DIVERSITY OF GENUS COSMARIA CORDA FROM ABHORA DAM OF JALGAON DISTRICT, MAHARASHTRA

*Patil S.B. and Kumawat D.A.
Sardar Vallabhbhai Patel Arts and Science College, Ainpur, Maharashtra
Department of Botany, Dhanaji Nana Mahavidyalaya, Faizpur, Maharashtra
*Author for Correspondence

ABSTRACT
During exploration of algal flora and ecological study of Abhora dam of Raver Tahsil of Jalgaon district of Maharashtra, the authors collected 36 taxa of desmids. The paper deals with the descriptions of 22 taxa of Genus Cosmarium Corda belonging to 13 species and 09 varieties. Abhora dam is situated near foot of Satpura hills at 70° 01’ North latitudes and 21° 18’ East longitudes. This is an earthen dam across the Bokad nalla of river Bhokar originating in Satpura ranges half kilometer towards Northeast from village Abhora Taluka Raver, Dist. Jalgaon, Maharashtra. All these species have been recorded for the first time from this region.

Keywords: Cosmarium, Diversity, Abhora Dam, Maharashtra

INTRODUCTION
During the course of studies on the algal flora and ecology of Abhora dam, Desmids along with other algal samples were collected in acid washed collection bottles and preserved in 4% formalin for further taxonomic investigation. In this communication description of 22 taxa of Genus Cosmarium Corda is given. Our knowledge of desmids in Maharashtra is known through the work of Gonzalves and Gangla (1947), Kamat (1947), Ashtekar and Kamat (1978), Freitas and Kamat (1978), Tarar et al., (1998), Jawale et al., (2005), Dhande and Jawale (2009), Mahajan (2011).

MATERIALS AND METHODS
The algal collection were made during April 2007 to March 2008. Abhora dam is located near foot of Satpura hills (76° 01’ North latitude and 21° 18’ East longitude) in the Raver Tahsil of Jalgaon district, Maharashtra. The collected samples were preserved in 4% formalin for microscopic studies and line drawings were drawn with the help of camera lucida technique from fresh as well as preserved material. Identification was made with help monograph of Turner (1892) and other recent available relevant literature.

Systematic Account
Cosmarium awadhense Prasad and Mehrotra.
Cell 19.5 μm broad, 24.9 μm long, isthmus 5.3 μm long, cell longer than broad, deeply constricted, sinus narrowly linear with a dilated extremity semicells subcircular, cell apices truncate and flat with straight margin, sides having 3-4 crenations without granules; side view elliptic; cell wall smooth; chloroplast axile with a single pyrenoid in each semicell.


Cosmarium bicardia Reinsch.
Cell 13.4 μm broad, 21.1 μm long and isthmus 7.3 μm long; cell slightly longer than broad, deeply constricted, sinus linear; semicells semicircular, lateral margins rounded; cell wall smooth; chloroplast axile with a single pyrenoid in each semicell.

Habitat: Coll. No. 422 October 2007

Cosmarium bioculatum Breb. var. canadense Krieg. et Gerl.
Cell 23.0 μm broad, 29.2 μm long and isthmus 5.7 μm long; as long as broad or very slightly longer, deeply constricted in the middle, sinus narrowly linear and with slightly dilated apex; semicells not perfectly elliptic, upper margin more convex than the ventral, lateral margins rounded; lateral view of semicell subcircular; apical view elliptic; cell wall smooth and colourless; chloroplast axile, with a single pyrenoid.
Habitat: Coll. No. 425 October 2007

*Cosmarium contractum* Kirch. var. *contractum* Kirch.  
Pl. I, Fig. 4.

Cells 24.9-26.1 μm broad, 29.9-33.4 μm long and isthmus 6.1-6.5 μm long; longer than broad, deeply constricted in the middle, sinus narrowly linear undulations subacute, apex narrow and retuse with rounded angles; semicells elliptic; cell wall smooth, colourless; chloroplast axile with a single pyrenoid in each semicell.


*Cosmarium furcatospermum* W. et G.S. West. var. *maius* Prasad & Misra  
Pl. I, Fig. 5.

Cell 23.0 μm broad, 32.6 μm long and isthmus 7.6 μm long, small, slightly longer than broad, deeply constricted, sinus linear; semicells truncate, sub-semicircular, lateral margins 4-5 crenately-granulate, apex broadly truncate and 5-6 undulate with 3 series of small granules within the whole margin, central region smooth; top view oblong-elliptic; each semicell with an axile chloroplast containing a large pyrenoid in the centre.


