

흰비단병균 (白絹病菌)의 菌核形成에 미치는 光線의 影響

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Effect of light on sclerotium formation of *Sclerotium rolfsii* Sacc. on agar media.

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Southern blight caused by the fungus *Sclerotium rolfsii* Sacc. often causes severe losses on a variety of crops throughout the tropic zones and warmer parts of the temperate zones of the world. The fungus attacks the roots or stems of 189 species in 8 monocotyledon and 42 dicotyledon families (Weber 1931). Host range of the fungus in Korea has been reported is soybean, tobacco, sugar beet, cucumber, watermelon, muskmelon, squash, *Panax ginseng* Meyer, *Cannabis sativa* L., *Luffa aegyptia* Miller, *Magnolia kobushi* Mayer, and *Symphytum officinale* L. (Anonymous 1972).

Sclerotia of the fungus not only enable the species to survive but increase the inoculum and chance of the infection. From the practical stand point, our knowledge of sclerotium formation could be related to the pathogenic activities of the fungus and control of the disease. Although there is a great deal of information concerning the environmental factors

such as nutritional and physical factors upon sclerotium formation (Aycock et al. 1962), very little is known about influence of light by the fungus. Trevethick et al. (1974) reported that sclerotium formation of an isolate of *S. rolfsii* is influenced both by light intensity and duration of the light treatments.

Present study is concerned with the effects of continuous fluorescent light on sclerotium formation of *S. rolfsii* with three isolates on agar media. The abstract has been presented in the annual meeting of the Korean Society of Microbiology in 1971.

Isolates of *S. rolfsii* were obtained from naturally infected ginseng (*Panax ginseng* Meyer), sugar beet (*Beta vulgaris* L.) and Russian cumphrey (*Symphytum officinale* L.) grown in Korea. These isolates were grown on potato sucrose agar (PSA) and tomato juice agar described elsewhere (Chung et al. 1962). The pH of the medium was adjusted to 5 after aut-

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oclaving. Cultures were started from a single sclerotium of each isolate produced on PSA under the continuous darkness. After 25 days incubation at $25 \pm 2^\circ\text{C}$ the mature sclerotia were removed from each plate, were counted, weighed and measured. Cultures of three isolates continuously received 1200 lux of daylight fluorescent light while the other plates were wrapped in aluminum foil and received no light. Three replications of each treatment were made.

In light sclerotia were consistently more numerous than in darkness regardless of the isolate or the medium. Isolates from ginseng and sugar beet produced about 3 times the number of sclerotia as the cultures kept in darkness on PSA. On tomato juice agar, however, isolates from ginseng, sugar beet and Russian cumphrey produced 30, 14, and 4 folds the number of sclerotia in light over those obtained in darkness, respectively. (Table 1 and Fig. 1). It was obvious that cultures on PSA produced significantly more abundant sclerotia than those on tomato juice agar in both treatments. (Fig. 1).

In both media illumination resulted in significant decrease in fresh weight and size of sclerotia regardless of the isolate. In light or darkness fresh weight of sclerotia on FSA was about a 15—25 fold increase as compared with each isolate on tomato

juice agar. Whereas illumination greatly increased the number of sclerotia on both media, fresh weight and size were significantly reduced by 3 isolates.

Thus sclerotia formation of *S. rolfsii* varied not only with the isolates, illumination, and culture media but also with ways of measurement whether counting the number, fresh weight or individual size.

References

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Table 1 Effect of light on sclerotium formation of *S. rolfsii* on agar media

Medium Isolates from	No. sclerotium/ plate		Fresh weight/ sclerotium(mg)		Diameter of sclerotium(mm)	
	Dark	Light	Dark	Light	Dark	Light
Ginseng	144	492	4.2	0.8	1.13×1.44	0.94×1.01
Potato Sugar beet	135	412	2.5	0.7	1.27×1.63	0.83×0.93
Sucrose Russiam						
Agar cumphrey	185	275	2.9	1.9	1.06×1.41	0.95×1.02
Ginseng	11	317	2.2	0.04	0.95×1.10	0.45×0.48
Tomato Sugar beet	18	269	1.2	0.06	0.88×0.96	0.48×0.57
Juice Russiam						
Agar cumphrey	29	116	1.0	0.2	0.77×0.90	0.55×0.61

Chung and Kim: Light effect on sclerotium form.

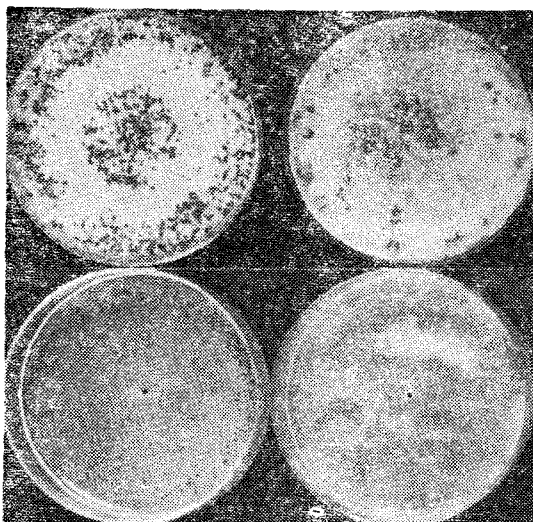


Fig. 1. Sclerotium formation of *Sclerotium rolfsii* ginseng isolate on potato sucrose agar (upper) and sugar beet isolate on tomato juice agar (lower) affected by continuous fluorescent light (left) or continuous darkness (right).

