

Noteworthy on colourless euglenoids from North Maharashtra region, India

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ABSTRACT

During the course of studies on biodiversity in algae from North Maharashtra region, the authors came across the 13 colourless euglenoids during January 2019 to November 2019. These are *Khawkinea quartana* (Moroft) Jahn et MC Kibbhen, *Astasia comma* Pringsh., *A. klebsii* Lemm. , *A. applanata* Pringsh., *Rhabdomonas costata* (Korsch) Pringsh. , *Peranema cuneatum* Playf., *P. inflexum* Skuja, *Urceolus gobii* Skv. *Petalomonas tricarinata* Skuja, *Anisonema platysomum* Skuja, *Entosiphon ovatum* Stokes, *Heteronema acutissimum* Skuja, & *Gyropaigne spirale* (Mutv.) Bourr. These were found in polluted waterbodies which have pH below 6 except *khawakenea quartana* was reported in freshwater, it's pH was 7.9. The species *Gyropaigne spirale* is first time recorded from India. All the presented species are described thoroughly & illustrated in this paper.

Keywords: Colourless, Euglenoids, Maharashtra.

INTRODUCTION

Euglenoids are interesting and beautiful microorganisms in biology that can eat food as animals by heterotrophy and can photosynthesis like plants by autotrophy, hence called them "plant-animal" organism in kingdom. North Maharashtra the northern part of Maharashtra state is rich in polluted and fresh water bodies. These water bodies represents a great variety in aquatic environments. Over the past year few reports are available on green Euglenoids occurring in Maharashtra (Kamat;1964, Kamat & freitas 1976; Ashtekar, 1982; Barhate & Tarar, 1985; Bhoge & Ragotheman, 1986; Waghodekar 2001; Narkhede, 2007; Kumawat,2013 & Dhande et al,2019) but colourless species are not reported from North Maharashtra keeping this in view the author surveyed the members of Euglenoids from North Maharashtra. The present communication includes 13 taxa of colourless Euglenoids are morphologically & ecologically described.

MATERIAL METHODS

Material for the present study were collected from different locality of North Maharashtra comprises Jalgaon, Dhule & Nandurbar district are located in the North-west region of the state Maharashtra (20 38' to 20 32' NL & 73 15' to 70 28' EL) the materials were collected between 8.00-10am.

Each sample allow to settle by Lugol's solution & small piece of copying pencil lead was added to it for staining of the flagella. Later sample were preserved in 3% formaldehyde. The camera Lucida drawings were drawn from fresh materials as far as possible immediately when the materials was brought in the laboratory & salient morphological features were recorded. Microphotograph of taxa were taken by Nikon Coolpix P4 camera. The taxa are identified with help of Monographs (Huber-Pestalozzi, 1955 & Asual, 1975). And the relevant research publications. The collections have been deposited in botany department, Dhanaji Nana Mahavidyalaya, Faizpur Dist. Jalgaon.

Systematic account

Euglenoids are one of the best flagellates algal group. Instead of a cell wall, they have protein rich membrane called "pellicle". They have a eyespot & majority are autotrophs but few are heterotrophs. They serve as connecting link between plants and animals.

1. *Khawkinea quartana* (Moroff), (Pl.1, Fig.1; Pl.2, Fig.5)

Jahn et McKibben Z.I.Asaul, 1975 Z.I.Asaul, 1975, p.281, pl. 178, fig. 1-12.

Cell elongate oval; narrowing anteriorly, bilabiate; posteriorly tapering into a tail like process. Pellicle spirally striated. Paramylum scattered oval granules, sometimes irregular in shape. Flagellum more than the body length. Cells 33.2-60x 11-23.4

Habitat- Found in Polluted water (P^H-5.9). Near Faizpur Dist. Jalgaon. During Feb. 2019.

2. *Astasia comma* Pringsh. (Pl.1, Fig.2; Pl.2, Fig.6)

Z.I.Asaul, 1975, p.293, pl. 190, fig. 1-6.

