

# Occurrence of genus *Scenedesmus* Meyen (Chlorophyceae) in western Uttar Pradesh, India

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Manuscript received: 06 May 2013  
Accepted for publication: 20 August 2013

## ABSTRACT

Tripathi S. K., Misra U. & Misra P. K. 2013. Occurrence of genus *Scenedesmus* Meyen (Chlorophyceae) in western Uttar Pradesh, India. *Geophytology* 43(2): 139-144.

The present paper deals with 19 species of the genus *Scenedesmus* Meyen (Class: Chlorophyceae, Order: Chlorococcales) collected from different aquatic habitats in Saharanpur, Meerut and Ghaziabad districts of western Uttar Pradesh. All these species are being reported from this area for the first time.

**Key-words:** *Scenedesmus*, Algae, Chlorophyceae, Chlorococcales, western Uttar Pradesh.

## INTRODUCTION

Fresh water chlorococcalean algae from Uttar Pradesh have been studied by Chaddha and Pandey (1977), Pandey and Gangwar (1986), Anand (1998), Gupta (2005) and Misra et al. (2008, 2009, 2010). Pandey and Gangwar (1986) studied chlorococcalean algae from Bareilly. Shukla et al. (2007) studied chlorococcalean algae from foothills of western Himalaya. Misra et al. (2009) investigated chlorococcalen algae from western Uttar Pradesh. Rawala and Ratan (1989) described several species of genus *Scenedesmus* Meyen from Punjab, Himachal Pradesh and Chandigarh. All the forms, described here, are new record for the study area.

## MATERIAL AND METHOD

Algal samples were collected by Random Sampling Technique from 3 districts, viz. Meerut, Saharanpur, Ghaziabad, in western Uttar Pradesh during June 2005 to February 2009 (Text-figure

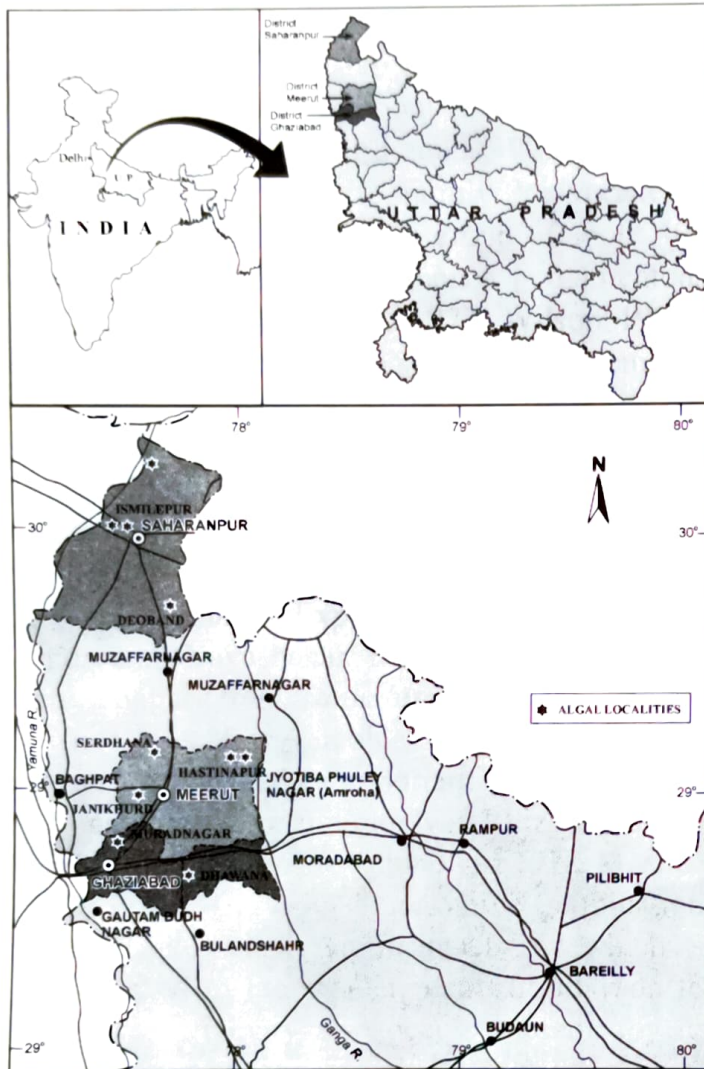
1). Generally, epiphytic forms were collected by squeezing submerged plants and planktonic forms with the help of planktonic mesh net (size 0.5 mm) in the plastic bottles (250 ml.). All the samples were fixed in 3-4% formalin. The collection number, date and locality of each sample were also noted in the field itself. Photomicrography was done under Nikon Labophot-II microscope E-400 with H-III photomicrographic attachment. Specific identification was done after Tiffany and Britton (1952), Prescott (1961), Philipose (1967), Komarek and Fott (1983) and Prasad and Misra (1992).

