Table 1 *Solubilization of tricalcium phosphate by soil fungi.*

Fungus	Total (PO_4) Solubilized mg/ml Culture	Control	% (PO_4) Solubilized	Final pH
Cylindrocarpon obtusisporum	0.84	0.2	20.9	6.0
Spegazzinia tessarthra	0.78	0 14	20.9	5.4
Beltraniella humicola	0.90	0.32	19.0	6.0
Scopulariopsis brumptii	0.62	0 14	15.7	5.4
Phoma exigua	0.56	0.13	14.0	5.1
Eladia saccula	0.60	0.21	12.7	5 6
Curvularia lunata	0.56	0 19	12.1	5.5
Myrothecium roridum	0.51	0 14	12.1	5.5
Humicola fuscoatra	0.46	0.10	11.8	4.7
Robillarda sessilis	*0.50*	*0.14*	*11 8*	*5.0*
Gliomastix murorum	0.51	0.18	10.8	5.0
Syncephalastrum racemosum	0.44	0 14	9.8	5.7
Periconia cambrensis	0.31	0.21	3.2	4.3
Cladosporium sphaerospermum	0.21	0.16	1.6	3.5
Scolecobasidium variable	0.25	0.27	—	5.9

Initial (PO_4) added = 3.05 mg/ml; Initial pH = 6 5

Spegazzinia tessarthra were the highest phosphate solubilizers (20.9%). The phosphate-solubilizing capacity of *Curvularia lunata* was lower (12.1%) than earlier reported[2] (58.9%) on 14 days' incubation. However, this difference appears to be due to lesser incubation period in the present study and different habitat (forest soils). The *per cent* phosphate solubilization by *Syncephalastrum racemosum* and *Robillarda sessilis* is comparable with the findings of Rudraksha[7]. The inability of *Scolecobasidium* to solubilize phosphate in this experiment is in accordance with the findings of Sethi and Subba Rao[8].

The decrease in post incubation pH of the medium was marginal (0.5–1.8) in majority of the fungi but they solubilized higher amount of phosphate. However, the decrease was higher in *Periconia cambrensis* and *Cladosporium shpaerospermum* (2 2 and 3 respectively) and the amount of phosphate-solubilized was less. This observation that fall in pH and the amount of phosphate solubilized are not correlated, is in conformity with earlier results[2, 3, 9] in which the same relationship was observed in different fungi.

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CHLOROCLONIUM GLOEOPHILUM BORZI—A NEW RECORD FOR INDIA

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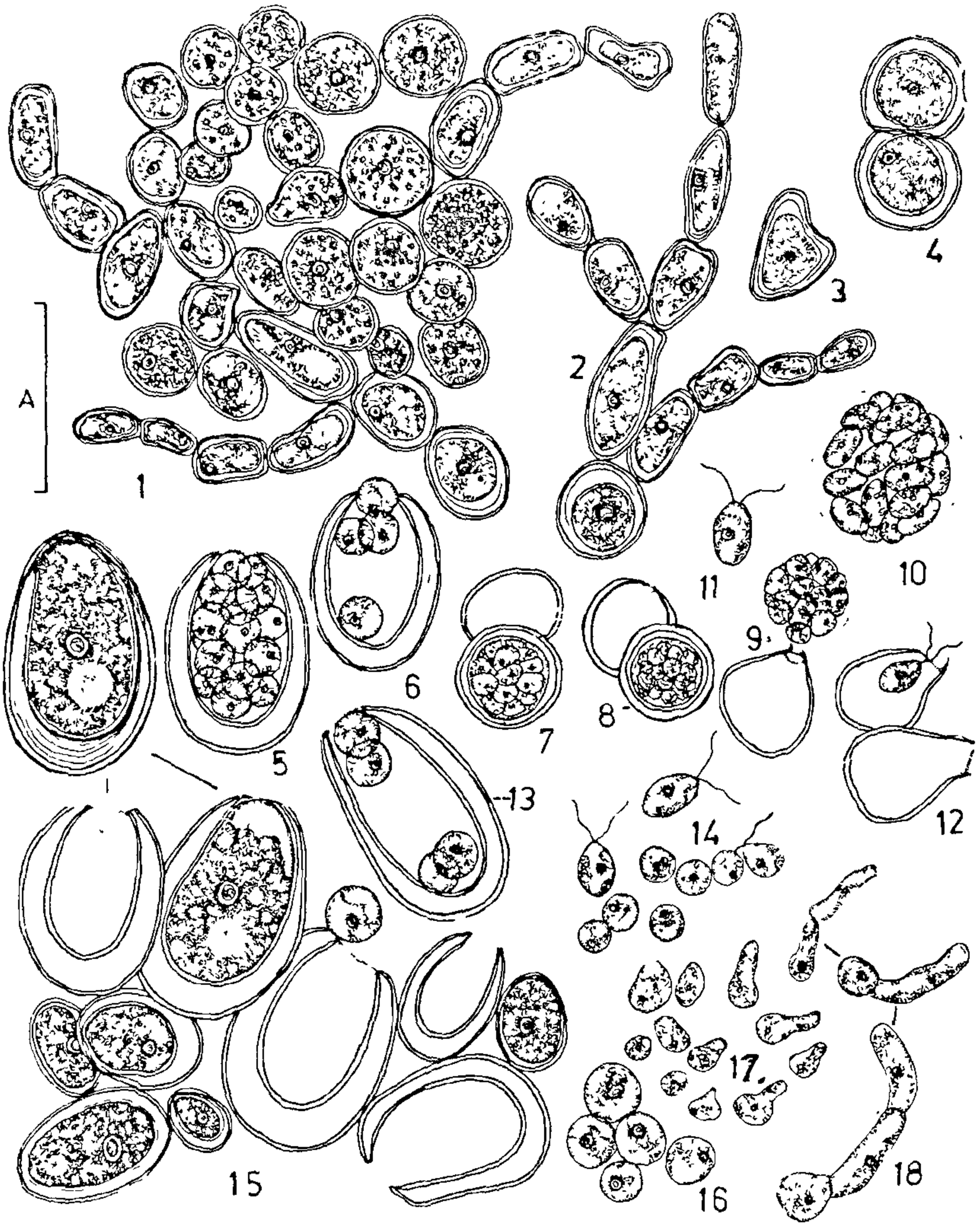
CHLOROCLONIUM GLOEOPHILUM is being reported for the first time since its original record by Skuja[1] from Rangoon, Burma. The alga came up in one of the cultures of a soil sample collected from Kirkee, Poona. A few observations on its morphology and reproduction are discussed.

