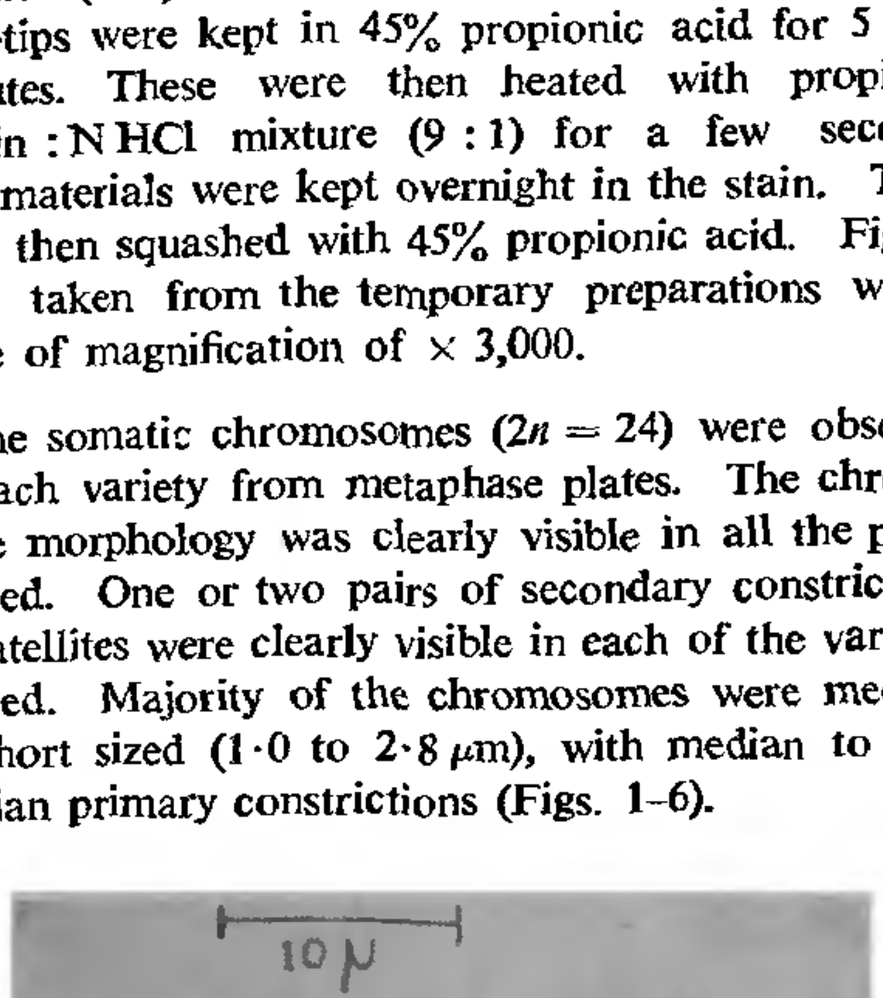
(3) Pusa 2-21, (4) Jaya, (5) Kalimpong-1 and (6) NC 678 at the Rice Research Station, Chinsurah (Hooghly). For somatic chromosome study, the seeds were germinated on moist filter-paper, healthy root-tips were selected and directly fixed in propionic acid and ethyl alcohol (1:2) for 45 to 60 min. After fixation, the root-tips were kept in 45% propionic acid for 5 to 7 minutes. These were then heated with propiono-orcein : N HCl mixture (9 : 1) for a few seconds. The materials were kept overnight in the stain. These were then squashed with 45% propionic acid. Figures were taken from the temporary preparations with a table of magnification of × 3,000.

The somatic chromosomes ($2n = 24$) were observed in each variety from metaphase plates. The chromosome morphology was clearly visible in all the plates studied. One or two pairs of secondary constrictions or satellites were clearly visible in each of the varieties studied. Majority of the chromosomes were medium to short sized (1·0 to 2·8 μm), with median to submedian primary constrictions (Figs. 1–6).