Cell elongate, wedge shaped; narrowing slightly towards the anterior end; broadly rounded at the posterior end. cytoplasm hyaline with a few many scattered paramylum granules. Pellicle apparently smooth. Flagellum thick, about the body length, showing peculiar trailing movement while swimming. Cells 28.86x7.41um

Habitat- Fairly common species of peaty water, particularly with decaying leaves (P^H-5.2). from Raver dist. Jalgaon. During May 2019.

3. *A. klebsii* Lemm. (Pl.1, Fig.3; Pl.2, Fig.8)

Z.I.Asaul, 1975, p.287, pl. 183, fig. 1-5.

Cell colorless, fusiform to spindle shaped; anterior half of body draw out into a long tail like process. Pellicle spirally straited, striae very faint. Paramylum bodies

many, ovoid in the wider posterior half of the cell. 43 x 19.5 µm.

Habitat- In a brackish water (P^H-6.0). Bhusawal, March 2019.

4. *A. applanata* Pringsh. (Pl.1, Fig.4; Pl.2, Fig.10)

Z.I.Asaul, 1975, p.304, pl. 198, fig. 11-18.

Cells colourless; osmotrophic; free-swimming; uniflagellate; solitary; without any envelope; non rigid, showing euglenoid movement moderate or pronounced; fusiform or elongate, cell oval to fusiform, slight flattening of the cell. Eyespot and flagellar swelling absent. contractile vacuole always present. Cells 33.15x19.11um

Habitat- In a fishery smell ditch in Tapi river, sarangkhedha, Dist. Nandurbar, (P^H-5.2). in May 2019.

5. *Rhabdomonas costata* (Korsch) Pringsh (Pl.1, Fig.5; Pl.2, Fig.3)

Z.I.Asaul, 1975, p.312-313, pl. 206, fig. 12-22.

Cell colorless, rigid, uniflagellate, spirally ridged, rounded at both the ends; slightly curved one side. Paramylum 2 oval discs with minute granules. 16.4 x 5.9 µm.

Habitat- In panzara river water mixed with effluent from sewage, found in Dhule, September 2019.

6. *Peranema cuneatum* Playf. (Pl.1, Fig.6; Pl.2, Fig.2)

Z.I.Asaul, 1975, p.324, pl. 213, fig. 6-8.

Cell elongate, wedge shaped; narrowing slightly towards the anterior end; broadly rounded at the posterior end. Cytoplasm hyaline with a few small scattered paramylum granules. Siphon body prominent. Pellicle apparently smooth. Flagellum thick, about the body length, cell colourless, 39 x 13.65 µm.

Habitat- In polluted water near village Nashirabad, Dist. Jalgaon. During August 2019.

7. *P. inflexum* Skuja (Pl.1, Fig.7; Pl.2, Fig.1)

Z.I.Asaul, 1975, p.325, pl. 214, fig. 1-3.

Cells cylindrical-conical; tapering anteriorly; truncated or rounded posteriorly. Pellicle soft and spirally striated. Cytoplasm granular. Pharyngeal rod present. Paramylum many small rounded granules, crowded in mid-region. Flagellum about the body length. Nucleus present posteriorly. 27.6 x 9.4 µm.

Habitat- In polluted puddle (P^H-4.5) near village Mukati, Dist. Dhule. In January 2019.

8. *Urceolus gobii* Skv. (Pl.1, Fig.8; Pl.2, Fig.13)

Z.I.Asaul, 1975, p.341, pl. 223, fig. 1,2.

Cell colorless, flask-shaped with attenuated anterior end and broadly rounded posterior end. Pellicle smooth. Flagellum single and long 44 x 21.5 µm.

