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MORPHOLOGICAL AND MORPHOMETRICAL STUDY OF ROTIFERS FROM FRESH WATER BODY OF JALNA DISTRICT, MAHARASHTRA, INDIA

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ABSTRACT

Zooplankton samples were collected monthly basis from four sampling stations at Upper Dudhana Dam of Jalna district, Maharashtra, India. Zooplankton were sampled using plankton net (40µ) during the sampling period from February 2014 to January 2015. The result revealed that the taxonomic details and biometric observations (length and width of lorica, width of corona, length of anterior, posterior, median, antero-lateraland antero-median spines) of nine species of rotifers. The measurements of each body parameters of rotifers help in accurate identification upto species level.

KEYWORDS: Micrometry, Rotifers, Upper Dudhana Dam

INTRODUCTION

Rotifers make up a phylum of microscopic, free swimming, aeronic, bisexual and pseudocoelomate animals. Rotifers play a vital role in the trophic tiers of fresh waters impoundments and serve as living capsule of nutrition (Sontakke et.al.,2014). There were some pioneering efforts towards the end of eighteenth century to provide a systematic for rotifers based on morphological details (Hudson, 1889). Most species of rotifers are about 200-500 micrometers long; however a few species are longer than millimeters. There are about 2000 species of rotifers divided into two classes, viz. Monogononta and Digononta. Monogononta is the largest group with around 1500 different species. Digononta is a particular note because of the absence of males and ability of cryptobiosis (George, 2011).

The body of rotifer is regionated into head, trunk and foot. Body is lined with thin cuticle secreted by syncytial hypodermis called lorica (Patil and Gouder, 1989). The head of a rotifer consist of chiefly of a characteristic retractile ciliary crown or disc called corona or trochal disc. The trunk is transparent and encloses the visceral organs. Foot and toes are used for locomotion and attachments (Dhanapathi, 2000).The most important characteristics for the entire phylum is the presence of muscular pharynx (mastax) with chitinous jaws (trophi). Usually the identification of many species is based on the morphology of trophialone (Fontaneto et. al., 2008). Although this morphological trait has been used in the separation of many species of rotifers, but it is not useful to distinguish closely resemble species of rotifers. Hence present work focus on micrometry of rotifers which helps in successful species identification.

STUDY SITE

Upper Dudhana dam is situated near village Somthana of Badnapur tahsil in district Jalna, Maharashtra, India on the river Dudhana. The dam is located at 19°55' 11.8" N to 75° 41' 39.9" E. This is an earthen dam and has a height of about 18m and 2.46 km in length, wherein the width is approximately 2 km.

MATERIALS AND METHODS

The study was conducted from month of February 2014 to January 2015. Zooplankton samples were collected fortnightly by filtering 100 lit.of water through 40µmesh nylon net and preserved in 4% formalin for further analysis. The rotifers were identified according to the standard keys of Altaff (2004), Edmondson (1959) and Pennak (1953) as well as image based identification provided by various websites

(http://rotifers.acnatsci.org/science),http://cfb.unh.edu,www.glerl.noaa.gov/seagrant/GLWL/zooplnkton/rotifers.

The measurements of various body parameters were made under 100X magnification on Photoplan microscope (Model: TRHL-66) Weswox optic made. The given measurements are the average values of each body parameters of each observed species.

OBSERVATIONS AND RESULTS

During the course of study nine species of rotifers from two families of a single order were recorded (Figure 1). These were recorded by various scientist from different parts of the world from which recent references are Nandini et.al.(2007), Altindag et.al.(2009),George et.al.(2011), Molly et.al.(2013), Sontakke (2014) and Tyor (2014) etc.