FIGS. 1–6. Karyotypic plate of the variety NX 1626, Kalimpong 1, Pusa 2–21, Dular, Jaya and NC-678 respectively showing $2n = 24$ chromosomes, × 3,000.

While confirming the chromosome number of rice as $2n = 24$, the size of the chromosomes was found to be from 1·0 to 2·8 μm which closely corroborates that observed by Nandi[2] who found the range to be from 0·7 to 2·8 μm. Other observations like median to submedian primary constrictions, one or two pairs of satellite or secondary constrictions, etc., were in conformity with the observations of Sharma and Mukhopadhyay[3], Mukherjee and Mukherji[1] and others.

From the present investigation, it is clear that karyotypic studies on rice are possible without any pretreating chemicals. The technique is useful due to the simplicity of the procedure and consistency of the results obtained. This method may be useful in the studies of cytology of other plants having small chromosomes.

Thanks are due to Shri B. Mandal, Director of Agriculture, Government of West Bengal and Dr. D. Mukherjee, Additional Director of Agriculture (Research) and also Dr. S. Biswas, Economic Botanist I, for their keen interest in the work.

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October 31, 1978.

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PHYTOALEXIN FROM THE GERMINATING SEEDS OF RICE (*ORYZA SATIVA*)

PHYTOALEXINS are the antimicrobial substances formed as a result of host-parasite interaction and they play a crucial role in the biochemical defence of plants against infection. Keen[1] reported that the germinating seeds of several plants challenged by the native microflora produced relatively large amounts of phytoalexins. No phytoalexins, however, were detected in the germinating paddy seeds using this technique. A modified seed technique[2] was used to investigate phytoalexin production in the germinating seeds of rice challenged with the sheath blight organism, *Corticium sasakii* (Shirai) Matsumoto.

Seeds of IR 20 cultivar (500 g) were soaked overnight in water. They were placed in metallic trays lined with moistened blotting paper and inoculated with agar plugs of mycelia and sclerotia of *C. sasakii* grown in potato dextrose agar for 7 days. The trays were covered with aluminium foil to maintain humidity and incubated for 7 days in the dark at room temperature These seeds were highly infected. Heat killed inoculated and germinated uninoculated seeds served as controls. The infected seeds were extracted

with methanol, concentrated *in vacuo* and then extracted twice with equal volumes of chloroform. The chloroform extract was evaporated to dryness and the residue dissolved in the minimum volume of benzene. The crude benzene extract was separated on thin layer chromatography (TLC) in chloroform-ethanol (97:3, V/V) solvent system. A single antifungal zone detected by TLC bioassay with *Curvularia* sp. was eluted in 5 ml absolute ethanol and assayed against mycelial growth of *C. sasakii*.

The phytoalexin-like substance thus obtained induced marked inhibition in the radial growth of *C. sasakii* and a total inhibition at 300 μl/ml (Fig. 1).

