days of their emergence. If seedlings produced primary leaves before infection, they were usually stunted and abnormal. Water soaking lesions were developed in the collar region of the seedlings near the soil surface and plants were frequently toppled over. Roots of these seedlings rotted and decayed with dark brown lesions on their surface (figure 1 B). Infection proceeded from root tips and checked the further growth. In control pots, all the seedling were healthy with well developed roots (figure 1 A). In inoculation experiments, pathogen caused infection on 59·5% seeds and seedlings of tomato.

This species of *Pythium* has not hitherto been reported to incite root rot of tomato in India or perhaps from any other Asiatic country. However, Robertson[7] artificially inoculated this species in tomato seedling roots and reported that *P. inflatum*, although, non-pathogenic to tomato seedlings in soil conditions, caused moderate infection of tomato roots in the laboratory assay. During the present study, *P. inflatum* was isolated from the Tarai fields both as pre- and post-emergence damping-off pathogen and showed its destructive effect to the growing crop.

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CERTAIN NEW TAXA OF *COSMARIUM* CORDA (DESMIDIACEAE) FROM KARNATAKA STATE (INDIA)

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ALGAL samples growing in a paddy field (with 40-day–old paddy crop and 6.5 pH of field water) at Belgaum were collected during August 1985 and preserved in 4% formaldehyde for further study. The collections are deposited at the British Museum (Natural History), London under accession number B.M. No. L993.

Cosmarium punctulatum Bréb. var. *minor* Oye et Cornill f. (figure 1) : 15.5–16.0 μm long, 14 μm wide, isthums 3·5 μm.

Differs from the type[1] in shape, the broadest area being at the base of semicells. Prof. G. W. Prescott also recorded a form similar to the present alga from Iowa (personal communication). The alga may also be compared with *C. reniforme* (Ralfs.) Archer[2] in the shape of outer margin, but greatly differs in that semicells are not reniform and hence is included in *C. punctulatum* Bréb. series.

Cosmarium regnelli Wille var. *pseudoregnellii* (Messik.) *Krieger* et *Gerloff* f. *angustum* Bongale f. nov. (figure 2):

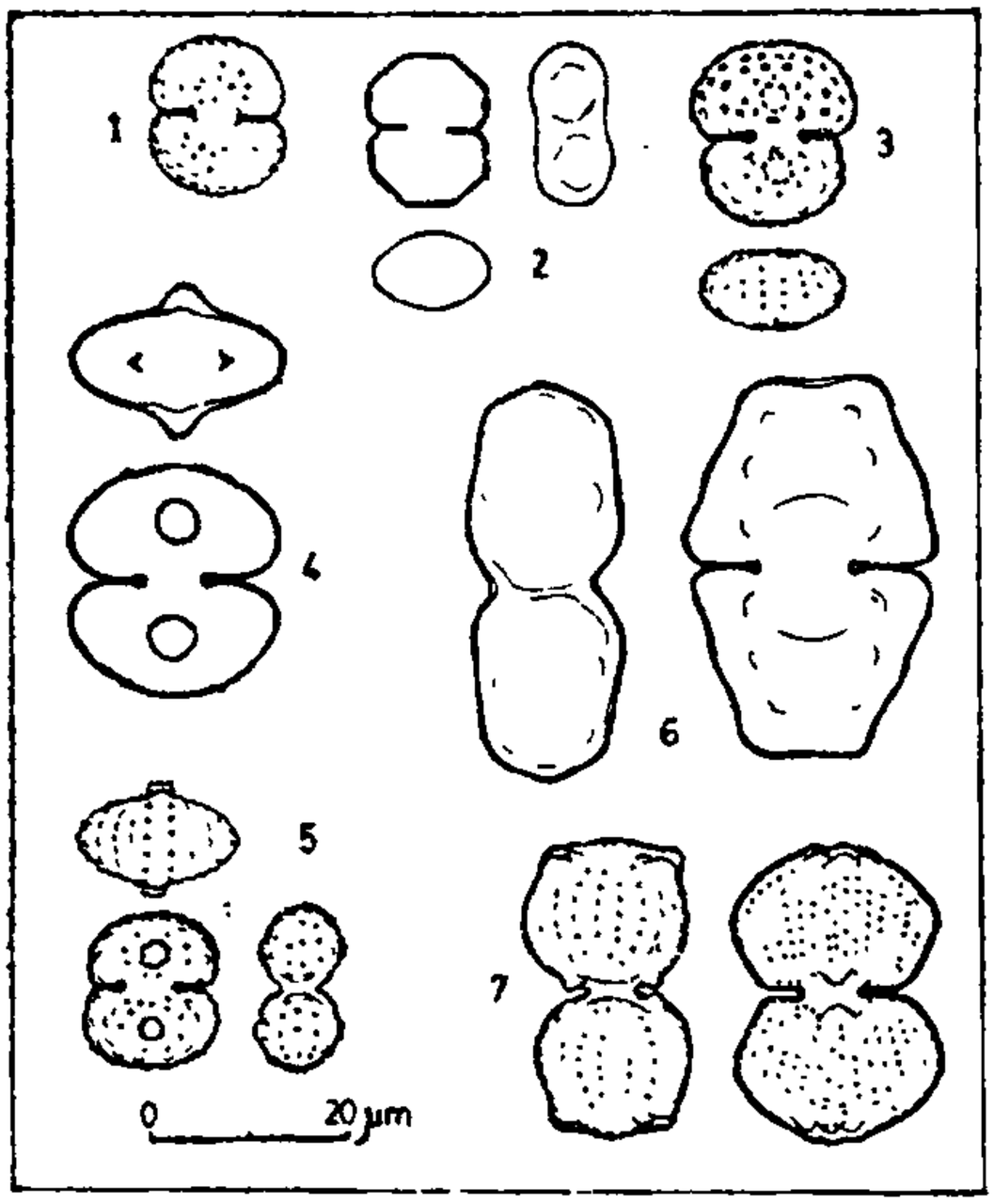
Forma cellulorum velut in typo; sinus clausus, margines inferiores lateralesque verticales, et marginem parvum angularemque basalemque versus sinum formantes; margo superior lateralisque per angulum 45° deflexus, angula acuta formans; 15–16 μm longae, 12.0–12.5 μm latae; isthmus 3.5 μm.

