I. INTRODUCTION

In recent years, use of steroidal hormones of biological origin have come into prominence. Some plant materials are chief sources of steroids. The tubers of the genus Dioscorea Linn. are the main source of diosgenin, a steroidal sapogenin, which is the most important and versatile precursor for the synthesis of cortisones, sex hormones, oral contraceptives and various steroidal drugs. The world steroid drug industry is now based mainly on diosgenin extracted from the tubers of Dioscorea spp. The ever growing demand for steroid drugs and hence for diosgenin led to frenzied research efforts all over the world to improve the sources of diosgenin.

Dioscorea Linn. is the genus of over 600 widely distributed species. Some of the species have been cultivated for a long time for their edible tubers in the tropical countries as potato substitutes. There are about 15 species of the genus which are known to contain steroidal sapogenin, chiefly diosgenin, are grown in wide areas throughout the world. The major Dioscorea growing regions of the world are Mexico, Guatemala, Puerto Rico in Central America; United States; Nigeria and South Africa in Africa; Afganisthan, Pakisthan, India, Nepal, Bhutan, Bangladesh, Malaya, Burma, China and Japan in Asia. Recently, some European countries and West

Indian Islands have been established modern Dioscorea Plantations. In India, about 2500 acres of land is estimated to be required for cultivation of Dioscorea Linn. to make enough diosgenin i.e., about 100/150 tons required annually to meet the demand for the production of various steroids, whereas the area under cultivation presently even on the basis of very liberal estimates would hardly exceed 300 acres (BCPCEPC, 1978).

According to recent records out of the total world production of 1000 to 1200 tons of diosgenin, Mexico is the world's foremost producer and supplies 80 to 90% of world's need. The annual production in India is estimated 50 tones and most production is from wild growing plants and fully consumed within the country.

Now, the cultivation of Dioscorea has enormously increased in India. Much of the success of cultivation in field is lost through microbial deterioration because of inadequate and inferior storage as well as transit facilities. As such increased attention is now being paid to improve the post harvest technology relating to the tubers of these species. A number of viral, nematode and fungal diseases of Dioscorea spp. have been reported from various parts of India and abroad which cause enormous damage to this important crop in the field at the one hand and tubers during storage

and transit on the other. Such diseased conditions, in many cases, affect the active principles, are a direct threat to the economy of diosgenin as well as pharmaceutical industry. A number of disease have been reported on different species of Dioscorea by various workers. Anthracnose rot caused by Colletotrichum gloeosporioides (SINGH and PRASHAD, 1960; 67), leaf spot caused by Helminthosporium spp. (KOCH, 1964; ALAM et al., 1970 and SAHA and CHATTERJEE, 1980) and Phisostomia leaf blight (CHOUDHURI, 1946) are the very common disease of Dioscorea spp. The most important disease, the microbial rotting of stored tubers has been reported by OSAFAR, 1966; and OGUNDANA et al., 1970 from Nigeria. The tuber rot in the field has been reported from India by BAJPAI et al.,(1972). There are also reports of so many other diseases, such as Cercospora leaf spot (GANGULI and PANDATRA, 1963), rust (PANDATRA and GANGULI, 1962), black scurf (NISHIHARA et al., 1969), viral diseases (RUPPEL et al., 1966; ALCONERO, 1969 and OKUTANA and KITAGI, 1979) and root knot caused by nematode (SCHIEBER and DOROTHEA, 1961; BRIEN and KOCH, 1963; JENKINS and HIRD, 1968 and UNNY and JERATH, 1965).

The diseases mentioned are not all of equal importance from economic losses they cause and they should therefore, be evaluated in proper perspective. Because of the modern efficient methods of handling, transportation and storage

most diseases to which the genus had been prone in the early days of industry are probably now of much less importance in the majority of Dioscorea cultivating countries on the basis of economic loss caused. In India, however, much more attention is needed for protecting the tuber from decay.

The Fusarium rot disease is very common in different parts of Darjeeling Hills of West Bengal under Dioscorea cultivation. The present investigator came across with high incidence of the disease from different plantations in and around Mungpoo, attacking almost all the species of Dioscorea with somewhat graded severity. Inspite of the disease being so prevalent and so severe, informations relating to its biochemical nature of attack as well as possible method of chemical preservation are insufficient. With the end in view the present investigation has been directed along the following broad lines : (a) the study of the causal organism in culture with a view to suggest the optimal conditions required for growth and sporulation of the test-fungus in different physical (pH, temperature, light) and chemical (carbon, nitrogen, vitamins, hormones, trace elements, phosphorus, sulphur and media) environments; (b) Biochemical changes in the tuber tissues during infection and decay by the pathogen (total sugar, starch, chitin, sapogenin, peroxidase, polyphenol oxidase); (c) Application of different