

Survey for Disease Incidence in Major Ginger Growing areas of Kerala During 1984 and 1985*

Among the ginger (*Zingiber officinale* osc.) growing states, Kerala occupies the unique position of being the largest producer and accounts for major share in the export of dry ginger from India. Ginger production is often affected by diseases and pests. Though, more than 20 pathogens have been reported to affect the crop, only a few cause economically important diseases such as rhizome rot caused by *Pythium* spp. and bacterial wilt caused by *Pseudomonas solanacearum*. Randhawa and Nandpuri (1970) reported *Pythium aphanidermatum* (Edson) Fitzp. as the primary species in India besides *Pythium butleri* Subr; *P. fragile* Schenk; *P. myriotylum* Drech (Subramaniam, 1919). The bacterial wilt caused by *Pseudomonas solanacearum* E. F. Sm. was reported from Ambalavayal (Kerala) by Sarma, Indrasenan and Iyer (1978) and Mathew et al. (1979) and the 'yellows' caused by *Fusarium oxysporum* Schlecht f. *zingiperi* Trujillo by Haware and Joshi (1973).

In view of the potential seriousness of *Pythium* spp. and *Pseudomonas solanacearum* to ginger cultivation, surveys were undertaken during 1984 and 1985 to examine the ginger fields in Kerala to identify the disease problems. The present study was carried out to determine the incidence and distribution of rhizome rot and bacterial wilt of ginger in major ginger growing areas of Kerala State.

Surveys were carried out from September to November, 1984, in Wynad, Cannanore, Pathanamthitta, Idukki and some parts of Kottayam and Ernakulam districts and again from September to December, 1985 in Quilon, Trivandrum, Malappuram, Palghat, Trichur and Calicut districts. For the survey, eight survey routes were used. The survey teams consisted of Pathologists and Entomologists who travelled by road and the distance covered was above 5200 km. to survey 195 gardens in 12 districts. Three gardens from each village were selected at random.

Each garden was divided into four parts and four beds from each garden were selected at random and these were inspected for rhizome rot and bacterial wilt infection. The observations were recorded on the incidence of disease in the field. The number of infected beds were counted and the severity reported after visual observations in field. The data at each location was collected in the Ginger Disease Survey Reporting Form. A total of 768 samples (260 diseased and 508 healthy) were collected at random for laboratory examination. The identity of the disease was further confirmed by isolating the associative organisms in the laboratory and the pathogenicity established.

The incidence at all the locations in a district was used for calculating the

* Contribution No. 69 of National Research Centre for Spices, Calicut 673 012, Kerala

