

BIODIVERSITY OF FRESH WATER MICROALGAE OF GAURIPADA LAKE, BHAGVA LAKE (KALA TALAO), MASUNDA LAKE (TALAOPALI) AND BRAMHALA LAKE OF THANE DISTRICT, MAHARASHTRA

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Abstract: The importance of water bodies in our ecosystem needs no overemphasis. The water bodies like lakes are source of peace and serenity for phycologists. It is the domain of algal species which contribute substantially to ecological balance. Microalgae which are primary producers help to maintain ecological balance of lakes and are good source of nutrition for zooplankton and fishes. The main aim of the study was to identify microalgal flora from the four selected lakes. Collection of algal samples was carried out from four different lakes initially in the month of August and further after a gap of two months. The samples were observed in laboratory under light microscope and identified using authentic reference books and various research journals from the department. Total 36 genera and 51 species of microalgae were identified from four different lakes.

IndexTerms – Microalage, Biodiversity, Cyanophyta, Chorophyta, Freshwater Lakes.

I. INTRODUCTION

Algae belong to a large group of simple photosynthetic organisms. They are subdivided into two major categories based on their size, i.e. Macroalgae (seaweed) and Microalgae. Microalgae can be found everywhere, from permanent snow and ice to deserts, the oceans, lakes, river, puddles, rocks and soil. Just as terrestrial plants are the basis of life on land similarly algae are the basis of aquatic life. Microalgae as a unicellular organism propagates rapidly than terrestrial plants and can grow in extreme conditions. They are small free-living microorganisms that can be found in a variety of aquatic habitats. Microalgal flora of fresh water lakes in thane district is not been explored much. Study of microalgae flora would provide an idea of the richness in diversity in a particular lake. The study may reveal the potential of fresh water lakes in production of various renewable products such as biodiesel, bioethanol, nutraceuticals, cosmetics etc. Microalgae are rich source of nutrients and bioactive compounds that can be harnessed for commercial use. The pigment responsible for the pink colour of salmon and trout is the carotenoid astaxanthin and one of the sources for natural oilastaxanthin is the fresh water green alga *Haematococcus pluvialis*. The microalgae are the source of nutrition for various aquatic organisms and play important role in ecosystem. *Spirulina* and *Chlorella* are known for their high protein content and these are consumed as supplements. Understanding the biodiversity of microalgae is beneficial for the study of morphology, cytology, properties of each alga and their importance in commercial application and their role in ecosystem as they are the primary producers in aquatic ecosystem.

The four lakes chosen for the study are

(1)Gauripada Lake:



Gauripada Lake is situated at Milind nagar, Kalyan west, district Thane, Maharashtra 421301. The lake is habitat for various fishes and birds and also rich in aquatic vegetation. Earlier the lake was used by the native people for washing clothes.

(2) Bhagva Lake (Kala Talao)



Bhagva Lake is commonly known as Kala talao. It is one of the top tourist attractions in kalyan city. It is situated at Swanand Nagar, Kalyan west; district Thane, Maharashtra, 421301

(3) MASUNDA LAKE (TALAO PALI)



Masunda Lake is one of the most famous lakes in Thane city .It is situated near the Thane railway station; district Thane, Maharashtra, 400601

