DIVERSITY OF ROTIFERS IN THE LAKES OF MYSORE CITY

BY

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CONTENTS

- Introduction
- Materials and Methods
- Results and discussion
- Conclusion

INTRODUCTION

- The **rotifers** (commonly called **wheel animals**) are one of the zooplankter belong to phylum Rotifera.
- These are microscopic, psuedocoelomate, have a size around 0.04-2 mm.
- These are numerically abundant in fresh water .
- These have a short lifespan of <14 days. Females are more common than males. In most of the species males are unknown, if known, they live for few hours to three days.
- A number of studies have identified rotiferan species as best indicators of different kinds of aquatic pollution (Mahajan, 1981; Kolkwitz and Marsson, 1902 & 1909).
- The body is divided in to head, trunk and foot. Head contains rotatory or wheel organ called corona, mouth and sensory organs. Corona is a ciliary organ, which has anterior (trochus) and posterior lines of cilia (cingulam). Corona helps in locomotion and food collection.This is withdrawn
- A rotifer has a transparent cylinder shaped trunk, may be (loricate) or may not covered by a thin cuticle (illoricate forms).

- In most of these cuticle thickens to form lorica. Lorica has a arched dorsal plate and a flat ventral plate connected by a flexible cuticular membrane, the sulci.

- Foot and toes are at the posterior end and used for locomotion and attachment, withdrawn in to the body in contracted condition.

- Taxonomically important characters are

Presence or absence of lorica and it's shape , size, etc.,

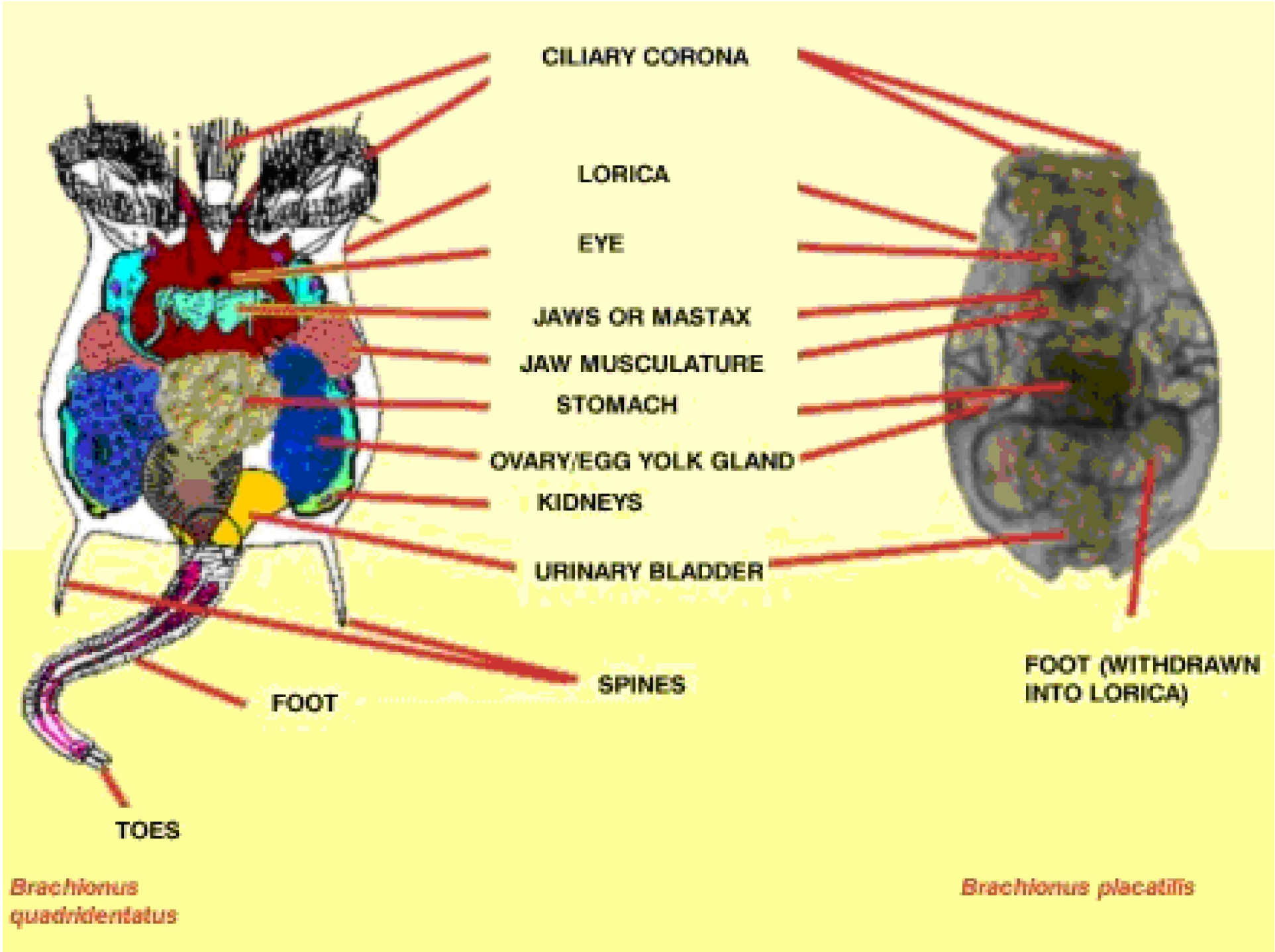
number, shape and size of spines on the anterior and posterior end of lorica.

Nature and types of corona. Foot-its presence or absence

Shape, structure and type of trophi.

