areas are either diseased or potentially diseased'. I feel that the data are too meagre for publication in your esteemed journal.

1 Valiathan, M S, Eapen, J T and Mathews, C K., *Curr Sci*, 1992, 63, 565-567

M. K. NAIR

Central Plantation Crops Research Institute
Kasaragod 671 124, India

M. S. Valiathan and J. T. Eapen reply:

1. While elemental concentration is more often reported on dry weight basis, expression in wet weight continues to remain in vogue (ref. 1). In fact, the measurements are being made on dry weight in our ongoing studies on the possible role of metal ions in the pathogenesis of the disease.
2. The values in dry weight of magnesium which Nair had worked out from our data in wet weight, despite the marked reduction in absolute quantities which is intriguing, confirm our observation that the magnesium level in the leaves of diseased palms is lower than that in the leaves from the healthy palms of Manavalakurichi. Nor do the dry weight values of magnesium negate in any manner the reciprocal relationship between magnesium and cerium which was the central theme in our paper.
3. In determining whether a particular relationship exists between two groups, the size of the sample should be such as to enable one to draw statistically valid conclusions and rule out chance associations. Beyond this, the large size of a sample *per se* does little to strengthen a new observation. In the paper which Nair relied upon for the conversion of wet weight to dry weight, for example, the sample size was only 20 palms.

1. Environmental Health criteria 81 Vanadium, World Health Organisation, Geneva, 1988.

M. S. VALIATHAN
J. T. EAPEN

Sree Chitra Tirunal Institute for Medical Sciences and Technology
Thiruvananthapuram 695 011, India

Cytoplasmic inheritance of tolerance to insects pests in rice

Brown plant hopper (BPH) has become major constraint in rice production in several countries and biotypes have been recorded long back. Rice varieties/types, viz. Babawee, Rathu- heenati, ASD-7, Mudgo, Manoharsali, PTB-33, ARC 6650 and ARC 5984 have been utilized as resistant donors, to incorporate resistance to plant hoppers in high-yielding varieties. Sona$_{♀}$ × Manoharsali$_{♂}$ crosses yielded strains, moderately resistant to BPH. But, the progenies derived from crosses between multiple resistant cultures, viz. ARC 6650 and ARC 5984 used as female parents and MTU 4569 (Mashuri$_{♀}$ × Vijaya$_{♂}$) as male, genetically inherited yield components from male parent, while retaining the tolerance of ARC 6650/ ARC 5984 for BPH. The varieties selected from these crosses, viz., MTU 4870, MTU 5182, MTU 5249, MTU 5293, MTU 5194, MTU 5195, MTU 5196 (ARC 6650$_{♀}$ × MTU 4569$_{♂}$) and MTU 2067, MTU 2077 (ARC 5984$_{♀}$ × MTU 4569$_{♂}$), are now spread over lakhs of hectares. These cultures, besides supporting/withstanding high populations of BPH (upto 500 numbers/clump), are capable of producing grain yield of 6–8 tonnes, while susceptible high yielding varieties like Mashuri and Swarna succumbed totally to BPH at about 1/10 of its intensity maintained on these tolerant lines. If these stress tolerant characteristics were genetically inherited, the donor as male should have imparted the traits through its haploid gamete. But the inheritance of tolerance in the progeny, only when the donor is female, speaks of inheritance to be from non-nuclear genome. It is indicative of high resourcefulness of cytoplasm in stress tolerant varieties.

Received 22 March 1991; revised accepted 6 January 1993

V. L. V. PRASADA RAO

Regional Agricultural Research Station, Anakapalle 531 001, India

Pleurotus djamor—A new edible mushroom

During a survey on the mushroom flora conducted on October 1991, *Pleurotus djamor* (Fr.) Boedijn was collected and is being reported for the first time from India. The sporophores of *P. djamor* appeared pure white, growing solitary or in groups on oilpalm bunch wastes dumped in the vicinity of India Oilpalm Ltd., Anchal, Quilon.

The fungus was isolated and grain spawn[1] was prepared. The mushroom was successfully cultivated (Figure 1) on sterilized water-soaked paddy straw in poly-bags[2] (45 × 30 cm) at room temperature (30 to 32°C) and RH of 70 to 90%. With 150 g spawn and 2.5 kg of sterilized water-soaked straw, an average yield of 399 g per bed was obtained, the biological efficiency being 80 per cent.

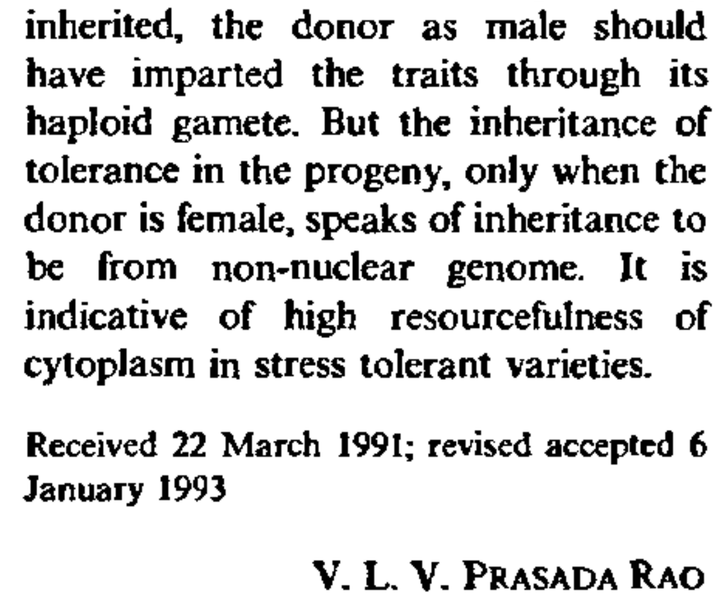

Figure 1. *Pleurotus djamor.*

1. Sinden, J. W., US Patent, 1932, **1**, 869.
2. Sivaprakasam, K. and Kandaswamy, T. K., *Indian J. Mush.*, 1981, **6**, 13.

