



## Genus *Gomphonema* from Anjani dam of Jalgaon district, Maharashtra

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### Abstract

Present article deals with the taxonomic enumeration of Genus *Gomphonema* from Anjani dam of Jalgaon district Maharashtra, India. The aim of this investigation is to contribute information on diversity of fresh water diatoms from Jalgaon District. The present work is carried out from 2017 to 2019 during the course of investigation total 11 taxa of genus *Gomphonema* including 06 species 05 varieties has been recorded from Anjani dam and are described systematically with illustrations.

**Keywords:** Anjani dam, Gomphonema, Diatoms, Jalgaon, Maharashtra

### Introduction

Diatoms are unicellular, microscopic, photosynthetic algae with a distinctive cell wall made of a high quantity of silica and comprise two interconnected valves. This intricate siliceous frustule (valve) morphology is the basis for their taxonomy. They occur in most aquatic habitats found on earth and play an important role in aquatic ecosystems. They use light to grow, provide food for many other organisms and are sensitive to environmental change. The diatoms are most prominent and ecologically significant group of microalgae on the earth. The significant contribution in the field of diatom studies in Maharashtra were known through the work of Gonzalves and Gandhi (1952-1953) [15, 16], Gandhi (1954 [8], 1956 [7], 1958 [10], 1959 [11], 1960 [12], 1962 [13], 1998), Sarode and Kamat (1984) [25] Jadhavar and Papdiwal (2012 [18], 2016) [17], Sonule and Mulani (2018) [26]. In North Maharashtra the work on diatom studies known through Barhate and Tarar (1983, 1985) [3, 4], Aher and Mahajan (2006) [20], Narkhede (2006) [22], Nandan *et al.* (2009) [21], Patil (2016, 2019) [23, 24], Aher *et al* (2017) [2], Mahajan (2019 a b) [20]. The present study is a step to explore and document the diversity of *Gomphonema* from Anjani dam of Jalgaon district.

### Materials and Methods

Anjani dam is located near the Palasdal village (20°54' North latitude and 75°19' East longitude) situated on Anjani river in the Erandol Tahsil of Jalgaon district, Maharashtra. The algal samples collections were made early in the morning between 7.00 to 09.00 am during May, 2017 to April, 2019 from different sites of Anjani dam. Diatoms were collected by using the plankton net and also by squeezing the hydrophytes. The diatoms were not usually found in very pure state in nature. The collections contained organic matter, calcium salts, sands etc. The samples collected in plastic bottles and fixed with 4% formalin. Diatoms were cleaned by acid treatment method (Sarode and Kamat 1984) [25] then observed under microscope under

appropriate magnifications for taxonomic study. The line drawings were made with the help of mirror type of camera lucida. Identification was made up to species level based on the consultation of keys and description given in standard publications like Cleve-Euler (1955) [5], Sarode and Kamat (1984) [25], Gandhi (1998 [14], 1960) [12] and relevant research publications.

### Taxonomic Enumeration

#### *Gomphonema constrictum* Ehr. var. *indica* Gandhi Pl.1, Fig. 1 Pl.2, Fig. 1

Sarode P. T. and Kamat N. D., 1984 [25], P. 184, Pl. 21, Fig. 494.

Valve 11.2 µm broad, 56.6 µm long; clavate with slightly constricted, broadly produced and rounded apex; raphe thick and straight; axial area narrow, linear; central area somewhat rhomboid, unilateral with a stigma on the opposite side; striae 10 in 10 µm in the middle and 12-13 in 10 µm towards the ends, radial and coarsely punctate. Coll. No.111.

#### *Gomphonema gracile* Ehr. var. *intricatiforme* Mayer Pl.1, Fig.2 Pl.2, Fig. 2

Sarode P. T. and Kamat N. D., 1984 [25], P. 186, Pl. 22, Fig. 500.