- Several taxonomists (Hyman, 1951; Pennak, 1953; Edmondson, 1959; Nogrady, 1982; Battish, 1992) proposed different types of classification.

- But in the present work the classification of Sugumaran *et al*., (2004) has been adopted, which is the latest and simplest.


CILIARY CORONA
LORICA
EYE
JAWS OR MASTAX
JAW MUSCULATURE
STOMACH
OVARY/EGG YOLK GLAND
KIDNEYS
URINARY BLADDER
SPINES
FOOT
TOES
FOOT (WITHDRAWN INTO LORICA)
Brachionus quadridentatus
Brachionus placatilis

MATERIALS AND METHODS

- Three lakes selected for this study –Kamana, Mandakally, and Devanoor lakes from Mysore city.
- The rotifer samples collected to estimate diversity and density (2006-2009).

Rotifers diversity

- By towing a plankton net (50µm mesh size) horizontally at a depth of 40cm for about 10 minutes

- The collected rotifers samples are fixed in 4% and preserved in 5% formaldehyde.

- The specimens are identified with the help of keys provided by Battish (1992), Dhanapathi (2000) and Altaff (2004).

Rotifers abundance

- By filtering known (70 L) quantity of water from the sampling stations concentrated samples are obtained.
- The rotifers enumerated from the concentrated samples by using Sedgwick rafter cell under the binocular microscope.
- The Rafter cell has a 50mm X 20 mm X 10 mm rectangular cavity that holds 1ml of sample.

1. *Brachionus forficula*

Phylum: Rotifera

Class: Monogononta

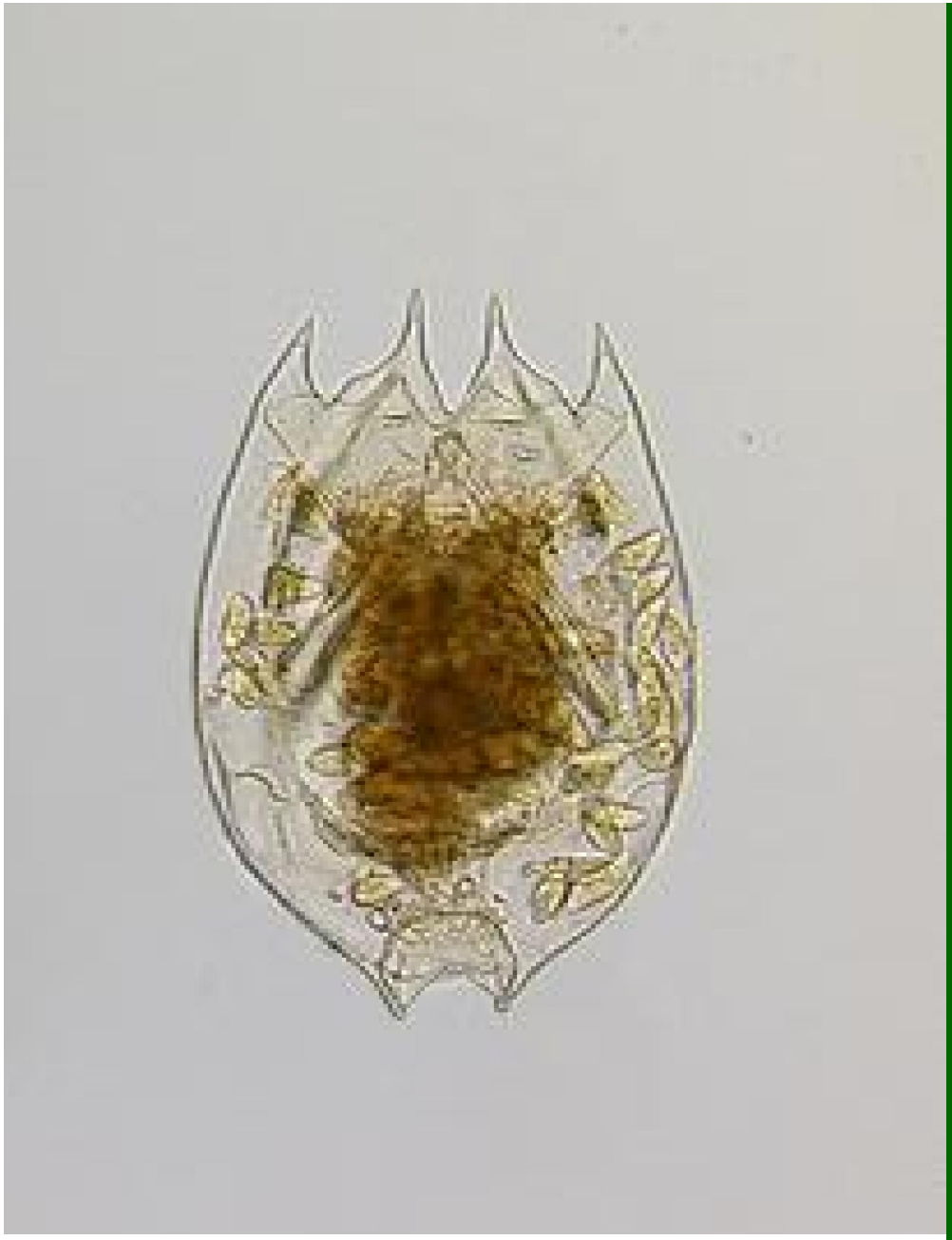
Order: Ploimida

Family: Brachionidae

Genus: Brachionus

Lorica,dorsoventrally compressed Anterior margin with four occipital spines,
anterolaterals longer than anteromedian spines.

