

ADDITION TO DESMID FLORA OF KERALA, INDIA

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ABSTRACT

Present paper deals with 34 taxa of desmids collected from Kadaplamattom, Kottayam district, Kerala. Out of these, 12 taxa are recorded for the first time from India. All are new to Kerala.

INTRODUCTION

So far, the contribution to the algal flora of Kerala State is scanty. SUXENA *et al.* (1973) recorded 49 taxa of desmids belonging to 9 genera from Cranganore. Thirty-three taxa of desmids belonging to 3 genera, *Cosmarium*, *Staurastrum* and *Micrasterias*, are described from Kadaplamattom, Kottayam district (PATEL *et al.*, 1977).

The present paper includes 34 taxa belonging to 16 genera from the collection made in 1972 (See PATEL *et al.*, 1977). Out of these, 12 taxa, viz. *Penium spirostriolatiforme*, *Euastrum longicolle* var. *capitatum* f. *reducta*, *E. spinulosum* var. *vaasii*, *Actinotaenium cucurbitinum* f. *minus*, *A. wollei*, *Xanthidium aculeatum*, *X. perissacanthum* var. *minus*, *Stauroidesmus curvatus* var. *kalimantanus*, *Sphaerosozma excavatum* var. *subquadratum*, *Spondylosium nitens* var. *triangulare* f. *javanica*, *Onychonema laeve* var. *macranthum*, and *Groenbladia neglecta*, are the new records for India.

SYSTEMATIC ACCOUNT

1. **Penium spirostriolatiforme** West *et* West

Fig. 1

A. M. Scott & G. W. Prescott, *Hydrobiologia*, 17(1-2) : 9 ; Pl. 1, f. 13 ; 1961.

L. 156. 8-211.2 μm ; W. 7.52-8.8 μm ; Zygosporangium oval, smooth, 33.6 \times 25 μm .

The zygosporangium in *P. spirostriolatiforme* var. *rectisporum* (Grönbl.) Croasdale is described as oval for the first time in the species (CROASDALE & SCOTT, 1976). The same type of zygosporangium has been observed in the present species.

2. **Closterium gracile** Bréb.

Fig. 2

W. West & G. S. West, *A Monograph of the British Desmidiaceae-1* : 166-167 ; Pl. 21, f. 8-12 ; 1904.

L. 124-140 μm ; W. 4-4.5 μm .

Distribution—Karnataka (BHARATI, 1965); Andhra Pradesh (SUXENA & VENKATESWARLU, 1968 a, b); Madhya Pradesh (AGARKAR, 1969); Maharashtra (KAMAT, 1974).

3. **Closterium kuetsingii** Bréb.

Figs. 3-4

W. West & G. S. West, *A Monograph of the British Desmidiaceae-1* : 186-187 ; Pl. 25, f. 6-11 ; 1904.

L. 303 μm ; W. 11.5 μm ; w. et apex 2 μm ; wall delicately striated. Zygosporangium 48 μm broad and 27.2 long; wall smooth.

