Research Paper :

Morphological variation in *Sclerotium rolfsii* Sacc. isolates causing stem rot in groundnut (*Arachis hypogaea* L.)

N.B. BAGWAN

International Journal of Plant Protection, Vol. 4 No. 1 (April, 2011) : 68-73

SUMMARY

Variability among 59 isolates of *S. rolfsii* collected from groundnut growing areas of Gujarat and Maharashtra states of India was studied. Besides morphological characters (growth rate, colony type, number, size and colour of sclerotia) vegetative compatibility and virulence of the isolates were considered for study of variability. The results revealed that out of 59 isolates, colonies of 35 isolates were fluffy, whereas 24 were compact. Twenty nine isolates were fast growing (diam. >80-90 mm), 24 moderately fast growing (61-79 mm) and 6 were slow growing (<60 mm). Twelve isolates produced a large number of sclerotia (>500 sclerotia/plate) but smaller in size (0.5-1.4), while 9 isolates produced relatively fewer sclerotia (140-286 sclerotia/plate) but larger in size (2.1-2.5 mm). The colour of sclerotia was dark brown, reddish brown and light brown. Nine isolates were highly virulent causing more than 60% mortality of plants due to stem rot. Vegetative compatibility matrix revealed that out of 3481 combinations only 1512 were compatible (44%). On the basis of compatibility and virulence four, isolates *viz*., NRCG-SR 6, 7, 18 and 57 were identified that could be used in a consortium for development of sick plot.

Correspondence to :
N.B. BAGWAN
Department of Plant Pathology, Directorate of Groundnut Research (ICAR), JUNAGADH (GUJARAT) INDIA
Email : dr_bagwan@yahoo.com

Bagwan, N.B. (2011).Morphological variation in *Sclerotium rolfsii* Sacc isolates collected from Maharashtra and Gujarat States causing stem rot in groundnut (*Arachis hypogaea* L.). *Internat. J. Pl. Protec.*, **4**(1): 68-73.

Key words : Groundnut, *S. rolfsii*, Virulence, Incompatibility, Stem rot

Received : ***July, 2010***
Accepted : ***December, 2010***

Stem rot of groundnut caused by *Sclerotium rolfsii* Sacc. has become a major constraint and potential threat to groundnut production in many warm humid areas of the world. Stem rot is also known as wilt, sclerotial disease, blight, foot rot, white mold, southern stem rot southern blight, sclerotium rot (Aycock, 1966, Kokalis-Burelles *et al.*, 1997), southern wilt, southern stem rot, Sclerotial wilt (Patil and Rane, 1983). The yield losses of over 25% have been reported by Mayee and Datar (1988) in Maharashtra. In India, stem rot occurs in all groundnut growing states, particularly it is most severe in Maharashtra, Gujarat, Madhya Pradesh, Karnataka, Andhra Pradesh, Orissa and Tamil Nadu, where it is estimated that over 50,000 ha of groundnut fields are infected with *S. rolfsii* pathogen (Mehan *et al.*, 1995).

S. rolfsii Sacc. is a devastating soil-borne plant pathogenic fungus with a wide host range (Aycock, 1966; Punja, 1988). Geographical variability among *S. rolfsii* populations was demonstrated by earlier workers (Harlton *et al.,* 1995; Nalim *et al.,* 1995; Okabe *et al.,* 1998). Studies on variability within the population in a geographical region are important because that document the changes occurring in the population. The importance could be realized in the light of the discovery of PCNB-tolerant strains of *S. rolfsii* isolated from a Texas peanut field in 1985 (Nelin, 1992). *S. rolfsii* has prolific growth and ability to produce persistent sclerotia contributing to a higher degree of economic loss (Mahen *et al.,* 1995).

Hence, the present study was carried at the variability in morphology, duration of sclerotia formation, mycelial growth rate, size, colour, number of sclerotia and compatibility of 59 isolates of *S. rolfsii* obtained from groundnut infected plants, and collected at hot spot location of Maharashtra and Gujarat state.

MATERIALS AND METHODS

Isolation and maintenance of *S. rolfsii* isolates:

Fifty nine isolates of *S. rolfsii* causing stem rot of groundnut were collected from