Posteriolaterally two stout, long and sub square spines, basally wide separated and tapering to blunt points, geniculate swellings present at bases of posterior spines.



2. *Brachionus calyciflorus*

Phylum: Rotifera

Class: Monogononta

Order: Ploimida

Family: Brachionidae

Genus: Brachionus

Anterior dorsal margin of the lorica with 4 broad based stout spines of variable length,

medians longer than laterals

Posterior spines are present here, but may be absent in other polymorphic forms.

3.*Brachionus falcatus*

Phylum: Rotifera

Class: Monogononta

Order: Ploimida

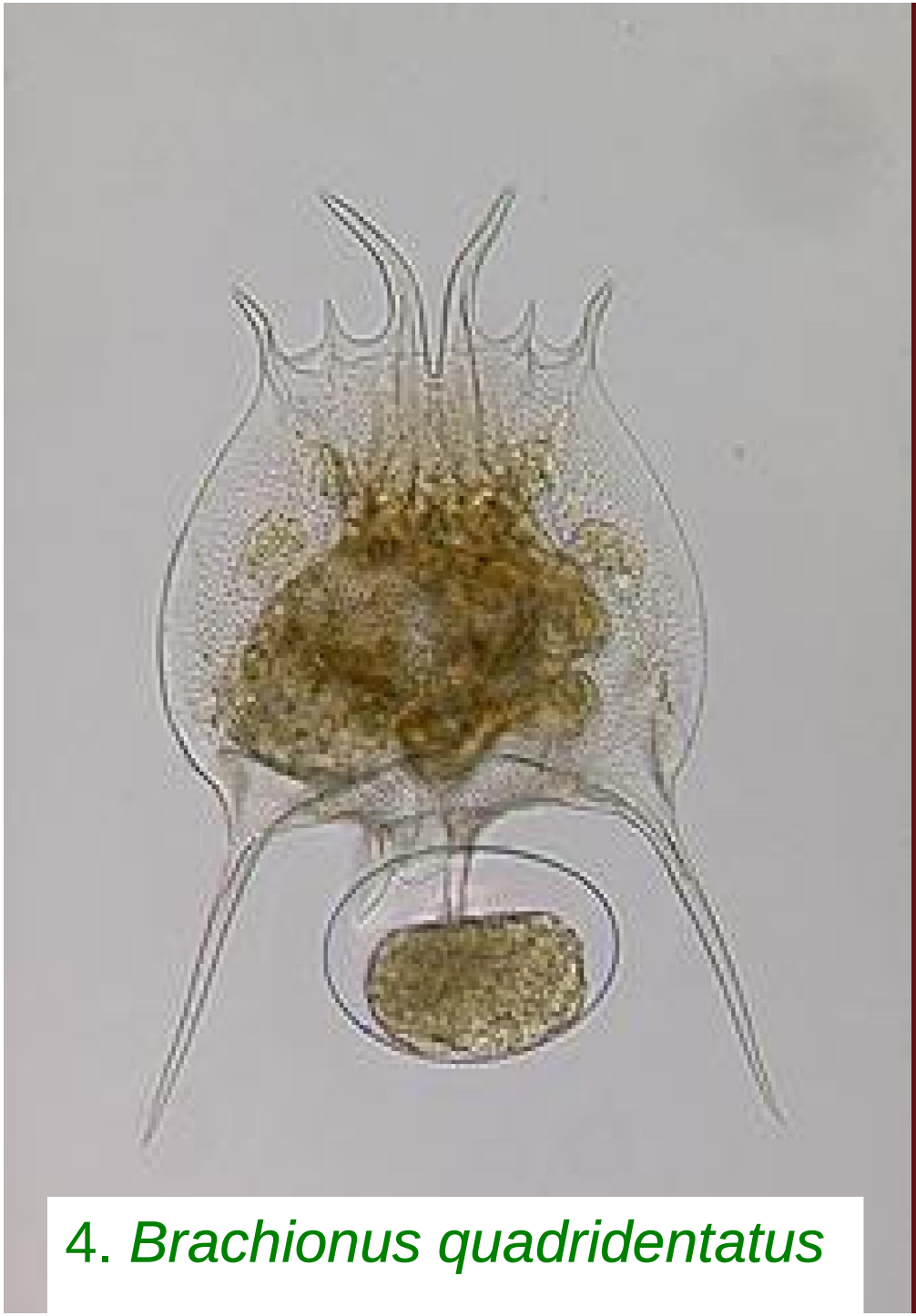
Family: Brachionidae

Genus: Brachionus

Anterior dorsal margin of lorica with six unequal spines,

The intermediate spines are longest and curved inward. Median spines are shortest

Two posterior spines very long, at base widely separated, bent inwards are present.



4. *Brachionus quadridentatus*

Phylum: Rotifera

Class: Monogononta

Order: Ploimida

Family: Brachionidae

Genus: Brachionus

Lorica broader than long, with six occipital spines

of which the medians are longest and curved outward,

laterals longer than intermediates.

Intermediates are shortest

Two posteriolateral spines present, but their length varies

5. *Brachionus caudatus*

Phylum: Rotifera

Class: Monogononta

Order: Ploimida

Family: Brachionidae

Genus: Brachionus

Lorica with six occipital spines,

the laterals longer than the medians, at times twice as long as medians,

intermediate spine reduced.

Posterior spines long.

6. *Brachionus diversicornis*

Phylum: Rotifera

Class: Monogononta

Order: Ploimida

Family: Brachionidae

Genus: Brachionus

Lorica elongate with four occipital spines,

of which the laterals longer than medians.

Right posterior spine longer than the left.

