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 *Cale- tropis* has to depend on. However, in Kukkanahally tank area the pollination of *Cale tropis* 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\(^4\).

The authors thank Dr. K. Gopinath and Dr. Virakta- murti, C. A., for identification of insects, and I. D. Gauld of the British Museum for confirmation of identity of insects. One of the authors (T. M. R.) is grateful to the UGC for a Teacher Fellowship.

Dept. of Botany, Manasa Gangotri, T. M. Ramakrishna, Govindappa D. Arekal
Mysore 570 006.


---

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

Ginger plants (*Zingiber officinale* Rox) 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.

**Symptomology**

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 terrarium-chloride-medium pink centred colonies were observed. The bacterium appeared as short gram-negative rods, reduced nitrate and did not hydrolyze starch. It was catalase positive. It did not produce hydrogen sulphide and indole but produced ammonia in traces. Milk was slightly curdled with production of acid. The organism utilized sucrose, dextrose and glucose. Arginine hydrolyase 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 *Pseudomonas solanacearum* E. F. Smith. This is supported by the fact that Buchanan and Gibbons have reported that the organism is p-hogonic on ginger. Further Ishii and Arakaki reported ginger wilt caused by *Pseudomonas solanacearum* E. F. Smith from Hawaii. Subsequently Hayward et al. reported this disease on ginger due to *Pseudomonas solanacearum* from Queensland. Later Zehr 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-geniero". 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.

The facilities provided by the Kerala Agricultural University for the investigations are gratefully acknowledged.

Depr. of Plant Pathology, JAMES MATHEW.  
College of Agriculture, KOSHY ABRAHAM.  
Vellayani, G. INDRASENAN.  
Trivandrum 695 522, MARYKUTTY SAMUEL.  
September 13, 1978.


**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. A promising new mutant was recovered in the same cultivar following treatment of the seeds with ethylmethane sulphate (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 M1 plants, selected at random, were individually collected from each treatment including the untreated control, and the seeds of the remaining plants were bulked.