Valve 10.8 µm broad, 63.0 µm long; lanceolate clavate, inflated in the middle; ends obtuse rounded; raphe somewhat thick and straight with distinct central nodules and curved terminal fissures; axial area narrow; linear; central area slightly, expanded with an isolated stigma on the opposite side; striae 12 in 10 µm in the middle and upto 15 in 10 µm towards the ends, slightly radial and coarse. Coll. No.111.

#### *Gomphonema gracile* Ehr. var. *major* Grun. Pl.1, Fig.3, Pl.2, Fig. 3

Cleve -Euler, 1955 [5], PP. 185-186, Figs. 1281 d, e.

Valves 10.1 µm broad, 72.1 µm long; narrowly lanceolate, turgid in the middle and gradually tapering towards the

rounded apex and base; raphe thin and straight; axial area narrow; central area with an isolated stigma on the opposite side; striae 11–12 in 10  $\mu\text{m}$ , slightly radial and finely punctate. Coll. No.221.

***Gomphonema intricatum* Kuetz. Pl.1, Fig.4 Pl.2, Fig. 4**

Sarode P. T. and Kamat N. D., 1984 <sup>[25]</sup>, P. 188, Pl. 22, Fig. 506

Valve 11.6  $\mu\text{m}$  broad, 49.5  $\mu\text{m}$  long, subclavate with constricted, slightly swollen broadly rounded apex and attenuated rounded base: raphe slightly thick: axile area narrow, linear; central area unilateral with an isolated stigma on the opposite side: striae 8 in 10  $\mu\text{m}$  in the middle and 10 in 10  $\mu\text{m}$  towards the ends, radial and coarse. Coll. No.291.

***Gomphonema intricatum* Kuetz. var. *vibrio* (Ehr.) Cleve. Pl.1, Fig.5, Pl.2, Fig. 5**

Sarode P. T. and Kamat N. D., 1984 <sup>[25]</sup>, P. 189, Pl. 22, Fig. 510

Valve 19.4  $\mu\text{m}$  broad, 102.6  $\mu\text{m}$  long, linear clavate gibbous in the middle with rounded truncate ends; axial area fairly broad; central area large unilateral with an isolated stigma on the opposite side; striae 8 in 10  $\mu\text{m}$  in the middle and 10 in 10  $\mu\text{m}$  towards the ends, clearly punctate. Coll. No.241.

***Gomphonema lacus-rankala* Gandhi var. *chandolensis* Gandhi Pl.1, Fig.6 Pl.2, Fig. 6**

Gandhi H.P., 1998, P.153, Pl.II, Fig 62-65

Valve 19.1  $\mu\text{m}$  broad, 57.7  $\mu\text{m}$  long, clavate with broadly truncate rostrate apex. Striae about 8-11 in 10  $\mu\text{m}$ . Coll. No.281.

***Gomphonema lanceolatum* Ehr. Pl. 1, Fig.7, Pl.2, Fig. 7**

Sarode P. T. and Kamat N. D., 1984 <sup>[25]</sup>, P. 190, Pl. 22, Fig. 514.

Valve 13.8  $\mu\text{m}$  broad, 68.6  $\mu\text{m}$  long, linear-lanceolate with attenuated rounded ends; raphe thin, straight; axial area narrow, linear; central area slightly unilateral with an isolated stigma on the opposite side; striae radial, lineate, 12 in 10  $\mu\text{m}$ . Coll. No.241.

***Gomphonema magnifica* Gandhi Pl.1, Fig.8, Pl.2, Fig. 8**

Gandhi H.P., 1960 <sup>[12]</sup>, P.37 Pl. IV, Fig.108.

Valve 19.4  $\mu\text{m}$  broad, 90.6  $\mu\text{m}$  long, broad, lanceolate clavate with acutely rounded apices the base sometimes concave; axial area narrow, linear; central area small slightly unilateral with an isolated stigma on the opposite side; striae 7-8 in 10  $\mu\text{m}$  very slightly radial, distinctly punctate, puncta about 12-15 in 10  $\mu\text{m}$  single middle striae distantly formed. Coll. No.291.