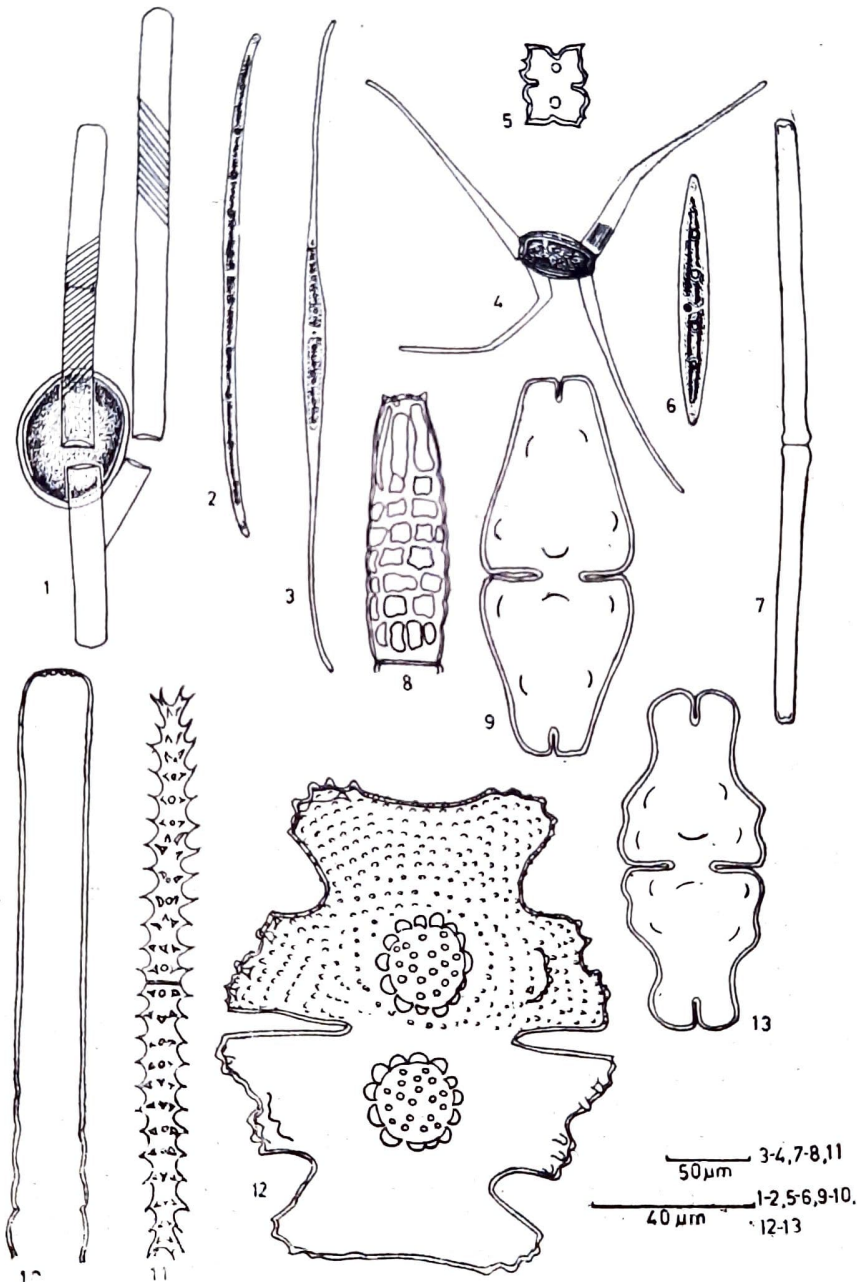
Distribution—Bengal (TURNER, 1892); Maharashtra (KAMAT, 1968a); Uttar Pradesh (PANDEY & PANDEY, 1980b). The present form agrees in all respects with that described by CROASDALE (1955).

