

Analyzing the Bivalve Species of Genus *Parreysia* Along with Water Quality of Kuadhas and Pangoli Rivers from Gondia Maharashtra, India.

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ABSTRACT

Aquatic environments benefit greatly from the contribution of freshwater bivalves. They are crucial for ancient remedies, and a variety of industrial uses, primarily the manufacturing of pearls, slacked lime, and use as a food source in various regions. Malacofauna was assessed from Kuadhas river and Pangoli river of Gondia Maharashtra for six months. The physicochemical parameters comprising pH, turbidity, color, nitrate, sulfate, phosphate, silica, free carbon dioxide, alkalinity, dissolved oxygen, and total hardness were evaluated since aquatic body water quality has an impact on the occurrence and survival of flora and fauna. This paper deals particularly with different species and varieties from the genus *Parreysia* among freshwater bivalves. From study sites genus *Parreysia* represents total 8 species as *Parreysia favidens*, *Parreysia favidens marcens*, *Parreysia corrugata*, *Parreysia corrugata nagpoorensis*, *Parreysia cylindrica*, *Parreysia Radiatula shurtleffiana*, *Parreysia (Radiatula) khadakvaslaensis*, *Parreysia Radiatula caerulea gaudichaudi*. Bivalve occurrence peaked in the post-monsoon season and declined during the monsoon. *Parreysia favidens* and *Parreysia corrugata* are widely distributed in the Kuadhas River. The two major species in the Pangoli River are *Parreysia (Radiatula) khadakvaslaensis* and *Parreysia favidens*. In both rivers *Parreysia favidens marcens*, *Parreysia corrugata nagpoorensis*, and *Parreysia Radiatula shurtleffiana* are listed as being rarer species.

KEY WORDS: PFRESHWATER BIVALVES, GONDIA DISTRICT, MAHARASHTRA, MALACOFUNA, PHYSICOCHEMICAL PARAMETERS.

INTRODUCTION

Freshwater mollusks contribute significantly to the biogeochemical cycle and are an essential component of the aquatic ecosystem (Dey, 2007). Among molluscs, bivalves don't have head like that of gastropods. Externally structure consisting of two valves made up of calcium carbonate and joined together by soft ligament at a hinge. Inside the shell have mantle secreted by shell enclosing visceral mass, two pairs of gills and foot (Rao, 1989). In rivers and lakes, freshwater bivalves serve as filters. Numerous species can be found in dense clusters and filter out a lot of silt, bacteria, diatoms, blue-green algae, and other microscopic organisms as well as heavy metals and big organic compounds. Genus *Parreysia* of class Bivalvia, comes under subclass

Palaeoheterodonta and family Unionidae of phylum Mollusca (Rao, 1989).

Some species of *Parreysia* are used as food sources such as *Parreysia favidens*, *Parreysia caerulea*. Soup made from *Parreysia favidens*, intended to treat blood pressure and heart issues also shell lime water is used to cure intestinal parasites (Tripathy and Mukhopadhyay, 2015). Molluscs distribution and abundance in water bodies are influenced by physicochemical parameters and the vegetation of the water body (Choubisa, 1992). Bad water quality and other human activities, leading to habitat destruction, effects on survival and diminishing diversity of sensitive malacofauna.

In India molluscan diversity and relation to physicochemical properties studied recently by number of researchers including, Chutia and Kardong (2021), Kumar et al., (2019), Padghane et al., (2017), Kamble (2018). Sarwade et al., (2015). Gondia situated north-eastern site of Maharashtra

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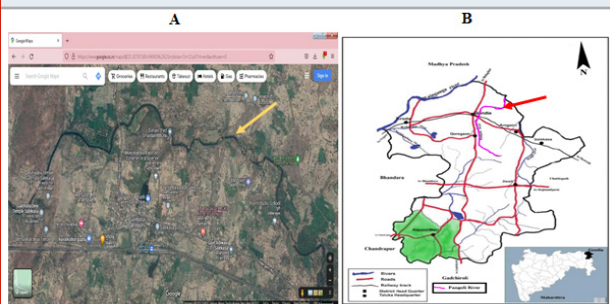
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state most of the land of district is covered with forest and lakes and rivers. It is in the northeastern region of Maharashtra state, and most of the district's territory is covered in rivers, lakes, and forests. In this area little or no work is done on malacofaunal diversity hence This paper particularly enlists species of genus *Parreysia* from Kuadhas and Pangoli rivers of Gondia Maharashtra along with information on some physicochemical parameters of these water bodies.

