depression is formed on the transverse axis of the cell and then apparently a line is drawn transversely across the width of the rod-shaped cell. Later, there is a transverse split and the rod-shaped bacterium is divided into two almost equal parts. In the case of some animal cells, multiplication may be by binary fission[3] with vertical splitting. In the present work binary fission was always found to take place by transverse splitting.

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A DETACHED LEAF TECHNIQUE FOR MAINTENANCE AND MULTIPLICATION OF *PHYTOPHTHORA INFESTANS* AND EVALUATION OF FUNGICIDES

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PHYTOPHTHORA INFESTANS, which incites late blight of potato, is quite difficult to isolate and sporulates poorly on synthetic media. Sufficient quantity of sporangial inoculum required for bioassays under artificial epiphytotic conditions is difficult to obtain from its cultures. An effective and quick method was devised for maintenance of *P. infestans* for evaluation of chemicals and screening of germplasm. Detached young leaves of a susceptible cultivar Kufri Chandramukhi were thoroughly washed with tap-water, air-dried and placed in enamel trays lined with moist cotton with their abaxial surface touching the cotton pads (figure 1). The leaves were inoculated with optimum level of sporangial suspension (4.5×10^4 sporangia/ml) using an atomizer. The trays were covered with polythene sheet to ensure high relative humidity and incubated in growth

