J. Phytol. Res. **16**(2) : 257-258, 2003

RHIZOSPHERE EFFECT OF SOME IMPORTANT SPICES PLANTS OF RAJASTHAN.

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Rhizosphere effect (R/S Ratio) is generally represented as ratio of number of micro-organisms in the rhizosphere (R) and their number in the soil away from the root system (S). In he present investigation R/S ratio of five plant species (viz. *Trigonella foenum-graecum, Capsicum annuum, Coriandrum sativum, Foeniculum vulgare* and *Cuminum cyminum)* were investigated. Minimum R/S ratio was observed in flowering stage of *Coriandrum sativum* that is 1.0 where as maximum R/S ratio was observed in vegetative stage of *Foeniculum vulgare* that is 2.6.

Keywords : Rhizosphere effect (R/S Ratio); Spices plants

When counts of micro-organisms in rhizosphere and non-rhizosphere was made, it is usual to express the difference in the form of the ratio, R/S ratio or rhizosphere effect. The ratio of microbial number per unit weight of rhizosphere soil : (R), to the population in the unit weight of non-rhizosphere soil : (S). Starkey[1], Katznelson[2] observed that R/S value of legumes was highest and of cereals, it was lowest. Bohra & Panwar[3] has also studied R/S ratio of different crop plants. Garrett[4] suggested that R/S value was associated with dead tissue. Macura[5] showed that rhizosphere effect is a general phenomenon occuring in the nature, its consequence for plant may be beneficial or harmful. In the present investigation R/S ratio of five plant species were investigated.

The five spices plants (viz. *Trigonella foenum-graecum, Capsicum annuum, Coriandrum sativum, Foeniculum vulgare* and *Cuminum cyminum)* which are economically very important and extensively grown in this region were selected for the study of rhizosphere effect.

Rhizosphere effect (R/S Ratio) was calculated by using the following formula; Katznelson[2].

$$\text{R/S Ratio} = \frac{\text{Number of organisms per gram of rhizosphere}}{\text{Number of organisms per gram of non-rhizosphere}}$$

The counts of rhizosphere soil and of the non-rhizosphere soil and their difference is expressed in the form of a ratio, the R/S ratio or rhizosphere effect. It has been established from numerous studies that the rhizosphere effect, to a great extent, depends on the age and vigour of plant as well as the plant species.

It was evident, from the Table No. 1, that R/S ratio of *Trigonella foenum-graecum* shows gradual increase from seedling to vegetative stage and at maturity it was 2.0. In case of *Capsicum annuum* R/S ratio ranges from 1.2 to 1.8 and maximum at maturity stage. In case of *Coriandrum sativum* the R/S ratio shows some lower values than other plants. At the flowering stage of this plant R/S ratio declined to 1. R/S ratio of *Foeniculum vulgare* shows maximum R/S ratio from 2.0 to 2.6 with maximum at vegetative stage. In *Cuminum cyminum* R/S ratio varies from 1.2 to 2.2. The maximum R/S ratio was at vagetative stage.

Thus, it was observed that the three plant, *Coriandrum, Foeniculum* and *Cuminum* which belong to family umbelliferae (apiaceae) showed, R/S ratio maximum at vegetative stage that of 1.7, 2.2 and 2.6 in *Coriandrum, Cuminum* and *Foeniculum* respectively where as R/S ratio was maximum at maturity in *Capsicum* and *Trigonella.*

Over all comparison of all the five plants as well as stage of the plant growth, the minimum R/S ratio (1.0) was observed at flowering stage of *Coriandrum* where as the maximum R/S ratio (2.6) was observed at vegetative stage of *Foeniculum.*

Rao[6] noted that the R/S value were higher in the plant when it was 30 days old. The ratio generally decreases afterward. Sullia[7] reported that R/S value in wild leguminous plants ranges from 1.9 to 5.8. Singh[8] recorded that R/S ratio ranges 0.8 to 4.7 in *Solanum nigrum.* In present

Table 1. Population (in/g soil) and rhizosphere effect (R/S ratio) on fungi of five spices plants.

Spices Plants	Stages of plant growth	Rhizosphere (in thousand)	Non-rhizosphere (in thousand)	R/S ratio
1. *Trigonella foenum graecum* Linn.	S	6	4	1.5
	V	7	4	1.7
	F	9	6	1.5
	M	12	6	2.0
2. *Capsicum annuum* Linn.	S	5	4	1.2
	V	7	5	1.4
	F	9	5	1.8
	M	11	6	1.8
3. *Coriandrum sativum* Linn.	S	5	4	1.2
	V	7	4	1.7
	F	6	6	1.0
	M	10	6	1.6
4. *Foeniculum vulgare* Mill	S	6	3	2.0
	V	8	3	2.6
	F	8	4	2.0
	M	11	5	2.2
5. *Cuminum cyminum* Linn.	S	7	4	1.7
	V	9	4	2.2
	F	9	7	1.2
	M	13	7	1.8

S = Seedling stage F = Flowering stage
V= Vegetative stage M= Mature stage

investigation R/S value of all the five plants, investigated *Trigonella* and *Capsicum* showed a gradual increase where as in *Coriandrum, Foeniculum* and *Cuminum* the R/S ratio was higher in vegetative stage and lower in seedling stage. Maximum R/S ratio was observed at vegetative stage of *Foeniculum* that is 2.6.

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