0.5 mm, anther 2-celled, yellow; pollinia, 8, all equal, free, 4 in each cell, yellow; stipe very short, gland minute; ovary *ca* 0.5 mm long including the pedicel, glabrous. Fruits not seen.

Holotype (*Bhargavan* 65795-CAL) and isotype (*Bhargavan* 65795-2 specimens-MH) were collected at Silent Valley R.F., Palghat District, Kerala, India at an altitude of 1000 m on 20-1-1980.

This species is named after Dr. N. Chandrasekharan Nair, Joint Director, Botanical Survey of India, Coimbatore in admiration of his valuable contributions to Indian Botany.

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RELATIONSHIP BETWEEN DOWNY MILDEW EVALUATION PARAMETER AND PEARL MILLET PRODUCTIVITY

C. D. Mayee and R. D. Siraskar
Department of Plant Pathology, Marathwada Agricultural University, Parbhani 431 402, India.

Downy mildew of pearl millet caused by *Sclerospora graminicola* (Sacc.) Schroet. assumed special economic significance during the last decade because of its capacity to attain epidemic proportions in a short span of time. However, no quantitative estimates of epidemic are available. Even the estimates of losses are only approximates[1,2]. The incidence of the disease ranging from 30% to 100% has often been equated to similar quantitative losses in yield. The Scientific Committee Report (ICAR, 1976, p. 11) on downy mildew epidemics in Maharashtra observed that "incidence of the disease is not necessarily an index of loss". With the availability of standardized method of mildew evaluation, such as percentage incidence, 30 days after planting and percentage infection index[3], the relationship with pearl millet yield, has been investigated.

Downy mildew susceptible hybrid, HB-3 was grown in twelve blocks, (10m × 10m). The number of suscepts was maintained around 2000 per block with the spacing of 40 × 10 cm between rows and plants. Oos-