4. *Closterium tumidum* Johnson

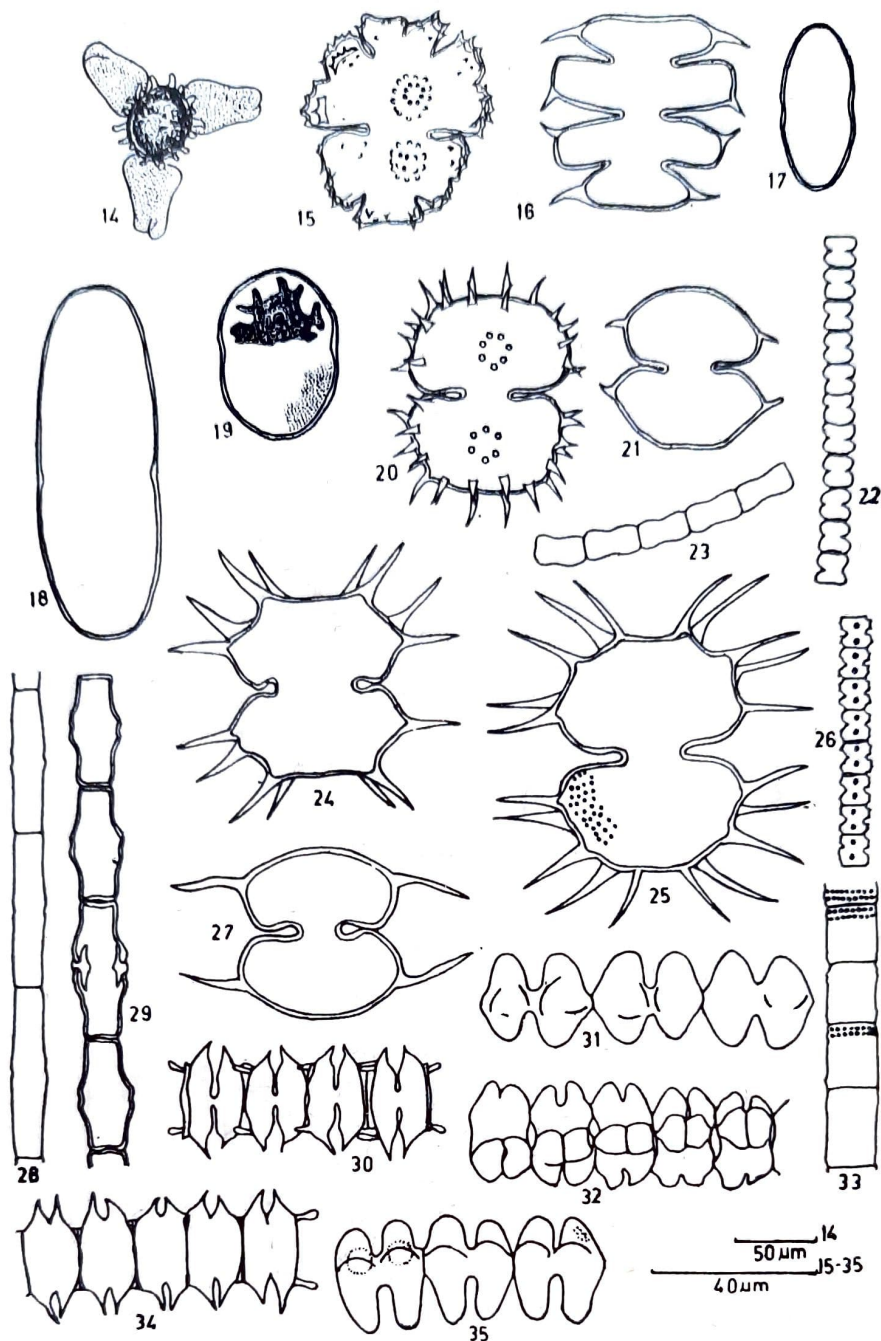
Fig. 6

W. West & G. S. West, *A Monograph of the British Desmidiaceae*-1 : 156-157 ; Pl. 19, f. 15-18 ; 1904.

L. 78 μm , W. 8.3 μm , W. at apex 1.6 μm .



FIGS. 1-13 : Fig. 1 *Penium spirostriolatifforme* West et West, Fig. 2 *Closterium gracile* Bréb., Figs. 3-4 *Closterium kuetzingii* Ehrénb., Fig. 5 *Euastrum binale* (Turp.) Ehrénb., Fig. 6 *Closterium tumidum* Johnson, Fig. 7 *Pleurotaenium baculoides* (Roy et Biss.) Playf., Fig. 8 *Pleurotaenium verrucosum* (Bail.) Lund. var. *bulbosum* Krieger, Fig. 9 *Euastrum ansatum* Ehrénb., Fig. 10 *Pleurotaenium ehrenbergii* (Bréb.) De Bary, Fig. 11 *Triptoceras gracile* Bail. var. *undulatum* Scott et Prescott, Fig. 12 *Euastrum turgidum* Wallisch var. *grunovii* Turner, Fig. 13 *Euastrum sinuosum* Lenorm.



FIGS. 14-35 ; Fig. 14 *Euastrum longicolle* Nordst. var. *capitatum* West et West f. *reducta* Croasdale et Scott, Fig. 15 *Euastrum spinulosum* Delponte var. *vaasii* Scott et Prescott, Fig. 16 *Micrasterias zeylanica* Fritsch var. *rectangularis* Scott et Prescott, Fig. 17 *Actinotaenium cucurbitinum* (Biss.) Teiling f. *minus* Teiling, Fig. 18 *Actinotaenium cucurbitinum* (Biss.) Teiling, Fig. 19 *Actinotaenium wollei* (Grönbl.) Teiling, Fig. 20 *Xanthidium aculeatum* Ehrénberg., Fig. 21 *Staurodesmus convergens* (Ehrénberg) Teiling, Fig. 22 *Sphaeroszoma excavatum* Ralfs var. *subquadratum* West, West et Carter, Fig. 23 *Hyalotheca undulata* Nordst., Fig. 24 *Xanthidium burkillei* West et West, Fig. 25 *Xanthidium perissacanthum* Scott et Prescott var. *minus* Scott et Prescott, Fig. 26 *Sphaeroszoma granulatum* Roy et Biss., Fig. 27 *Staurodesmus curvatus* (Turner) Teiling var. *kalimantanus* (Scott et Prescott) comb. nov., Fig. 28 *Groenbladia neglecta* (Racib.) Teiling, Fig. 29 *Gymnozyga moniliformis* Ehrénb. var. *gracilescens* Nordst., Fig. 30 *Onychonema laeve* Nordst. var. *macranthum* Grönblad, Fig. 31 *Spondylosium nitens* (Wall.) Arch. var. *triangulare* Turner, Fig. 32 *Desmidium aptogonum* Bréb., Fig. 33 *Hyalotheca mucosa* (Mert.) Ehrénb., Fig. 34 *Onychonema laeve* Nordst. var. *laeve*, Fig. 35 *Spondylosium nitens* (Wall.) var. *triangulare* Turner f. *producta* Turner.