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7. *Brachionus plicatilis*

Phylum: Rotifera

Class: Monogononta

Order: Ploimida

Family: Brachionidae

Genus: Brachionus

Lorica is oval, narrows anteriorly,

Anterodorsal margin with six broad based pointed spines, all are almost equal in length.

Posterior spines absent

8. Brachionus angularis

Phylum: Rotifera

Class: Monogononta

Order: Ploimida

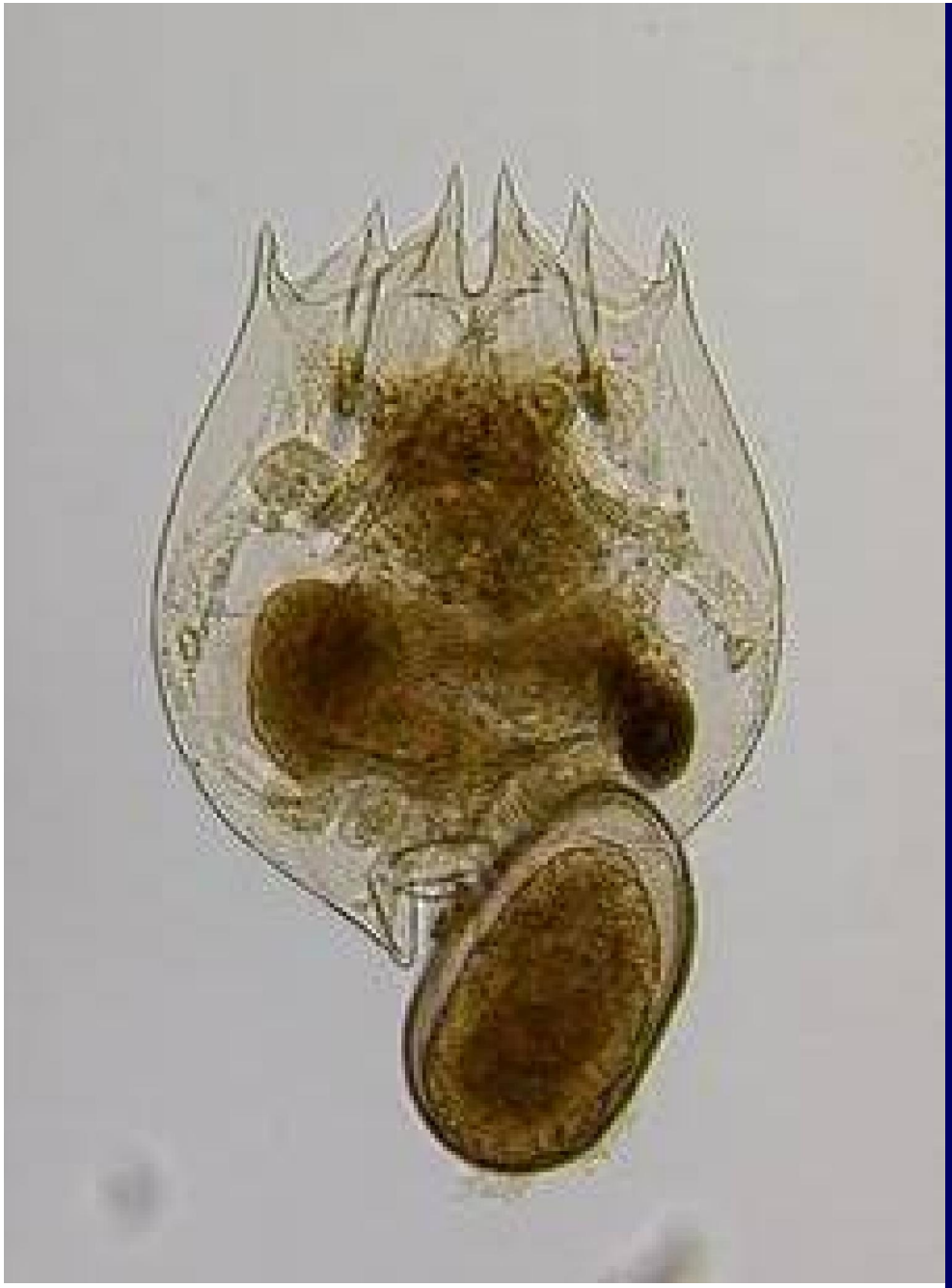
Family: Brachionidae

Genus: Brachionus

Lorica oval shaped & stippled,

anterodorsal margin with two median spines flanking a V shaped notch.

Lateral and intermediate spines usually obliterated. Posterior spines wanting.



