EFFECT OF NEAR—ULTRAVIOLET AND VISIBLE RADIATIONS ON ENDOGENOUS RESPIRATION OF CONIDIA OF *NEUROSPORA CRASSA* AND *MYROTHECIUM RORIDUM*

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NEAR-ULTRAVIOLET (NUV) radiation is known to inhibit the growth[1], damage the membrane system[2] and interfere with respiration of bacteria[3]. This radiation also inhibits the vegetative growth of some fungi[4,5] and induces sporulation in many of them[6]. However its effect on the spores of fungi is not known. It was found that NUV radiation retards the endogenous respiration of conidia of two fungi.

Spores of *Neurospora crassa* and *Myrothecium roridum* were collected from fresh cultures and suspended in water (with Tween 80) and filtered through cotton to get mycelium—free spores. The spores were resuspended in water and 10 ml of this suspension was taken in a 10 cm petri dish. This suspension of spores (3 mm in depth) was exposed to NUV or white light for one hour. NUV radiation was provided by two 40 W 'black light' lamps (Sylvania, USA, emission mostly between 300–400 nm with peak at 350 nm) from a distance of 10 cm. Irradiation with visible light was carried out using two Philips 40 W 'Cool White day light fluorescent lamps (emission mostly between 400–570 nm with some in the NUV also) at a distance of 10 cm. The light energy from 'black light' lamps and from day light fluorescent lamps were 3 W/m^2 and 9.5 W/m^2 respectively as measured by a calibrated radiometer (Yellowsprings Instrument Co; Kettering, Ohio). The temperature during irradiation was $25 \pm 2°$ C. Spore suspensions incubated in total darkness served as control. The rate of O_2 uptake by the spores was determined immediately after irradiation by manometric method in a dark room. Each Warburg flask had 2.5 ml of spore suspension and the central well contained 0.2 ml of 20% KOH. Three replicates were maintained. The O_2 uptake is expressed in $\mu l/10^6$ spores/hour.

Exposure to NUV light reduced endogenous respiration of the conidia of both the fungi by about 50%. Irradiation with visible light also reduced the O_2 uptake to a certain extent (table 1). This result is similar to that observed by Sprott and Usher[3] in *E. coli*. In this bacterium NUV radiation is known to inhibit cytochrome a_2 components of the electron transport chain[7].

TABLE 1

The effect of NUV and visible radiations on endogenous respiration of spores of Neurospora crassa and Myrothecium roridum

Treatment	O_2 uptake $\mu l/10^6$ spores/hr	
	N. crassa	*M. roridum*
Dark	4.83	0.21
Visible light	3.58	0.17
NUV light	2.70	0.11

Day light fluorescent lamps emit some NUV radiation[8] and this may be responsible for the reduced respiratory rate in conidia exposed to visible light. Since green-yellow light[9] and blue light[10] are also known to interfere with respiration, only further studies can clearly explain this phenomenon.

In fungi, hyphal apices are regarded as the most photosensitive zone[11]. Our results show that even ungerminated conidia of some fungi are sensitive to light, particularly to NUV.

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