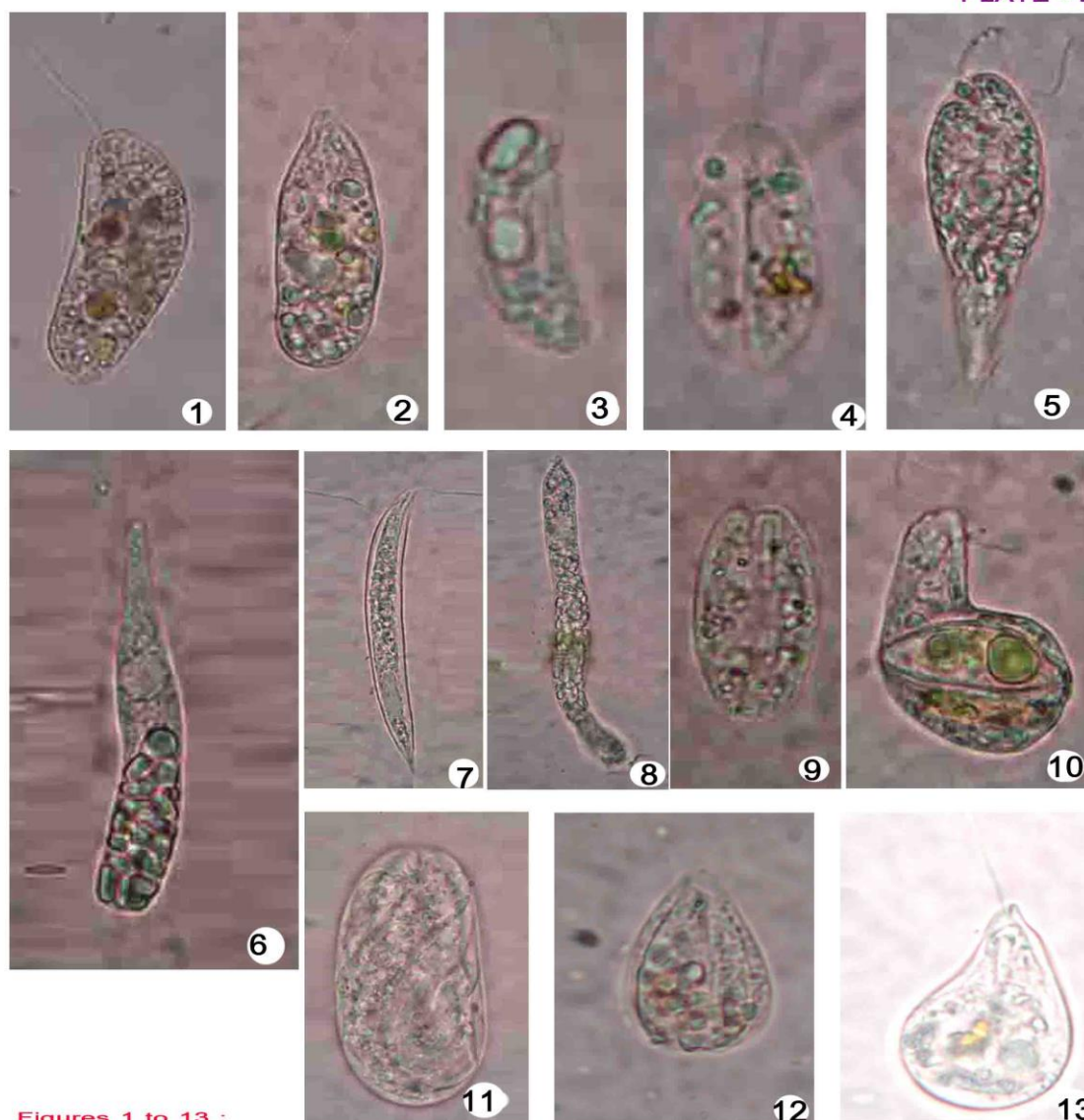
Habitat- In polluted tiny pool (P^H-5.8) near village Lumkheda, Dist. Nandurbar.

