

against acute and chronic type of disease. The inclusion of IFA does not seem to enhance the immunogenicity in both the experiments. The parameters used to study have elucidated that *M. habana* has afforded protection against *M. ulcerans* infection in mice. The study has paved the way for future research in the direction of vaccine and chemotherapy of this infection.

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### URONEMA AFRICANUM BORGE FROM ANDAMAN ISLANDS—A NEW ADDITION TO INDIAN FLORA

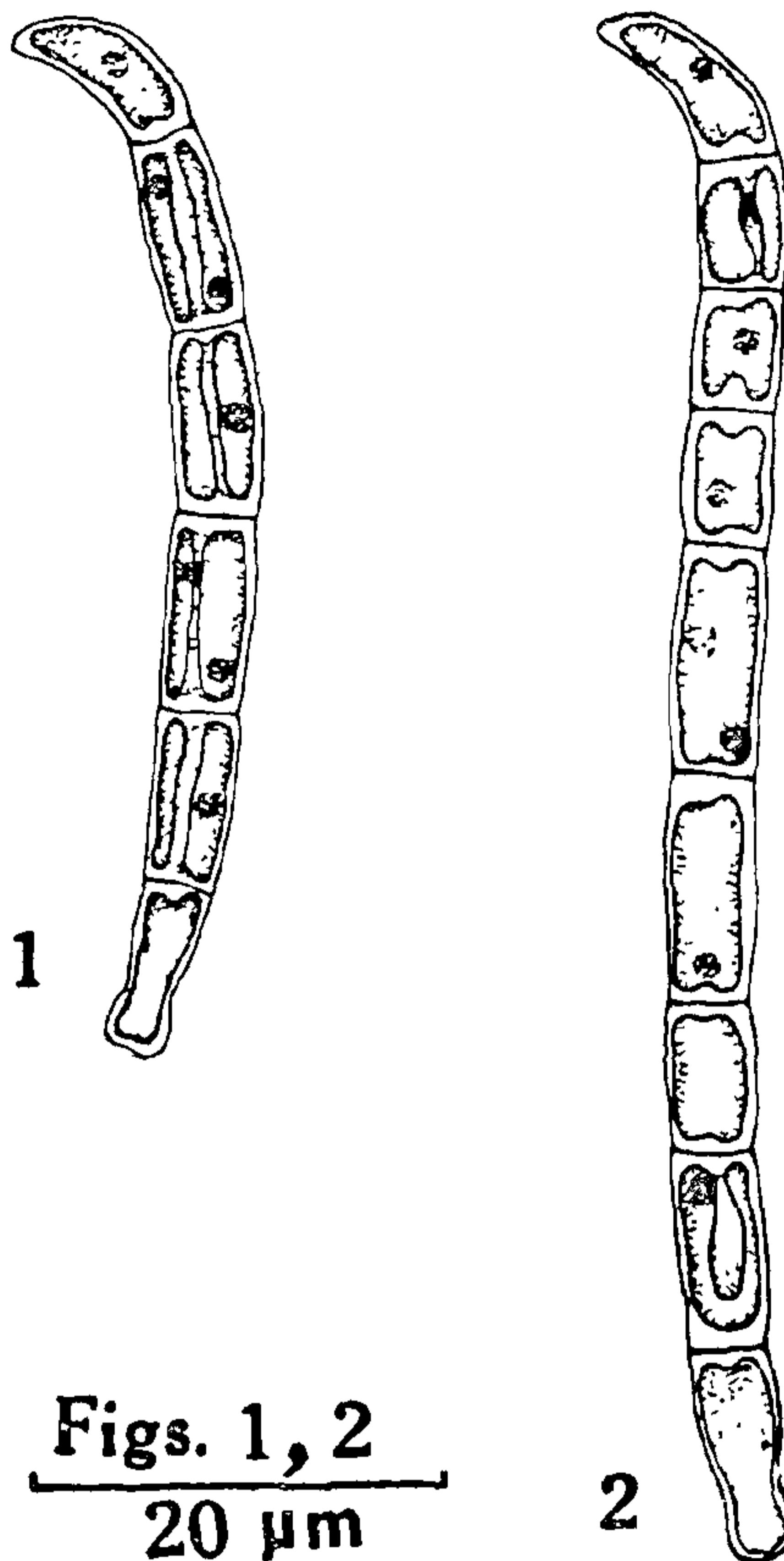
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THE genus *Uronema* Lagerheim is represented in India by five species only<sup>1-3</sup>, viz., *U. confervicolum* Lagerheim, *U. elongatum* Hodgetts, *U. gigas* Visher, *U. indicum* Ghose and *U. terrestre* Mitra. The present paper records a sixth species *U. africanum* Borge<sup>2</sup> from Port Blair (South Andaman Island). It is intended to record the taxon as an addition to the Indian flora and to briefly describe the Indian plant.