9. Brachionus rubens

Phylum: Rotifera

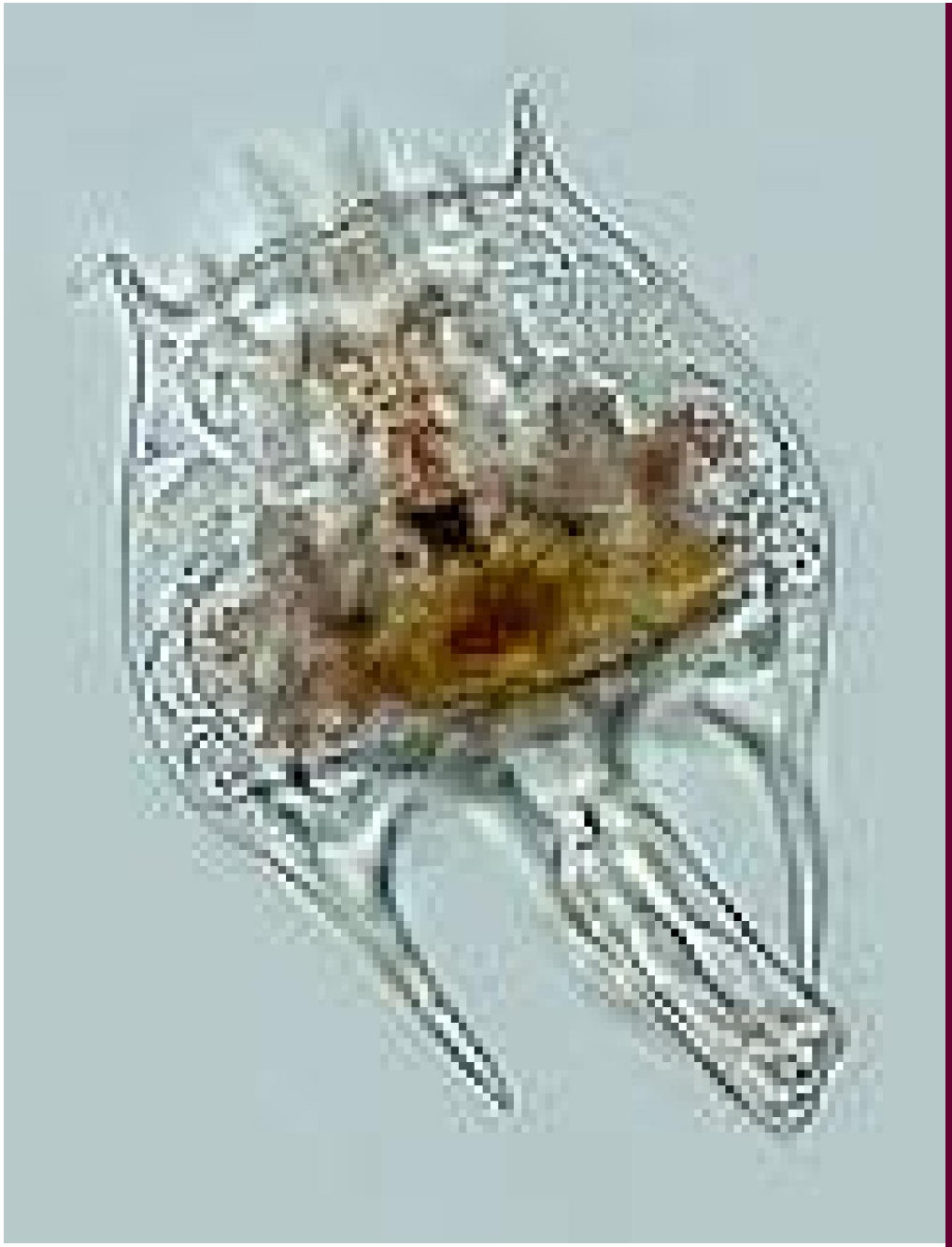
Class: Monogononta

Order: Ploimida

Family: Brachionidae

Genus: Brachionus

Lorica oval, anterior dorsal margin with six spines, Medians longest, Laterals shortest
Intermediates longer than laterals.
Medians and intermediates with peculiar asymmetric shape (saw-toothed), posterior spines absent; foot opening subsquare and small.



10. Brachionus bidentata

Phylum: Rotifera

Class: Monogononta

Order: Ploimida

Family: Brachionidae

Genus: Brachionus

: Lorica firm, stippled, with definite pattern of plaques.
Lorica divided in to dorsal, ventral and basal plates. The dorsal and ventral plates soldered together for three-fifth (3/5) of the lorica and thereafter united to a third basal plate.;
dorsal margin with six spines; lateral always longer than medians, medians longer than intermediates, posterior spines may be vary in length and position of origin but may be absent; foot opening with foot

11. *Plationus patulus*

Phylum: Rotifera

Class: Monogononta

Order: Ploimida

Family: Brachionidae

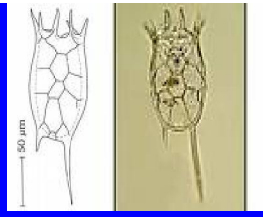
Genus: Plationus

Occipital margin with six spines

medians slightly longer than the intermediate. Which is longer than laterals

posterior margin with four spines. Posterior lateral spines are longer than the median.

12. *Keratella tropica*



Phylum: Rotifera

Class: Monogononta

Order: Ploimida

Family: Brachionidae

Genus: Keratella

3 hexagonal plaques are present on dorsal plate of lorica. A small four sided plaque is present between the posterior border of lorica and the last hexagonal plaque

Anterior margin of lorica has six spines (some times four). Median spines curved and longest. Intermediate spines are shortest. Posterior end has two unequal spines. The right posterior spine is longer than left posterior spine.