(4) BRAMHALA LAKE



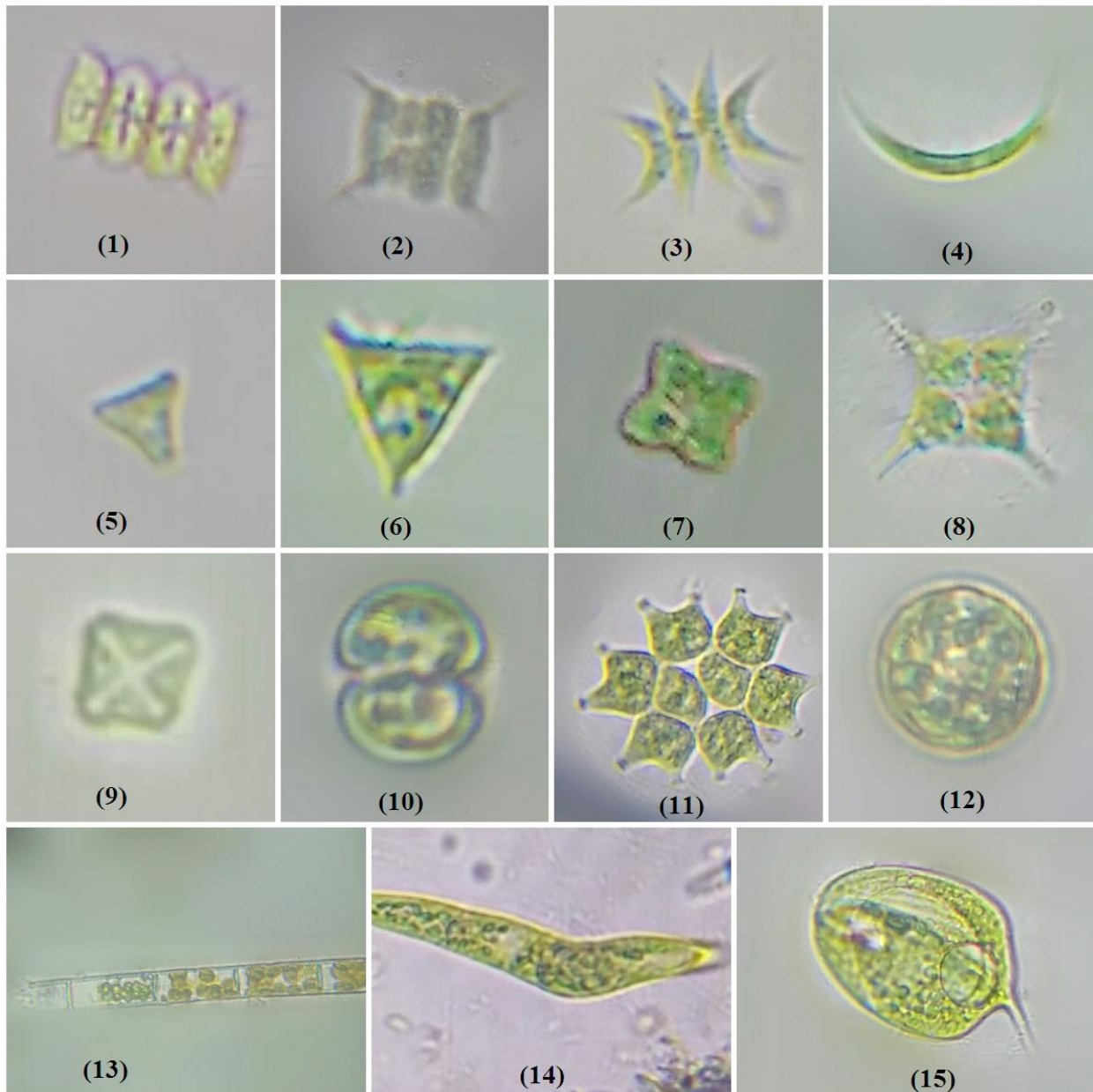
Bramhala Lake is situated at Uthalsar 2Km away from Thane station, District: Thane, Maharashtra, 400601

II. MATERIALS AND METHODS:

- Water samples of four lakes viz. Gauripada Lake, Masunda Lake, Bramhala Lake and Bhagva Lake were collected separately in a disposable bottle at the depth of 1feet. Samples were collected in the month of August and October.
- These samples were centrifuged at 4000 rpm for 10 minutes and the precipitate were observed and photographed under Light microscope at 10x and 40x magnifications.
- The different microalgae were identified with the help of standard reference books; Indian Fresh water Microalgae (Anand, 1998); The freshwater algae (Prescott 1954), authentic research papers and journals.

