Effect of microwave radiation on conidial viability

K. Rodland
P.J. Russell

Follow this and additional works at: http://newprairiepress.org/fgr

Recommended Citation

This Technical Note is brought to you for free and open access by New Prairie Press. It has been accepted for inclusion in Fungal Genetics Reports by an authorized administrator of New Prairie Press. For more information, please contact cadis@k-state.edu.
Effect of microwave radiation on conidial viability

Abstract
Effect of microwave radiation on conidial activity.

Creative Commons License
This work is licensed under a Creative Commons Attribution-Share Alike 4.0 License.
Sterility mutants were induced by irradiating conidia of wild type strain, En. A, with gamma rays. Mutants were found to fall at different steps in the sexual developmental cycle and were placed into four different groups. Five of these mutants (242A, 270A, 278A, 366A, and 575A) belonging to the four different groups, a highly fertile strain (599A), two UV induced mutants (7232A, 9312A), and wild type Em A were selected for a UV spectrophotometric analysis of the sex hormonal substances (Islam and Weijer 1969 Neurospora Newsl. 15:24; Islam 1973 Mycopath. et Mycol. Aop. 51:87; Islam 1977 Neurospora Newsl. 24:5). All strains were grown as stationary cultures in Vogel's liquid minimal medium (10 ml/100 ml flask) for 15 days at a temp. of 25°C (dark), and hormones were extracted by the procedure previously described (Islam and Weijer ibid.; Vigfusson et al. 1971 Folia Microbiol. 16:166) and collected in chloroform. UV absorption patterns were determined with a Beckman spectrophotometer.

The results shown in Figure 1 demonstrate a clear qualitative difference between the absorption patterns of extracts of 9312A and wild type Em A. Quantitative differences between 366A, 575A, and wild type were also observed. Division of Genetics, Irradiation and Pest Control Research Institute, Bangladesh Atomic Energy Commission, P. O. Box 164, Ramna, Dacca, P. & T. D.

Figure 1. -- UV spectrograms of the hormonal extracts of Em A (wild type), 7232 A (sterile), and 9312 (sterile).

Rodland, K. and P. J. Russell. Effect of microwave radiation on conidial viability

Microwave ovens are a recent innovation in many laboratories and are used for many applications such as media preparation and thawing of frozen stocks. Microwave radiation could be a valuable alternative for heat sterilization if it is capable of killing potentially contaminating microorganisms and conidia and destroying nuclease activity.

The effect of microwave radiation on conidial viability was tested by exposing replicate samples of various volumes of a suspension of wild type Neurospora conidia in deionized water \(3.34 \times 10^6 \text{ conidia/ml}\) to microwave radiation in a Sanyo microwave oven (output 2450 MH, at 450 Watts). Samples of the suspension were removed after 0, 5, 10, and 15 minutes and plated onto Vogel's complete medium. After 5 days of incubation at 25°C, the control plates containing conidia which had not been subjected to microwave radiation were overgrown, while none of the experimental plates showed any signs of conidial growth. Thus it appears that exposure to microwave radiation for as little as 5 minutes is sufficient to kill all conidia in suspension with volumes of 50, 100, 200, and 400 ml.

In conclusion, the result of this experiment suggests that exposure of experimental solutions to microwave radiation may be an effective alternative to autoclaving in eliminating biological contaminants. (Supported by N.G.M.S., N.I.H grant GM26082.) -- Biology Department, Reed College, Portland, Oregon 97202.