*Cosmarium granatum* Breb.  
Pl. I, Fig. 6.

Cell 27.2 μm broad, 46.3 μm long and isthmus 7.2 μm long; medium sized, elongate-rhomboid; semicells sub-pyramidal with rounded angles, side coverings to a broadly rounded or sub truncate apex; sinus narrow and closed; wall punctate.


*Cosmarium hammeri* Reinsch var. *schmidlei* Groenblad et Scott.  
Pl. I, Fig. 7.

Cell 27.2 μm broad, 40.9 μm long, 7.2 μm long, small, longer than broad, sub-hexagonal, deeply constricted sinus narrowly linear with dilated apex; semicells with upper part of lateral margins converging and retuse, apices faintly retuse with rounded angles; cell wall thick and smooth; top view elliptic.


*Cosmarium isthmocymatium* Skuja  
Pl. I, Fig. 8.

Cell 24.9 μm broad, 72.5 μm long and isthmus 6.9 μm long; elliptic, longer than broad, deeply constricted in the middle, sinus narrowly linear; margins broadly undulate, undulations subacute, apex flat; cell wall with small and solid granules; chloroplast parietal; single pyrenoid in each semicell.


*Cosmarium laeve* Raben.  
Pl. I, Fig. 9.

Cell 15.4 μm broad, 19.2 μm long and isthmus 5.0 μm long, cells longer than broad, oval, deeply constricted; sinus linear with dilated apex; semicells semi elliptic; basal angles rounded, apex narrowly truncate, rounded and retuse; cell wall slightly undulate; chloroplast axile, single pyrenoid in each semicell.


*Cosmarium lagenarioides* (Roy et Biss.) Luetk var. *intermedium* Gutw.  
Pl. I, Fig. 10.

Cell 21.1 μm broad, 68.3 μm long and isthmus 9.9 μm long; cell longer than broad, deeply constricted, sinus linear with dilated extremity; semicells oblong-rectangular with rounded angles and slightly convex sides and apex; cell wall smooth; chloroplast axile with two pyrenoids in each semicell.


*Cosmarium margaritatum* (Lund) Roy et Biss.  
Pl. I, Fig. 11.

Cell 43.6 μm broad, 51.8 μm long and isthmus 11.8 μm long; small, longer than broad, deeply constricted, sinus gradually opening from a round extremity, isthmus slightly elongated; semicells sub-reniform and granulate; each semicell with an axile chloroplast and a pyrenoid.

Habitat: Coll. No. 455 January 2008

*Cosmarium melanosporum* Archer.  
Pl. II, Fig. 1.

Cell 10.3 μm broad, 13.4 μm long, isthmus 4.2 μm long, cells globose, small, slightly longer than broad, deeply constricted in middle, sinus linear; semi cells sub globose; single pyrenoid in each semicell.
Research Article

**Habitat:** Coll. No. 453 January 2008

*Cosmarium nitidulum* De Not  
Pl. II, Fig. 2.

Cells 21.1-23.4 μm broad, 37.2-37.6 μm long, isthmus 5.3-6.1 μm long, cell slightly longer than broad, deeply constricted, sinus narrowly linear with slightly dilated apex; semicells truncate-sub semicircular, tapering evenly from rounded basal angles to flattened apex with straight margins; cell wall minutely punctate; top view elliptic; chloroplast monocentric with one pyrenoid


*Cosmarium obtusatum* Schm. var. *undulatum* Fritsch and Rich  
Pl. II, Fig. 3.

Cell 36.4 μm broad, 51.8 μm long and isthmus 10.7 μm long, cells longer than broad, constricted in the middle; sinus linear with slightly dilated apex; semicells in vertical view narrowly ellipsoid; poles flattened slightly exerted; lateral margins with only 5-6 shallow undulation, apex also undulate; two chloroplast in each semicells; one pyrenoid in each chloroplast.

**Habitat:** Coll. No. 454 January 2008

*Cosmarium ocellatum* Eichl. and Gutw. var. *incrassatum* West et West  
Pl. II, Fig. 4.

Cell 15.3 μm broad, 17.6 μm long and isthmus 4.2 μm long, cells longer than broad, deeply constricted in the middle, sinus slightly open; semicells elliptic, basal angles dilated, apex rounded; cell wall smooth and colourless; chloroplast axile with single pyrenoid in each semicell.