10. Euastrum sinuosum Lenorm.

Fig. 13

C. C. Kossinskaja, Desmidiaceae Fasc. 1. *Flora Plantarum Cryptogamarum*, 5 ; Conjugatae, 2 : 343-344 ; Pl. 45, f. 12-14 ; 1960.

L. 81.6 μm ; W. 39.2 μm ; W. at apex 21.6 μm ; Isth. 9.6 μm .

Distribution—Kodaikanal (IYENGAR & VIMLA BAI, 1941); Karnataka (BHARATI, 1965); Madhya Pradesh (PATEL & SATYANARAYAN, 1976); Goa (HEGDE & BHARATI, 1980).

11. Euastrum binale (Turp.) Ehrénb.

Fig. 5

J. Ralfs, *The British Desmidiaceae* : 90. Pl. 14, f. 8 b, c, h ; 1848.

L. 21.6 μm ; W. 16.8 μm ; Isth. 5.6 μm .

Distribution—Bengal (TURNER, 1892); Maharashtra (KAMAT, 1963a, 1974).

12. Euastrum longicolle Nordst. var. **capitatum** West f. **reducta** Croasdale et Scott

Fig. 14

H. Croasdale & A. M. Scott, *Nova Hedwigia*, 27(3-4) : 518 ; Pl. 4, f. 3 ; 1976.

L. of semicell 38.3 μm ; W. 30 μm ; W. at apex 16-16.65 μm ; zygospore 50-53 μm in diameter with curved or straight spines.

The present species resembles the form of CROASDALE AND SCOTT (1976) except in slight change in nature and size of spines.

13. Euastrum spinulosum Delponte var. **vaasii** Scott et Prescott

Fig. 15

A. M. Scott & G. W. Prescott, *Hydrobiologia*, 17 (1-2) : 40 ; Pl. 10, f. 6 ; 1961.

L. 50.4 μm ; W. 45.6 μm ; Isth. 10.4 μm .

14. Euastrum turgidum Wallisch var. **grunovii** Turner

Fig. 12.

W. B. Turner, *K. Svenska Vet. Akad. Handl.*, 25 : 74-75 ; Pl. 10, f. 29 ; 1892.

L. 112 μm ; W. 96 μm ; Isth. 33.6 μm .

Distribution—Banka Island (TURNER, 1892).

The present specimen resembles in all respects the one described by TURNER (1892). SCOTT AND PRESCOTT (1960) discussed the validity of *Euastrum turgidum* and its varieties. They discarded var. *typicum* Wall., var. *grunovii* Turner and f. *bitumida* Turner as the illustrations given by WALLISCH AND TURNER are not convincing. KRIEGER (1932) recorded var. *grunovii* from Java but later revised it to var. *simplex* Borge (KRIEGER, 1937).

SCOTT AND PRESCOTT (1960) studied the photocopy of a sketch showing a specimen of *E. turgidum* from RABENHORST'S Exs. No. 1727, made from the original specimens from Banka Island. It showed the central tumour covered with triangular pits arranged in hexagons with a small granule in the centre. TURNER'S fig. 29 with a verrucose central tumour is not identical with GRUNOV'S plant. KRIEGER (1937) also excluded TURNER'S

var. *typicum*, var. *grunovii* and f. *bitumida*. But the present form is similar in all respects with that described by TURNER (1892), and hence *E. turgidum* var. *grunovii* Turner is retained here.

15. *Micrasterias zeylanica* Fritsch var. *rectangularis* Scott et Prescott
Fig. 16

A. M. Scott & G. W. Prescott, *Hydrobiologia*, 17 (1-2) : 53 ; Pl. 21, f. 5-7 ; 1961.

L. 46.4 μm ; W. 51.2 μm with spines; W. 41.6 μm without spines; W. of polar lobes 29-33 μm ; Isth. 9.6 μm .

Distribution—Maharashtra (KAMAT, 1974).