Iconotypus: Figure 2.

Shape of the cells same as in type, sinus closed; lower lateral margins vertical and forming a small angular basal margin towards the sinus; upper lateral margin bent at nearly 45° forming acute angles; 15–16 μm long, 12.0–12.5 μm wide, isthmus 3.5 μm.

Iconotype: Figure 2.

Differs from the type[3] in having narrower apical margin and in the margin being not undulated.



Figures 1–7. **1.** *Cosmarium punctulatum* var. minor Oye et Cornill; **2.** *C. regnellii* var. *pseudoregnellii* f. *angustum* Bongale f. nov; **3.** *C. punctulatum* var. *subpunctulatum* (Nordst.) Borges; **4.** *C. phaselous* var. *elevatum* f. *epicondatum* Bongale f. nov; **5.** *C. calcareum* var. *spetsbergens* f. *minor* Bongale f. nov; **6.** *C. anceps* f. *varians* Bongale f. nov; **7.** *C. nygaardii* Bongale sp. nov.

Cosmarium punctulatum Bréb. var. *subpunctulatum* (Nordst.) Borges f. (figure 3):

18–19 μm long, 16.0–16.5 μm broad, isthmus 3.5 μm, 7 μm broad in top view.

Differs from the type[4] in being much smaller. Also differs from the algae recorded by Scott and Prescott[5], and Bharati and Hegde[6] in being much smaller and in having a central ring of granules over the surface in which character the present alga resembles that described by Forster[4].

Cosmarium phaseolus Bréb. var. *elevatum* Nordst. f. *epicondatum* Bongale f. nov. (figure 4):

Forma cellularum velut in typo; sinus latae apertus extrinsecus, margines laterales rotundatusque formans; margo apicalis dentes 2 praebet; 23–24 μm longae, 22.0–22.5 μm latae, isthmus 5·5 μm, a summo visae 11 μm crassae tuberculis 16 μm.

Iconotypus: Figure 4.

Shape of cells as in type; sinus widely open outside forming rounded lateral margins; apical margin with two teeth; 23–24 μm long, 22.0–22.5 μm wide, isthmus 5.5 μm, 11 μm broad in top view and 16 μm with tuberculations.

Iconotype: Figure 4.

Differs from the type[4] in having two apical teeth apart from being smaller and isthmus narrower.

Cosmarium calcareum Wittr. var. *spetsbergens* (Boerg.) Forster f. *minor* Bongale f. nov. (figure 5):

Cellulae longiores quam latiores; semicellulae fere rectangulares, angulis rotundatis; margines laterales paene verticulares, margines apicalis lati; varruca unica magnaque emergensque in media superficie; sinus clausus; semicellulae a latere visae oblongae et a summo visae ovales; granula a summo visa ordinata in seribus 12–13 verticalibus; 14.0–15.5 μm longae, 13–14 μm latae, isthmus 4 μm, a latere vissae 8 μm crassae, a summo visae 10 μm crassae.

