

results also support the earlier findings of the role of tenuazonic acid in *Alternaria* blight of *D. innoxia* caused by *A. alternata*⁵ and brown spot of tobacco caused by *A. longipes*².

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1. Janardhanan, K. K. and Husain, A., *Indian J. Exp. Biol.*, 1975, 31, 321.
2. Mikami, Y., Nishijima, Y., Iimura, H., Suzuki, A. and Tamura, S., *Agric. Biol. Chem.*, 1971, 35, 611.
3. Kinoshita, T., Renbutsu, Y., Khan, I. D., Kohmoto, K. and Nishimura, S., *Ann. Phytopath. Soc. Jpn.*, 1972, 38, 397.
4. Umetsu, N., Kaji, J. and Tamari, K., *Agric. Biol. Chem.*, 1972, 39, 859.
5. Janardhanan, K. K. and Husain, A., *Mycopathologia*, 1983, 83, 135.

ACID-TEMPERATURE-SHOCK TREATMENT AS A METHOD FOR INDUCING RESTING SPORE GERMINATION IN SOME TROPICAL SYNCHYTRIA

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RESTING spores in the genus *Synchytrium* De Bary et Woronin are important structures in perpetuating the species. Germination of resting spores has been observed only in 42 of the total more than 200 species^{1,2}. The presence of thick exosporium, lack of knowledge concerning the physiology and relatively a difficult task in germinating the resting spores are some of the factors for not determining the germination in the majority of the species. Initial difficulties were also observed in germinating resting spores of some tropical species of *Synchytrium*. Hence methods were evaluated for inducing resting spore germination and the results are presented in this communication.

Five species of tropical *Synchytria* viz., *S. lagenariae* Mhatre and Mundkur, *S. trichosanthidis* Mhatre and Mundkur, *S. sesamicola* Lacy, *S. brassicae* Singh and Pavgi and *S. akshaiberi* Lingappa, were included in the present study. The dry infected material containing abundant resting spores of the species was soaked in

tap water for 24–48 hr until the tissue became soft. The softened material was treated as follows:

- (a) a dip in 0.5% con. HCl, H₂SO₄, NaOH or KOH (acid or alkali treatment)
- (b) exposure to moist heat at 40–45°C for 1–2 hr (temperature-shock treatment)
- (c) exposure of acid treated material to moist heat at 40–45°C for 1–2 hr (acid-temperature-shock treatment).

The treated material was washed under tap water for 30 min. The resting spores were extracted by crushing the material in a pestle and mortar. The host material was separated from the resting spores by repeated filtration through 2–3 layered coarse cloth and spores suspended in clean water were collected by sedimentation. The resting spores were sown for germination on filter papers in moist petri dishes or fixed on microslides by alternate wetting and drying method and incubated^{3,4} at 30–35°C.

Among the different acid and alkalis tested, dilute hydrochloric acid was found to be satisfactory in corroding the thick exosporium. The alkalis on the other hand tended to cause damage to the resting spores, thereby making them nongerminable, although results with hydrochloric acid did not yield a very high per cent of germination (60–65%). A very high percentage of germination was secured when HCl-treated resting spores were subjected to moist heat at 40–45°C for 1–2 hr. The germination percentage ranged from 85–90%. This temperature shock-triggered germination could be correlated with the environmental conditions prior to the initiation of the disease. The incidence of *Synchytrium* gall disease of many crops appear in the gangetic plains of north India usually after the onset of monsoon showers in July. The soil (before the rains) is heated to 40–50°C because of the high summer heat prevalent in May–June. When monsoon showers are received the pre-heated soil emits steam or moist heat, which provides the necessary trigger for germination of resting spores. The resting spores present in the soil are known to resist high summer heat without endangering their viability⁵. This principle of temperature-shock treatment proceeded by a dip in acidulated water proved very effective in inducing resting spore germination of dormant resting spores. The technique appears to work well for other tropical species of *Synchytrium*.

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1. Lingappa, B. T., *Proc. Indian Acad. Sci.*, 1955, **B64**, 59.
2. Lingappa, B. T., *Ann. J. Bot.*, 1955, **42**, 841.
3. Thirumalachar, M. J. and Pavgi, M. S., *Indian Phytopathol.*, 1950, **3**, 177.
4. Thirumalachar, M. J. and Narasimhan, M. J., *Mycologia*, 1953, **45**, 461.
5. Raghavendra Rao, N. N. and Pavgi, M. S., *Phytopathol. Medit.*, 1979, **18**, 203.

TWO NEW GENERIC REPORTS TO FUNGI OF INDIA

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DURING survey of mycoflora of Maharashtra two interesting fungi, which are new to India were collected. These are described and illustrated below:

Conidioxyphium gardeniorum Batista and Ciferri¹. (figure 1). Colonies epiphyllous; Conidiomata superfi-

cial, brown, upto 400 μm long, broadest (20–55 μm) in middle, tapering (6.5–10.5 μm) towards apex; Conidia in slimy mass, hyaline, ellipsoidal, o-septate, guttulate, 2–4(3) \times 0.5–1.5 μm .