*Uronema africanum* Borge (Figs. 1-2)

Filaments 2-11 cells long, basal cell with attaching disc slightly constricted towards base; apical cell attenuated with pointed end and curved at a 45° angle. Cells cylindrical, 3.5-5.0 μm broad and 6-12.5 μm long, basal cells 4-9 μm long. Each cell with one parietal chloroplast filling the whole cell and containing 1 or 2 pyrenoids. At some intercalary positions,



**Figs. 1, 2**  
**20 μm**

FIGS. 1-2. *Uronema africanum* Borge. Fig. 1. A young filament. Fig. 2. A mature filament showing basal and apical cells.

filaments are slightly constricted at septa. Zoospores not seen.

*Habitat* :

Epiphytic on *Cladophora* sp. and *Oedogonium* sp. in a freshwater pond at Sipighat (Port Blair). Coll. No. 516F. Date 10-10-1979.

The present specimen differs slightly from Borge's plants<sup>2</sup> in possessing slightly less curved apical cells. However, the overall morphology of the plants is similar to his description.

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### INHIBITION OF AFLATOXIN PRODUCTION BY FERULIC ACID ON SOME CEREALS AND OIL-SEEDS

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CEREALS and oil-seeds are very rich substrates for aflatoxin production<sup>1</sup>. Natural contamination of aflatoxins in these food-stuffs has been reported in literature<sup>2,3</sup>. Their deleterious effects have been established on various animals<sup>4</sup> as well as in human beings<sup>5</sup>. Control of aflatoxins has, therefore, been a subject of attention during the last few years.

Use of aqueous plant extracts for inhibiting aflatoxins was earlier found to be successful. Out of

102 plants screened against aflatoxin production by *Aspergillus parasiticus* in liquid culture, 12 plant extracts inhibited toxin production in the range of 70 to 90%<sup>6,7</sup>. Some of these plant extracts also prevented aflatoxin production on solid substrates<sup>8</sup>. The inhibition is attributed to the presence of phenolics in plant extracts which affect the fungal metabolism<sup>9</sup>. In the present investigation an attempt has been made to evaluate the efficacy of ferulic acid against aflatoxin production by *Aspergillus parasiticus* on some cereals and oil-seeds.

Twenty-five g each of the three common cereals, viz., rice (var. Sita), wheat (var. S-308) and maize (var. Ganga-2) and two oil-seeds, viz., groundnut (var. AK<sub>12-24</sub>) and mustard (var. BR-13) were soaked in 500 ppm aqueous solution of ferulic acid for 2 hours in 150 ml Erlenmeyer flasks. Control seeds were soaked in distilled water. After decanting extra amount of water/solution, the seed lots were autoclaved at 15 psi for 10 minutes. On the following day, the seeds were inoculated with 0.5 ml spore suspension of an aflatoxin producing strain of *Aspergillus parasiticus* (NRRL-3240). Seed lots were incubated for 7 days at 28 ± 1°C. Aflatoxins were extracted by the method of Jones<sup>10</sup> and estimated spectrophotometrically<sup>11</sup>.

Percentage seed germination was also recorded with the seeds of wheat, maize, groundnut and mustard in order to evaluate the toxic effects of ferulic acid on seed germination (Table I).

Ferulic acid inhibited aflatoxin production by *A. parasiticus* on all the seeds by more than 56%. Maximum inhibition was recorded in rice (78.24%) followed by wheat (72.20%), mustard (66.34%), groundnut (61.42%) and maize (56.21%). It did not have any pronounced effect on seed germination.

TABLE I

Effect of ferulic acid on aflatoxin production and seed germination of cereals and oil-seeds

| Seeds     | Amount of aflatoxin produced (ppm) |         | % Seed germination |         | % inhibition in      |                  |
|-----------|------------------------------------|---------|--------------------|---------|----------------------|------------------|
|           | Control                            | Treated | Control            | Treated | Aflatoxin production | Seed germination |
| Rice      | 8.300                              | 1.806   | ..                 | ..      | 78.24                | ..               |
| Wheat     | 6.010                              | 1.671   | 100.0              | 96.0    | 72.20                | 4.0              |
| Maize     | 5.437                              | 2.381   | 100.0              | 100.0   | 56.21                | 0                |
| Groundnut | 4.293                              | 1.656   | 50.0               | 47.0    | 61.42                | 6.0              |
| Mustard   | 2.575                              | 0.867   | 63.0               | 58.0    | 66.34                | 8.0              |