The observed rotifers are classified according to Altaff (2004), Edmondson (1959) and Pennak (1953) as follows:

Phylum: Rotifera (Pennak, 1953)

Class: Monogononta (Remane, 1933)

Order: Ploimida (Delage, 1997)

Family: Brachionidae (Ehrenberg, 1938)

The measurements are,

***Brachionuscalyciflorus* (Pallas, 1776)**

Average length of lorica-238.35 µm

Average width of lorica-191.625 µm

Average width of corona-133.35 µm

Anteromedian spine-46.2 µm

Anterolateral spine-41.475 µm

Description: Lorica flexible, smooth. Anterior dorsal margin with stout spines, broad at the base and with rounded tips. Median spines slightly longer than the laterals. Posterior spines are absent.

***Brachionuscaudatus* (Daday, 1894)**

Average length of lorica-150.15 µm

Average width of lorica-138.6 µm

Average width of corona-86.1 µm

Anteromedian spine-21 µm

Anterolateral spine-19.95 µm

Posterior spine-36.225 µm

Description: Lorica with few occipital spines, the lateral slightly longer than the medians. Posterior spines long.

***Brachionus falcatus* (Zacharias, 1898)**

Average length of lorica-202.65 µm

Average width of lorica-142.8 µm

Average width of corona-86.1 µm

Anteromedian spine-16.275 µm

Anterolateral spine-24.15 µm

Posterior spine-122.85 µm

Description: Anterior dorsal margin with six unequal spines, the medians long and curved ventrally at the end. Posterior spines very long, bent inwards and almost touch to each other at their tips.

***Brachionusangularis* (Gosse, 1851)**

Average length of lorica-132.3µm

Average width of lorica-92.4µm

Average width of corona-51.45µm

Description: Lorica stippled with two very small projections in occipital margins. Posterior spines absent.

***Brachionusaculeatus* (Gillard, 1948)**

Average length of lorica-118.125 µm

Average width of lorica-112.875 µm

Average width of corona-56.7 µm

Anteromedian spine-16.8 µm

Anterolateral spine-13.125 µm

Posterior spine-53.55 µm

Description: Lorica stippled with four occipital spines of equal length. Posterior lateral spine apart with tooth like projections on inner side.

***Keratella Tropica* (Asptein, 1907)**

Average length of lorica-127.575 µm

Average width of lorica-73.5 µm

Average width of corona-58.8 µm

Anteromedian spine-33.075 µm

Anterolateral spine-27.825 µm

Posterior spine-112.35µm(Right) ,35.175µm(Left)

Description: Lorica composed dorsoventrally. The anterior dorsal margin with six spines, median being the longest, stoutest and curved. Posterior right spine being always longer than the left.

***Keratellaquadrata* (Muller, 1786)**

Average length of lorica-96.075 µm

Average width of lorica-62.475 µm

Average width of corona-47.25 µm

Anteromedian spine-24.15 µm

Anterolateral spine-22.05 µm

Posterior spine-68.25 µm

Description: Three median plaques on the dorsal side of the lorica, the posterior one has common border with posterior margin of lorica. The anterior spines are subequal.

FAMILY: ASPLANCHNIDAE

***Asplanchnabrightwelli* (Gosse, 1850)**

Average length of lorica-380.1 µm

Average width of lorica-243.6 µm

Average width of corona-135.45 µm

Description: Body large, saccate and transparent. Intestine, foot and toes are absent. Trophiincudate, rami having horn like projection at outer margin of the base.

***Asplanchnapriodonta* (Gosse,1850)**

Average length of lorica-289.8 µm

Average width of lorica-219.45 µm

Average width of corona-78.75 µm

Description: Body is semioval, transparent. TrophiIncudate type. The anus has shifted and lies on the same side as the mouth.