Acknowledgement. We thank Dr D. N. Pegler, Mycological Research Institute, Kew, for identifying the mushroom.

Received 28 December 1992; accepted 8 January 1993

D. GEETHA
K. SIVAPRAKASAM
Dept. of Plant Pathology,
Agric. College & Res. Institute,
Madurai 625 104, India

Natural occurrence of phyllody disease in niger (*Guizetia abbysinica*) 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 phylloid 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 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.

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

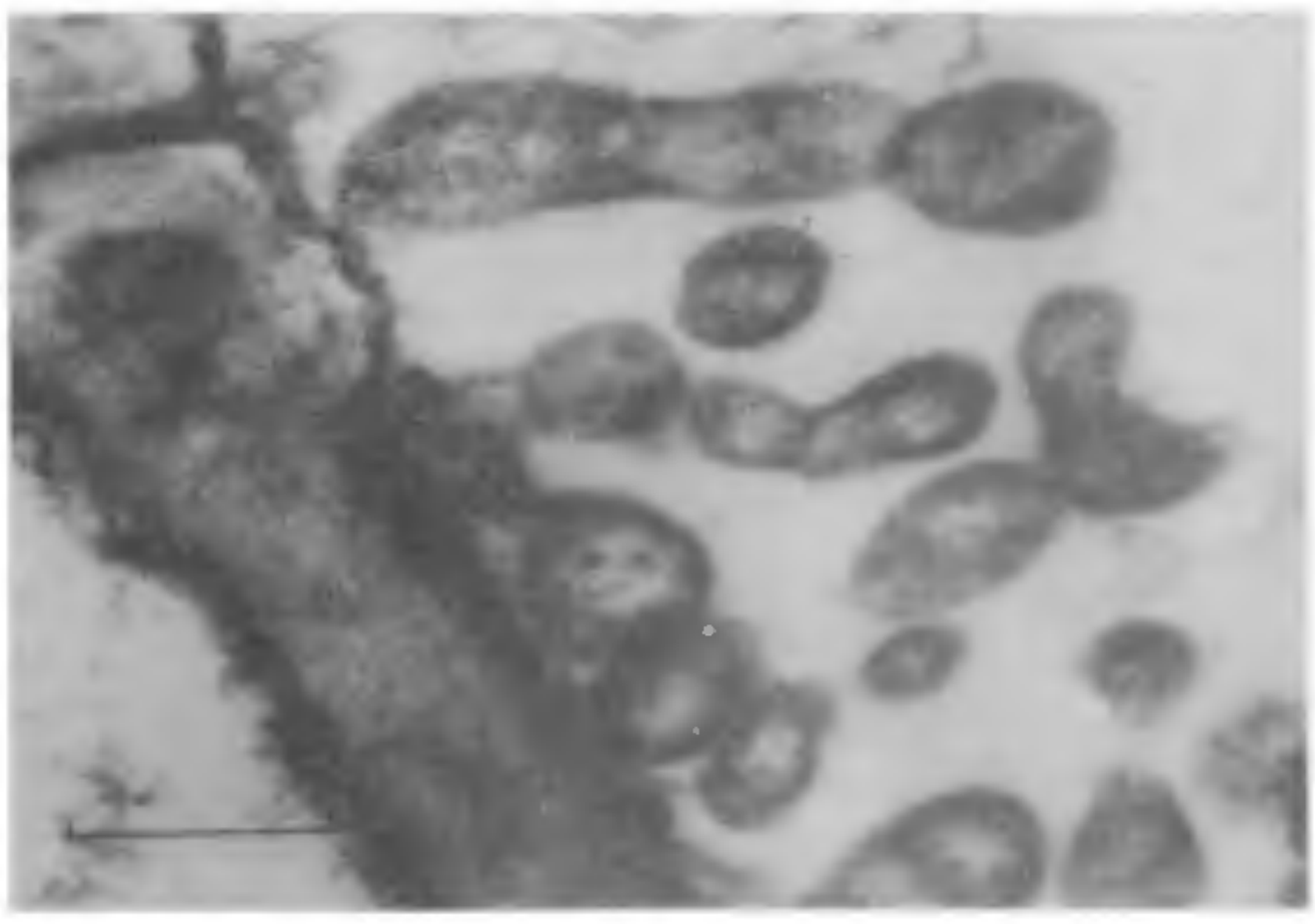

Figure 2. Pleomorphic mycoplasma like organism in a phloem sieve tube cell of niger infected with phyllody disease. Bar indicates 500 nm