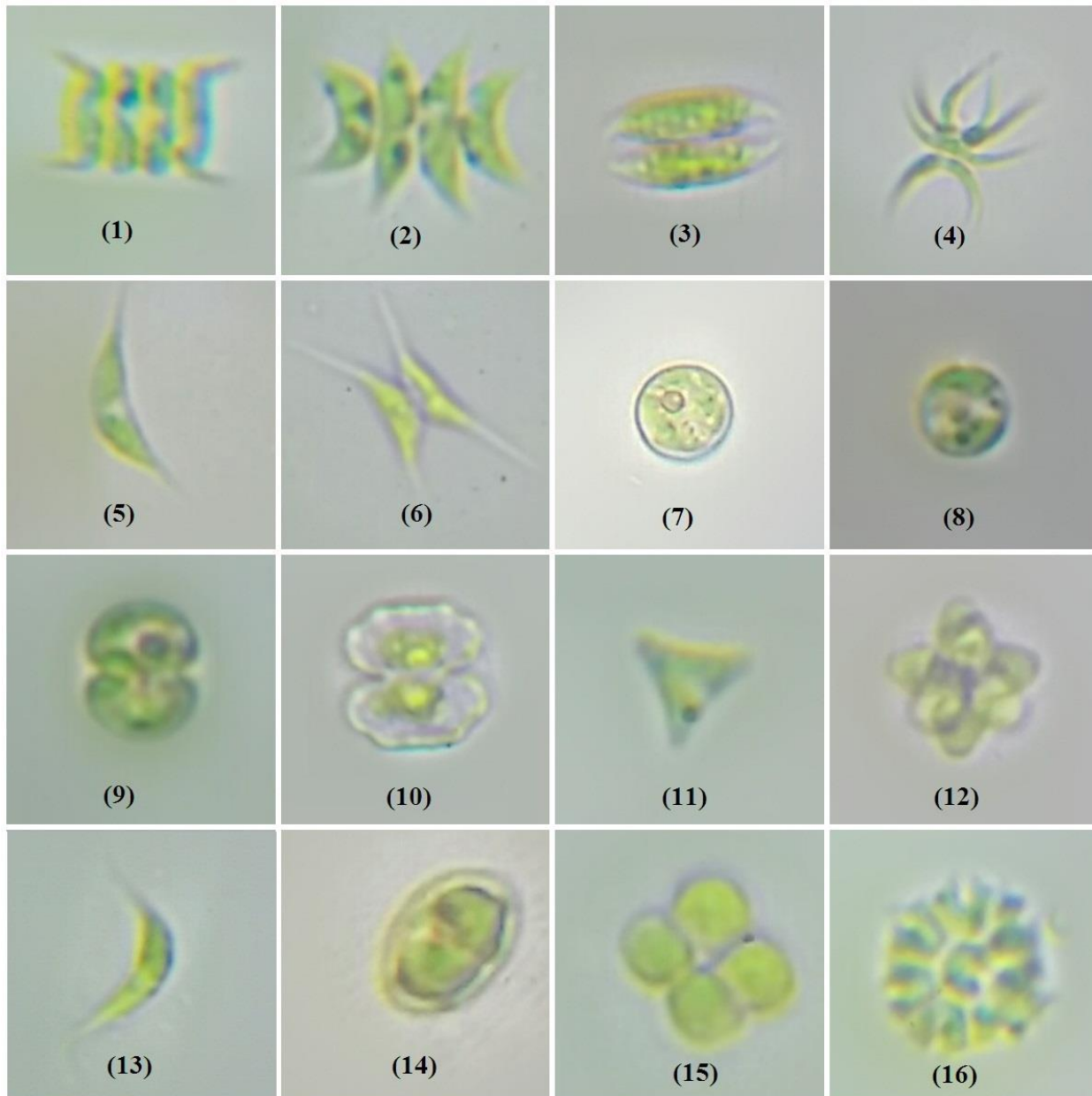
III. OBSERVATIONS:

GAURIPADA LAKE:



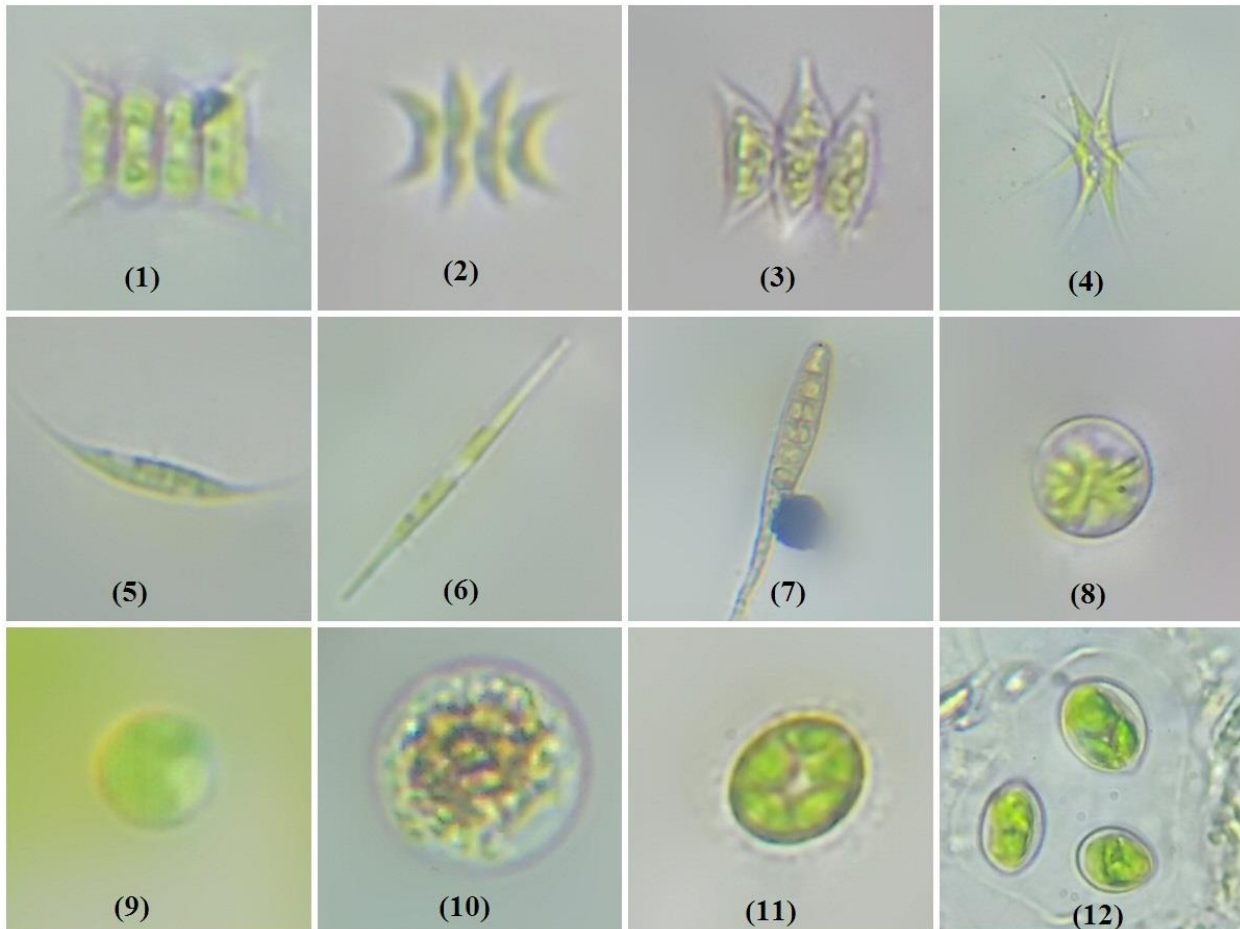
(1)-
 (2)*Scenedesmus quadricauda* (Turp.), (3)*Scenedesmus dimorphus* (Turpin), (4)*Ankistrodesmus* sp. , (5) *Tetraedron tumidulum* (Reinsch), (6)*Tetraedron trigonum* (Nägeli), (7) *Tetraedron minimum* (A.Braun), (8)*Tetraedron caudatum* (Corda), (9)*Crucigenia tetrapedia* (Kirchner), (10) *Cosmarium granatum* , (11)*Pediastrum duplex*, (12)*Eremosphaera viridis*, (13)*Tribonema* sp, (14)*Euglena gracilis*, (15)*Phacus acuminatus*.