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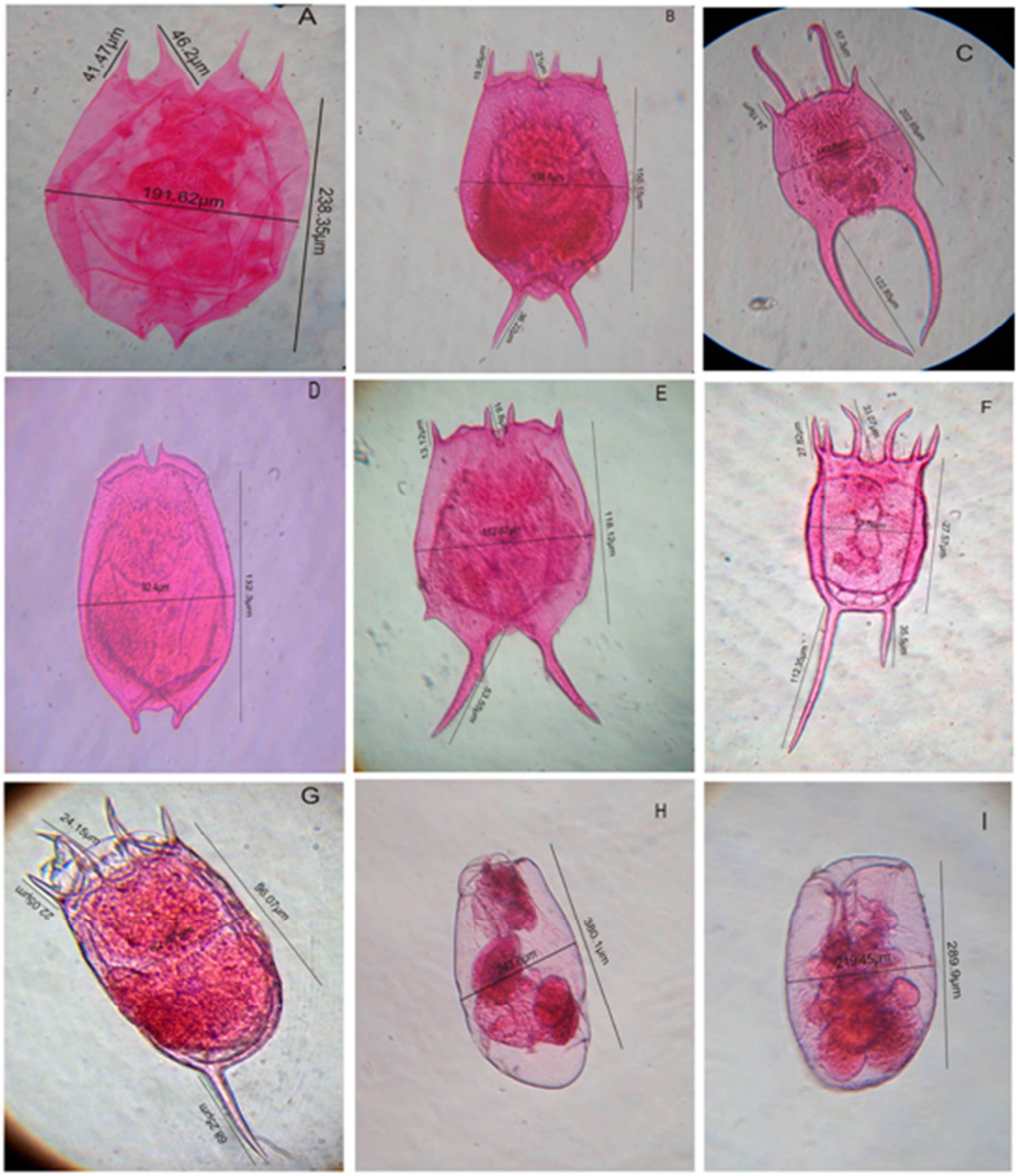

Figure 1: A: Brachionus Calyciflorusm B: Brachionus Caudatus, C: Brachionus Falcatusm D: Brachionus Angularism E: Brachionus Aculeatus, F: Keratella Tropica, G: Keratella Quadrata, H: Asplanchna Brightwelli, I: Asplanchna Priodonta