Phylum: Rotifera

Class: Monogononta

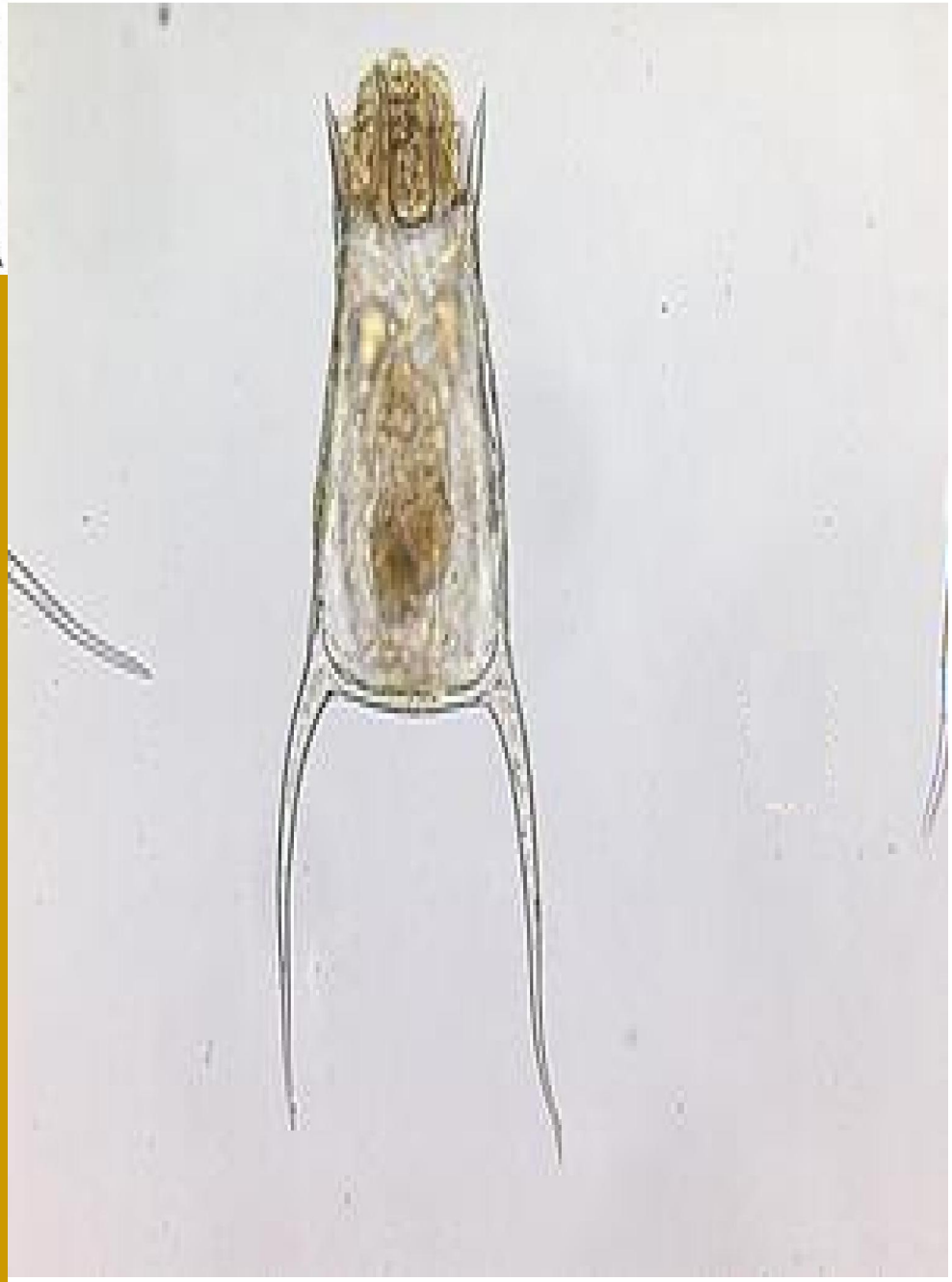
Order: Ploimida

Family: Brachionidae

Genus: Keratella

Dorsal plate of lorica with three median plaques and one pentagon terminates in to a short median line.

Anterior margin of lorica with six spines, medians longest and curved ventrally, laterals shortest. Posterior spines almost equal.



13. *Keratella quadrata*

Phylum: Rotifera

Class: Monogononta

Order: Ploimida

Family: Brachionidae

Genus: Keratella

Dorsal plate of lorica with three median plaques and one pentagon terminates in to a short median line.

Anterior margin of lorica with six spines, medians longest and curved ventrally, laterals shortest.

Posterior spines strong, median & single.

14. *Keratella cochlearis*

15. *Filinia terminalis*

Phylum: Rotifera

Class: Monogononta

Order:Floscullariacae

family: Filinidae

Genus: Filinia

Lorica thin, flexible and barrel shaped when contracted.

Two setiform anterolateral spine equal in length; with one terminal posterior spine. Anterior spines are longer than posterior spine