BHAGVA LAKE (KALA TALAO)



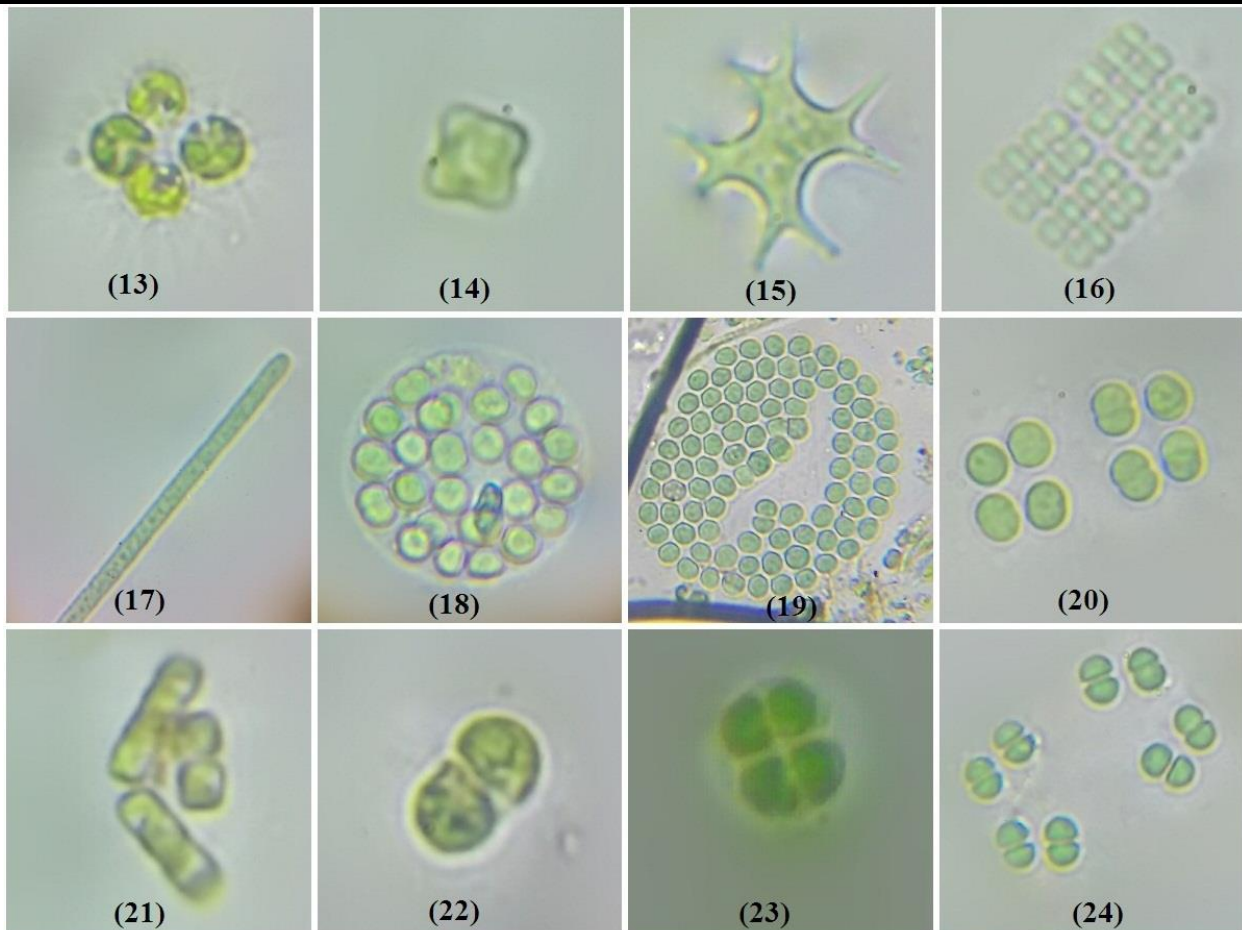
(1)*Scenedesmus quadricauda* (Turp.), (2)*Scenedesmus dimorphus* (Turpin), (3)*Arthrodesmus gibberulus*, (4)*Ankistrodesmus falcatus* (Corda), (5)*Schroederia indica*, (6)*Dicloster acuatus*, (7)*Chlorococcum humicola*, (8)*Chlorella vulgaris*, (9)*Cosmarium granatum*, (10)*Euastrum insulare* (Wittrock), (11)*Tetraedron tumidulum* (Reinsch), (12)*Coelastrum microporum* Nageli in A.Braun, (13)*Ankistrodesmus convolutus*, (14)*Gloeocapsa nigrescens*, (15)*Synechocystis crassa*, (16)*Pediastrum tetras*.

