# Whispers of **River**



In North-West of Pune City two rivers Ram and Mula originate and meet to form a river confluence. This confluence creates a beautiful stretch of green patch full of life in the midst of busy Aundh Balewadi link road.

This story is of Mula and her little friends..

A migratory bird who is flying towards her destination with her flock and is currently resting on a tree nearby river, hops to drink water.

River is happy to see this new friend and starts a conversation.

Hello Little one! Are you the famous Yellow Wagtail bird??

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Bird, who is tired from her long flight gets startled at first and looks towards the direction of the voice but then finds comfort in a friendly face. Bird replies "Yes, my name is Wagtail," "Who are you?" River is delighted to see a new visitor.



After conversing for a while, the bird hesitantly asks River, "Mula, Why do you look so lifeless - all the rivers I have seen are so full of life! To which River Mula says, "It's a long story. Why don't you rest. You must be tired from your journey." Wagtail replies, "I love stories. Please!"

Mula laughs and says, "Alright! When I was young, the ecosystem around me was pristine and was teeming with life, harboring a riparian" ecosystem. It had unique indigenous flora which helped in groundwater recharge and water filtration. I was the green lung of Pune city and home to a variety of aquatic as well as terrestrial plants and animals."

River Mula continues, "Once, children could swim freely here and drink my water safely. The deep black soil along my bank would fill with dense vegetation when it rained and form a mini-corridor for amphibians, reptiles and small mammals. I gushed with enthusiasm and was full of life and joy. Oh! How I cherish those days!"

As time passed, I started losing my identity as dams were built and my waters were channeled. My banks were encroached by realtors, industries and brick-kiln owners. Untreated sewage discharge, waste and the dumping of debris added to this.

This severely affected the quality of my water that resulted in loss of habitat diversity of aquatic animals and plants, like zooplanktons\*, who called me home. They are extremely sensitive to changes in water. Many of them were lost due to increasing pollution of my waters. The good days were long gone!! Why are you so concerned about this 'zooplanton' ?

It's 'Zooplanktons', and you should be worried too, You feed on fishes and smaller insects and they eat this zooplankton. I need them to keep my water clean and you need them for food, little Wagtail. A young girl, Heena, was closeby and overheard Wagtail and Mula's conversation.

> Hi, I am Heena. I have been listening to your conversation. I know some scientists who can help us examine the invertebrate\* diversity and also changes in water.

> > River Mula and Wagtail readily agreed to meet Heena's scientist-friends.

The next day Heena came with a group of concerned citizens & scientists. They understood that River Mula was a living ecosystem and not merely a source of water.

"They began a preliminary survey to explore the diversity of invertebrates found in my ecosystem. I realized it was the beginning of a new friendship. It was also the beginning of their conservation efforts. They found a total of 70 species of invertebrates." Mula recounts. Heena informed Wagtail and River Mula, "The scientists chose three sample collection spots as their study sites."

Heena: "They sampled zooplankton from the selected sites using two plankton nets of different sizes and hand nets."

Heena: "They collected samples in 100 ml bottles and took them to their laboratory, where they studied and observed them under a microscope. They were able to identify many organisms in these samples. They studied bugs, beetles and odonates\* with naked eye and photography and also sometimes with a portable microscope that they brought with them to the river banks. This group of people worked hard to identify all the fauna\* using various reference books and with the help of experts."

Plankton Net

Wagtail & River Mula: "What are they studying about the water?"

Heena: "Scientists have many criteria which they are using to study changes in waters of Mula - they will test its color, temperature, turbidity and whether its suitable to drink or not. They think the flow and depth of Mula has changed over time and all these factors affect the number of invertebrates living here."



Different kinds of lifeforms found during the 3 collection months in river Mula

Here are some representative Cladocera\* observed during the collection period.





Simocephalus mixtus

Kurzia longirostris

ANININ



Three species of Ostracods\* that were observed

Cyclopoid copepod

Ostracoda

Macrobrachium sp.

Copera cf. marginipes

### Pseudagrion rubriceps

Brachythemis contaminata

Anisops cavifrons

Representative insects: Bugs, Dragonflies and Damselflies Limnogonus nitidus

North I



I still don't understand why we need to conduct so many tests of your water, River?

Well, this study helped in finding ~70 species of freshwater invertebrates. These microscopic small animals form the base of the aquatic food chain and play a vital role in maintaining the ecological balance. Many species are also indicative of disturbances in the habitat.

Me too!!

For example, bivalve Corbicula can still be seen in the ecosystem, which indicates that the shore/littoral\* region of habitat is not disturbed. This habitat also supports microhabitats so that the aquatic vegetation can harbor a locally rare species.

That means you will always have more varieties of food to eat when you come here, Wagtail. And Mula if these invertebrates can be conserved that will keep you healthy and your waters clean which means I can come for a swim with my friends here like you said kids used to do in earlier days. Heena: "River biodiversity helps in maintenance of its water quality. Conserving these aquatic invertebrates could help protect the river from getting polluted."

Heena: "So if we conserve these species, the efforts needed towards water treatment & purification can be reduced. You Wagtail also will be ensured food all the time."

> That would be so nice! But how do we do this?

I have sketched all these information about Mula in a small book and I will share with my classmates and on social media so that more people learn about Mula.

> I called my friends. We will fly around and sing to more friends about biodiversity of Mula.

I will whisper it to the riverine community. I meet them often and also to other rivers.

All three are delighted and a flock of wagtails is happily watching them

Color and guess your river friends



Color and guess your river friends





Animals can be divided into two groups



# Glossary

#### Cladocera

Water fleas, small crustaceans that feed on microscopic chunks of organic matter.

#### Crustacea

Invertebrates with a hard outer shell that mainly occupy marine habitats.

#### Fauna

The animals of a particular region, habitat, or geological period.

Invertebrates Cold-blooded animals with no backbone.

Riparian Relating to wetlands adjacent to rivers and streams.

Zooplankton Small, aquatic microorganisms in the water.

Littoral A region lying along a shore.

#### Molluscs

Invertebrate animals that have soft bodies which typically have a "head" and a "foot" region, usually wholly or partly enclosed in a calcium carbonate shell.

#### Odonates

Aquatic or semi-aquatic as juveniles. Adults are most often seen near bodies of water and are frequently described as aquatic insects.

#### Ostracods

Ostracods are animals with several pairs of legs and a body made up of sections that are covered in a hard outer shell.

#### Protozoans

Eukaryotic nonfilamentous single-celled organisms, that use organic carbon as a source of energy, and are confined to moist or aquatic habitats.

#### Rotifera

Multicellular animals that are microscopic, aquatic invertebrates with body cavities, commonly called wheel animals because of circular arrangement of moving cilia.

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"If we want children to flourish, to become truly empowered, then let us allow them to love the earth before we ask them to save it."

#### -David Sobel

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Bunyache Pani Stories of Pune Waters

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