16. *Actinotaenium cucurbitinum* (Biss.) Teiling.
Fig. 18.

E. Teiling, *Bot. Notiser*, 4 : 399-401 ; f. 36 ; 1954.

L. 81.6; μm W. 32 μm ; Isth. 27.2 μm ; wall thickness 1.33 μm .

Distribution—Maharashtra [KAMAT, 1974 as *Cosmarium cucurbitinum* (Biss.) Lutkem.]

17. *Actinotaenium cucurbitinum* (Biss.) Teiling f. *minus* Teiling
Fig. 17.

E. Teiling, *Bot. Notiser*, 4 : 399 ; 1954.

=*Penium cucurbitinum* Biss. f. *minor* West et West

W. West & G. S. West, *A Monograph of the British Desmidiaceae*-1 : 95, Pl. 9, f. 16 ; 1904.

L. 38.5 μm ; W. 18.4 μm .

18. *Actinotaenium wollei* (Grönbl.) Teiling
Fig. 19

E. Teiling, *Bot. Notiser*, 4 : 397 ; f. 40 ; 1954.

L. 38.4 μm ; W. 27 μm ; wall punctate.

19. *Xanthidium aculeatum* Ehrénb.
Fig. 20.

W. West & G. S. West, *A Monograph of the British Desmidiaceae* 4 : 79 ; Pl. 112, f. 5-9 ; 1912.

L. 54.4—59.2 μm with spines; L. 40-45 μm without spines; W. 46.4-49.6 μm with spines; W. 37-40 μm without spines; L. of spines 7-9 μm ; Isth. 8-9.6 μm ; wall punctate; puncta large.

20. *Xanthidium burkillei* West et West
Fig. 24.

A. M. Scott & G. W. Prescott, *Hydrobiologia*, 17(1-2) : 80 ; Pl. 40, f. 1 ; 1961.

L. 64 μm with spines; L. 45 μm without spines; W. 67.2 μm with spines; W. 41.6 μm without spines; Isth. 20.8 μm .

Distribution—Maharashtra (FREITAS & KAMAT, 1979).

21. *Xanthidium perissacanthum* Scott et Prescott var. *minus* Scott et Prescott
Fig. 25.

L. 60 μm without spines; L. 87 μm with spines; W. 53 μm without spines; W. 83.2 μm with spines; Isth. 14.4 μm .

22. *Staurodesmus convergens* (Ehrénb.) Teiling var. *curtus* (Turner) comb. nov.
Fig. 21.

= *Arthrodermus convergens* Ehrénb. var. *curtus* Turner

W. B. Turner, *K. Svenska Vet. Akad. Handl.*, 25 : 134 ; Pl. 11, f. 32 ; 1892.

L. 48 μm ; W. 60 μm with spines; Isth. 14 μm .

Distribution—Bengal (TURNER, 1892 as *Arthrodesmus convergens* Ehrénb. var. *curtus* Turner); Karnataka (BHARATI, 1966; HEGDE & BHARATI, 1980 as *A. convergens* var. *curtus*); Andhra Pradesh (SUXENA & VENKATESWARLU, 1968a as *A. convergens* var. *curtus*); Madhya Pradesh (AGARKAR & AGARKAR, 1973); Uttar Pradesh (PANDEY & PANDEY, 1980 a).

23. *Staurodesmus curvatus* (Turner) Teiling var. *kalimantanus* (Scott et Prescott) comb. nov.

Fig. 27.

= *Arthrodesmus curvatus* var. *kalimantanus* Scott et Prescott

A. M. Scott and G. W. Prescott, *Hydrobiologia*, 17(1-2) : 77 ; Pl. 34, f. 1 ; 1961.

L. 41 μm ; W. 77 μm with spines; W. 41 μm without spines; L. of spines 18.4 μm ; Isth. 11.2 μm .

24. *Sphaerzogma excavatum* Ralfs var. *subquadratum* West, West et Carter
Fig. 22.

W. West, G. S. West & N. Carter, *A Monograph of the British Desmidiaceae-5* : 212 ; Pl. 160, f. 4-5 ; 1923.

L. 7.7-8 μm , W. 8-9 μm ; Isth. 3.2-3.3 μm .

25. *Sphaerzogma granulatum* Roy et Biss.