MUSUNDA LAKE:



(1) *Scenedesmus quadricauda* (Turp.) (2) *Scenedesmus dimorphus* (Turpin) (3) *Scenedesmus acuminatus* (Lagerheim), (4) *Ankistrodesmus falcatus* (Corda), (5) *Schroederia indica*, (6) *Nitzschia acicularis* (Kützing), (7) *Meridion circulare* (Greville), (8) *Trebouxia humicola*, (9) *Chlorella vulgaris* (Beyerinck), (10) *Asterococcus limneticus*, (11) *Oocystis* sp., (12) *Oocystis borgei*.

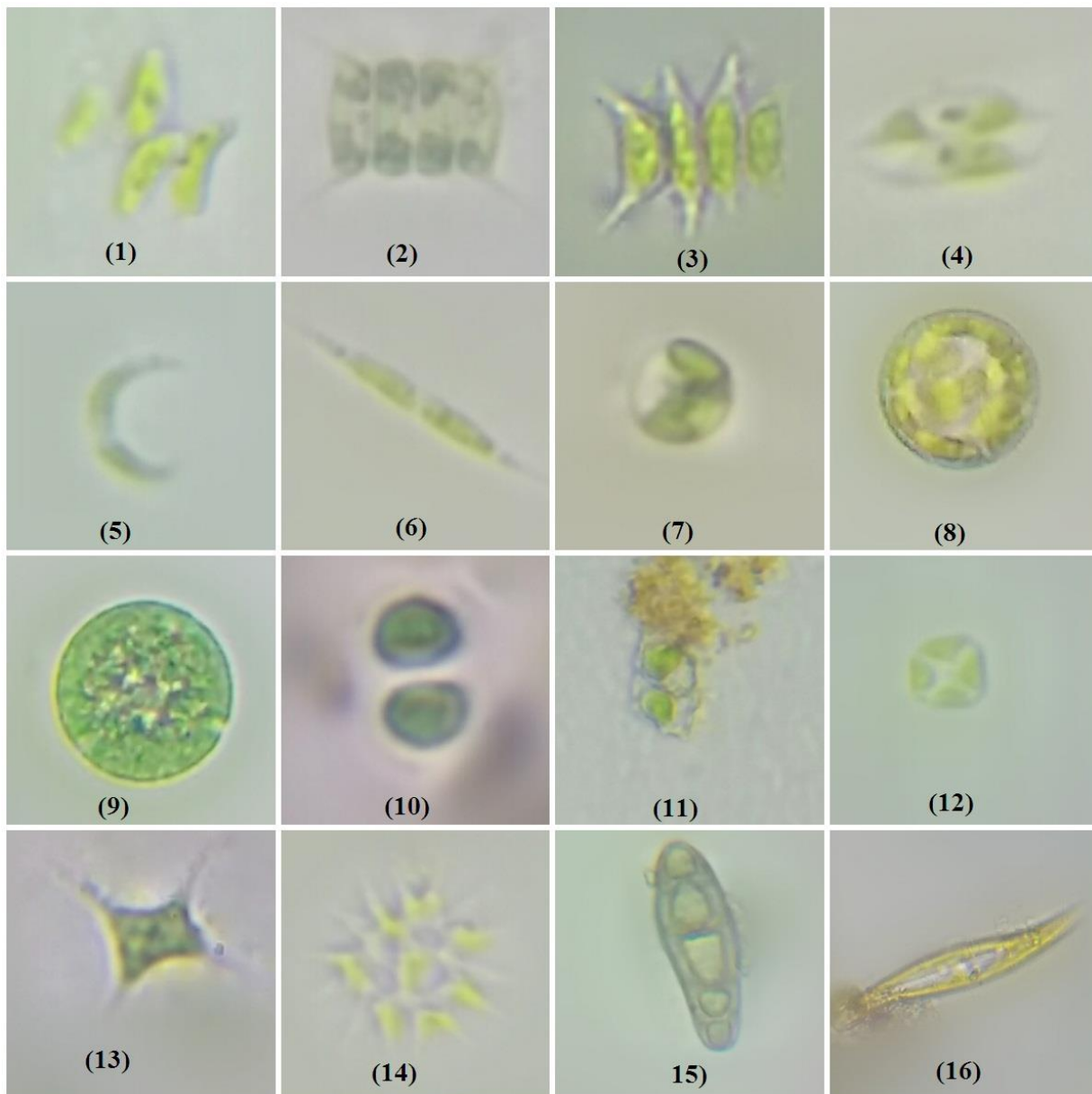




(13)*Gonium quadratum*, (14)*Tetraedron minimum* (A.Braun), (15)*Tetraedron gracile* (Reinsch), (16)*Merismopedia glauca* (Ehrenberg), (17)*Phormidium lucidum*, (18)*Pleodorina californica*, (19)*Eudorina elegans*, (20)*Eucapsis alpina*, (21)*Stichococcus bacillaris*, (22)*Chroococcus* sp., (23)*Chroococcus turgidus* (Kutzing), (24)*Chroococcus minor* (Kutzing).



BRAMHALA LAKE:



(1)*Scenedesmus producto-capitatus*, (2)*Scenedesmus quadricauda*(Turp.), (3)*Scenedesmus acuminatus*(Lagerheim), (4)*Arthrodesmus* sp., (5)*Ankistrodesmus* sp., (6)*Closterium* sp., (7)*Chlorella vulgaris*, (8)*Cyclotella meneghiniana*, (9)*Haematococcus pluvialis*, (10)*Chroococcus cohaerens* (Brebisson), (11)*Euastrum* sp., (12)*Crucigenia tetrapedia* (Kirchner), (13)*Tetraedron incus*(Teiling), (14)*Pediastrum duplex*, (15)*Meridion circulare*(Greville), (16)*Gyrosigma acuminatum* (Kützing).

Result:

The four lakes of Thane district of Maharashtra chosen for the examination comprises of diversified algal species as listed below.

GAURIPADA LAKE:

Scenedesmus, *Ankistrodesmus* sp, *Tetraedron tumidulum*, *Tetraedron trigonum*, *Tetraedron minimum*, *Tetraedron caudatum*, *Crucigenia tetrapedia*, *Cosmarium granatum*, *Pediastrum duplex*, *Eremosphaera viridis*, *Tribonema* sp, *Euglena gracilis* and *Phacus acuminatus*.