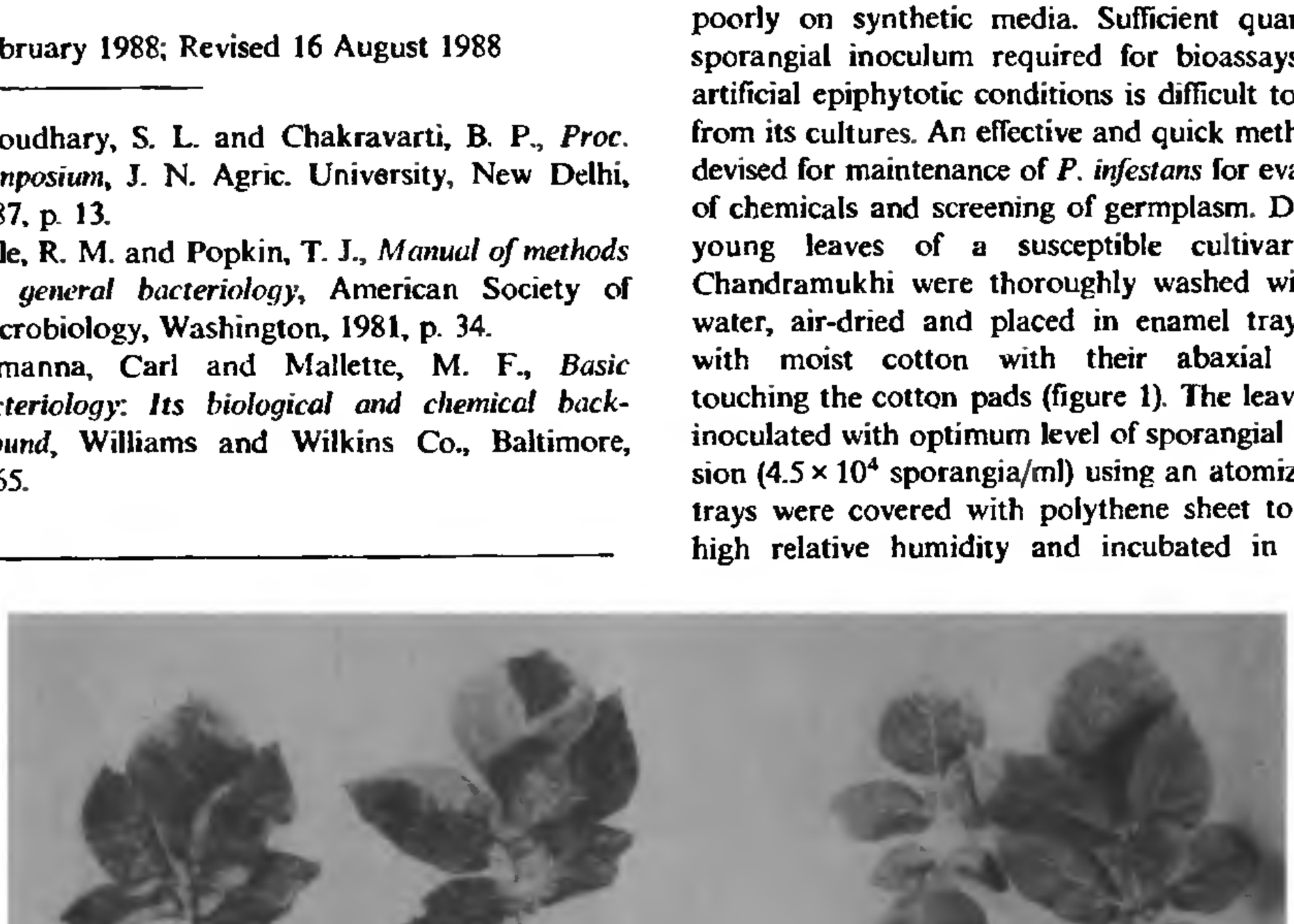

Figure 1. Detached potato leaves inoculated with *P. infestans* placed on moist cotton in an enamel tray. Left: Untreated leaves showing late blight lesions. Right: Leaves treated with Ridomil (0.2%) showing complete disease control.

room (temperature 20±2°C, light period 12 h with flourescent tubes). Light brown, water-soaked lesions started appearing after 3 days and a profuse whitish growth of sporangia and sporangiophores was visible after 5 days of incubation. The pathogen was thus multiplied and maintained on detached leaves as above by serial inoculations for further experiments.

Six fungicides, viz. Dithane M-45 (75% manganese ethylene bis-dithiocarbamate+2% zinc ion) @ 0.3%, Blitox (50% copper oxychloride) @ 0.3%, Foltaf (80% N-(1,2,2-tetrachloroethyl-cis-Δ-4-cyclohexane-1, 2-dicarboximide) @ 0.2%, Bordeaux mixture (2:2:250), Mikal (50% aluminium tris phosphonate+25% N-(trichloromethyl thio phthalimide)) @ 0.2%, Ridomil (25% N-(2,6-dimethylphenyl)-N-methoxyl-acetylalanine) @ 0.2% and a combination of Ridomil (0.1%) plus Dithane M-45 (0.3%) were evaluated against this disease. Leaves of potato variety Kufri Chandramukhi were taken from plants after 18 h of spray with test fungicides and placed in enamel trays lined with moist cotton. Unsprayed leaves were used as controls. Leaves were inoculated and incubated as described earlier. Observations on per cent leaf area infected were recorded on a 0–5 scale after 5 days of inoculation. All the fungicides provided complete control of the late blight infection except Blitox (0.3%) and Bordeaux mixture (0.8%) in which 15 to 20% disease intensity was observed.

In another experiment, detached potato leaves were first inoculated with sporangial suspension and then sprayed with the test fungicides after 12 h. Observation on disease development recorded after 5 days revealed that only Ridomil (0.2%) and Ridomil (0.1%) plus Dithane M-45 (0.3%) were able to arrest the disease development while all other chemicals proved ineffective in checking the infection when applied as post-inoculation treatments (figure 1).

With the use of this technique fresh and viable inoculum of *P. infestans* can be maintained on detached leaves and the sporangial inoculum can be rapidly multiplied for use in fungicide evaluation, screening of germplasm under laboratory conditions and other laboratory experiments.

A LEAF MUTANT IN GRAM (*CICER ARIETINUM* L.)

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A spontaneous mutation affecting leaf morphology was obtained in gram (*Cicer arietinum* L.) variety Pink-2. It bred true indicating that the character was controlled by a recessive gene. The mutant leaf was small in size and narrow in shape (figure 1). Trigenic interaction has been reported in the inheritance of leaf shape in gram[1] and the narrow tiny leaf was designated as Slv Slv tlv tlv nlv nlv double recessive homozygote. The present note deals with the effect of leaf size on the seed yield and its components when compared to its parent and another similar genotype (GRU 2/6119) obtained from ICRISAT.

The characters observed are presented in table 1. There was very little difference in the plant height; however, the mutant matured earlier than its parent; there was an increase in the number of branches per plant, biological yield and grain yield. However the pod number was reduced in the mutant. The grain colour was also changed to brown from its parents' pink colour. It might be possible that the brown colour was associated with leaf shape as GRU 2/6119 also had brown seed coat. The flower colour was the same as its parent (white) but differed from GRU 2/6119 (blue).

The mutant showed superiority over its parent and GRU 2/6119 in grain yield, biological yield and the harvest index, indicating that leaf shape brought

Figure 1. Leaf mutant in gram.