Infected plants were stunted and their leaves were greatly reduced in size. Distinct, countable, chlorotic, circular lesions were produced on *C. amaranticolor* 9–11 days after inoculation. These turned necrotic with a pale halo after 18–20 days. The disease could also be transmitted to healthy sissoo plants by cleft grafting. Transmission studies have clearly indicated the aetiology of the disease of sissoo to be viral in nature. This virus disease is being reported for the first time from India.

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SCANNING ELECTRON MICROSCOPIC STUDIES ON HILUM STRUCTURES IN BLACK AND GREEN GRAMS

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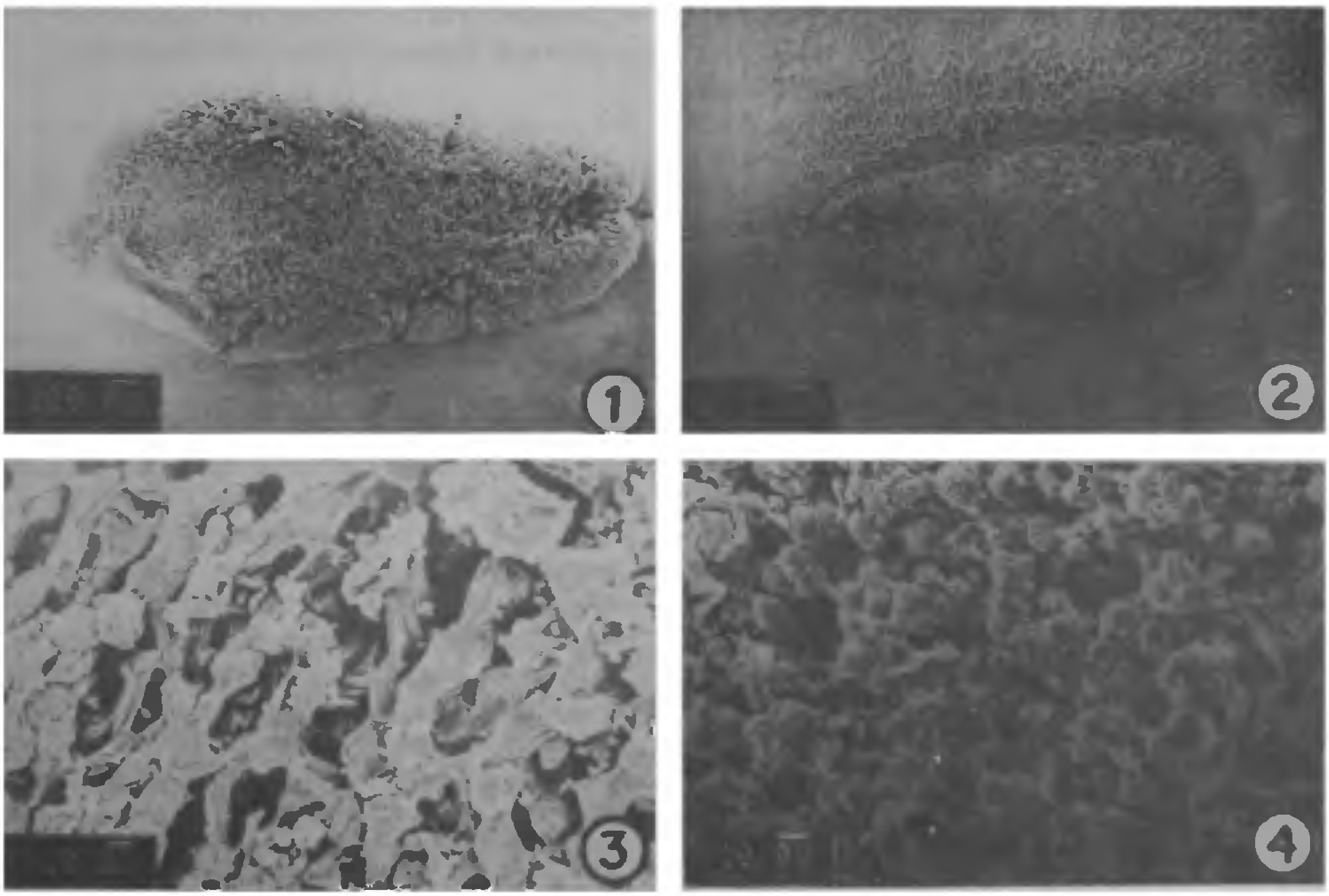
THE genus *Vigna* (Phaseoleae: Papilionoideae: Leguminosae) has many cultivated species, of which *Vigna mungo* (L.) Hepper, former synonym *Phaseolus mungo* L. (black gram), and *Vigna radiata* (L.) Wilczek, former synonym *Phaseolus radiatus* L. (green gram), are most important grain legumes of the Indian subcontinent[1]. They differ from each other in many morphological features, colour of seed and shape of hilum being the main distinguishing features[2–4]. Scanning electron microscopy (SEM) has been employed to study testa topography by many workers[5–9]. However, the hilum has remained uninvestigated. The present SEM studies deal with



