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Mycelial combatability in *Sclerotium rolfsii* causing Stem rot Disease

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Abstract
Sunflower (*Helianthus annus*) is one of the important oil seed crops in India, which belongs to the family Asteraceae (Compositae). In this study mycelial compatability there are two isolates were usually paired on one dish and the test was repeated at least twice. Totally 56 pairings were formed using the eight isolates of *S. rolfsii*. Out of 56 pairings, 40 were found to be normal intermingling without any antagonistic reaction. Induction of basidial stage conducted to study the ability of each *S. rolfsii* isolate to undergo sexual stage.

Keywords: combatability, *Sclerotium rolfsii*, *Helianthus annus*

Introduction
Sunflower (*Helianthus annus*) is one of the important oil seed crops in India, which belongs to the family Asteraceae (Compositae). In India it is grown in an area of about 7,20,000 hectares with an annual grain production of 5,00,000 tonnes (Anonymous, 2012) [1]. In Tamil Nadu it is cultivated in 20,000 hectares with a production of 30,000 tonnes (Anonymous, 2012) [1]. The crop has shown distinct superiority over other oil seed crops owning to its wider adaptability to different agro climatic conditions, high potential yield per unit area, short duration and ability to withstand drought. Diseases are one of the important factors limiting the productivity of sunflower. Among them stem rot caused by *Sclerotium rolfsii* is an important disease.
S. rolfsii is a soil-borne pathogen capable of infecting wide range of crops especially during reproductive stage of the crop. Among the crops *viz.*, soybean, peanut, sugar beet, pepper, tomato and potato suffer maximum losses, whereas sorghum, wheat, rice, lentil, betel vine, alfalfa, cotton, sugarcane, tobacco, sunhemp, sunflower, chrysanthemum, gladiolus and other ornamental species suffer minor damage (Ansari, 2005) [2]. Garren (1961) [4] has estimated the losses due to *S. rolfsii* to the extent of 10 to 20 million dollars annually in southern USA. The yield loss upto 75 to 80 per cent has been reported in New Mexico (Aycock, 1966) [3]. In severely infected field, loss ranges from 10 to 25 per cent and sometimes, it reaches upto 80 per cent (Mehan and McDonald, 1990) [5]. In India, stem rot caused by *S. rolfsii* is a major problem in most of the states accounting for 10-11 per cent yield loss (Santha lakshmi Prasad *et al*., 2012) [6]. The typical symptom of the disease is rapid wilting and sickly appearance of plants with brownish lesion at the stem base near the soil lane which later girdles the stem. White mycelial growth forms over the infected tissue and often radiates over the soil surface.

Materials and Methods
Growth in solid media
The following media were used for the growth of different isolates of the pathogen.

***Cyperus rotundus* rhizome meal agar (CRMA) (Prithiviraj *et al*., 2000)**

Cyperus rhizome (pealed and sliced)	-	200 g
Dextrose	-	20 g
Agar agar	-	20 g
Distilled water	-	1000 ml
pH	-	7.0

Mycelial compatibility
Mycelial discs (5 mm diameter) taken from the edge of an actively growing colony (3 to 4 days old) of two isolates of *S. rolfsii* in opposite corners were placed in 9 cm Petri dishes and incubated at 25±2° C. Two isolates were usually paired on one dish and the test was repeate at least twice.

The pairings were examined macroscopically after 5 -15 days for the presence of an antagonistic (barrage or aversion) zone in the region of mycelial contact as described by Punja and Grogan (1983) [8].

Induction of Basidial stage

This experiment was conducted to study the ability of each *S. rolfsii* isolate to undergo sexual stage. Each isolate was inoculated into CRMA (*Cyperus rotundus* rhizome meal agar medium) and incubated in darkness and observed for 20 days for induction of sexual stage (Prithiviraj *et al*., 2000) [7].

Result and Discussion

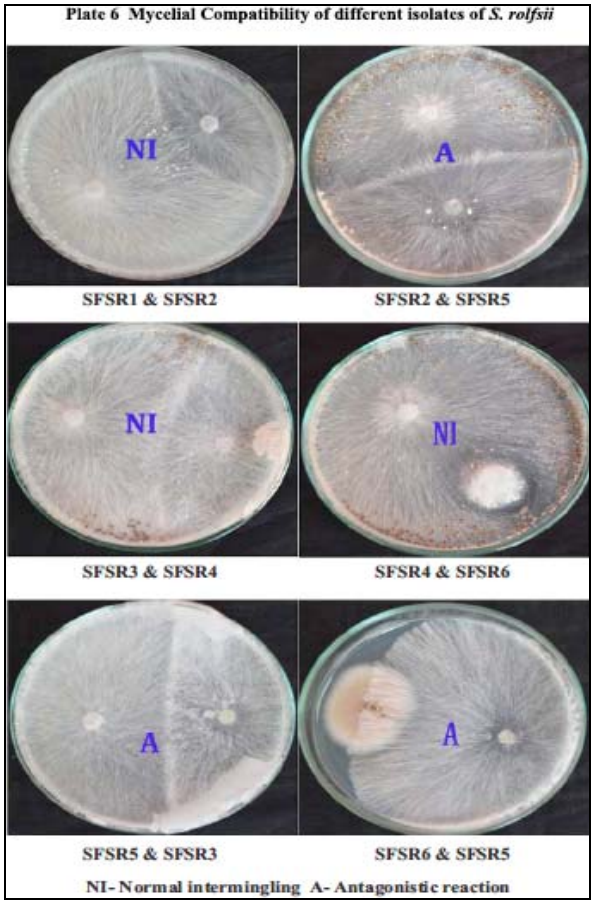
Mycelial Compatibility

Totally 56 pairings were formed using the eight isolates of *S. rolfsii*. Out of 56 pairings, 40 were found to be normal intermingling without any antagonistic reaction. The remaining 16 pairings exhibited significant antagonism between them resulting in formation of barrage (Table 1 and Plate 1). All the eight isolates did not produce the teliomorph on *Cyperus rotundus* rhizome meal agar medium.

Table 1: Mycelial compatibility of different isolates of *S. rolfsii*

	SFSR1	SFSR2	SFSR3	SFSR4	SFSR5	SFSR6	SFSR7	SFSR8
SFSR1		NI	NI	NI	A	A	NI	A
SFSR2	NI		NI	NI	A	NI	NI	A
SFSR3	A	A		NI	A	NI	NI	NI
SFSR4	A	NI	NI		A	NI	NI	NI
SFSR5	NI	A	A	NI		NI	A	A
SFSR6	NI	NI	NI	NI	NI		NI	NI
SFSR7	NI	NI	NI	NI	NI	NI		NI
SFSR8	NI	A	NI	NI	A	NI	NI	

NI- Normal intermingling, A- antagonistic reaction



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