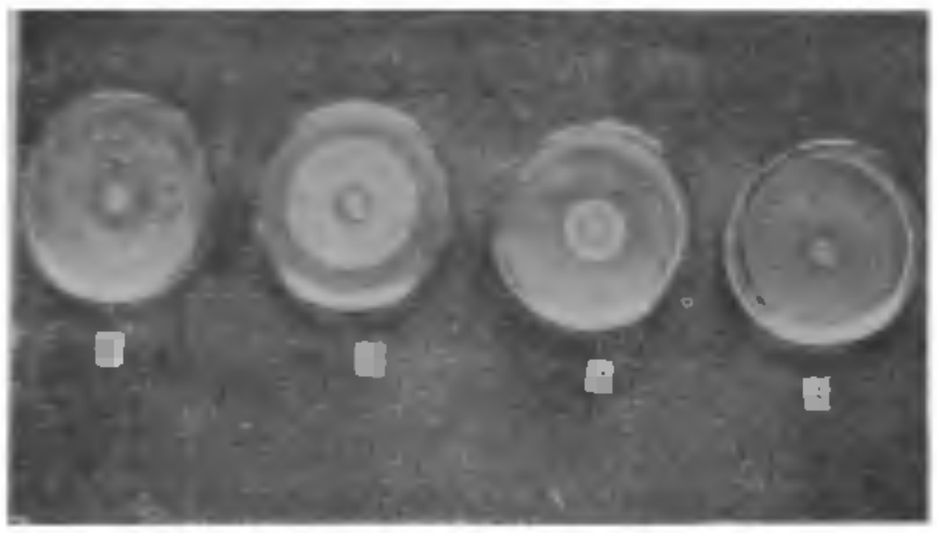

FIG. 1. Phytoalexin-like substance induced inhibition in the radial mycelial growth of *C. sasakii* at 100 (1), 200 (2) and 300 (3) μl/ml, respectively. Absolute ethanol (100 μl/ml) served as control (c). Note the absence of any inhibition in control plates.

The extract also caused germination inhibition (upto 70%) of conidia of *Helminthosporium oryzae* and *Curvularia* sp. Malformations were induced by the phytoalexin extract on the spores of *H. oryzae*. Extracts from control seeds did not cause any such inhibition nor malformation.

Clearly phytoalexin-like substance is produced by the germinating paddy seeds inoculated with *C. sasakii*. Phytoalexin production in rice was indicated for the first time by Uehara[3] in 1958. However, Cartwright *et al.*[4] characterized the phytoalexin from *Pyricularia oryzae* infected rice leaves as momilactones A and B. But our substance differs from either of these because of the difference in its mobility on TLC plates and UV absorption spectrum.

We thank Director, Centre for Advanced Studies in Botany, for facilities and Prof. A. Mahadevan and Dr. S. S. Gnanamanickam for their criticism. One of us (M. Z.) is grateful to U.G.C. for the award of a Junior Research Fellowship.

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A FRUIT ROT OF *PYRUS COMMUNIS* CAUSED BY *TRICHODERMA VIRIDE*

DURING marketing, some fruits of 'Nukh' (*Pyrus communis* L.) were found infected showing light brown to dark brown spots on their surface. Approximately 5–7% fruits were spoiled.

Following conventional mycological techniques, the pathogen, *Trichoderma viride* pers. ex. fres was isolated and found persistently associated with the pathogenesis. The artificially inoculated[5] injured healthy fruits when incubated at 28° C (± 2° C) developed the characteristic symptoms. No symptom was however, displayed on uninjured fruits. The control fruits in either case remained healthy throughout. Repeated reisolations from the inoculated diseased fruits yielded the said pathogen.

Initiation of the rot symptom was evident with the appearance of dense greenish spore mass at the site of superficial incision. Slowly an irregular peach coloured patch developed at the site of inoculation. The affected portion finally turned soft, pulpy, water soaked and light brown in colour, emitting bad odour.

Keeping in view the wide variation of temperature and relative humidity prevailing in plains, hills and coastal areas of India during transportation and marketing of this fruit, the efficiency of the pathogen was determined by inoculating the healthy fruits and, subjecting them to different temperatures (20–22° C, 28° C and 35° C) and a relative humidity of 30% (low), 60% (moderate) and 90% (high). Three replicates, each consisting of three fruits, were employed. The maintenance of relative humidity in desiccators and the calculation of percentage rot were done by adopting the procedure and formula suggested by Prasad and Bilgrami[3].

The maximum rot of fruits was caused by the pathogen at 60% relative humidity. Expectedly, only 5% rot was caused at low humidity (30%), but rather unexpectedly, even at the higher relative humidity of 90%, only 7–10% rot was induced by the pathogen. It may be noted that optimum relative humidity (60%) favoured by the pathogen, for the maximum rot production in 'Nukh' fruits is, in fact, prevalent in major parts of the country and comparatively for a longer duration of the year.