cell has rounded tip while the basal cell is a crucible shaped with distinct inserted hilum showing the point of attachment. Conidium size 19·8–46·2 × 11·0–24·2 μm.

Curvularia tuberculata Jain was found highly pathogenic on widely diverse plants like Citrus[1], Motha[2], Maize[3], Sorghum[4], Guava[5] and was also found from the soils of Guntur District, Andhra Pradesh and in Uttar Pradesh[7]. Its natural occurrence on the leaves of mango trees of moderate age causing blight symptoms is newly established here. Manual inoculations of this fungus from mango gave negative results on citrus and the fungus from citrus (*C. karna*) also gave *negative results on mango showing negative cross-*pathogenicity. The two races on mango and citrus, thus, appear to be different. The culture has been deposited in I.T.C.C., I.A.R.I., New Delhi, under Accession No. 2737.

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ENDOGENOUS RESPIRATION OF CONIDIA OF *PHYLLACTINIA DALBERGIAE PIROZYNSKI*

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The respiratory rate (oxygen uptake) and effect of metabolic inhibitors on it, was studied in the case of germinating and nongerminating conidia of *Phyllactinia dalbergiae*. The rate of respiration was found to be considerably higher in germinating conidia. Almost all the metabolic inhibitors tested suppressed the rate of respiration.

Introduction

Respiratory characteristics of plant pathogenic fungi are of great fundamental, as well as, applied importance and have received considerable attention lately. Although work on such fungal species as *Fusarium solani*[1], *F. oxysporum*[2], *Penicillium chrysogenum*[3], *Aspergillus sojae*[4] has been reported. Very little work has been done with obligate parasitic fungi[5]. The present studies were, therefore, undertaken to investigate respiratory characteristics of *Phyllactinia dalbergiae*, the powdry mildew pathogen of *Dalbergia sisso*.

Materials and Methods

Preparation of Material

Spore samples were obtained[6] and the spore suspension was prepared by suspending 25 mg of spores in 100 ml of 0·1 M phosphate buffer usually at pH 6 and shaken vigorously on a electric shaker for about 10 minutes. Most of the mycelial pieces were filtered off on two layers of cheese cloth. The remainder was again shaken vigorously on the shaker.

Rapid germination of spores was obtained on cellophane paper laid on the surface of host extract medium[7]. In all experiments percentage of germination was determined after 24 hours, using first appearance of a germ tube as the criterion. Results are on counts of 100 spores where 50 to 60% germination was observed. Spore suspension for germinating spores was prepared as described earlier.

Respiratory activity was determined as the oxygen uptake and the effect of various metabolic inhibitors on respiration rate following usual standard techniques[8], employing Warburg's constant volume respirometer. Each Warburg flask contained 0·2 ml of 20% KOH in central well, 2·7 ml of spore suspension in the main compartment and 0·3 ml of treatment inhibitor containing solution in the side arm. In control flasks 0·3 ml of buffer was used in place of inhibitor containing solution. The rate of oxygen uptake was measured at 22° ± 1° C as Qo_2 μl of oxygen consumed/10^3 spores/hr. All experiments were done three times with duplicate flasks for each of the treatment. Variation was usually slight between results of repeated experiments. Additional experiments were performed for further verification.

Results and Discussion

The results are presented in Table I. Respiratory rate of germinating conidia, *viz.*, 2·22 μl of $O_2/10^3$ conidia/hr was considerably high as compared to ungerminated conidia, *viz.*, 1·18 μl of $O_2/10^3$ spores/hr. Almost all the inhibitors used in present study showed

TABLE I

Respiratory metabolism of conidia of Phyllactinia dalbergiae

Treatment*	Ungerminated conidia		Germinated conidia	
	Qo_2**	% change over control	Qo_2**	% change over control
Control	1·18		2·22	
Sodium hydrogen malate	0·09	−1·09	1·35	−0·87
Sodium azide	0·18	−1·00	1·56	−0·66
Sodium fluoride	0·07	−1·11	0·91	−1·31
Sodium hydrogen malonate	1·17	−0·01	1·72	−0·50
Sodium fluroacetate	0·32	−0·86	1·72	−0·50
Sodium arsenate	0·14	−1·04	1·16	−1·06

* Concentration of metabolic inhibitors 0·5 M. ** Qo_2 μl of $O_2/10^3$ spores/hour.

inhibitory effect on conidia respiration and respiration during germination of conidia. However, sodium hydrogen malonate was more or less ineffective as inhibitor for conidial respiration.

In accordance with earlier reports[10,12] our results show marked increase in respiratory rate during germination of conidia. Respiratory response induced by addition of various respiratory inhibiters reveals valuable information regarding pathways of oxidative metabolism. Respiratory inhibition caused by sodium fluoride indicates presence of EMP, glycolytic and Kreb's cycle pathway in this fungus, while inhibition induced by sodium azide may be due to its capacity of binding iron in cytochrome oxidase, similar results have been obtained in case of *Verticillium alboatrum*[12], *Curvularia lunata* and *Helminthosporium oryzae*[12] sodium arsenate and sodium fluoroacetate are known to inhibit oxidative decarboxylation of pyruvic acid. Sodium hydrogen malonate principally causes inhibition of succinic dehydrogenase[12]. It, however, was ineffective in causing inhibition of coridial respiration. In the light of above observations it may be suggested that aerobic respiratory pathway in *Phyllactinia dalbergiae* involves common EMP, glycolate, Kreb's cycle, however, each enzyme system should be worked out for further clarification.

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