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STABILITY OF CONIDIAL APPENDAGE OF *HELMINTHOSPORIUM SIGMOIDEUM* VAR. *IRREGULARE*[1]

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Key words: *Helminthosporium sigmoideum* var. *irregulare*; conidial appendage; temperature.

One of the major differences between *Helminthosporium sigmoideum* and *H. sigmoideum* var. *irregulare*, the causal fungi of rice stem root, is that the most of conidia of the latter fungus possesses a long appendage. In our preliminary observations we found that conidia developed with no appendages when the fungus was grown at relatively lower temperatures. We report herein the results of the effect of temperature on appendage development and the morphological features of conidia of *H. sigmoideum* var. *irregulare*.

Isolates PT-19 and TT-1 of *H. sigmoideum* var. *irregulare* were isolated from stem rot of rice collected at Pei-tou and Tsao-tun, respectively. The cultures were stored on V-8 agar slant at 20°C in darkness. This fungus grows and sporulates well on autoclaved corn leaf sections placing on Sach's medium under cool white fluorescent illumination with a 14 hr photoperiod. A mycelial agar block (2 mm dia.) cut from the margin of an active growing colony cultivated on V-8 juice agar plate was placed on the center of sterilized corn leaf section (1.5 cm^2) which was laid on Sach's medium in a 6 cm dish. Two plates of each of two isolates were incubated at 15°, 20°, 25° and 30°C incubators with a 14 hr photoperiod. Ten days after incubation, conidia were harvested and stained with rose bengal. Conidia with and without appendage were examined before and after harvest under microscope and size of conidia was measured.

Temperature profoundly influenced the appendage development of conidia of

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or nearly entire no appendage. Shape and size of conidia formed at lower temperature were shorter and wider than those formed at higher temperatures. No conidia produced at 15°C either on sterilized corn leaf section or on sclerotia seeded on water agar plate.

Results of the present experiment were only to indicate that appendage development on conidia of this fungus is not a stable character but is affected by environmental factors such as temperature. However, it is still a reliable character to differentiate this fungus from *H. sigmoideum* only we have to grow them at relatively high temperatures at around 28°C for comparison and this always happened to be the case in nature. Temperature effect on the morphology of condidia has recently been reported by Honda and Aragaki (1978). These authors observed that the protuberant conidial hilum of *Exserohilum* spp, such as *E. turcicum* and *E. rostratum* was absent at higher temperatures at 28° and 34°C in the dark, respectively.

Literature Cited

Honda, Y. and M. Aragaki. 1978. Stability of hilum protuberance in *Exserohilum* species. Mycologia **70**: 547-555.

Helminthosporium sigmoideum var. *irregulare* 之分生孢子頂端條狀體附屬器之穩定性

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Helminthosporium sigmoideum var. *irregulare* 和 *H. sigmoideum* 都是稻莖腐病之病原菌，兩者間主要不同處，一是前者之菌核大小不一，而後者之菌核大小均一；二是前者之分生孢子頂端具一微旋之條狀體而後者之分生孢子無，此分生孢子頂端條狀體附屬器並不穩定，因溫度變化而呈有無，在低溫下，如 20°C，所形成之分生孢子均不具此附屬器，而高溫如 25°C 和 30°C 生長下形成之分生孢大部份具此附屬器。

both isolates tested. Most of conidia formed at 20°C were absence of appendage. Conidia formed at 25° and 30°C were with typical and slightly spiral appendages although some of the conidia formed at 25°C developed no typical appendage but with an elongated apical end (Fig. 1). Temperature also affected the size and shape of conidia. Conidia formed at 20°C were shorter and broader than those formed at 25° and 30°C. No significant differences in size and shape of conidia of isolate PT-19 formed at 25° and 30°C (Table 1). Sclerotia spreaded on water agar plate and incubated at aformentioned conditions also produced conidia directly on sclerotia. Sclerotia were prepared by inoculation of sterilized rice straw sections with conidial suspension in a 250 ml flask and incubated 25°C for a month. Tremendous number of sclerotia formed inside rice straws. Similar results were obtained that conidia formed directly on sclerotia at lower temperature, i. e., 20°C, developed no

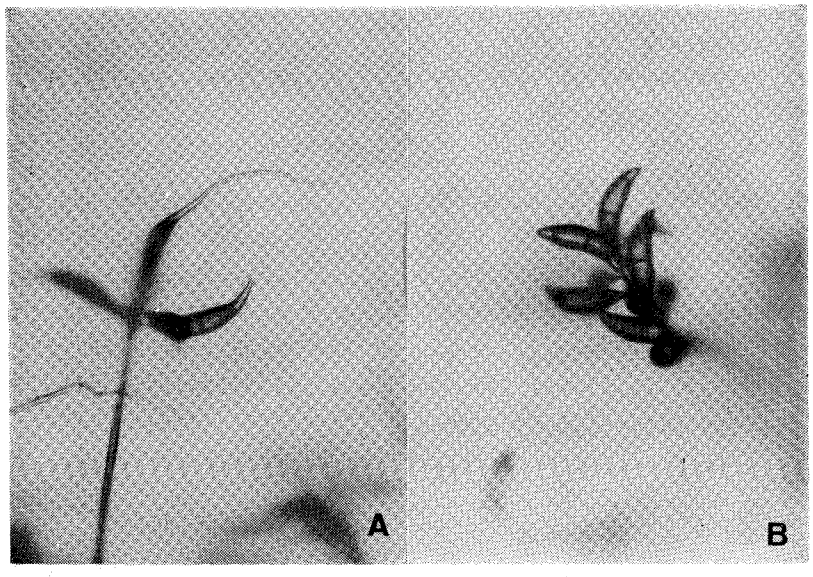

Fig. 1. Conidia of *Helminthosporium sigmoideum* var. *irregulare* formed at 25°C with appendage or elongated apical end (A), and at 20°C with no appendage (B). (280×).

Table 1. *Variations of conidia of* ***Helminthosporium sigmoideum*** *var.* ***irregulare*** *at different temperatures*

Isolate	Length (μm) of conidia formed at			Width (μm) of conidia formed at		
	20°C	25°C	30°C	20°C	25°C	30°C
PT-19	47.650^{b}	55.125^{a}	60.125^{a}	12.750^{b}	11.125^{a}	10.225^{a}
TT-1	48.855^{c}	55.915^{b}	63.435^{a}	12.775^{b}	11.475^{ab}	10.450^{a}

* Data with different letters are significant at 5% level according to Duncan's multiple range test.