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and produced phyllody symptoms, indicating the transmission of causal agent from infected niger to healthy niger. An average of 65 per cent of plants were infected in two experiments.

The leaf samples were collected from the laboratory-infected niger plants and immediately fixed in 2 per cent phosphate buffered (0.1 M, pH 7.0) glutaraldehyde solution for 2 h. The tissues were then washed in buffer and post fixed in 2 per cent phosphate buffered osmium tetroxide solution. The tissue were dehydrated through an ethanol series and embedded in epoxyresin. Ultrathin sections (60–80 nm) were then cut in an LKB ultramicrotome. Sections were stained with aqueous 4 per cent uranyl acetate, counter stained with lead citrate and examined in a JEOL 100 S transmission electron microscope. Pleomorphic mycoplasma-like organisms (Figure 2), measuring 100–800 nm size, were seen in the ultrathin sections of the phloem sieve tubes of diseased niger but not in phloem tissue of healthy plants.

Symptoms associated with the niger phyllody disease were comparable to any other yellow-type diseases of plants. The disease has been successfully transmitted by the leafhopper vector *Orosius albicinctus*. The vector is known to transmit many mycoplasmal diseases of plants^{3–5}.

Pleomorphic organisms observed in phloem sieve tubes of niger phyllody-infected plants, confirm the probable mycoplasmal association with the disease.

Natural occurrence of phyllody disease in niger (*Guizetia abyssinica*) in Karnataka state

Plant pathogenic mycoplasmas are known to infect wide range of plants causing considerable economic loss. Many important oilseed crops, viz. sunflower, safflower and groundnut have also been found to be infected by mycoplasma-like organisms (MLOs)². Phyllody disease on niger was observed for the first time at the Agricultural Research Farm during the kharif season of 1991. The disease incidence ranged from 1.5 to 12 per cent.

The diseased plants were characterized by the transformation of floral organs into leaf-like structures (Figure 1). Production of secondary shoots bearing again phyllod flowers was seen in many diseased plants. Early infected plants were very much stunted in their growth. The plants infected at later stages had some branches showing typical phyllody symptoms, while rest of the branches remained apparently

healthy with normal development of flowers.

Insect transmission tests carried out indicated that the agent of disease can be transmitted by the leafhopper, *Orosius albicinctus*. For this a large number of second instar nymphs of *O. albicinctus* were collected from pure colony and allowed to feed on phyllody-infected niger plant for 24 h. After acquisition access period, the leafhoppers were maintained on healthy niger plants for 20 days for completion of incubation period. Viruliferous leafhoppers were enclosed on three-weeks-old healthy niger seedlings with the help of polyvinyl chloride (PVC) tubes (7.5 × 2 cm) for 24 h. Ten leafhoppers were used per seedling. The inoculated plants were maintained in insect-proof glasshouse for symptom expression. Of 40 seedlings inoculated with agent of phyllody disease of *O. albicinctus*, 26 plants were infected



Figure 1. Transformation of floral organs of niger into leaf like structures due to the infection of mycoplasma-like organism.

