RESEARCH PAPER International Journal of Agricultural Sciences, Vol. 5 Issue 1, January to May, 2009 : 187-189

Arbuscular mycorrhizal fungi association with paddy (cv. KAPPA) rhizosphere soil : occurence and distribution

REKHA R. NAIK AND H.C. LAKSHMAN*
Department Post graduate studies in Botany (Micro biology Lab), Karnatak University, DHARWAD (KARNATAKA) INDIA

ABSTRACT

Arbuscular mycorrhizal fungi (AMF) form obligate symbiotic association with the roots and other underground parts of the plant and enhance plant growth and biomass. Studies were conducted on the AMF associated with the paddy rhizosphere soil, and the relation of various physico-chemical characteristics of soils with the number of AMF propagules. Twenty two species of AMF belonging to all the six genera of Glomales were recorded. *Acaulospora* and *Glomus* were the predominant genera. *A. rehmii* and *G. fasciculatum* were the most frequently occurring species. The number of AMF propagules/100 g soil ranged from 107-305. Increasing moisture content had a positive effect on the number of AMF propagules. Nutritionally deficient soils and phosphorous deficient soils in particular harboured more AMF.

Key words : Arbuscular mycorrhizal fungi, Paddy, Rhizosphere soil, Phosphorous.

INTRODUCTION

Oryza sativa L. cv. KAPPA cultivated under dry or upland semi-dry conditions. It has a considerably high nutrient content with about 90% carbohydrates, 8-10% proteins, 1% fats and 1.5% mineral status. Phosphorus and potash accounts 0.5-0.7%, it is a staple form of food to our sub continent.

Arbuscular mycorrhizal fungi (AMF) are ubiquitous in phosphorus deficient soil and form obligate symbiotic association with roots and other underground parts of most plants (Smith and Read, 1997). Their potential to enhance plant growth and biomass is well known. Because of this ability AMF are called as biofertilizers. AMF are capable of scavenging phosphorus from the soil into the root system mainly through the exploration of the soil by the extraradical hyphae beyond the root hairs and phosphorus depletion zone. There are reports on the natural colonization in many cereals (Schreiner and Bethlenfalvay, 1995; Patil and Lakshman, 2005; Sudheta and Jha, 2007). There are no reports on the AMF associated with the rhizosphere soil of *Oryza sativa* L. cv. KAPPA hence, an attempt was made to investigate the qualitative and quantitative composition of AMF associated with paddy cv. KAPPA rhizosphere soil and various physico-chemical characteristics of the soil in relation to the number of propagules of AM fungi.

MATERIALS AND METHODS

Oryza sativa L. cv. KAPPA rhizosphere soil samples were collected from paddy fields of Karwar South Canara district in Karnataka from each paddy plant triplicate rhizosphere soil and root samples were collected and brought to the laboratory. A part of soil was used for physico chemical properties and major part of the soil sample were used for isolation of AMF spores following wet sieving and decanting method (Gerdemann and Nicolson, 1963) and counted. Mycorrhizal roots were stained and per cent root colonization was established according to (Phillips and Hayman, 1970). The AMF were identified with the help of relevant literature (Schenck and Perez, 1990). Physico-chemical characteristics of the soils *viz.* pH, moisture content, soil texture, nitrogen, phosphorus and potassium contents were determined according (Jackson, 1973).

RESULTS AND DISCUSSION

Twenty two species of AMF were isolated and identified from the rhizosphere soils paddy Var. Kappa (Table 3). The number of AMF propagules/100 g soil ranged from 107-305 (Table 2). Species belonging to all the six genera of AMF were isolated from the soils. Species of *Acaulospora* dominated the rhizosphere soil supporting ginger cultivation. Nine species of the genus *Acaulospora*, one species of *Entrophospora*, two species of *Gigaspora*, eight species of *Glomus*, one species each of *Sclerocystis* and *Scutellospora* were isolated and identified. *A. rehmii* and *Glomus fasciculatum* were the most frequently occurring species isolated from one sample each. Tisdall (1991) isolated six species of AMF from agriculture land Koske and Gemma (1997) isolated 35 species of AMF from grasses rhizosphere soil.

The physico-chemical characteristics of ginger

* Author for correspondence