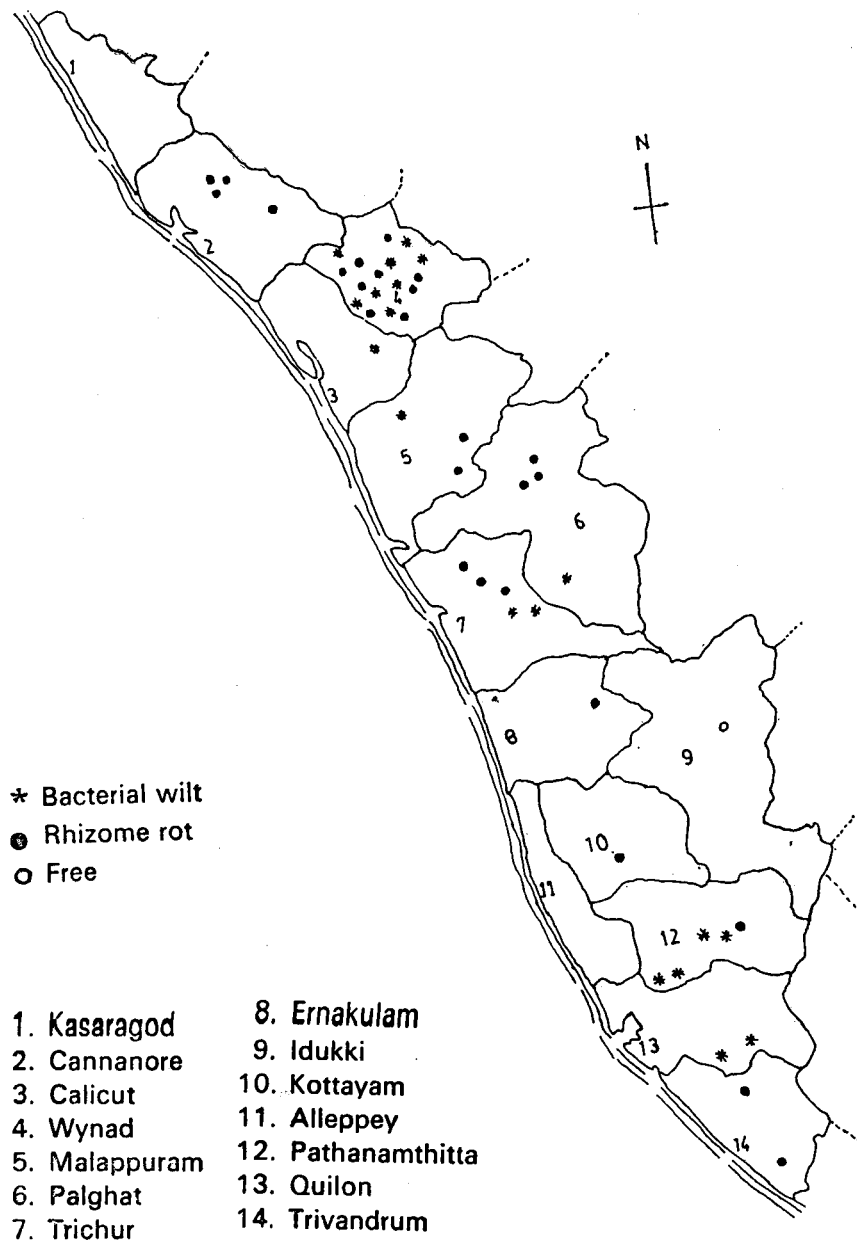


Fig. 1. Incidence of bacterial wilt and rhizome rot of ginger in Kerala

district averages, which were later compiled for calculating the average incidence in the state. These averages indicate relative prevalence of ginger diseases during the 2 years of survey.

The two-year survey revealed that the incidence of bacterial wilt is on the increase in Wynad, Pathanamthitta, Quilon and Trichur districts since its report from Ambalavayal in 1978. However, the rhizome rot was present only in scattered locations in Cannanore, Palghat, Ernakulam, Malappuram, Wynad, Trichur and Pathanamthitta districts. In Idukki, Kottayam, Trivandrum and Calicut districts the incidence of bacterial wilt and rhizome rot was very less (Fig. 1). The 'yellows' caused by *Fusarium* spp. was of relatively less

importance. The infected tissues/rhizomes from the 195 gardens were examined and the pathogens viz., *Pseudomonas solanacearum*, *Pythium* spp. and *Fusarium* spp. were isolated from 29.61%, 21.61% and 8.84% of the samples respectively.

ACKNOWLEDGEMENT

The authors are grateful to Dr. K. V. Ahamed Bavappa, former Director, Central Plantation Crops Research Institute, Kasaragod and to Dr. M. K. Nair, former Joint Director, National Research Centre for Spices, Calicut for encouragement, suggestions and providing facilities. They also thank Mr. K. M. Abdulla Koya, Scientist S-1 (Agricultural Entomology) for his help in the survey of major ginger growing areas of Kerala.

REFERENCES

- HAWARE, M. P. and JOSHI, L. K. 1973. Yellow disease of ginger (*Zingiber officinale*) from Madhya Pradesh. *Indian Phytopath.* 26: 754-755.
- MATHEW, J., ABRAHAM, K., INDRASENAN, G. and SAMUEL, M. 1979. A new record of bacterial wilt of ginger incited by *Pseudomonas solanacearum* E. F. Sm. from India. *Curr. Sci.* 48: 213-214.
- RANDHAWA, K. S. and NANDPURI, K. S. 1970. Ginger (*Zingiber officinale* Rosc.) in India—a review. *Punjab Horti. J.* 10: 111-122.
- SARMA, Y. R., INDRASENAN, G. and IYER, R. 1978. Bacterial wilt of ginger (*Zingiber officinale* Rosc.) *Indian Arecanut Spices and Cocoa J.* 2: 39-41.
- SUBRAMANIAM, L. S. 1919. A *Pythium* disease of ginger, tobacco and papaya. *Mem. Dept. Agri. India (Bot. Ser.)* 10: 181-194.