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## Dry Heat Sterilization of Wood

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## Dry Heat Sterilization of Wood

GEORGE L. COFFEY

In experiments dealing with wood rotting fungi, the best means of sterilizing the wood has long been a controversial question. In the majority of the work, the autoclave has been used for this purpose. This intense moist heat undoubtedly has an effect on the chemical composition of the wood, and therefore is not a satisfactory means of sterilization.

Spauling (1906) states that at 100°C. 15-40 hours are necessary to effect any changes in the wood elements. Snell (1922) says that 12 hours at 105°C. (dry heat) is necessary to kill all of the mycelium in wood blocks  $\frac{3}{4}$  inch square (1.8 cm.). McGuire (1938) recommends dry heat for such sterilization and states that a minimum of four days at 90°-95°C. is necessary to sterilize wood blocks of the size employed in his investigation (10 x 1 x 1 cm.).

It is believed that sterilization at temperatures below 100°C. would have the least effect on the composition of the wood, and would therefore be the most satisfactory means of sterilization. This paper is the result of an attempt to confirm McGuire's experiment.

### *Procedure*

Oak blocks 7.6 x 1 x 1 cm. which had been contaminated, were placed in test tubes, placed in a dry heat oven for a given time and at a given temperature. After the completion of the time period, the blocks were removed from the oven, allowed to cool and then covered with sterile distilled water. The blocks were then examined for signs of contamination during a period of four weeks.

The first group of blocks was placed in an oven at 75°C. for 72 hours, the second at 80°C. for 72 hours, the third at 80°C. for 94 hours, the fourth at 90°C. for 72 hours and the fifth at 90°C. for 94 hours. In the first and second groups there was 100% contamination. In the third there was 75% contamination, while in the fourth and fifth groups there was no sign of any growth.

Another set of blocks was sterilized in the same manner, at 90°C. for 72 hours. After they had completed their time period and had cooled, nutrient beef broth was added. After a week of incubation at 30°C. there was no sign of any growth, either fungal or bacterial. Samples were then taken from each tube and streaked on nutrient beef agar plates. On one of these plates one colony of an unidentified fungus grew. The tube from which the plate had been streaked was examined again. There was now also signs of growth in the tube. This fungus was one which grew rather rapidly, and it is believed that it was a contamination made at the time of the transfer, since it had not developed previous to the time of the transfer.

Another set of blocks was sterilized at the same temperature and for the same length of time. The experiment was then repeated. All of these blocks were completely sterile.

*Conclusions*

1. The practicability of using dry heat for sterilization of wood blocks to be used in the study of wood decaying fungi, as advocated by McGuire, has been confirmed.

2. It has been found that a somewhat lower temperature than that suggested by Snell, and a shorter sterilization time than that recommended by McGuire is effective in producing complete sterility in blocks 1 cm. square and 7.5 cm. long.

This work was done in the Mycological Laboratories at the University of Iowa, under the direction of Dr. G. W. Martin.

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*Bibliography*

- McGuire, J. M. 1938. Technique in the Study of Wood Rotting Fungi. Thesis, State University of Iowa, Unpublished.
- Spaulding, P. 1906. Studies on the Lignin and Cellulose of Wood. Mo. Bot. Gard. Ann. Rept. 17: 41-58.
- Snell, W. A. 1922. The Effect of Heat on the Mycelium of Certain Structural Timber Destroying Fungi Within Wood. Pathology 12: 59.