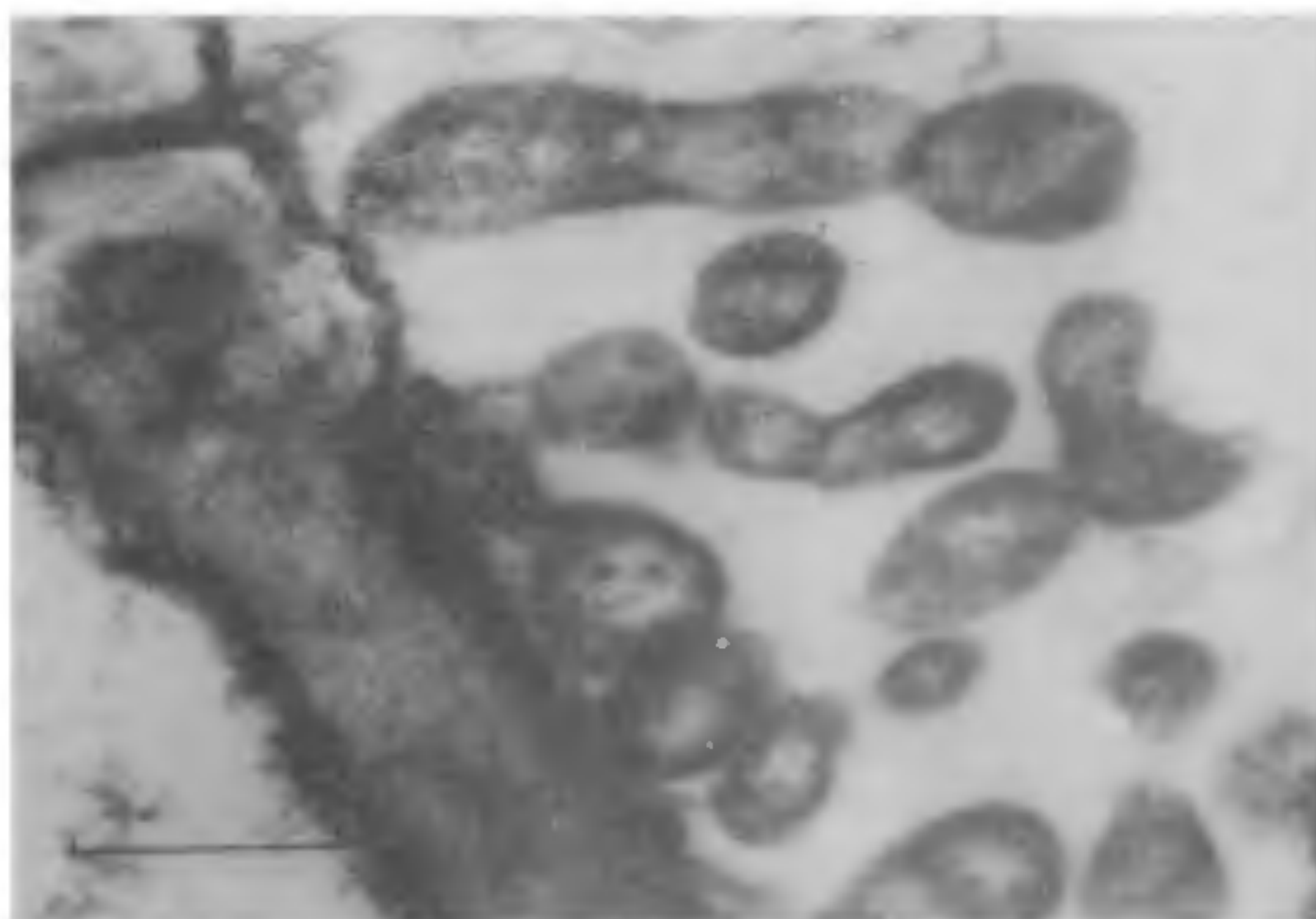


Figure 2. Pleomorphic mycoplasma like organism in a phloem sieve tube cell of niger infected with phyllody disease. Bar indicates 500 nm

SCIENTIFIC CORRESPONDENCE

The symptoms and MLO of the niger phyllody disease resemble other MLO-associated plant diseases⁴⁻⁶.

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NEWS

Third NOST conference

The National Organic Symposium Trust (NOST) conducted its third conference at Hotel Kalinga Ashoka, Bhubaneswar during 6th-9th December 1992. Continuing the tradition set in the second meeting at Aurangabad (cf., *Current Science*, 1991, 60, 138), the third NOST conference was dedicated to the memory of Professor T. R. Seshadri, an eminent organic chemist of yesteryears (1900-1975) who did a life time research on the oxygen heterocycles of natural origin. A carefully chosen group of 54 enthusiastic scientists, representing the academic institutions, national research laboratories and industrial research institutions, from all over the country belonging to the age group 25-80 participated in the Bhubaneswar meeting and did the 'karseva' to Indian organic chemistry without any destruction or distraction. Unlike the earlier meetings, a welcome change noticed in the Bhubaneswar meeting was the participation of five scientists from abroad, four from USA and one from Israel. The meeting was organized in a pleasant and peaceful atmosphere despite the fact that total unrest was prevailing in most parts of the country during that time.

There were 35 presentations in all, packed in 12 sessions each focusing a different theme, covering almost all the areas of organic chemistry ranging from natural products to bioorganic chemistry, organic synthesis using conventional reagents to fancy organometallics, photochemistry to electrochemistry, theoretical aspects to computer-designed synthesis. As earlier the afternoons were kept free for informal interactions

as all the participants were housed under one roof. After the formal welcome address by K. Nagarajan, Chairman, NOST-Council, the meeting started in the evening of 6th December 1992 with a dedication speech by T. R. Govindachari (SPIC, Madras) covering various facets of the life of Professor T. R. Seshadri (whom Sir Robert Robinson used to rate as the best student he ever had) including his dedication to research at the expense of social life. The scientific session was flagged off with a fine lecture on the development and application of the α -metallation of tertiary amines chelated to Lewis acids, by one of the pioneering synthetic organic chemists of the country, S. V. Kessar (Punjab University, Chandigarh). In the post dinner session, A. Hassner (Bar Ilan University, Israel) highlighted the importance of the intramolecular 3+2 dipolar cycloadditions for the regio- and stereoselective construction of heterocycles, whereas the use of hetero Diels-Alder reaction for the same purpose was presented by R. S. Kuruskar (Poona University, Pune). Synthesis and various transformations of heterocycles was the subject matter of the talk given by Harjit Singh (Gurunankdev University, Amritsar).

The second day started with emphasis on carbohydrates. Modification of carbohydrates to useful carbocyclic chirons and more interestingly to ligands of industrially useful chiral catalysts (for Ni catalysed hydrocyanation) was presented by T. V. Rajanbabu (Dupont, USA). Contemporary developments in the field of carbohydrate chemistry was

reviewed by K. Vijayakumaran (Laboratory Chimique and VHS, Madras). A. V. Rama Rao's (IICT, Hyderabad) presentation dealt with two aspects. First he discussed the pros and cons of development of technology for various drugs in India, and in the second part, he explained the progress in his group's synthetic efforts towards vancomycin. The systematic development of proscar as a 5α -reductase inhibitor and drug for the treatment of prostate enlargement was explained by Raman Bakshi (Merck, USA). Development of various methodologies as well as total synthesis of various terpenoids was focused in the evening session. First G. S. R. Subba Rao (IISc, Bangalore) explained the use of dihydro-aromatics obtained by Birch reduction, in the synthesis of various sesquiterpenes of diverse molecular frameworks. This was followed by an account of the efforts made towards the construction of the carbon skeleton present in Taxol, a very hot molecule in cancer therapy, which was presented by G. Saha (IACS, Calcutta). Later, development of a radical cyclization reaction-based methodology for spirobutyrolactones and its extension to the sesquiterpenes, bakkenolides was presented by A. Srikrishna (IISc, Bangalore). A practical and simple synthesis of chiral artemisinin, an anti-malarial, using an intramolecular Diels-Alder reaction strategy was explained by T. Ravindranathan (NCL, Pune). This was followed by a presentation from B. Venugopalan (Hoechst, Bombay) on the synthesis of various analogues of artemisinin and evaluation of their anti-malarial activity. R. Jeyaraman (Bharatidasan University, Trichy) explained the generation of dioxiranes and their