16. *Filinia longiseta*

Phylum: Rotifera

Class: Monogononta

Order:Floscullariacae

family: Filinidae

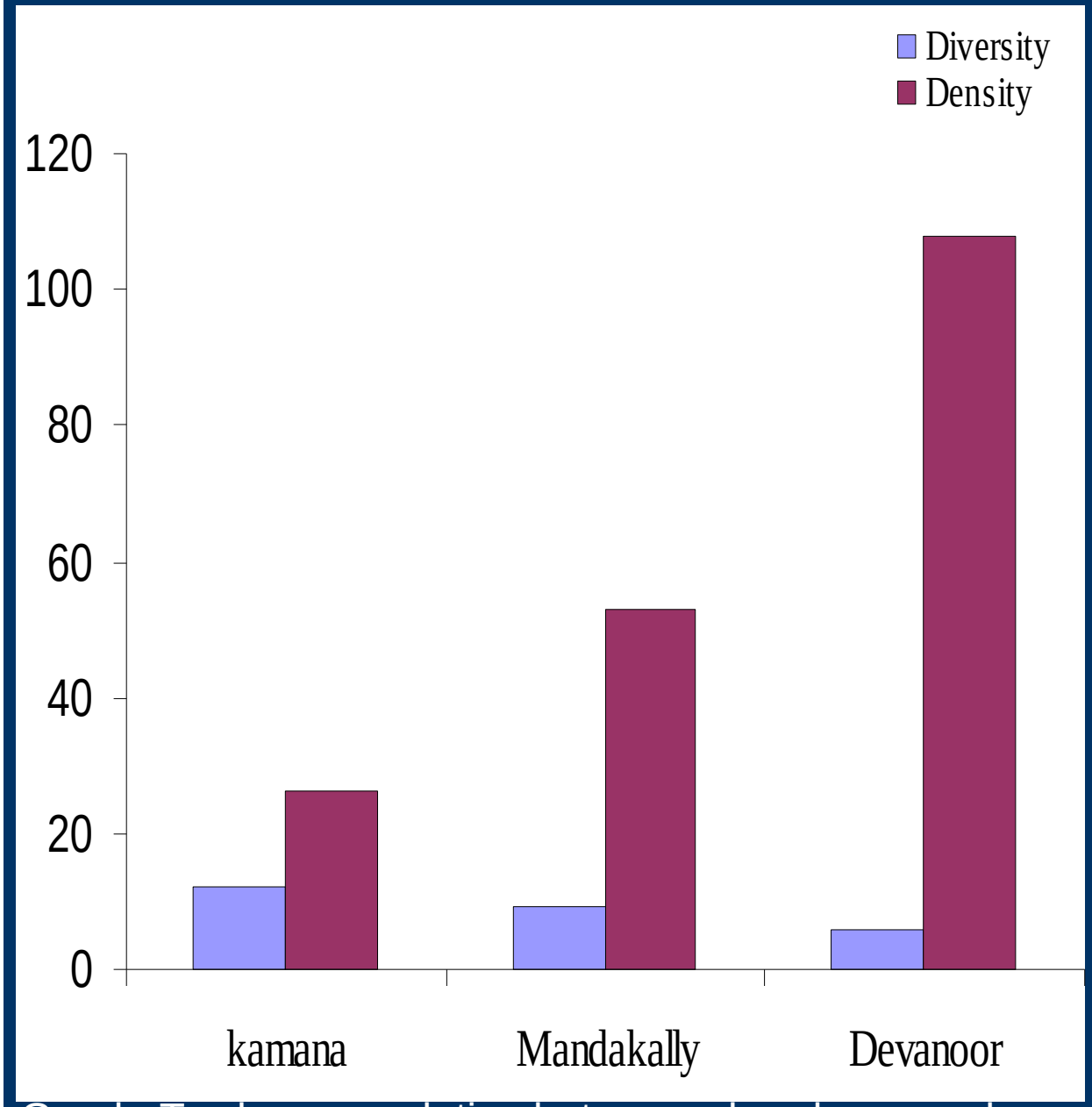
Genus: Filinia

Lorica barrel shaped when contracted, with two equal anterior spines and one posterior spine.

Posterior, ventral subterminal spine is terminal & longer than anterior spines.

Table: Diversity and abundance of Rotifers (Avg.No./l) in the lakes of Mysore (2006-09).

	Kamana lake (12 sps)	Mandakally lake (9 sps)	Devanoor lake (6sps)
Brachionus forficula	79	100	189
Brachionus calyciflorus	67	130	192
Brachionus falcatus	42	-	-
Brachionus quadridentatus	10	-	-
Brachionus caudatus	15	138	252
Brachionus diversicornis	16	-	-
Brachionus plicatilis	30	-	-
Brachionus angularis	18	-	-
Brachionus rubens	22	18	-
Brachionus bidentata	16	20	46
Plationus patulus	12	15	18
Keratella tropica	15	23	-
Keratella procurva	14	-	-
Keratella cochlearis	-	22	-
Filinia longiseta	-	08	23
Filinia terminalis	-	-	-
Total	**356**	**474**	**720**



