3.3 Novel poly amine biosynthetic inhibitors to control the phytopathogenic fungal diseases

M.K.B.Weerasoorya and T.A.N.S. Thambugala
Department of Chemistry, University of Kelaniya

ABSTRACT

Fungal polyamines play a major role in controlling the growth and development of the fungal cells. Higher polyamine levels enhance the fungal growth whereas lower levels retard the growth. Therefore depleting polyamine level by selective inhibition of poly amine biosynthesis through specific inhibitors, could be used to control variety of fungal diseases in plants. Following this line of thinking we aimed to identify potential and specific inhibitors of polamine biosynthetic enzymes.

The fungus *Colletotrichum gleosporoides* which causes anthracnose in a wide range of plant in many parts of the world was selected for the study. Arginine decarboxyalse, a rate limiting enzyme of the polyamine biosynthesis was isolated from fungus. Fungus was grown in Cook's 2 media. Crude enzyme extract was prepared from 12-13 days old cultures, mycelia were harvested, immersed in citrate buffer (50mM, pH 5.6) and ground in a motor with a pestle at 4°C. Thus prepared crude enzyme extract was partially purified 25 fold with 16.7% recovery by ammonium sulphate fractionation (0-25%) followed by DEAE cellulose and gel filtration chromatography. Enzyme activity was assayed by detecting the released carbon-dioxide with warbug manometer. Several plant extracts were tested as possible inhibitors for the enzyme.

Of them Leaf extract of *Ocimum sanctum* (maduru thala) and *Jatropha curcus* (Rata Endaru) and tuber extract of *Acorus calamus* (Wadha kaha) and *Zingiber zerumbet* (Wal inguru) were found as inhibitors for the enzyme where as leaf extract of *Ocimum basillicum* (Suwanda thala) and tuber extract of *Costus speciosus* (Thebu)
were found as non inhibitors for the enzyme.

100% inhibition of the enzyme was seen at 0.1g/1ml concentration level of *Ocimum sanctum* and *Jatropha curcus* and 0.08g/1ml level of *Acorus calamus,* and *Zingiber zerumbet.*