

Infectivity and Effectivity of *Glomus Mosseae* Mycorrhizae in Four Different Species of Medicinal Plants*

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Abstract

The effect of inoculation of four medicinal plant species (*Salvia officinalis* L., *Artemisia dracunculus* L., *Thymus vulgaris* L. and *Ocimum basilicum* L.) with *Glomus mosseae* (Nicol. and Gerd.) Gerdemann and Trappe in a marginal soil was studied. Inoculation increased total shoot and root dry weight compared to uninoculated control in all plant species.

Keywords: endomycorrhizae, *Glomus mosseae*, *Artemisia dracunculus*, *Ocimum basilicum*, *Salvia officinalis*, *Thymus vulgaris*.

Introduction

Many medicinal plants are included in the family Labiatae which are known to form vesicular-arbuscular mycorrhiza (VAM) under natural conditions. In recent years these plants have been cultivated in Spain with the aim of obtaining crops with fixed characteristics; in fact till now the only source of these plants was the collection of wildflowers. No studies have been done concerning the VA mycorrhizal status of cultivated medicinal plants, except for lavender (Azcon et al., 1982) and peppermint (Biermann and Linderman, 1981, Sirohi and Singh, 1983). This study examined the mycorrhizal dependency of these plants when cultivated in low-nutrient soils where the VAM propagules are known to be scarce.

The growth response to VA mycorrhizal inoculation of 3 species of Labiatae: *Salvia officinalis* L., *Thymus vulgaris* L. and *Ocimum basilicum* L. and 1 specie of Compositae: *Artemisia dracunculus* L. has been examined.

*Reviewed

Materials and Methods

Seeds of *S. officinalis*, *T. vulgaris*, *A. dracunculus* and *O. basilicum* were germinated in autoclaved sand, uniform seedlings were transplanted into individual pots (7 cm in diam.) filled with sterilized marginal soil. Each plant species was treated as a separate experiment with two treatments: control and inoculation with *Glomus mosseae* (Nicol. and Gerd.) Gerdemann and Trappe at the time of planting. Inoculum was applied as 5 g pre-infected soil from a stock plant containing a mean value of 30 *G. mosseae* sporocarps per 10 g soil, as well as infected root fragments. There were ten replicates per treatment.

After three months, plant growth was recorded by determining shoot and root dry weights. The roots were examined for VA infection. The whole root system of each plant was cleared in KOH 10% and stained with 0.05% trypan blue in lactic acid (Kormanik and McGraw, 1982). The percentage of root colonization was determined using a grid-line intersect method (Giovannetti and Mosse, 1980). Data were subjected to Tukey Test at 0.01 significant level.

Results and Discussion

G. mosseae improved the growth of all plant species compared to uninoculated controls. Dry weight of shoots was greater in inoculated treatments (Table 1). This result is of interest since the shoots of this medicinal crops have economic value.

Plants inoculated with *G. mosseae* were well infected whereas no trace of mycorrhizal infection was detected in roots of control plants (Table 1). These results indicated that *G. mosseae* infected and colonized extensively the root system of the medicinal plants studied and that VAM could help these plants to establish in soils low in available nutrients.

Table 1. Shoot dry weight and mycorrhizal infection of four medicinal plants inoculated with *G. mosseae*

	Treatment	Shoot dry weight(g)	% of infection
<i>A. dracunculus</i>	Inoculated	0.15 ± 0.03	81.20 ± 5.87
	Control	0.07 ± 0.04	0
<i>O. basilicum</i>	Inoculated	0.07 ± 0.01	72.44 ± 7.16
	Control	0.02 ± 0.01	0
<i>S. officinalis</i>	Inoculated	0.10 ± 0.03	53.74 ± 14.06
	Control	0.04 ± 0.01	0
<i>T. vulgaris</i>	Inoculated	0.06 ± 0.01	46.75 ± 19.74
	Control	0.03 ± 0.01	0

Mean ± SD. Average of ten plants.

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