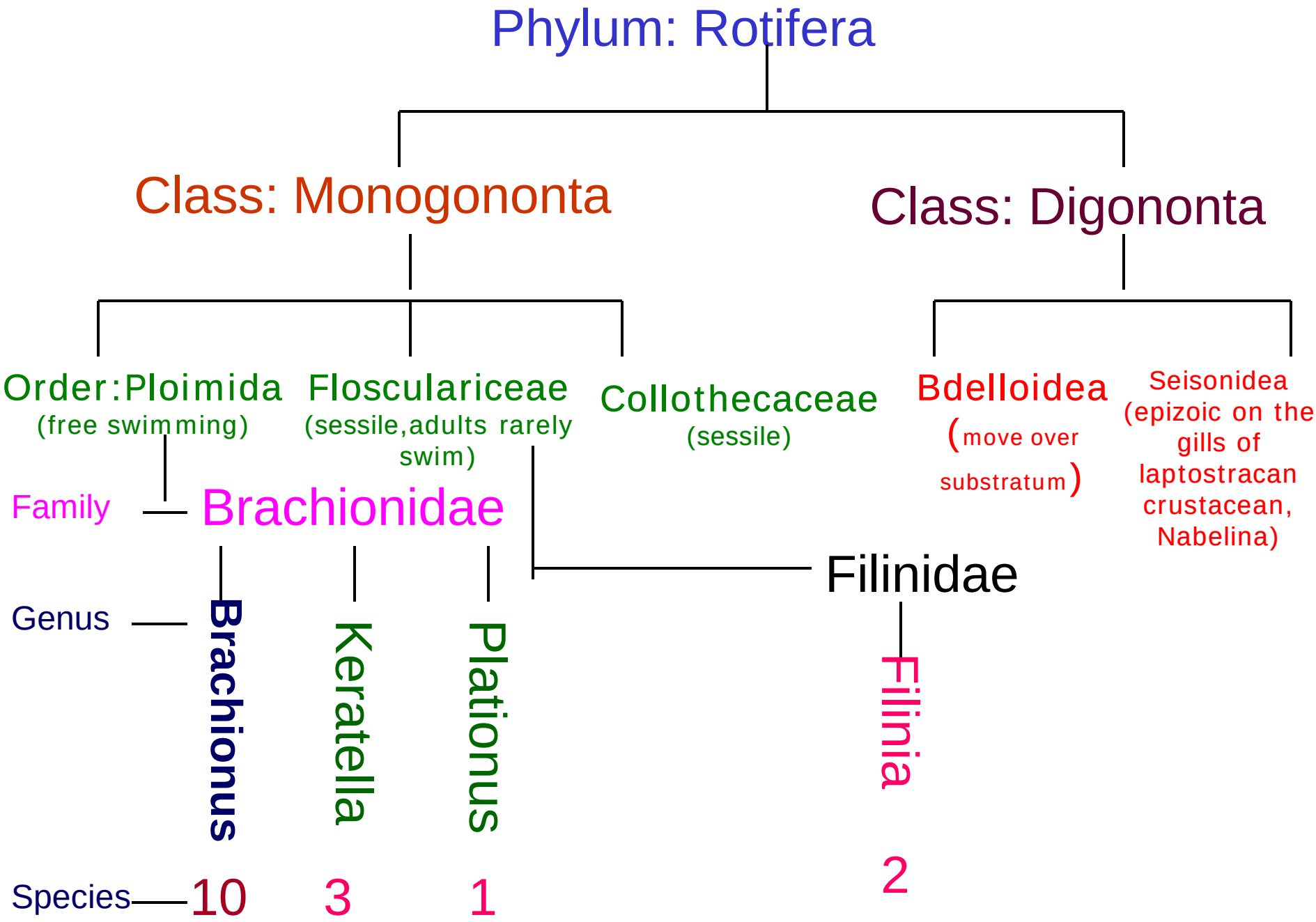
Graph: To show correlation between abundance and diversity of rotifers

Kamana lake documented highest diversity and lowest abundance

Devanoor lake recorded lowest diversity and highest abundance of rotifers

Message

- As abundance increases,
  diversity of rotifers decreases
  in the lakes of Mysore


Phylum: Rotifera
Class: Monogononta
Class: Digononta
Order:Ploimida
(free swimming)
Flosculariceae
(sessile,adults rarely swim)
Collothecaceae
(sessile)
Bdelloidea
(move over substratum)
Seisonidea
(epizoic on the gills of laptostracan crustacean, Nabelina)
Family
Brachionidae
Filinidae
Genus
Brachionus
Keratella
Plationus
Filinia
Species
10
3
1
2

Conclusion

- Total 16 species of rotifers are recorded during this study period (2006-2009) form the lakes of Mysore city.

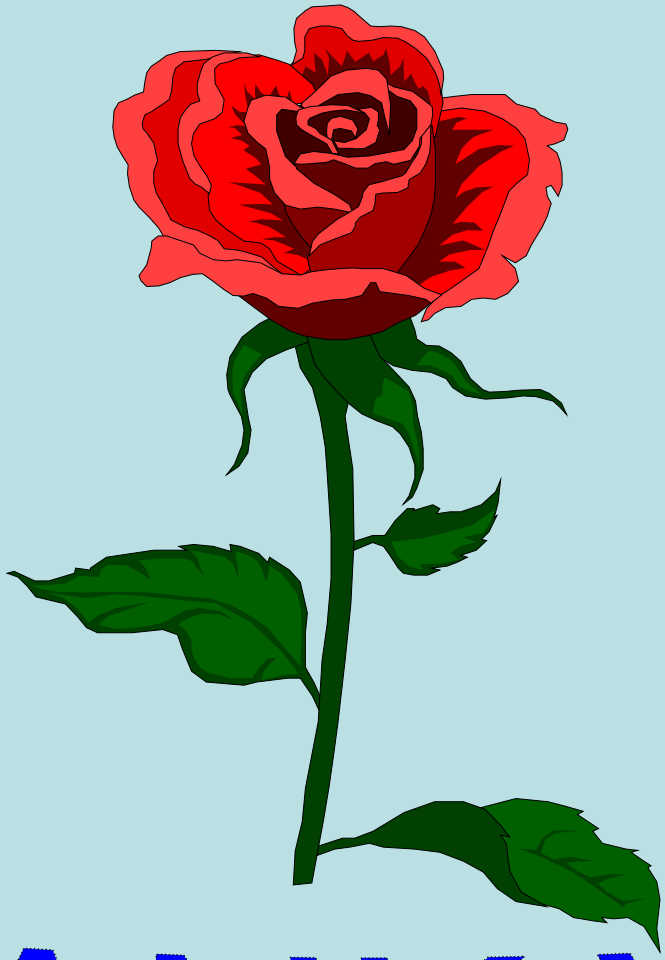
- Out of which, 10 species belong to genus Brachionus, 3 species belong to genus Keratella, 1 species belong to genus Plationus.
-
- These three genuses belong to Family Brachionidae.
-
- This Brachionidae family belongs to Ploimida order.

- *Filinia longiseta* and *Filinia terminalis* belong to genus filinia, family Filinidae, order Floscullariacea.

- Ploimida and Floscullariacea orders belong to Monogononta class of Phylum Rotifera.

- Highest diversity and lowest density of rotifers documented in the Kamana lake, whereas lowest diversity and highest density recorded in the Devanoor lake .

- As the diversity decreases the abundance of rotifers increases.



THANK YOU

LET US NURTURE THE NATURE