FIGS. 1–4. Fig. 1. *Xylocopa dissimilis* Male, ×3. Fig. 2. *X. dissimilis* Female, × 3. Fig. 3. Tibia of Fig. 1 with pollinia, × 15. Fig. 4. *X. collaris* Female, × 4. Arrow in figures shows the pollinia.

insect is poised on one side of the gynostegium and the abdomen on the other side, while the sternum almost resting on the top of the stigma. *X. collaris*, on the other hand, sits obliquely on one edge of the stigma and in this position the bee circumambulates one nectary to the other obliquely inserting its proboscis. In the process of circumambulation the insect shifts its legs, the bristels of the insect leg incidentally comb the stigmatic region removing the twin-pollinia which get interlocked with the bristles. In most cases the marginal bristles of the tibia carry pollinia. The pollinia gradually lose water and assume a parallel disposition (Fig. 3) and during subsequent visit of the insect to the flowers, the pollinia get transferred on to the stigma. The transfer of pollinia on to the receptive surface of the stigma occurs in two ways. A careful examination of flowers visited by insects has revealed that nearly two out of ten have entire twin-pollinia on the stigmatic surface while in a few others, had only the pollen sacs (bereft of other parts). An examination of insects that had pollinated revealed that only the translator apparatus was present amidst the bristles indicating the detachment of pollinia. In the former case, therefore, the pollination occurs due to the sliding down of pollinia from the bristels and in the latter it is due to the separation of pollinia proper from the translator apparatus.

A noteworthy feature is, insects which are hovering around the flowers alight only on the unvisited flowers. This observation confirms the view of Pijl[1] and Wanntrop[2] that the insects probably leave an indication as a scent mark on the flowers visited.

The above observations, indicate that there are two different insects—*X. dissimilis* and *X. collaris*—which actively effect pollination in *C. gigantea* in Kukkanahally tank area. Although, *X. dissimilis* visits individually carrying larger number of twin-pollinia, (Fig. 1) such a feature is also noted during pollination of *Asclepias syriaca*[3]. On the other hand, *X. collaris* carries a smaller number of pollinia, they are efficient enough to pollinate larger number of flowers, since swarms of them visit the flowers at a time. One other aspect to be noted here is that in *X. dissimilis* among three appendages of the body, it is the mesothoracic appendage that carries a larger number of pollinia. In Srinivasapur area our observation reveals that *X. dissimilis* is the sole pollinating agent that *Calotropis* has to depend on. However, in Kukkanahally tank area the pllination of *Calotropis* is performed both by *X. dissimilis* and *X. collaris*. Apparently *C. gigantea* is pollinated either exclusively by a single species of insect or by more than one depending upon the area in which the plant is growing and the availability of the pollinating insect(s) in that region. This confirms the conclusions of Faegri and Pijl[4].

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A NEW RECORD OF BACTERIAL WILT OF GINGER INCITED BY *PSEUDOMONAS SOLANACEARUM* E. F. SMITH FROM INDIA

GINGER plants (*Zingiber officinale* Rosc) growing at the Horticultural Research Station, Ambalavayal, Calicut District, Kerala, exhibited symptoms of yellowing and wilting during the monsoon months of 1978. Microscopic examination of the infected portions of the plants revealed the presence of bacteria, oozing out profusely from the cut ends.

The disease was found to be prevalent in other fields of the locality also. Later, the disease was observed in the ginger plantations of the Forest Development Corporation of Kerala in Trivandrum District.

Symptomatology

The initial symptoms of the disease appeared as loss of turgidity of the leaves. Soon the leaves started rolling accompanied by wilting (Fig. 1). The leaves of the infected plants become orange yellow at the margins with a band of green area on either sides of the midrib. The yellowing progressed and the shoots get detached from the rhizome. The basal portions of the shoots and the rhizomes were involved in a soft-rot. On splitting the shoot longitudinally, vascular discoloration was noticed in the internal tissues. The entire plant died in 2–3 weeks' time (Fig. 1).