BHAGVA LAKE:

Scenedesmus quadricauda, *Scenedesmus dimorphus*, *Ankistrodesmus falcatus*, *Schroederia indica*, *Dicloster acuatus*, *Chlorococcum humicola*, *Chlorella vulgaris*, *Cosmarium granatum*, *Euastrum insulare*, *Tetraedron tumidulum*, *Ankistrodesmus convolutus*, *Gloeocapsa nigrescens*, *Coelastrum microporum*, *Arthrodesmus gibberulus*, *Synechocystis crassa* and *Pediastrum tetras*.

MASUNDA LAKE:

Scenedesmus dimorphus, *Scenedesmus quadricauda*, *Scenedesmus acuminatus*, *Ankistrodesmus falcatus*, *Schroederia indica*, *Nitzschia acicularis*, *Meridion circulare*, *Trebouxia humicola*, *Chlorella vulgaris*, *Asterococcus limneticus*, *Oocystis* sp, *Oocystis borgei*, *Gonium quadratum*, *Tetraedron minimum*, *Tetraedron gracile*, *Merismopedia glauca*, *Phormidium lucidum*, *Pleodorina californica*, *Eudorina elegans*, *Eucapsis alpine*, *Stichococcus bacillaris*, *Chroococcus* sp, *Chroococcus turgidus* and *Chroococcus minor*.

BRAMHALA LAKE:

Scenedesmus producto-capitatus, *Scenedesmus quadricauda*, *Scenedesmus acuminatus*, *Arthrodesmus sp*, *Ankistrodesmus sp*, *Closterium sp*, *Chlorella vulgaris*, *Cyclotella meneghiniana*, *Haematococcus pluvialis*, *Chroococcus cohaerens*, *Euastrum sp*, *Crucigenia tetrapedia*, *Tetraedron incus*, *Pediastrum duplex*, *Meridion circulare*, *Gyrosigma acuminatum*

Conclusion:

From the above results, it is evident that the lakes examined have diversified microalgal flora. Majority of the microalgae belong to division cyanophyta and chlorophyta. The most frequent alga was *Scenedesmus*. The lakes comprises of 36 genera and 51 species of microalgae.

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REFERENCES

- [1] Anand, N. 1998. Indian Fresh water Microalgae. BishenSingh Mahendrapal Singh, 23-A, Cannaught Place, Dehra Dun,
- [2] Prescott, G.W. 1951. Algae of Western great lakes area: Wm.C. Brown Co. Publishers Dubuqu Iowa.
- [3] P. Arulmurugan, S. Nagaraj and N. Anand .Biodiversity of fresh water algae from Guindy campus of Chennai, India
- [4] Ashish W.Yenkar, Bio-Diversity of Fresh Water Algae of Rotha-Ii Reservoir of Wardha District of Maharashtra, India. International Journal of Research Studies in Biosciences (IJRSB)
- [5] Prasad, B. N. & Srivastava, M. N. 1992. Fresh water algal flora of Andaman and Nicobar Islands, Vol. I. Bishen Singh and Mahendra Pal Singh, Dehradun, India.
- [6] M.D. & Guiry, G.M. 2017. AlgaeBase.
- [7] Korshikov, A.A. (1953). [The Freshwater Algae of the Ukrainian SSR. V. Sub-Class Protococcineae. Vacuolales and Protococcales]
- [8] Komárek, J. (2003). Coccoid and colonial cyanobacteria. In: Freshwater Algae of North America. Ecology and Classification
- [9] Gupta, R. K. 2005. Algal flora of Dehradun District Uttanchal. Bot. Surv. of India 1-298pp.
- [10] Lorenz RT, Cysewski GR, Commercial potential for *Haematococcus* microalgae as a natural source of astaxanthin