Iconotypus: Figure 5.

Cells longer than broad, semicells nearly rectangular with rounded angles; lateral margine nearly vertical, apical margin broad; single large emerging verruca in centre on surface; sinus closed; semicells oblong in lateral view and oval in top view; granules arranged in 12–13 vertical rows in top view; 14.0–15.5 μm long, 13–14 μm wide, isthmus 4 μm, 8 μm broad in side view, 10 μm broad in top view.

Iconotype Figure 5.

Differs from the type[7] in being much smaller, sinus not flat, semicells being angular and central rosette much more emerging than in type. Alga can also be compared with *C. arnelli* Boldt. var. *notatum* Grönbl[8] in the shape of cells but differs much in ornamentation.

Cosmarium anceps Lund f. *varians* Bongale f. nov. (figure 6):

Semicellulae pyramidales regione apicali plana; margo lateralis exiguas curvaturas 2 et margo apicalis exiguam curvaturam 1 habent; superficies laevis est et tumores exiguos habent; sinus anguestus et planus usque 2/3 suae latitudinis, cuius pars exterior aperta et rotundata est; 38–41 μm longae, 25–26 μm latae, isthmus 8.0–8.5 μm, a latere visae 15–16 μm latae.

Iconotypus : Figure 6.

Semicells pyramidate with flat apical region lateral margin with two and apical margin with one slight curvatures; surface smooth with slight swellings;

sinus close and flat up to 2/3 across and roundly open outside; 33–41 μm long, 25–26 μm wide, isthmus 8.0–8.5 μm, 15–16 μm wide in lateral view.

Iconotype: Figure 6.

Among different taxa of *C.anceps* Lund, the present alga can be compared with f. *crispula* Nordst[9] in having flat apical margin, but differs much in shape of semicells and marginal curvatures being not deep in the present form.

Cosmarium nygaardii Bongale sp. nov. (figure 7) Semicellulae rhombeae a fronte et fere circulares a latere visae; granula in serieb :s verticalibus deposita; tubercula 3 apicalia et unum sub isthmo sunt; sinus clausus; 29–30μm longae,22.0–23.5μmlatae; isthmus 5·0–5·5 μm, a latere visae 16·5 μm crassae.

Iconotypus : Figure 7.

Semicells rhomboid in front and nearly circular in side view; granules arranged in vertical rows; three apical and one subisthmal tuberculations; sinus open; 29–30 μm long, 22.0–23.5 μm wide, 5.0–5.5 μm isthmus, 16.5 μm broad in side view.

Iconotype : Figure 7.

Shape of the present alga resembles that of *C. bituberculatum* Fritsch et Rich[10], but differs much in having three subapical (instead of two) and additional subisthmal tuberculations; it can also be compared slightly in shape with *C. subnudiceps* West et West[11], but both these taxa are without granular walls. In view of the above distinctive characters, a new taxon is raised and is named after the algologist Nygaard Gunnar.

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MYCELIAL AMINO ACID COMPOSITION OF DIFFERENTIALLY VIRULENT ISOLATES OF *RHIZOCTONIA SOLANI*

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RHIZOCTONIA SOLANI is a versatile pathogen and has gained considerable importance as it attacks an array of important crops causing severe losses. Sheath blight incited by *R. solani* is one of the major diseases of rice leading to serious damage of the crop in all rice growing countries.

Reddy and Rao[1] earlier reported greater production of amino acids by a virulent *R. solani* isolate from groundnut, than by a non-virulent isolate. Ramalingam[2] obtained a positive correlation between the toxin (*p*-HPAA) production by *R. solani* isolates and their virulence rating. Aromatic amino acids, L-phenylalanine and L-tyrosine, have been known as the main precursors of certain toxic metabolites produced by *R. solani*[3]. Hence, a preliminary investigation was carried out on the possible correlation between the mycelial amino acid composition of five *R. solani* isolates from rice and their relative virulence.

Five differentially virulent *R. solani* isolates from rice[4], designated as R1, R2, R3, R4 and R5 (ATCC No. 48502, 48503, 48570, 48504 and 48505, respectively) were used in the present study.

Mycelial mats, from 8-day-old potato dextrose broth grown cultures (static condition), were harvested after filtering through a four-layered cheese cloth. Any sclerotia found were removed with a forceps and the mats were repeatedly washed with glassdistilled water. The amino acids were extracted by boiling the mycelia in water for 15 min and the suspension was centrifuged. The pellet was reex-