

CHAPTER - I

INTRODUCTION

Introduction

Betel vine (*Piper betle L.*) belongs piperaceae is an important crop grown for its leaves. It is grown over on area of 40,000 hectares in the country. It is the largest producer of betal leaves and the value of annual turnover of leaves has been estimated to be about Rs.700 crores (Balasubrahmanyam et al; 1990). It is grown an area of 1300 ha. In Sangli, Satara, Kolhapur, Nashik, Jalgaon, Buldhana, Akola, Amaravati, Nagpur and Thane districts of Maharashtra

Leaves of *Piper betel* are used traditionally for chewing purpose with arecanut and lime Although Betel vine is under cultivation in India for centuries, not much research work has been done on its improvement. The vine is evergreen and perennial, with glossy heart shaped leaves and catkin inflorescence and grows to a height of about 5 meter. It occupies a significant place in everyday life of the Indian people. The vine is grown as a ground cover or a small climber. It is intimately linked with the history, religion and cultural life of the people of the Sub continent and East Asian countries.

The annual turnover of betel vine is more than Rs.67 crores engaging 15 lakhs families in Maharashtra. The vine is very sensitive attached by many fungal, pests, will and bacterial diseases. The betel vine

wilt/rot disease is caused by fungus *Phytophthora parasitica* var. *piperina* which lives in soil.

Betelvine (*Piper betle* L.) has been under cultivation in India for centuries, its different usage and different names indicated in many of the Indian languages.

Following names are given in different states.

1.	Sanskrit	-	Nogovalli, Tombulam
2.	Hindi	-	Pan
3.	Marathi	-	Pan, Videchapana
4.	Bengali	-	Pan
5.	Gujarati	-	Pan, Nagurvel
6.	Tamil	-	Vethlai
7.	Telgu	-	Tomolopaku, Killi, Nagavalli
8.	Kannada	-	Vijayodeli
9.	Malayalam	-	Vetillai

Betel Vine pan is very important at all Hindu religions ceremonies and worship. In fact, no Hindu religious ceremony or worship is complete without pan and areca nut having been afford^{ed} or used for certain rituals. The functions like dinner and social get-together, pan is a customary (post – perendial) offering at lunch. K

Piper betle is most delicate plant (attached) by several pests and diseases such as Foot rot, Stem rot, leaf rot caused by *phytophthora spp.*, Anthracnose & Marginal blight by *dolletotrichum capsici*, Basal rot by *Sclerotium rolfsii*, Charcoal rot by *Rhizoctonia bataicola*, wilt by *Fusarium Solani*, Bacterial leaf spot & stem spot by *Xanthamonas compestris* pv. *Beticola* & Root knot by *Melaidogyne incognito*. The most important foot rot disease is caused by fungus *Phytophthora parasitica* var. *piperina* which is dangerously affecting the yield (Ma RaC 1934, Dastur 1935). Spraying of leaves and soil with fungicides before and during rains gives effective protection from the disease. However non chemical method of *Phytophthora* of management in betel vine would be very soft. The extent of losses may vary from 5-90% (Dasgupta and Sen;1999) It varies during the winter and very rarely occurs in the off-season.

Mehrotra and Tiwari (1969) have studies^d control of foot rot and Root rot of *Piper betel* by using *Trichoderma Viride*. Hence, use of

The generic name piper is probably a derivative of the Sanskrit word pippalli for pepper. The meaning of betle is betel leaf, is considered to have come from the Malayalam word betre (Gowdo, 1951).

Piper betle L.vine has been very intimately closely related and connectd with the ancient Indian history, religion and culture, as it is evidenced by ample references to it in the early Sanskrit literature (3000 B. C.), like the Vedas (Yajurveda) and the species like the Ramayana and Mahabharata.

Among the Aryans, pan was commonly put to a cosmetic use by their women for colouring their lips and flavouring their breath. 'Mahavansha', a Pali treatise, written about 2000 B.C. in Ceylon, defers to the usage of pan in their travelers are Herodotus and Megasthenes (4th century B.C.), mention it in their travelogues. Silopaddik aram - Sangam literature in Tamil, produced in the second century B.C. also makes a prominent mention of it.

Morcopolo, (1295 A.D.) more recently, takes notice of the pan-chewing habit of the people of south India and describes in detail the pan preparations. Over the centuries, pan-chewing had become so prevalent that sewing and chewing of pan had been raised to the level of a fine art of the Mughal court, during the Akbar's region.

Trichoderma utilization for the foot rot disease management in the betel vine. They applied *Trichodema* and studies the disease resistance, production, mineral nutrition, application of different fertilizers to the plant in control of disease and to increase production. However, the phytopathological studies with respect to internal changes in metabolism and actual working of enzymes developing disease resistance and folerance in betel vine is not made.

Hence in the present investigation, the studies on enzymes involves in mycoparasitism by *Trichodema Spp.* In controlling foot-rot disease of *Piper betle L.* has undertaken.

The enzymes like polyphenol oxidase, peroxidase and cellulase from control (healthy), Infected and Infected vine treated with *Trichoderma sp.* Of *Piper betle L.* were studied. The mineral contents and organic parameters werer also analysed from the same samples.

The present dissertation consists of following part polio regarding the research work performed. Chapter-I deals with brief introduction of the *Piper betle L.* vine with its cultivation, production and importance of *Trichoderma* fungus in controlling foot-rot disease.

The review of literature containing information of *Piper betle* vine in agriculture, medicine, Cosmetic, etc. with reference to its cultivation practivers, yield production, diseases, disease control management etc.

Trichoderma spp. Spray on leaves, stem, root zone of soil along with proper media was adapted by Betel Cultivars in Maharashtra and other states. It is observed that *Trichoderma* play an important role in controlling Root-Rot disease in *Piper Betle* without affecting leaf production, quality, taste and market value of the crop.

The betel vine is important cash crop and commercially grown in India. The Government of India has started the research on crop improvement, production, disease management with regards to the Betel vine cultivation in India. Several Research Stations were established which carries out the research work from 1981, in six research centres like Dharwad, Bhuvaneshwar, Chinthapudi, Vellore, Jabalpur, Rahuri etc. upto date there are 11 centers are working for Betel vine 1981 to 2006. The main objects was Epidemiology and control of various betel vine diseases and also to collect and maintain the disease free germplasm of all the clones in the country.

This All India Coordinated Research Project is now working and following Xth plan of the Government successfully by developing a All India Networking Researching Project on Betel vine throughout all centers in India.

The work of this organization is a challenging one for the plant diseases like *phytophthora* foot rot disease. They have also worked on

The work of use of *Trichoderma* in control of foot-rot of Betel vine is also summerised. The enzymes relating mycoparasitism in the disease are also discussed in the Chapter-II of the dissertation.

Chapter-III inform the collection of plant material and other treatment of *Trichoderma* to the diseased plants and methods of estimation on organic, inorganic constituents and enzymes studies.

The results of organic constituents, inorganic constituents as well as enzyme analysis in control (healthy), Infected and Infected but *Trichoderma* treated vine leaves by *Phytophthora* were discussed in the light of possible up-to-date references in the literature, in Chapter-IV of the dissertation.

In the Chapter-V, summary and conclusions of the present investigation are enlisted discussed indicating important achievement of the present research work.

The research journals, papers, monographs books, reference books and other information used in the preparation of dissertation is cited in the Chapter-VI of Bibliography.