**Habitat:** Coll. No. 497 March 2008.

*Cosmarium pygmaeum* Arch.  
Pl. II, Fig. 5.

Cell 11.1 μm broad, 12.6 μm long, isthmus 4.2 μm long, cell slightly shorter, deeply constricted in the middle, sinus narrow linear; semicells transversely oblong-rectangular, basal angles obtuse, rounded, lateral margin some what straight, apex straight, minute papilla within each lateral angles, lateral view of semicells subcircular, apical view elliptic and with a minute papilla on each side near the poles; cell wall smooth, colourless; chloroplast axile, each with a central pyrenoid.

**Habitat:** Coll. No. 475 March 2007.

*Cosmarium regnellii* Wille  
Pl. II, Fig. 6.

Cell 12.2 μm broad, 14.9 μm long and isthmus 5.3 μm long, as long as broad; deeply constricted in the middle; sinus linear open; semicells sub-rectangular, basal angles rounded; apex straight; lateral margin undulate; single pyrenoid in each semicell.

**Habitat:** Coll. No 497 March 2008.

*Cosmarium reniforme* (Ralfs) Arch.  
Pl. II, Fig. 7.

Cell 50.9 μm broad, 60.9 μm long and isthmus 14.5 μm long, medium size, slightly longer than broad, constriction deep, sinus narrow and linear with widely dilated extremity; semicells reniform; cell wall granulate, granules fairly regular, horizontal and in indistinct vertical series; chloroplast axile with two pyrenoids in each semicell.

**Habitat:** Coll. No. 453 January 2008

*Cosmarium speciosum* Lund.  
Pl. II, Fig. 8.

Cell 37.0 μm broad, 53.6 μm long and isthmus 10.9 μm long, medium size, about 1.5 times longer than broad; moderately constricted, sinus narrowly linear; semicells sub-rectangular or sub pyramidate with rounded angles, sides slightly convex and very gradually attenuated upwards to broadly truncate apex, margin with 4 apical and 7 lateral crenations; cell wall granulate, granules in regular, radial and concentric series, each showing 3-4 granules, space across the base and just above the isthmus exhibits 5-6 vertical series of 6-7 granules; chloroplast axile with two pyrenoids in each semicell.

**Habitat:** Coll. No. 467 March 2008.

*Cosmarium subalatum* W. et G.S. West.  
Pl. II, Fig. 9.

Cell 19.5 μm broad, 24.5 μm long and isthmus 5.3 μm long, cells small, slightly longer than broad, deeply constricted, sinus narrowly linear, semicells widely truncate to pyramidate, sides tricrinate, angles rounded, apex with two small crenations, crenations bigranulate, central tumour rounded with 7 granules arranged in circular fashion; top view elliptic; chloroplast axile with one pyrenoid in each cell.

**Habitat:** Coll. No. 463 February 2008.
Research Article

Cosmarium subtumidium Nordst. var. borgei Krieg. et Gerl.  
Pl. II, Fig. 10.
Cells 19.5-20.3 μm broad, 25.3-26.1 μm long and isthmus 4.2-5.7 μm long, cells longer than broad, constricted in the middle; sinus narrowly linear and dilated towards the apices; semicells pyramidal, basal angles rounded, apex rounded; in side view circular, in end view broadly elliptic and thicker; chloroplast with single pyrenoid.


Cosmarium undulatum Corda ex Ralf. var. minutum Wittr.  
Pl. II, Fig. 11.
Cell 20.3 μm broad, 23.8 μm long and isthmus 3.8 μm long; cells small quadrate-elliptic, slightly longer than broad, deeply constricted, sinus narrow with dilated extremity; semicells sub-semicircular with 7-8 shallow undulations, apex slightly retuse, cell wall smooth; chloroplast axile with a single pyrenoid in each semicell.


Conclusion
Total of 22 taxa of Genus Cosmarium Corda have been identified. They were recorded during in all seasons (summer, winter and rainy). All species are new records from this region.
ACKNOWLEDGEMENTS
The author is grateful to Principal and Head, Department of Botany, Dhanaji Nana Mahavidyalaya, Faizpur and Principal, S.V.P. Arts and Science College, Ainpur for providing facilities for this work.

REFERENCES
Bongale UD and Kaulapur VS (1990). Euastrum bombayense (Gonzalves et Gangla) Brandham var. gokakense var. nov.- an interesting asystematic desmid from Karnataka State, India. Perspectives in Phycology 73-76
Research Article