## DESCRIPTION

**Family:** Scenedesmaceae

**Genus:** *Scenedesmus* Meyen 1829

**Description:** Colony generally a flat (rarely curved) plate of 2-4-8-32 ovoid, fusiform, crescent-shaped, or oblong cells lying side by side in a single series or in a double row with spines, teeth,



**Text-figure 1.** Map showing algal localities of western Uttar Pradesh.

and ridges; chloroplast a parietal plate covering most of the cell wall and often showing a median lateral notch; 1 pyrenoid.

### 1. *Scenedesmus abundans* (Kirchner) Chodat

Plate 1, figure 4

Philipose M. T. 1967: 278, figure 184d.

**Description:** Cells 10  $\mu\text{m}$  long, 3  $\mu\text{m}$  broad, spines 3  $\mu\text{m}$  long. Colonies usually 2-4 celled, rarely eight-celled, arranged in linear series. Cells

ovoid to oblong-ovoid. External cells with one or more median lateral spines from the outer face, in addition to spines from four corners of the colony. Internal cells with 1-2 spines from their poles, or rarely without spines.

**Collection Number and Date:** 16SP/UP; 01 April 2007.

**Locality:** Devikund, Deoband, Saharanpur.

### 2. *Scenedesmus acutiformis* Schroeder

Plate 1, figure 5

Tiffany L. H. & Britton M. E. 1952: 123, plate 35, figure 356.

**Description:** Cells 20  $\mu\text{m}$  long, 6  $\mu\text{m}$  broad. Cells arranged in a single series of 4 (2 to 8), fusiform-elliptic, with poles sharply pointed; inner cells with a single facial longitudinal ridge, outer cells with 2-4 longitudinal ridge.

**Collection Number and Date:** 16SP/UP; 01 April 2007.

**Locality:** Devikund, Deoband, Saharanpur.

### 3. *Scenedesmus bijuga* (Turpin) Lagerheim

Plate 1, figure 6

Tiffany L. H. & Britton M. E. 1952: 123, plate 35, figure 371.

**Description:** Cells 10  $\mu\text{m}$  long, 5  $\mu\text{m}$  broad. Colonies composed of 2-8 cells in a single (rarely alternate) flat series; cells ovate or oblong, with teeth or spines.

**Collection Number and Date:** 6ME/UP; 06 June 2005.

**Locality:** Budhi Ganga River, Hastinapur, Meerut.

### 4. *Scenedesmus bijugatus* (Turpin) Kuetzing var. *alternans* Hansgirg

Plate 1, figure 7



## Plate 1

1. *Scenedesmus* sp. 1. 2. *Scenedesmus* sp. 2. 3. *Scenedesmus* sp. 3. 4. *Scenedesmus abundans* (Kirchner) Chodat. 5. *S. acutiformis* Schroeder. 6. *S. bijuga* (Turpin) Lagerheim. 7. *S. bijugatus* (Turpin) Kuetzing var. *alternans* Hansgirg. 8. *S. bijugatus* (Turp.) Kuetz. var. *gravenitzii* Bernard. 9. *S. brevispina* (Smith) Chodat. 10. *S. denticulatus* var. *australis* Playfair. 11-12. *S. dimorphus* (Turpin) Kuetzing. 13. *S. linearis* Komarek. 14. *S. obliquus* (Turpin) Kuetzing. 15. *S. opoliensis* Richter. 16. *S. ovalternus* (Chodat) var. *ovalternus* Kom. and Fott. 17. *S. platydiscus* (Smith) Chodat. 18. *S. quadricauda* (Turpin) Breb. var. *maximus* West & West. 19. *S. quadricauda* (Turpin) Breb. var. *parvus* Smith. 20. *S. szemesii* Hortb.

