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EFFECT OF DIFFERENT NATURAL BAITS ON ZOOSPORE AND OOSPORE PRODUCTION BY TWO *PYTHIUM* SPECIES

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Abstract

Pieces of *Zea* leaf were found to be a good substrate for the production of zoosporangia and zoospores in *Pythium*. Deciduous *Quercus* leaf pieces were a good substrate for oogonial production by *Pythium aquatile* and *P. dissotocum*. Spore production was related to temperature: *P. aquatile* produced more zoospores and oogonia at 5°C whereas the optimum for *P. dissotocum* spore production was closer to 15°C.

Introduction

Grass blade is commonly used for the production of zoospores by *Pythium* species (Emerson, 1958; Webster & Dennis, 1967). A comparative assessment of other particulate organic nutrient sources on the production of zoospores by *Pythium* species has not been reported. The present report describes the effect of different natural baits on zoospore and oospore production by 2 *Pythium* species viz., *P. aquatile* and *P. dissotocum*.

Materials and Methods

Corn meal agar blocks (5 mm^2) from actively growing axenic cultures of *Pythium aquatile* and *P. dissotocum* were transferred to Petri dishes containing sterile double glass distilled (DGD) water. Segments (25x5 mm) of *Agrostis, Zea, Quercus* (deciduous) and *Potamogeton* leaves were autoclaved at 15 psi for 10 minutes, cooled, rinsed and placed on the agar blocks of the *Pythium* species. Cultures were incubated for 24 h at 15°C after which time the leaf pieces were colonized by the test fungi and transferred to fresh Petri dishes containing DGD water. Two similar sets were prepared for incubation at 5 and 15°C. There were three replicates for each treatment. Cultures were observed under low power (x10 ocular and x4 objective) through the lid of the Petri dish after each 24 h for up to 7 days for zoosporangial production. Number of full zoosporangial vesicles per 330 µm length of substrate (µ diameter of microscopic field) was recorded at three different places on each leaf segment; a mean value was calculated for each substrate and expressed as number of vesicles mm^{-1}. The number of oogonia was recorded using X10 objective, and the final count taken after 15 days. The whole experiment was repeated once, and a third, partial data was obtained for confirmation.

Table 1. Number of oogonia of *Pythium aquatile* and *P. dissotocum* produced per millimetre of leaf segment after 15 days at two incubation temperatures.

Treatment	*P. aquatile*		*P. dissotocum*	
	5°C	15°C	5°C	15°C
	(No. of oogonia/mm leaf segment)			
Zea	379	271	0	0
Agrostis	436	236	0	0
Quercus	900	629	0	521
Potamogeton	607	234	362	50

Results and Discussion

Results are given in Fig. 1 and Table 1. Generally the zoospore production was highest on first, or in some cases, on the second day, gradually declining thereafter. Zoospore production declined more gradually at 5°C; at 15°C a sharp decline occurred after 24 h. *Zea* leaf pieces were found to be the best substrate for zoospore production. For *P. aquatile* the temperature for zoospore production was nearer to 5°C but for *P. dissotocum* the optimum was closer to 15°C.

P. aquatile produced oogonia on all the substrates tested, whereas *P. dissotocum* produced oogonia only on *Quercus* and *Potamogeton* leaves. *Quercus* leaf proved to be the most suitable substrate for oogonial production for both species followed by the *Potamogeton* leaves. The *Agrostis* leaves were least satisfactory. Temperature optima were similar for zoospore and oogonial production.

For both the two species tested, *Zea* and *Quercus* leaves gave enhanced production of zoospores and oogonia respectively. The temperature preferences for both zoospore and oospore production were similar for a given species. This observation may facilitate preparation of sporulating isolates for class demonstration. The applicability of these results to other zoosporic species of *Pythium* needs investigation. It may be mentioned that *P. opalinum* (Shahzad *et al.*, 1990) failed to produce zoosporangia and zoospores by standard techniques or the method described by Emerson (1958), but produced spherical sporangia and zoospores at 15°C when grown on *Zea* leaves.