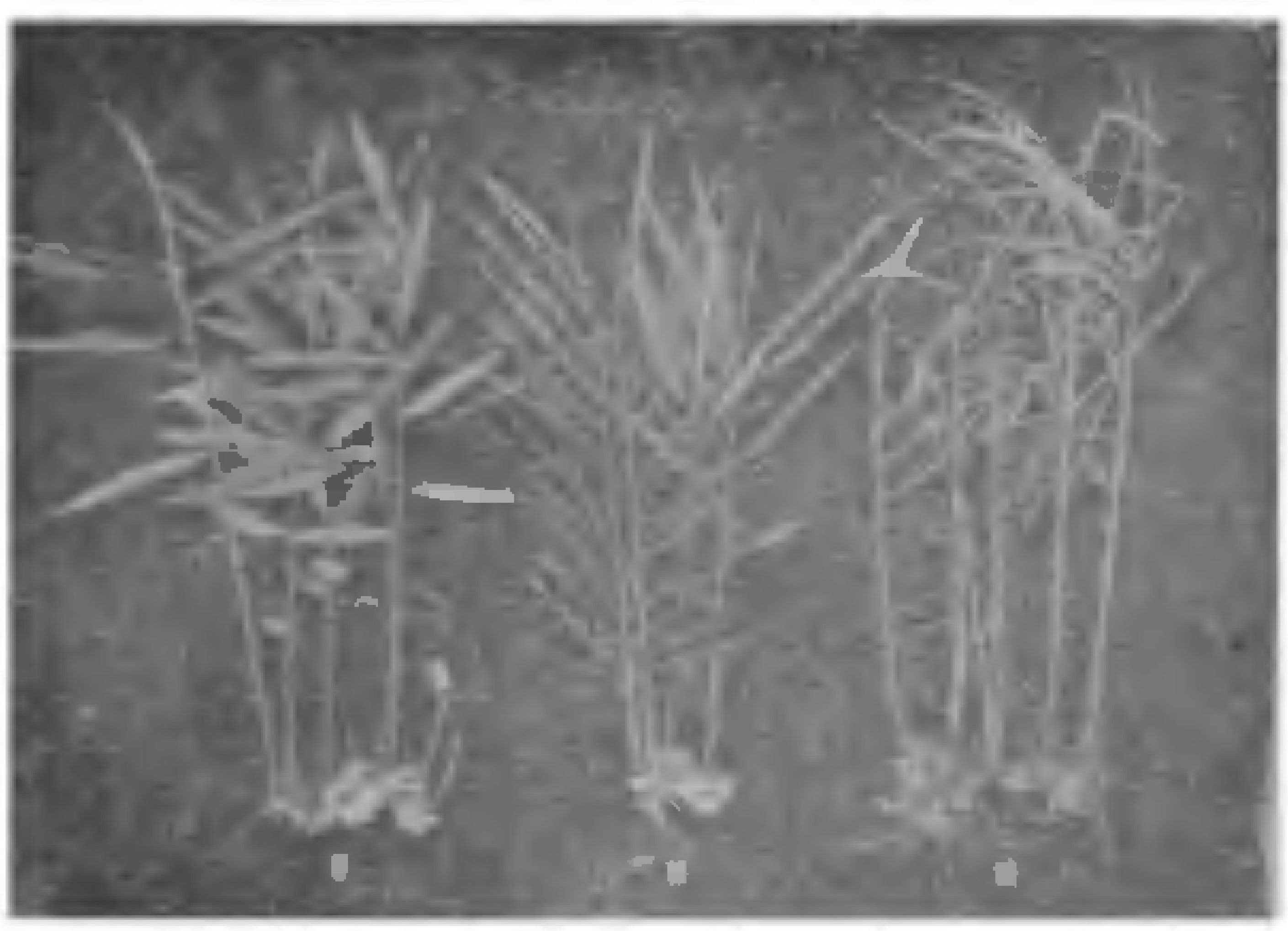

FIG. 1

Etiology of the Disease and Identity of the Pathogen

The bacterium was isolated on potato-dextrose agar medium. The colonies appeared small, circular, white, smooth and slimy. On tetrazolium-chloride-medium pink centred colonies were observed. The bacterium appeared as short gram-negative rods, reduced nitrates and did not hydrolyze starch. It was catalase positive. It did not produce hydrogen sulphide and indole but produced ammonia in traces. Milk was slighly curdled with production of acid. The organism utilized sucrose, dextrose and glucose. Arginine hydrolase activity was negative and the growth was slightly inhibited with 2% sodium chloride. From the above bacteriological properties and pathogenicity trial on ginger plants, the bacterium causing ginger wilt was identified as *Psedomonas solanacearum* E. F. Smith. This is supported by the fact that Buchanan and Gibbons[1] have reported that the organism is pathogenic on ginger. Further Ishii and Aragaki[2] reported ginger wilt caused by *Pseudomonas solanacearum* E. F. Smith from Hawai. Subsequently Hayward *et al*[3]. reported this disease on ginger due to *Pseudomonas solanacearum* from Queensland. Later Zehr[4] reported its occurrence from Philippines.

Epidemiological Factors

This disease was reported during the monsoon months of July–August. High rainfall and relative humidity conditions play a definite role in disease development and spread. Infected seed rhizomes can serve as the source of primary inoculum. The disease was found to be severe on the ginger variety " Rio-de-geniro ". Detailed studies on the disease, its pathogen and control have already been initiated in this laboratory.

This is the first authentic report of occurrence of ginger wilt incited by *Pseudomonas solanacearum* E. F. Smith from India.

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EMS-INDUCED HIGH YIELDING, EARLY MUTANT IN LINSEED (*LINUM USITATISSIMUM* L.)

AN early dwarf mutant, *TL*–1, induced in linseed cv. *Neelum*, was assessed for its agronomic performance and yield potential[1,2]. A promising new mutant was recovered in the same cultivar following treatment of the seeds with ethylmethane sulphonate (EMS). The possible use of this mutant for commercial cultivation is reported in this paper.

Dry seeds of linseed var. *Neelum* were treated with 0·05 to 0·20% EMS solution for 16 hrs. After treatment, the seeds were thoroughly washed in running water and were sown in the field. Seeds of 20 M_1 plants, selected at random, were indiviudally collected from each treatment including the untreated control, and the seeds of the remaining plants were bulked