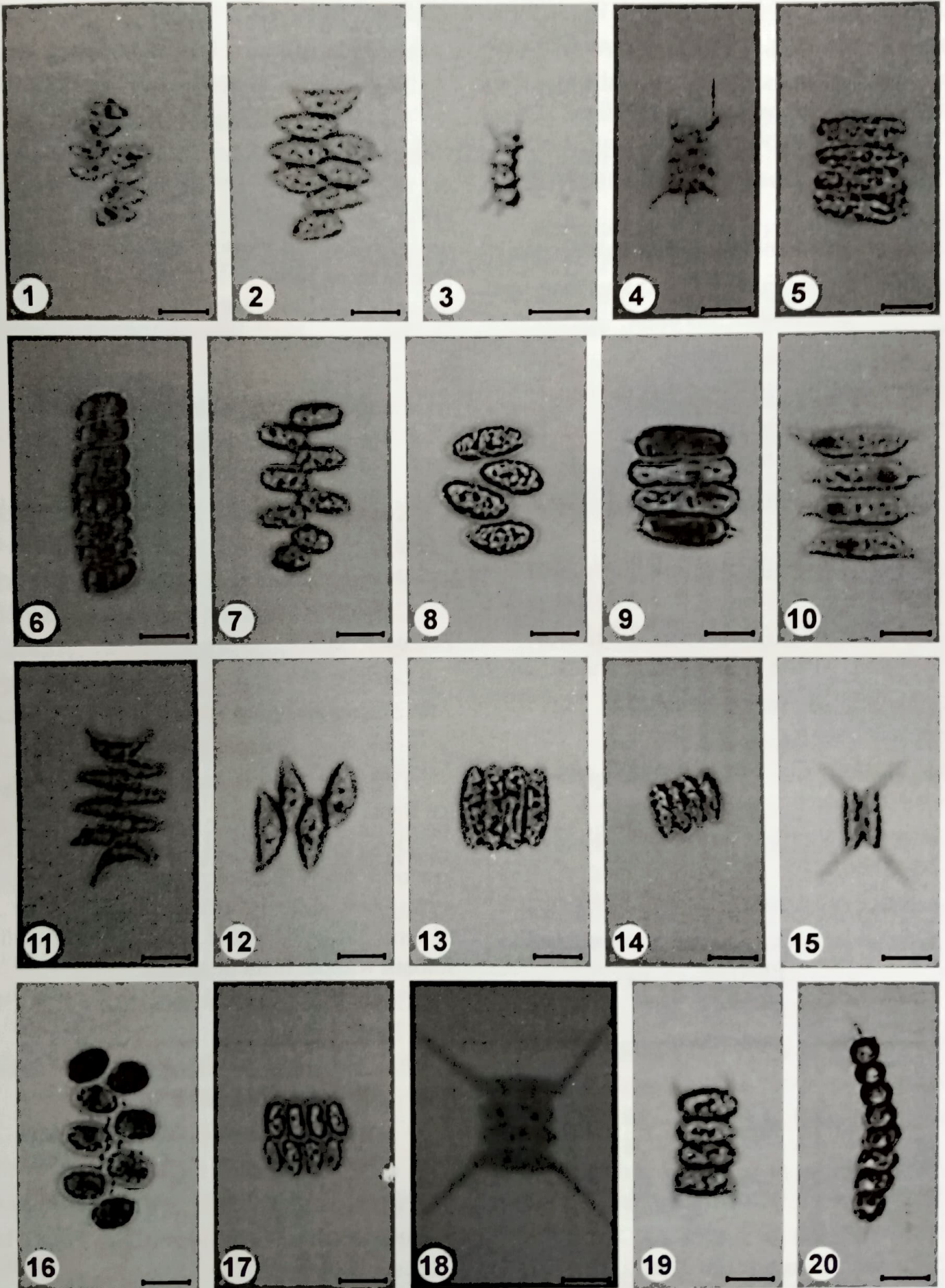


Plate 1

Philipose M. T. 1967: 254, figure 164g.