On leaves of *Ficus* sp., Bhambragad (Dist. Gadchiroli), Leg. K. G. Karandikar, 24.12.1983, AMH 6625.

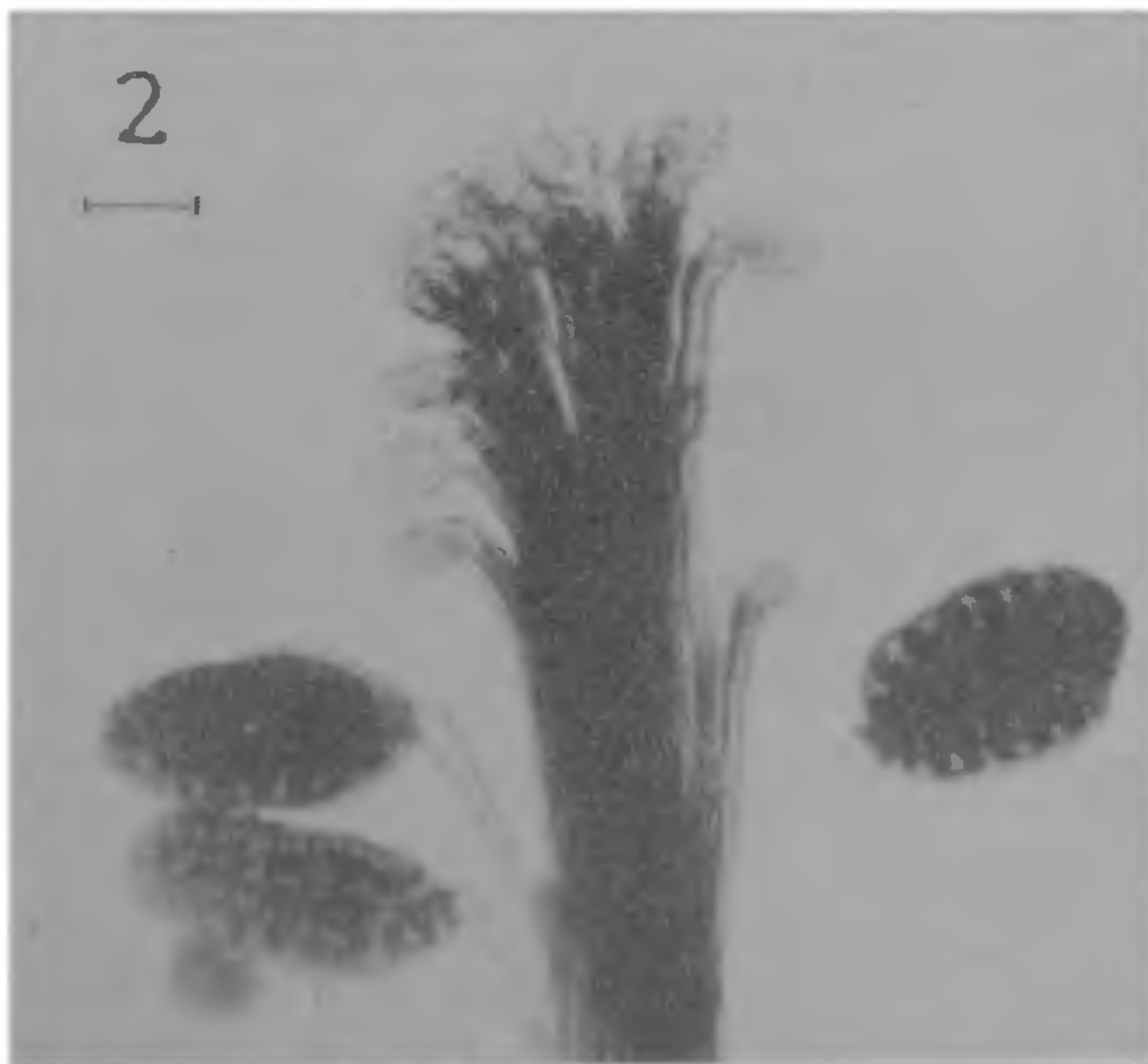
Kosteromansinda magna (Boedijn) Rifai² (figure 2).

Colonies effuse; synnemata dark brown upto 435 μm high, 19–52 μm thick, Conidiophores 2–6 μm thick; Conidia acrogenous, solitary, muriform, broadly ellipsoidal, with a pale brown supporting vesicle, 34.5–69(55.5) \times 20–34.5 (30) μm ; vesicles 3.5–10 \times 7–8 μm .

On dead Bamboo culms, Talkat (Dist. Sawantwadi), Leg P. R. Tikhe, 4.3.1983, AMH 5934; 6622 (Leg. K. G. Karandikar).

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1. Batista, A. C. and Ciferri, R., *Quad. Ist. Bot. Univ. Pavia*, 1963, **31**, 73.
2. Rifai, M. A., *Reinwardtia*, 1968, **7**, 378.



Figures 1, 2. 1. *Conidioxyphium gardeniorum*: Superficial hyphae and conidioma with slimy mass of conidia. 2. *Kosteromansinda magna*: Apical part of synnema, showing vesicles and conidia. Marker indicates 30 μm .