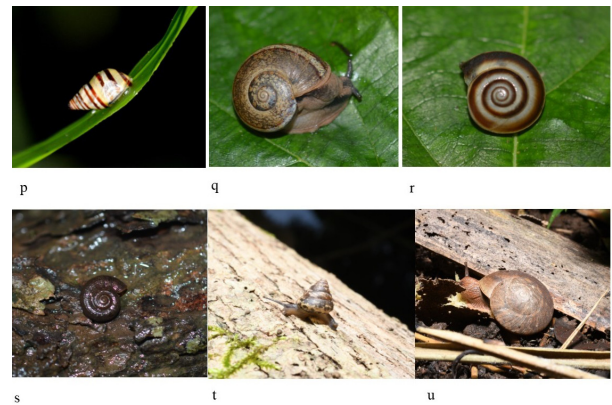


Fig. 3. Living land snails: p. *Rhachistiabengalensis* (Lamarck, 1822); q. *Ariophantaexilis* (Müller, 1774); r. *Ariophantalaaidlayana* (Benson, 1856); s. *Pterocyclusrupestrus* (Benson, 1832); t. *Kaliellabarrakporensis* (Pfeiffer, 1853); u. *Ariophantahimalana* (Lea, 1834)

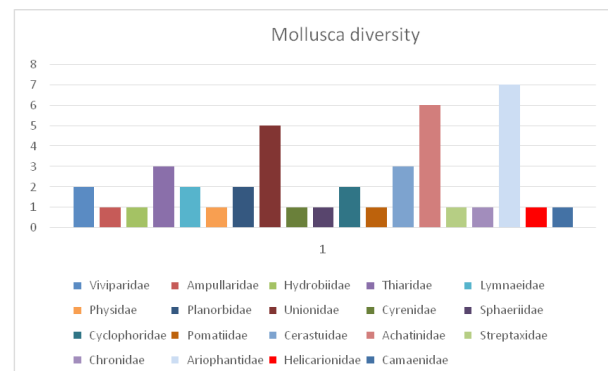


Fig. 4. Non marine malacofaunal diversity in Papikonda National Park

merated, Unionidae and Ariophantidae were found to be the most speciose families in freshwater and terrestrial habitats, respectively. In the present study, four species, viz. *Rhachistia bengalensis*,

Rhachistiapulchra, *Cryptausteniabensoni* and *Chloritis propinqua*, have been reported for the first time from the state. Their IUCN status has not yet been assessed. During the study, habitat alteration and pol-

Table 2. Taxonomic list of freshwater molluscs from Papikonda National Park

Class	Order	Family	Species
Gastropoda	Archaitaenioglossa	Viviparidae	1. <i>Filopaludinabengalensis</i> (Lamarck, 1822)
			2. <i>Idiopomadissimilis</i> (Mueller, 1774)
		Ampullaridae	3. <i>Pila virens</i> (Lamarck, 1822)
		Hydrobiidae	4. <i>Gabbiastenothyroides</i> (Dohrn, 1857)
		Thiaridae	5. <i>Meiniplotiascabra</i> (Muller, 1774)
			6. <i>Melanoides tuberculata</i> (Mueller, 1774)
			7. <i>Tarebia granifera</i> (Lamarck, 1816)
	Hygrophila	Lymnaeidae	8. <i>Radix rufescens</i> (Lamarck, 1822)
			9. <i>Racesinaluteola</i> (Lamarck, 1822)
			10. <i>Physellaacuta</i> (Draparnaud, 1805)
		Physidae	11. <i>Gyraulusparvus</i> (Benson, 1850)
		Planorbidae	12. <i>Helicorbiscantori</i> (W.H. Benson, 1850)
	Bivalvia	Unionidae	13. <i>Indoplanorbisexustus</i> (Deshayes, 1834)
			14. <i>Lamellidensgenerosus</i> (Gould, 1847)
			15. <i>Lamellidenscorrianus</i> (Lea, 1834)
			16. <i>Lamellidensmarginalis</i> (Lamarck, 1819)
			17. <i>Parreysiacorrugata</i> (Muller, 1774)
			18. <i>Indonaiacaerulea</i> (Lea, 1831)
			19. <i>Corbicula striatella</i> Deshayes, 1854
	Venerida	Cyrenidae	20. <i>Hindupisidiumclarkeanum</i> (Nevill & Nevill, 1871)
		Sphaeriidae	

Table 3. Taxonomic list of land snails in Papikonda National Park

Class	Order	Family	Species	
Gastropoda	Architaenioglossa	Cyclophoridae	1. <i>Lagocheiluspolynema</i> (Pfeiffer, 1854)	
			2. <i>Pterocyclusrupestris</i> (Benson, 1832)	
	Littorinimorpha	Pomatiidae	3. <i>Cyclotopsissubdiscoidea</i> (Sowerby, 1850)	
		Stylommatophora	Cerastuidae	4. <i>Rhachistia bengalensis</i> (Lamarck, 1822)
			5. <i>Rhachistiapulchra</i> (Gray, 1825)	
			6. <i>Rachis punctata</i> (Anton, 1838) (Anton, 1838)	
	Achatinidae			7. <i>Glessulacrassula</i> (Reeve, 1850)
				8. <i>Glessulasubtornensis</i> Gude, 1914
				9. <i>Glessulafilosa</i> (Blanford, 1870
				10. <i>Lissachatinafulica</i> (Bowdich, 1822)
				11. <i>Subulinaoctona</i> (Bruguière, 1789)
				12. <i>Allopeas gracile</i> (Hutton, 1834)
	Streptaxidae			13. <i>Gulellabicolor</i> (Hutton, 1834)
			Chronidae	14. <i>Kaliellabarrakporensis</i> (Pfeiffer, 1853)
	Ariophantidae			15. <i>Ariophantahimalana</i> (Lea, 1834)
			16. <i>Ariophantaidlayana</i> (Benson, 1856)	
			17. <i>Ariophantabelangeri</i> (Deshayes, 1832)	
			18. <i>Ariophantaexilis</i> (Müller, 1774)	
			19. <i>Euplectaindica</i> (L. Pfeiffer, 1846)	
			20. <i>Euplectasubcastor</i> (Beddome, 1891)	
			21. <i>Macrochlamysperplana</i> Godwin-Austen, 1883	
			22. <i>Macrochlamys indica</i> Godwin-Austen, 1883	
	Stylommatophora	Helicarionidae	23. <i>Cryptausteniaben soni</i> (Pfeiffer, 1849)	
		Camaenidae	24. <i>Chloritispropinqua</i> (Pfeiffer, 1857)	

lution were main threats observed to malacofauna. It is highly recommended to conduct further systematic research studies for deeper understanding of malacofauna of the park.

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Conflict of Interest- None

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