**Description:** Cells 12  $\mu\text{m}$  long, 6  $\mu\text{m}$  broad. Colonies flat, usually eight-celled, but sometimes four celled. Cells ellipsoid to ovoid-ellipsoid with rounded ends. Cells about twice as long as broad.

**Collection Number and Date:** 18SP/UP; 15 February 2009.

**Locality:** Devikund, Deoband, Saharanpur.

**5. *Scenedesmus bijugatus* (Turp.) Kuetzing var. *graevenitzii* Bernard**

Plate 1, figure 8

Philipose M. T. 1967: 254, figure 164b.

**Description:** Cells 16  $\mu\text{m}$  long, 6  $\mu\text{m}$  broad, colonies 30  $\mu\text{m}$  in diameter.

**Collection Number and Date:** 20SP/UP; 15 February 2009.

**Locality:** Roadside pond, Talhedi, Deoband road, Saharanpur.

**6. *Scenedesmus brevispina* (Smith) Chodat**

Plate 1, figure 9

Komarek J. & Fott B. 1983: 275, tafel 237, figure 4.

**Description:** Cells 14  $\mu\text{m}$  long, 2  $\mu\text{m}$  broad, spines 9  $\mu\text{m}$  long.

**Collection Number and Date:** 18SP/UP; 15 February 2009.

**Locality:** Devikund, Deoband, Saharanpur.

**7. *Scenedesmus denticulatus* var. *australis* Playfair**

Plate 1, figure 10

Philipose M. T. 1967: 271, figure 176h.

**Description:** Cells 21  $\mu\text{m}$  long, 7  $\mu\text{m}$  broad, spines 2  $\mu\text{m}$  long. Colonies two-four celled. Cells arranged in a single linear series, oblong-cylindrical with more or less rounded ends and with one (very rarely two) short teeth from the pole of all cells.

**Collection Number and Date:** 18SP/UP; 15 February 2009.

**Locality:** Devikund, Deoband, Saharanpur.

**8. *Scenedesmus dimorphus* (Turpin) Kuetzing**

Plate 1, figures 11-12

Philipose M. T. 1967: 249, figure 160 b.

**Description:** Cells 18  $\mu\text{m}$  long, 4  $\mu\text{m}$  broad. Colonies 4-8 celled, with cells arranged in a linear or sub-alternating series (eight-celled colonies always in sub-alternating series). Differs from *S. obliquus* (Turpin) Kuetzing in the outer cells of colony being more or less lunate and the apices of the cells being attenuated.

**Collection Number and Date:** 2ME/UP; 05 June 2005.

**Locality:** Ganga Canal, Jane, Meerut.

**9. *Scenedesmus linearis* Komarek**

Plate 1, figure 13

Komarek J. & Fott B. 1983: 832, tafel 226, figure 7.

**Description:** Cells 15  $\mu\text{m}$  long, 4  $\mu\text{m}$  broad.

**Collection Number and Date:** 18SP/UP; 15 February 2009.

**Locality:** Devikund, Deoband, Saharanpur.

**10. *Scenedesmus obliquus* (Turpin) Kuetzing**

Plate 1, figure 14

Tiffany L. H. & Britton M. E. 1952: 123, plate 35, figure 369.

**Description:** Cells 12  $\mu\text{m}$  long, 4  $\mu\text{m}$  broad, fusiform, with acute apices, in a linear or sublinear series; cell sides in straight contact, free sides of terminal cells lunate or symmetric; cell-wall smooth without teeth or spines.

**Collection Number and Date:** 7GB/UP; 08 June 2005.

**Locality:** Upper Ganga Canal, Dehrajhal Bairaj Dhawana, Ghaziabad.

**11. *Scenedesmus opoliensis* Richter**

Plate 1, figure 15

Philipose M. T. 1967: 275, figure 181b.