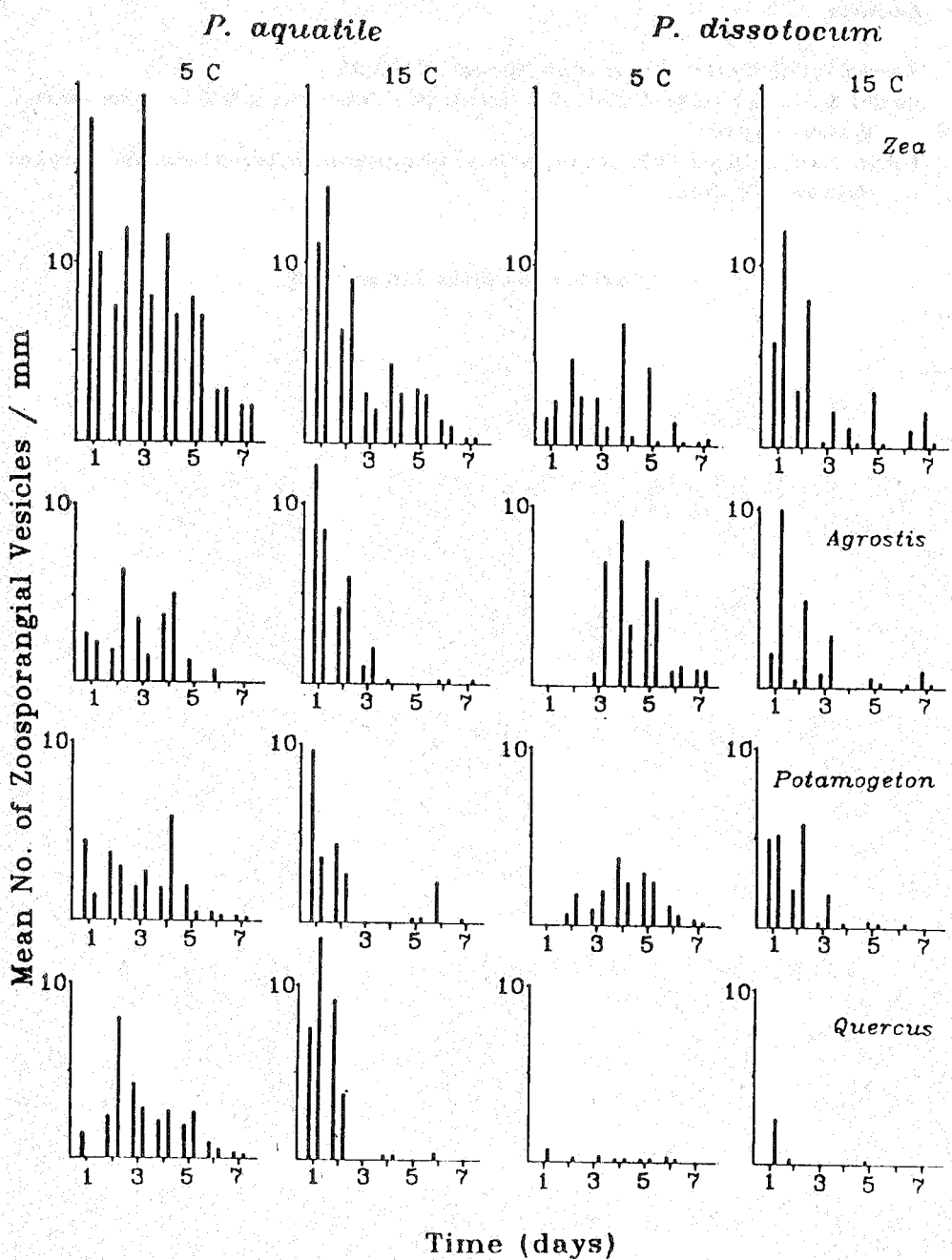

Fig. 1. Mean number of zoosporangial vesicles mm^{-1} recorded at 24 h interval on different leaf baits. The bars at each datum point represent the first and repeat experiments respectively.

References

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