Figure 1: Location of study area Kuadhas river (A) and Pangoli river (B)



MATERIAL AND METHOS

Gondia district in the Indian state of Maharashtra. It is located between latitudes 20.39 and 21.38 North and 79.27 and 80.42 East. As most of the territory is covered by forests, the Gondia district of Maharashtra is home to a wide variety of plants and animals. Kuadhas river originates from Darekasa hills of the district and is a sub-tributary of Bagh River of the region. Pangoli river has it's beginning from Tumsar hills of the district and is tributary of Bagh River (Figure 1).

Kuadhas and Pangoli rivers were visited from November 2022 to April 2023. The quadrat sampling method was used to perform the quantification (Christian and Harris 2005). Samples were collected from bank of rivers by hand picking and with the help of hand net and scoop net. (Rao et al., 1989). (Only molluscan shells are used for study and no live molluscs were brought to laboratory for analysis). After being transported to the lab, the shells were cleaned with a soft bristle brush to avoid breaking the shells and to properly clean the mud for shell character identification. Identification of malacofauna was done by following keys by Rao (1989), Ramkrishna and Dey (2005).

Table 1. Physicochemical analysis of Kuadhas river and Pangoli river in Gondia district Maharashtra, India

Study Sites Water Parameters	Kuadhas River		Pangoli River	
	Minima	Maxima	Minima	Maxima
Temperature ($^{\circ}$ C)	24	31	23.6	32
pH	7.0	7.52	7.33	7.67
Color (Hazen)	-----	BQL	BQL	3
Turbidity (NTU)	1.5	2.61	3.8	23.1
Phosphate (mg/L)	BQL	0.29	BQL	4.43
Sulphate (mg/L)	8.73	10.38	2.94	17.26
Nitrate (mg/L)	1.14	3.86	1.50	16.16
Total Dissolved Solids (mg/L)	82	224	106	322
Alkalinity (mg/L)	42	104	55	124
Total Hardness (mg/L)	45	130	55	130
Dissolved Oxygen (mg/L)	5.50	6.80	5.8	6.7
Silica (mg/L)	BQL	4.24	0.31	4.12
Free CO ₂ (mg/L)	3.17	7.4	3.0	5.28

Water samples were collected from both rivers at the same time and analysed for thirteen water parameters as temperature, pH, color, turbidity, total dissolved solids, total hardness, alkalinity, free carbon dioxide, dissolved oxygen, silica, phosphate, sulphate and nitrate of water sample. The physicochemical analysis of water was performed as per standard methods, (APHA, 1998; Trivedi and Goel 1984).

RESULTS AND DISCUSSION

The studied physicochemical parameters of water samples from Kuadhas river and Pangoli river have been given

in Table 1. The physicochemical parameters of Kuadhas river were recorded as: water temperature (24 - 31 $^{\circ}$ C), pH (7.0-7.52), Color (BQL), Turbidity (1.5- 2.61 NTU), Phosphate (BQL- 0.29 mg/L), Sulphate (8.73-10.38 mg/L), Nitrate (1.14- 3.86 mg/L), Total Dissolved Solids (82- 224 mg/L), Alkalinity (42-104 mg/L), Total Hardness (45-130 mg/L), Dissolved Oxygen (5.50-6.80 mg/L), Silica (BQL - 4.24mg/L), Free CO₂ (3.17-7.4 mg/L).