**Description:** Cells 14  $\mu\text{m}$  long, 2  $\mu\text{m}$  broad, spines 9  $\mu\text{m}$  long.

**Collection Number and Date:** 18SP/UP; 15 February 2009.

**Locality:** Devikund, Deoband, Saharanpur.

**12. *Scenedesmus ovalternus* (Chodat) var. *ovalternus* Kom. & Fott**

Plate 1, figure 16

Prescott G. W. 1961: 280, plate 64, figure 4.

**Description:** Cells 11  $\mu\text{m}$  long, 5  $\mu\text{m}$  broad, spines 17  $\mu\text{m}$  long. A variety differing from the type by the larger size of the cells and relatively longer spines.

**Collection Number and Date:** 18SP/UP; 15 February 2009.

**Locality:** Devikund, Deoband, Saharanpur

**13. *Scenedesmus platydiscus* (Smith) Chodat**

Plate 1, figure 17

Philipose M. T. 1967: 257, figure 165.

**Description:** Cells 5  $\mu\text{m}$  long, 5  $\mu\text{m}$  broad.

**Collection Number and Date:** 18SP/UP; 15 February 2009.

**Locality:** Devikund, Deoband, Saharanpur.

**14. *Scenedesmus quadricauda* (Turpin) Breb. var. *maximus* West & West**

Plate 1, figure 18

Philipose M. T. 1967: 286, figure 187g.

**Description:** Cells 12  $\mu\text{m}$  long, 5  $\mu\text{m}$  broad. Cells ovoid-cylindrical, about 2-2.5 times as long as broad, spines very long.

**Collection Number and Date:** 20SP/UP; 15 February 2009.

**Locality:** Roadside pond, Talhedi, Deoband road, Saharanpur.

**15. *Scenedesmus quadricauda* (Turpin) Breb. var. *parvus* Smith**

Plate 1, figure 19

Philipose M. T. 1967: 286, figure 187f.

**Description:** Cells 11  $\mu\text{m}$  long, 4  $\mu\text{m}$  broad. Cells ovoid-cylindrical, as long as broad, spines very small.

**Collection Number and Date:** 20SP/UP; 15 February 2009.

**Locality:** Roadside pond, Talhedi, Deoband road, Saharanpur.

**16. *Scenedesmus szemesii* Hortb.**

Plate 1, figure 20

Komarek J. & Fott B. 1983: 271, tafel 235, figure 7.

**Description:** Cells 8  $\mu\text{m}$  long, 7  $\mu\text{m}$  broad, Colony 43  $\mu\text{m}$  in diameter.

**Collection Number and Date:** 22ASP/UP; 15 February 2009.

**Locality:** Yamuna River, Sarsawa, Saharanpur.

**17. *Scenedesmus* sp. 1**

Plate 1, figure 1

**Description:** Cells 8  $\mu\text{m}$  long, 3  $\mu\text{m}$  broad. Colonies usually 8 celled, rarely arranged in linear series.

**Collection Number and Date:** 20SP/UP; 15 February 2009.

**Locality:** Roadside pond, Talhedi, Deoband road, Saharanpur.

**18. *Scenedesmus* sp. 2**

Plate 1, figure 2

**Description:** Cells 9  $\mu\text{m}$  long, 5  $\mu\text{m}$  broad, spines 2  $\mu\text{m}$  long. Colonies usually 8 celled.

**Collection Number and Date:** 24GB/UP; 08 February 2009.

**Locality:** Brijghat, Ganga River, Garhmukteshwar, Ghaziabad.

**19. *Scenedesmus* sp. 3**

Plate 1, figure 3

**Description:** Cells 2  $\mu\text{m}$  long, 2  $\mu\text{m}$  broad, spines 2  $\mu\text{m}$  long.

**Collection Number and Date:** 18SP/UP; 15 February 2009.

**Locality:** Devikund, Deoband, Saharanpur.

**ACKNOWLEDGEMENT**

The authors are thankful to the Ministry of Environment and Forests, New Delhi for financial assistance (J.22018-75/2004 -CSC Tax.) and to the

Head, Department of Botany, Lucknow University, Lucknow for encouragement and for library and laboratory facilities.

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