C. gloeophilum occurred in biphasic cultures as a green scum overlaying the water in the culture flasks. A few bits of such scumlike growth are shaken in sterile distilled water and cultured either on BBM-agar plates or soil water-flasks.

The alga appeared as pseudoparenchymatus mat which is composed of loosely aggregated, round thick-walled cells and from the periphery of the mat radiate branched filaments (figure 1) The peripheral radiating



Figures 1–18. *Chloroclonium gloeophilum* Borzi. **1.** Habit., **2.** Branches showing the cell structure and constrictions at the septa., **3, 4.** Cell from the peripheral and central parts of the alga., **5, 6, 13, 15.** Akinetes showing the formation of aplanospores, **7, 8.** Swarmer formation in the cells, **9, 10.** Liberation of protoplasts in a vesicle from the cells, **11, 14.** Zoospore, **12.** Zoospore liberation and dehisced cell, **14, 16–18.** Resting zoospores and germination. (Scale Bar A = 25 μ)

filaments are sparsely branched and the branching often one sided. Rarely branches of the second order are also seen.

The cells are cyclindrical, 4–6 μ broad and upto 6 times as long, markedly constricted at the septa (figure 2). The terminal cells of the branches are rounded. Each cell is uninucleate and a parietal, laminate-perforate chloroplast with a single pyrenoid. The organisation is often obscured in older cells by accumulation of reserved food material. The cell wall is 2 to few layered.

The beaded appearance is so pronounced suggesting a high degree of fragmentation and is probably one of the ways in which the alga propagated. Isolated cells belonging to the peripheral branches (figure 3) or the central portions (figure 4) are frequently seen floating in the medium.

Besides fragmentation, formation of reddish brown thick walled akinetes is also seen. These akinetes develop mostly from the round cells of the central portion by gradual growth and enlargement (figure 15). Fully developed akinetes were 7.5–24 μ broad, 10.5–37.5 μ long, round to ovoid with a very thick lamellated wall and dense granular contents which generally obscure internal organisation but on careful examination showed the features of vegetative cell (figure 15). The akinetes produced a number of small thin walled aplanospores which were released through an apical pore (figures 5, 6, 13, 15).

Swarmer formation is also seen. The round cells of the central portion of the oval basal cells of the peripheral filaments produced 32–64 swarmers by repeated divisions of the contents (figures 7, 8). The protoplasts were extruded through an apical or lateral pore into a vesicle where they developed their characteristic configuration and flagella (figures 9, 10). It looked as though the zoospores were not always liberated into a vesicle. Occasionally direct liberations of zoospore (figure 12) occurred. The liberated zoospores were ovoid to pyriform, 3.4–5 μ broad, 6–9 μ long and biflagellate with a laminate unipyrenoidal chloroplast, a pair of contractile vacuole, and an anterior stigma (figures 11, 14). After swarming for a while they settled down, rounded up, enlarge and grew into new thalli (figures 14, 16–18).

The only previous record of *C. gloeophilum* from this region is that of Skuja[1]. The collections were from the University College Laboratory and made on the 11th December 1936. In the first collection the alga occurred as free-floating circular patches as reported here. The second was apparently grown on the sides of a glass jar. Prior to Skuja's (and the present) record *C. gloeophilum* was known to occur only as an endophyte in the mucilage of various blue-green algae[1]. This appears to be the first record of this interesting alga from India.

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DISTRIBUTION OF pH IN THE CENTRAL ARABIAN SEA BY REDFIELD KETCHUM AND RICHARD'S MODEL

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WE have recently shown[1] that the organic decomposition model of Redfield *et al*[2] can successfully define the linear relationship between total inorganic carbon and apparent oxygen utilization (AOU) (average $\Delta C/\Delta O$ ratio = 0.395, as compared with theoretical value 0.384) in the Central Arabian sea. This model however has not been utilized for computing the distribution of pH in sea water. In this note, we establish equations for computing pH in Central Arabian sea using the above model. For this purpose, 13 stations (lat. 15°–20°N, long. 58–71°E) with 269 observations were worked out from the earlier reported work[3].

Total CO_2 (TCO_2) is computed by equations of Takahashi *et al*[4] as

$$TCO_2 = \left[TA - \frac{T_B - K'_B}{a_H + K'_B}\right] \left[\frac{a_H^2 + a_H K' + K'_1 K'_2}{a_H K'_1 + 2K'_1 K'_2}\right] \quad (1)$$

where TA and T_B are total alkalinity and total boron respectively. T_B is given by $1.21 \times 10^{-5} S$ where S is salinity. K'_1 and K'_2, first and second apparent dissociation constants of carbonic acid and their pressure