***Gomphonema olivaceum* (Hormemann) Brebisson Pl.1, Fig.9, Pl.2, Fig. 9**

Das S.K. and Adhikary S.P., 2012 <sup>[6]</sup>, P.176, Pl.3, Fig 77

Valves 12.7  $\mu\text{m}$  broad 47.2  $\mu\text{m}$  long; lanceolate clavate with broad rounded apices, attenuated apices, middle wide striation coarse and distinct parallel 8-10 in 10  $\mu\text{m}$ . Coll. No.161.

***Gomphonema sphaerophorum* Ehr. Pl. 1, Fig.10, Pl.2, Fig. 10**

Sarode P. T. and Kamat N. D., 1984 <sup>[25]</sup>, P. 196, Pl. 23, Fig. 534.

Valves 8.6  $\mu\text{m}$  broad, 31.1  $\mu\text{m}$  long, elliptic with constricted capitate apex and slightly constricted feebly capitate base, raphe thin and straight; striae 14-15 in 10  $\mu\text{m}$  indistinctly ends, punctate, radial.

**Coll. No. 231. *Gomphonema subventricosum* Hustedt Pl.1, Fig.11, Pl.2, Fig. 11**

Sarode P. T. and Kamat N. D., 1984 <sup>[25]</sup>, P. 199, Pl. 23, Fig. 542.

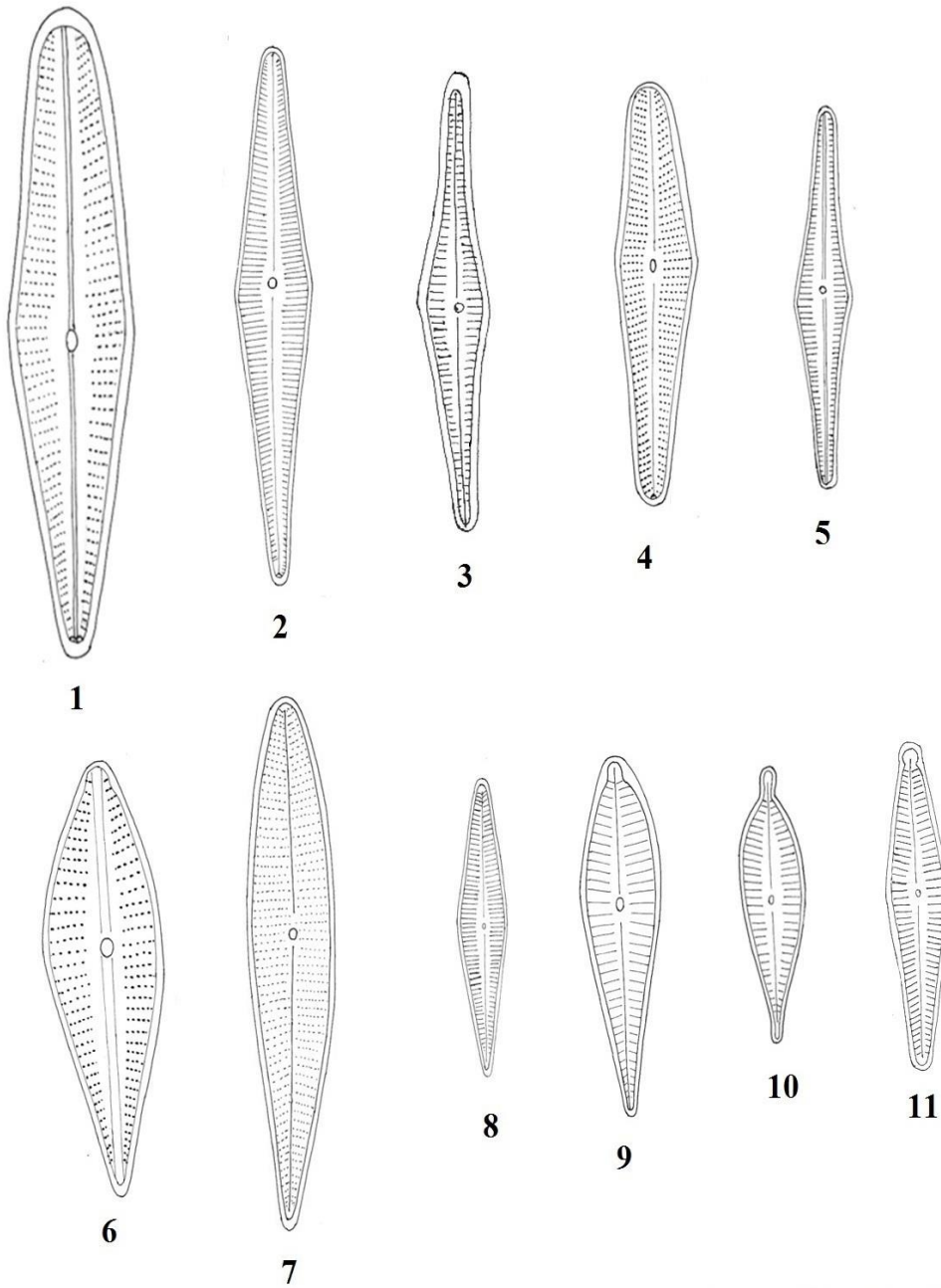
Valve 15.7  $\mu\text{m}$  broad, 74.0  $\mu\text{m}$  long; lanceolate clavate with somewhat produced, slightly constricted feebly capitate apex and attenuated base; raphe thin and straight, axial area narrow; central area unilateral with an isolated stigma on the opposite side; striae 10- 12 in 10  $\mu\text{m}$  radial.