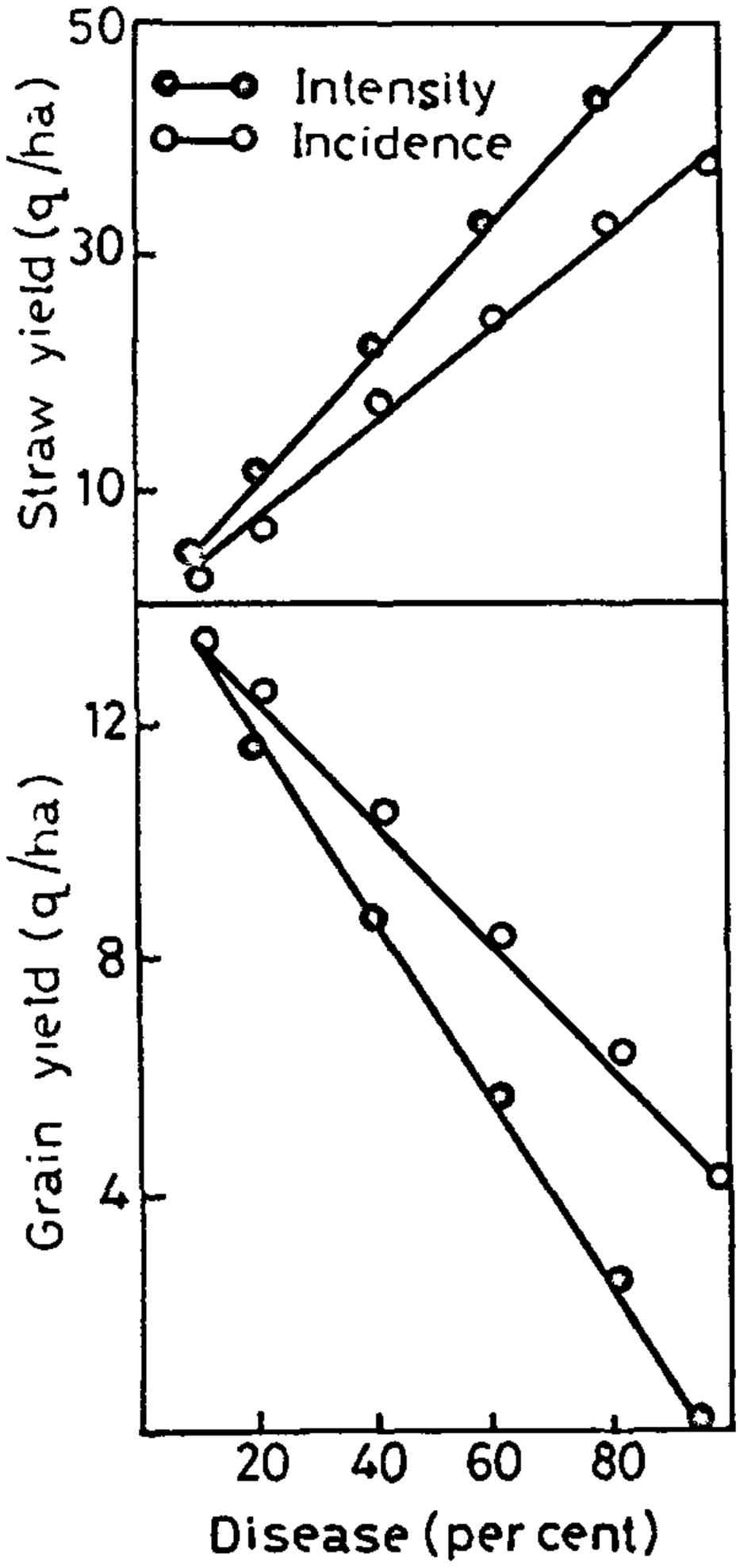

Figure 1. Relationship between downy mildew incidence, infection index and grain, straw yield of pearl millet.

poric material was incorporated into each plot at a varying rate of 10 to 25 g/100 m². 'Protector' rows of maize (a local tall cultivar) were planted around the plots 21 days prior to the main sowing plot, to obstruct movement of sporangia from plot to plot and also to raise the humidity within the plots[3]. The parameters quantified were, percentage incidence 30 days after planting and percentage infection index calculated from severity ratings as per the method of Deshmukh *et al*[3] and Deshmukh and Mayee[4]. Grain and straw yields were obtained from each block. Disease incidence in various blocks ranged from 24.4% to 98.1% while the intensity varied from 18.1% to 75.1%.

Near perfect negative correlation existed between incidence and grain yield ($r = -0.9895$**) and intensity and grain yield ($r = -0.9859$**). While high positive correlation occurred between incidence and straw yield ($r = 0.9446$**) and intensity and straw yield ($r = 0.9273$**). The relationship for data within the range of disease incidence and intensities was linear (figure 1) and hence regression functions were worked out. The regression equations obtained were: $Yg = 14.69 - 0.11\%$ INF-30, $Yg = 15.05 - 0.16$ INFINDX, $Ys = 25.80 + 0.35\%$ INF-30 and $Ys = 19.56 + 0.48$ INFINDX, where Yg is the estimated grain yield and Ys the estimatd straw yield. It was evident from the analysis that with every 10% increment of disease incidence (% INF), the grain yield loss was 1.07 Q/ha while with every 10% increment in intensity (INFINDX) grain yield reduced by 1.48 Q/ha. Since, downy mildew disease is characterized by the transformation of floral organs into leafy structures, it was obvious that the increase in the disease is associated with an increase in straw yield. Mogle and Mayee[5] have demonstrated that downy mildew infection resulted in 37–48% reduction in the height and 25% reduction in the dry matter weight, of the susceptible pearl millet host and hence greater reduction in grain yield is often expected. The results further indicate that the intensity is a closer representation of grain yield loss than incidence.

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QUANTITATIVE ESTIMATION OF DIOSGENIN IN DIFFERENT POPULATIONS OF *COSTUS SPECIOSUS*

M. De, M. Banerjee and A. K. Sharma
Centre of Advanced Study in Cell and Chromosome Research, Department of Botany, University of Calcutta, 35, Ballygunge Circular Road, Calcutta 700 019, India.

Diosgenin, one of the active sapogenins, is usually found in different species of *Dioscorea*. But in the present paper *Costus speciosus* is selected for the extraction of diosgenin, as it is widely available in different parts of India and also grows more profusely than *Dioscorea*.

Extensive collections of *Costus speciosus* had been made from different parts of India, and had been grown in the University garden, Department of Botany. Among different populations collected so far, ten were estimated by the method of Sanchez *et al*[1].

Rhizomes of different populations of *Costus speciosus* were collected during the active period of growth, washed thoroughly, dried for 24-28 hr at 28-30° C and then at 70° C to maintain constant weight.

Hydrolysis of dried rhizomes was done in 2.5N HCl for 4–6 hr on a steam bath. After hydrolysis, the rhizomes were washed repeatedly with distilled water to make them acid free and dried again at 70° C.

The dried rhizomes were then extracted in a Soxhlet extractor with petroleum ether for 30–32 hr. The solvent was removed by distillation and the crude sapogenin residue was weighed. Diosgenin was isolated from this sapogenin residue by thin-layer chromatography. The concentration of diosgenin was determined by spectrophotometric method, as described below.

Crude sapogenin residue (1 mg) of each population was dissolved in 1 ml of chloroform and spots were developed on activated thin-layer silica gel plates. For identificaition of diosgenin, a spot of standard diosgenin was also obtained. In each plate one lane was left free to be used as a blank.

For separation of different components, chromatograms were developed in chloroform: acetone (80:20) solvent system, visualization was done with iodine vapour, the areas of diosgenin corresponding to standard ones were marked and the iodine was eliminated by keeping the plates in the incubator at 100° C for 15 min.