Fig. 26

W. West, G. S. West & N. Carter, *A Monograph of the British Desmidiaceae-5* : 213-214 ; Pl. 160, f. 6-7 ; 1923.

L. 7.2-8 μm ; W. 8 μm ; Isth. 3.2 μm .

Distribution—Andhra Pradesh (SUXENA & VENKATESWARLU, 1968 b); Maharashtra (KAMAT 1968a); Himachal Pradesh (KAMAT, 1968b); Madhya Pradesh (PATEL & SATYANARAYAN, 1976).

26. *Spondylosium nitens* (Wall.) Arch. var. *triangulare* Turner f. *javanica* Gitw.
Fig. 31.

A. M. Scott & G. W. Prescott, *Hydrobiologia*, 17(1-2) : 121 ; Pl. 60, f. 10 , 1961.

L. 28-29 μm ; W. 22-24 μm ; Isth. 7-8 μm .

27. *Spondylosium nitens* (Wall.) Arch. var. *triangulare* Turner f. *producta* Turner
Fig. 35.

W. B. Turner, *K. Svenska Vet. Acad. Handl.* 25 : 44-45 ; Pl. 18, f. 17a ; 1892.

L. 22-23 μm ; W. 25-27 μm ; Isth. 6-7 μm .

Distribution—Bengal (TURNER, 1892).

28. Onychonema laeve Nordst. var. **laeve**

Fig. 34.

A. M. Scott, R. Grönblad & H. Gröasdale, *Acta Botanica Fennica*, 69 : 62 ; Pl. 19, f. 234 ; 1965.

L. 14.4-15.7 μm ; W. 18.4-19.2 μm without spines; W. 29-30 μm without spines;
L. of spines 5-6 μm ; Isth. 3.2 μm .

Distribution—Bengal (TURNER, 1892 as *Onychonema laeve* var. *minus*).

29. Onychonema laeve Nordst. var. **macranthum** Gronblad.

Fig. 30.

A. M. Scott, R. Grönblad & H. Croasdale, *Acta Botanica Fennica*, 69 : 62 ; Pl. 19, f. 235 ; 1965.

L. 15-16 μm without spines; L. 15-17.6 μm with spines; W. 11-20 μm without
spines; W. 28-29 μm with spines; Isth. 3.2 μm .

30. Hyalotheca mucosa (Mert.) Ehrénb.

Fig. 33.

W. West, G. S. West & N. Carter, *A Monograph of the British Desmidiaceae*—5 : 235 ; Pl. 162, f. 1-4 ; 1923.

L. 14.4-17.6 μm ; W. 13.5-14.5 μm .

Distribution—Maharashtra (KAMAT, 1963b); Gujarat (PATEL, 1969); Madhya
Pradesh (PATEL & SATYANARAYAN, 1976).

31. Hyalotheca undulata Nordst.

Fig. 23.

A. M. Scott & G. W. Prescott, *Hydrobiologia*, 17(1-2) : 122 ; Pl. 61 ; f. 3 ; 1961.

L. 12 μm ; W. 7.2 μm .

Distribution—Bengal (TURNER, 1892).

32. Desmidium aptogonum Bréb.

Fig. 32.

W. West, G. W. West & N. Carter, *A Monograph of the British Desmidiaceae*—5 : 242-243 ; Pl. 164, f. 1-3 ; 1923.

L. 15-16 μm ; W. 26-26.5 μm ; Isth. 13.5-14.5 μm .

Distribution—Assam (BRUHL & BISWAS, 1926).

33. Groenbladia neglecta (Racib.) Teiling

Fig. 28.

A. M. Scott & G. W. Prescott, *Hydrobiologia*, 17(1-2) : 122-123 ; Pl. 61, f. 7 ; 1961.

L. 29-37 μm ; W. 8-10 μm ; Isth. 7-8.5 μm .

34. Gymnozyga moniformis Ehrénb. var. **gracilescens** Nordst.

W. West, G. S. West & N. Carter, *A Monograph of the British Desmidiaceae*—5 : 256-257 ; Pl. 166, f. 10, 1923.

L. 24-30.4 μm ; W. 13.5-17 μm .

Distribution—Bengal (TURNER, 1892 as *Bambusina brebissoni* Kuetz.) ; Kodaikanal
(IYENGAR & VIMLA BAI, 1941 ; BHARATI & PAI, 1972, *Gymnozyga moniliformis* Ehrénb.);
Assam (ALFRED, 1978).

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