PLATE - 1



Figures 1 to 13 :

1. *Khowkenia quartana*(Moroff)Jahn et McKibben, 2. *Astasia comma* Pringsh., 3. *A.klebsii* Lemm. , 4. *A. applanata* Pringsh. , 5. *Rhabdomonas costata*(Korsch) Pringsh, 6. *Peranema cuneatum* Play f., 7. *P.inflexum* Skuja, 8. *Urceolus gobii* Skv., 9. *Petalomonas tricarinata* Skuja 10.*Anisonema platysomum* Skuja, 11. *Entosiphon ovatum* Stokes, 12. *Heteronema acutissimum* Skuja, 13. *Gyropaigne spirale* (Matv)Bourr



Figures 1 to 13 :

1. *Paranema inflexum* Skuja, 2. *P. cuneatum* Playf., 3. *Rhabdomonas costata*(Korsch) Pringsh 4. *Anisonema platysomum* Skuja, 5. *Khowkenia quartana*(Moroff)Jahn et McKibben, 6. *Astasia comma* Pringsh. 7. *Heteronema acutissimum* Skuja 8. *Astasia klebsii* Lemm., 9. *Entosiphon ovatum* Stokes, 10. *Astasia applanata* Pringsh. 11. *Gyropaigne spirale* (Matv)Bourr, 12. *Petalomonas tricarinata* Skuja 13. *Urceolus gobii* Skv.

9. *Petalomonas tricarinata* Skuja(Pl.1, Fig.9; Pl.2, Fig.12)

Z.I.Asaul, 1975, p.385, pl. 246, fig. 1-4.

Cell colorless, broadly ovoid, flattened anterior end narrowed, truncated; posterior end broadly rounded with three keels Pellicle striations run parallel to keels. Paramylum granules tend to lie in longitudinal row. Flagellum single. 25.7 x 13.5 µm.

Habitat- Present mixed slimy detritus (PH^{4.9}) near railway bridge Bhusawal, Dist. Jalgaon, In April 2019.

10. *Anisonema platysomum* Skuja(Pl.1, Fig.10; Pl.2, Fig.4)

Z.I.Asaul, 1975, p.352, pl. 227, fig. 16-17.

Cell colorless, rigid, oval; anterior end rounded; posterior end slightly narrowed, flattened with one longitudinal furrow. Flagella 2 and equal. Pellicle smooth. 19.5 x 10.5 µm.

Habitat- Polluted zone of the river tapi near Dipnagar, Bhusawal Dist. Jalgaon, June 2019.

11. *Entosiphon ovatum* Stokes (Pl.1, Fig.11; Pl.2, Fig.9)

G.Huber-pestalozzi,1955, p.533, pl.109 ,f.1101

Cell oval, rounded at the both the ends. Pellicle with 10-12 longitudinal ridges, clearly located at anterior end of cell. Swimming flagellum smaller than the body length, the siphon funnel shaped reaching the length of the body. Cytoplasm clear with scattered paramylum granules. 21.7-29 x 14.2-16.2 µm

Habitat- In a drying water pool, (P^H-4.0) Sakri, Dist. Dhule, march 2019.

12. *Heteronema acutissimum* Skuja (Pl.1, Fig.12; Pl.2, Fig.7)

Z.I.Asaul, 1975, p.330, pl. 218, fig.5,6.

Cell colourless, twisted and acuminate at anterior end; posterior end rounded, obliquely cut. Pharyngeal rod present, separated from the gullet. Cytoplasm hyaline, with peripheral small granules. Reservoir with 1-2 vacuoles. Swimming flagellum about 1½ times the body length, trailing flagellum about the body length. Nucleus slightly sub-central. Slightly metabolic. 17.5 x 21.5 µm.

Habitat- Along with other algae (P^H-5.0) near Mandane Dist. Dhule, May 2019.

13. *G. spirale* (Matv) Bourr (Pl.1, Fig.13; Pl.2, Fig.11)

Z.I.Asaul, 1975, p.311, pl. 204, fig. 8,9.

Cell colourless, broadly ovate; narrowed anteriorly; broadly rounded. Pellicle indistinctly striated. 31.2 x 24.2 µm.

Habitat- In stagnant fresh water pond (P^H-7.9) near village Prakasha Dist. Nandurbar, May 2019.

Conflicts of interest: The authors stated that no conflicts of interest.

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