PLATE 1

*Hydrogonium arcuatum*

A. Spore germination showing emergence of tube;  B. Chloronema;  C. Caulonema;  D. Bud on protonema;  
E. Control culture.
PLATE 2

Hydrogonium arcuatum

Effect of auxins:  A. Culture supplemented with $10^{-8}$ M IAA;  B. Culture supplemented with $10^{-6}$ M 2,4-D;  C. Culture supplemented with $10^{-8}$ M NAA;  D. Culture supplemented with $10^{-8}$ M NOA.
Plate 3

Hydrogonium arcuatum

Effect of cytokinins:  A. Culture supplemented with $10^{-5}$M BAP;  B. Culture supplemented with $10^{-4}$M BAP;  C. Culture supplemented with $10^{-5}$M Kinetin;  D. Culture supplemented with $10^{-5}$M Kinetin;  E. Culture supplemented with $10^{-6}$M 2 iP
Hydrogonium arcuatum

A. Cultures supplemented with $10^8$M BAP;  B. Cultures supplemented with $10^5$M BAP;  C. Culture supplemented with $10^8$M GA$_3$;  D. Culture supplemented with $10^6$M Kinetin.
Effect of heavy metals: Production of gemmae like structures.

A. Gemma from cultures supplemented with $10^{-8}$M cadmium acetate; B. Gemma from cultures supplemented with $10^{-8}$M cadmium sulphate; C. Gemmae from cultures supplemented with $10^{-5}$M cadmium nitrate; D. Gemma from cultures supplemented with $10^{-6}$M lead acetate.
PLATE 6

_Hydrogonium arcuatum_

Developmental stages in gemma formation:  
A. Gemma initial;  
B. Swollen apical cell showing transverse division;  
C-D. Vertical divisions and basal hyaline cell for detachment of gemmae at maturity;  
E. Multicellular gemma showing hyaline basal cell;  
F. Mature gemmae.
Plate 7

Anoectangium clarum

Spore germination and protonema formation: A-C. Various stages of spore germination showing uni- and bipolar germination; D. Chloronema showing transverse walls and dense chloroplasts; E. Heterotrichous caulonemal filament.
Plate 8

Anoectangium clarum

Effect of auxins: **A.** Control culture at 3,500 lux; **B.** Cultures supplemented with $10^{-7}$M 2,4-D showing maximum protonemal growth; **C.** Cultures supplemented with $10^{-8}$M IAA showing thin long shoots; **D.** Cultures supplemented with $10^{-6}$M 2,4-D showing long brown prostrate branch.
PLATE 9

Anoectangium clarum

A. Cultures supplemented with $10^{-8}$ M NAA showing thin long shoots; B. Cultures supplemented with $10^{-5}$ M NAA showing thick short shoots; C. Cultures supplemented with $10^{-8}$ M NOA showing thin long shoots.
Plate 10

*Anoectangium clarum*

Effect of cytokinins showing reduced aerial system:  
A. Cultures supplemented with $10^{-7}$ M BAP;  
B. Cultures supplemented with $10^{-6}$ BAP;  
C. Cultures supplemented with $10^{-8}$M Kinetin;  
D. Cultures supplemented with $10^{-6}$M Kinetin.
Plate 11

_Anoctangium clarum_

Effect of cytokinins - 2 iP:  
A. Cultures supplemented with $10^{-4}$M;  
B. Cultures supplemented with $10^{-5}$M;  
C. Cultures supplemented with $10^{-6}$M;  
D. Cultures supplemented with $10^{-7}$M.
PLATE 12

Anoectangium clarum

A. Cultures supplemented with $10^{-5}$M GA$_3$ showing brown-green protonema;  B. Cultures supplemented with $10^{-6}$ cadmium acetate showing abnormal protonema;  C. Cultures supplemented with $10^{-8}$M cadmium sulphate showing pale-green protonema;  D. Culture supplemented with $10^{-4}$M cadmium nitrate showing aerial protonemal filament;  E. Control culture.
Plate 13

*Anoectangium clarum*

Effect of heavy metals: A. Normal caulonemal filament; B. Cultures showing swollen terminal cell; C. Formation of spherical cells; D. Germinating brood cells on fresh basal medium; E. Brood cell
Plate 14

*Anoectangium clarum*

Effect of cadmium sulphate: *(A-D)* Brood cell formation at lower concentrations of cadmium sulphate.
Plate 15

Anoectangium clarum

Effect of cadmium nitrate: A. Normal protonema  B-E. Formation of spherical cells at higher concentrations of cadmium nitrate  F. Brood cell producing fresh protonema on basal medium.
Plate 16

Anoectangium clarum

Effect of lead acetate: A-D. Cultures showing protonema with various abnormalities
Plate 17

*Anoectangium clarum*

Effect of lead nitrate: **A.** Swollen tip  **B-F.** Formation of spherical cells at higher concentration of lead nitrate.