Figures 1–4. SEM photographs of hilum of seeds of *Vigna mungo* and *V. radiata*. **1,** *V. mungo*: ovate and concave hilum with thick and raised hilar rim (×54); **2,** *V. radiata*: lanceolate and flat hilum without any rim (×54); **3,** *V. mungo*: reticulo-tuberculated pattern (×540); **4,** *V. radiata*: simple tuberculated pattern (×540).

the microstructural details of the hilum.

Seeds of *V. mungo* and *V. radiata* were procured from G. B. Pant University of Agriculture and Technology, Pantnagar. Two or three randomly selected seeds were mounted on a brass stub and coated with a thin film (200Å) of gold in a JFC-1100 ion sputter coater. The coated specimens were examined in a JEOL-JSM-35C microscope at an accelerating potential of 15 kV. Photographs were taken using 120 mm film.

In *V. mungo*, the hilum is concave and ovate. Besides, a thick and raised rim is also present around the hilum (figure 1). The hilum of *V. radiata*, on the other hand, is flat and lanceolate without any rim. The hilar region is, however, demarcated from the testa by a narrow groove (figure 2).

With regard to the microstructural details, the hilar region of *V. mungo* revealed reticulo-tuberculated pattern, the tubercles being situated unevenly over the loosely knitted reticulae (figure 3). In case of *V. radiata*, the hilum was simply tuberculated without any reticulation. The tubercles were, however, larger than those of *V. mungo* and found scattered evenly throughout the hilar region (figure 4).

Based on the earlier SEM studies on seed coat structures in the species under investigation, many conclusions have been drawn. Sharma *et al.*[5] pointed out the role of surface characters in solving taxonomic and phylogenetic problems. Kumar and Rangaswamy[10] could report that the seed surface of *Vigna* was species-specific. Trivedi and Gupta[8,9], while studying the seed coat structures, concluded that the shape of the hilum was significant from the taxonomic point of view.

The present SEM studies are of taxonomic and phylogenetic utility. It may be concluded that *V. mungo* and *V. radiata*, having distinct hilum microstructures, are separate species. Besides, the presence of tubercles in the hilar region of both the species could suggest their origin from a common ancestral stalk—the view also shared by Zukovskij[11], Dana[12] and Jain and Mehra[1].

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MECHANISM OF LEAF ROLLING IN RICE

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LEAF rolling is one of the earliest visible physiological responses of plants to water deficit[1]. In rice (*Oryza sativa* L.) it begins at relatively high leaf water potential and progresses across a wide water potential range[2]. Although leaf rolling has often been explained as a means of reducing transpiration rate by plants experiencing water deficit[3], quantitative experimental data were provided only recently[4]. The mechanism of such drought-induced leaf rolling, however, has not been systematically studied. This communication provides information on leaf rolling initiation, progression and completion in response to field moisture stress in 100 genotypes of rice.

These rice genotypes, with a range of maturity duration, were grown under unirrigated rainfed upland conditions at the Crop Research Station (Masodha), Faizabad, during 1982 and 1983. Plants