**Coll. No.291.**

**Conclusion**

During the study total 11 taxa of genus *Gomphonema* including 06 species 05 varieties were reported from Anjani dam. They were recorded maximum in summer season and minimum in winter season.

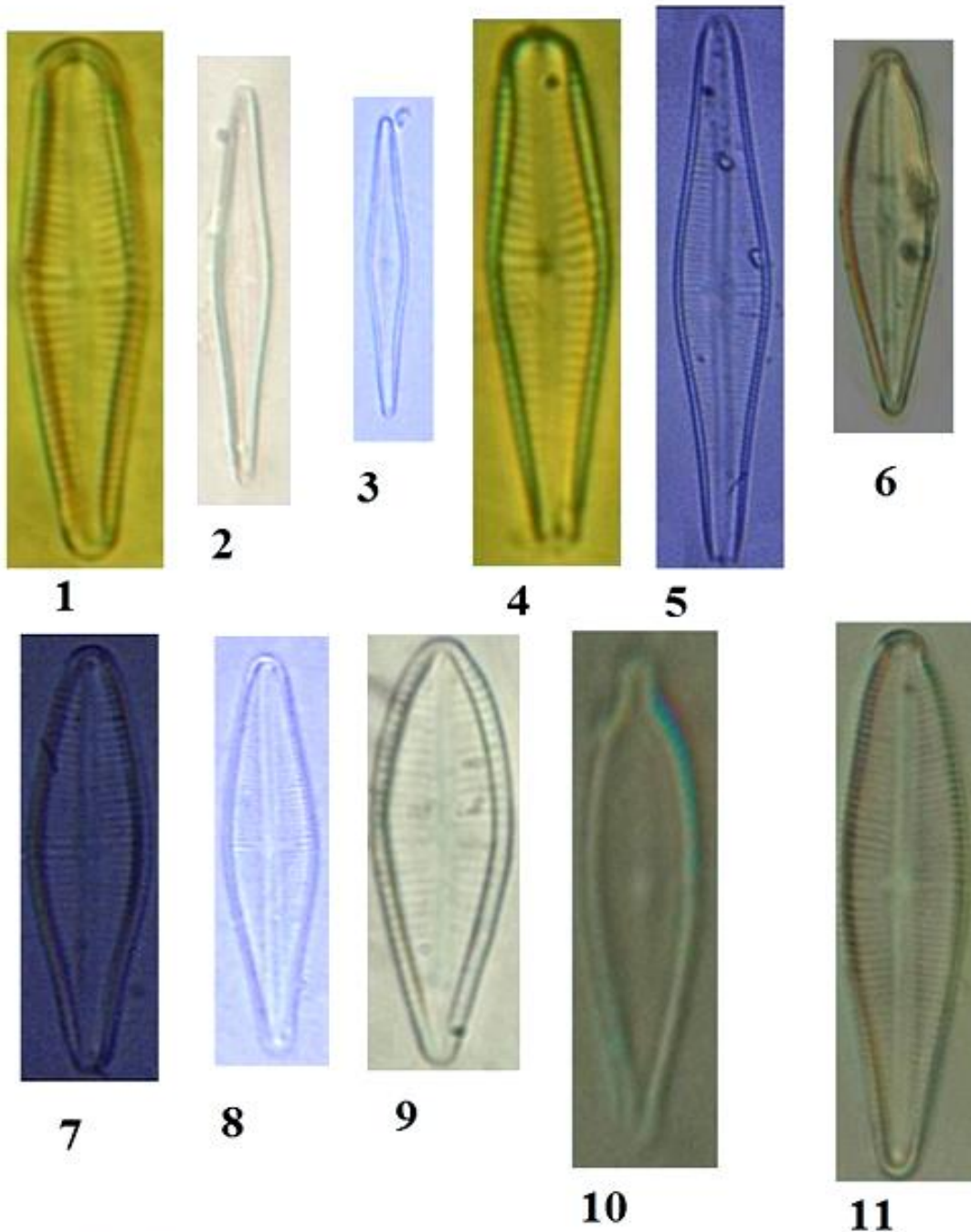
**PLATE - 1**



**Fig.** Scale bar A : 10  $\mu$ m    Scale A : Figs. 1, 2, 4, 6, 7, 9, 10  
 Scale bar B : 25  $\mu$ m    Scale B : Fig. 3, 5, 8, 11

- |   |                                      |
|---|--------------------------------------|
| 1. <i>Gomphonema constrictum</i> var. <i>indica</i>         | 7. <i>Gomphonema lanceolatum</i>     |
| 2. <i>Gomphonema gracile</i> var. <i>intricatiforme</i>     | 8. <i>Gomphonema magnifica</i>       |
| 3. <i>Gomphonema gracile</i> var. <i>major</i>              | 9. <i>Gomphonema olivaceum</i>       |
| 4. <i>Gomphonema intricatum</i>                             | 10. <i>Gomphonema sphaerophorum</i>  |
| 5. <i>Gomphonema intricatum</i> var. <i>vibrio</i>          | 11. <i>Gomphonema subventricosum</i> |
| 6. <i>Gomphonema lacus-rankala</i> var. <i>chandolensis</i> |                                      |

# PLATE-2



### Photographs

- |   |                                      |
|---|--------------------------------------|
| 1. <i>Gomphonema constrictum</i> var. <i>indica</i>         | 7. <i>Gomphonema lanceolatum</i>     |
| 2. <i>Gomphonema gracile</i> var. <i>intricatiforme</i>     | 8. <i>Gomphonema magnifica</i>       |
| 3. <i>Gomphonema gracile</i> var. <i>major</i>              | 9. <i>Gomphonema olivaceum</i>       |
| 4. <i>Gomphonema intricatum</i>                             | 10. <i>Gomphonema sphaerophorum</i>  |
| 5. <i>Gomphonema intricatum</i> var. <i>vibrio</i>          | 11. <i>Gomphonema subventricosum</i> |
| 6. <i>Gomphonema lacus-rankala</i> var. <i>chandolensis</i> |                                      |

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