As compared to Kuadhas river, the upper and lower limits of water parameters of Pangoli river had higher: temperature (23.6 - 32 $^{\circ}$ C), pH (7.33-7.67), Color (BQL-3 Hazen), Turbidity (3.8- 23.1 NTU), Phosphate (BQL- 4.43

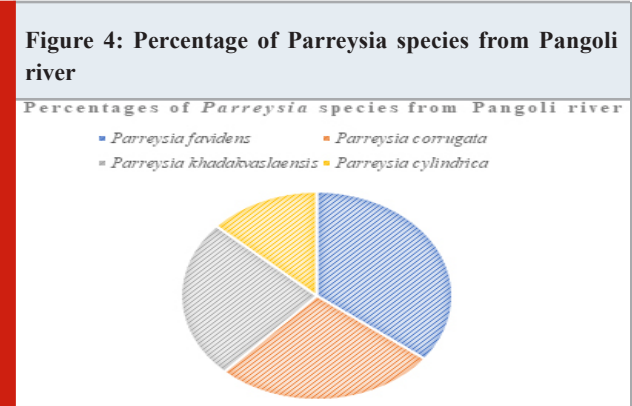
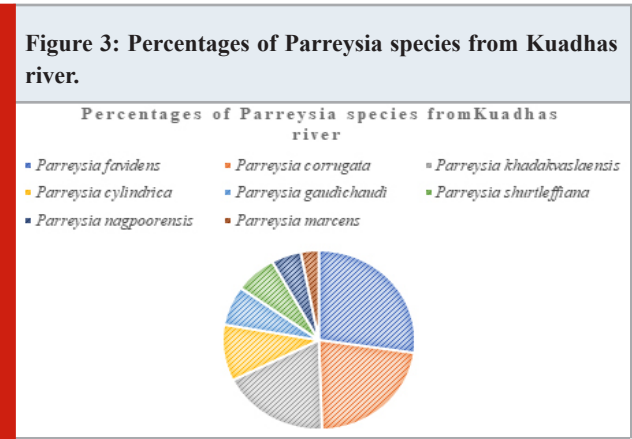
mg/L), Sulphate (2.94-17.26 mg/L), Nitrate (1.5- 16.16 mg/L), Total Dissolved Solids (106-322 mg/L), Alkalinity (55-124mg/L) Total Hardness (55-130 mg/L), Dissolved Oxygen (5.8-6.7 mg/L), except Silica (0.31 – 4.12mg/L) and Free CO₂ (3.0-5.28 mg/L). Positive correlation between molluscan population and total hardness, alkalinity, chlorides, phosphates, nitrate- nitrogen by many researchers (Garg et al 2009; Dorlikar et al., 2014; Sarwade et al., 2015).

In the present work, we have reported species from genus *Parreysia* of family Unionidae of bivalves from Kuadhas and Pangoli rivers of Gondia district Maharashtra India (Figure 2). All eight species of Genus *Parreysia* were found at Kuadhas river from November 2022 to April 2023 includes,



Parreysia favidens, *Parreysia favidens marcens*, *Parreysia corrugata*, *Parreysia corrugata nagpoorensis*, *Parreysia cylindrica*, *Parreysia Radiatula shurtleffiana*, *Parreysia (Radiatula) khadakvaslaensis*, *Parreysia Radiatula caerulea gaudichaudi*. *Parreysia favidens* followed by *Parreysia corrugata* are most abundant species found at Kuadhas river and Pangoli river. *Parreysia corrugata nagpoorensis* and *Parreysia favidens marcens* as rare species at study area. Only four species of *Parreysia* were reported from Pangoli river includes *Parreysia favidens*, *Parreysia corrugata*, *Parreysia (Radiatula) khadakvaslaensis* and *Parreysia cylindrica* (Figure 3 and 4).

Kuadhas river showed maximum diversity of molluscs due to present of phytoplankton vegetation serve as food for molluscs, less anthropogenic activity found at this river. Least diversity and molluscan assemblage found at Pangoli river due to habitat destruction as number of small dams built across the river and other anthropogenic activities.



CONCLUSION

Eight species of genus *Parreysia* were recorded from two rivers Kuadhas and Pangoli rivers from Gondia district Maharashtra during six months of the survey. This is the first attempt to study malacofauna in this region and will help to explore malacofauna and development of conservation policies to protect the species in the near future. Further study will be continued for a longer period and from different water bodies of the region to enlist molluscan diversity and their seasonal variations.

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