

PRODUCTION OF FRUIT-BODIES IN *TRAMETES LACTINEA* BERK. IN CULTURE

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Various attempts have been made by different workers for the production of typical fruit-bodies of hymenomycetous fungi, particularly the wood-rotting ones, in artificial culture. So far the records show that only in a few cases typical fruit-bodies of full size have been produced and no standard method has yet been developed for the purpose. While working with *Trametes lactinea* Berk., a common wood-rotting local polypore, for obtaining their fruit-bodies in cultures, difficulties were encountered. Long and Harsch (1918), Bose (1929), Badcock (1941, 1943), Banerjee (1956), Banerjee and his collaborators (1955, 1956), and others have thrown light on many aspects of the problem.

Mature fructifications of *Trametes lactinea* along with its host-wood (*Terminalia procera* Roxb.) were collected from log-yard near Calcutta. Cultures of primary and secondary mycelia of the fungus and its isolates were obtained and utilised for three separate sets of experiments.

While grown in Petridishes containing culture media, viz., *Potato-Dextrose-agar* (Fritz, 1923), *Malt agar* (2.5% malt extract, 2.5% agar and Distilled water), *Zapeck's synthetic agar* (as modified by Fritz, 1923) and *wood-decoction agar* it was found by the present author (1966) that neither its primary mycelia nor its secondary mycelia produced any fruit-body even after one month's incubation. These experiments along with another set with the isolate of the fungus were repeated and incubated under laboratory condition for more than three months but without any success. Subsequently wood block culture with sound sap-wood blocks of its selective host (*Terminalia procera*) were employed and experiments were undertaken following the method essentially similar to that employed by Banerjee and Sarkar (1956).

In a number of sterile Kolle flasks containing 2.5% *malt agar* medium, 20 days old cultures of primary and secondary mycelium as well as that of the isolate

of the fungus were obtained separately. Water-soaked, sterilised wood-blocks were then exposed to those cultures aseptically and incubated at ordinary temperature (30-34°C), humidity (65-95%) and diffused light of the laboratory. Within 48 hours of inoculation the mycelia in each case attacked the wood-block from the four sides and in about a week covered the wood-blocks forming mats of dense white felty mycelium over them. The mats gradually became condensed, thick and tough. Light-Buff to Buff colouration appeared after about ten days mainly on the somewhat patchy areas of the mats. These were also characterised by the appearance of shining water drops above area. In about a month small irregular lumps of mycelium developed here and there. The lumps were very much ill developed in case of the cultures containing the primary mycelium. All the cultures were then incubated under the identical conditions for four months when they were supplied periodically with the sterile distilled water aseptically. Very little development of the cultures of the primary mycelium was noticed except in the thickness of the mat. In case of the cultures of the secondary mycelium and the isolate, a few small and compact hemispherical lumps were developed. However, none of them expanded into fruit-bodies even after a further period of one month.

The mats containing the wood-blocks were then taken out from the Kolle flasks, kept over moist cotton pads in Petri dishes and incubated in a culture room maintaining a temperature of 25°C and in the ordinary diffused light of the culture room. Very little change excepting the formation of a few more pustules over the mats of the cultures of secondary mycelium and the isolate were observed. After a period of one month the Petri dishes containing the infected blocks were taken out from the culture room and arranged in such a way under a tap of the laboratory that the blocks could obtain a moderate supply of water. After constant showering for about ten days they were bathed only at regular intervals. Remarkable changes were observed within 20 days of this artificial showering. New compact knobs developed over the mats of the secondary mycelium and the isolate of the fungus. These turned creamish at an early stage and began to expand horizontally. Perous area developed on the under surface of these structures. Some of these structures did not develop further while a few others formed typical small fruit-bodies of *Trametes lactinea* that were observed during the field studies. They were bracket-shaped and each with a flat upper surface and a lower fertile hymenial layer and attained a dimension of 1.5×.75×.5 c. cm. (Plate 1, Fig. 1-2). In case of the cultures of the primary mycelium, no appreciable change was observed.

On microscopic examinations it was found that these fruit-bodies produced typical basidia and basidiospores. The period of spore-fall was short. Spore-deposits from these fruit-bodies were obtained and the polysporous cultures made from them resembled similar cultures obtained from the fructifications growing in nature.

Under identical conditions the cultures of the secondary mycelium as well as those of the isolates of the test-fungus produced fruit-bodies of small size whereas the primary mycelium did not produce them at all. The behaviour of the primary mycelium thus corroborated the heterothallic nature of the fungus (Banerjee, 1970).

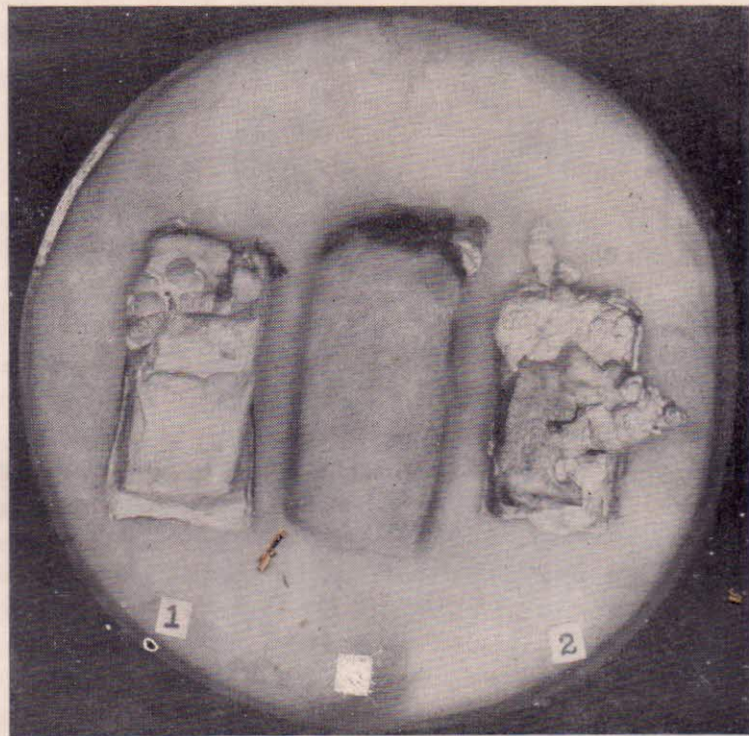
It is evident from the foregoing observations that for the production of fruit-bodies of *Trametes lactinea* in culture agar-media are not suitable. The author maintained the cultures on agar-media for more than six months in test-tubes, Petridishes and Kolle flasks. None of them gave any positive result. The wood-rotting fungi, like the test-fungus in question, seems to bear a definite relation with their hosts and wood-block cultures are necessary for the production of their fruit-bodies in the laboratory. During field studies also it was noticed by the author that the test-fungus grows only on a particular host in any timber-yard.

Besides the above, a favourable environmental condition is absolutely necessary for the growth of the mycelial knobs and their subsequent development in to fruit-bodies. Of all the conditions necessary, abundant moisture supply, temperature and proper aeration seem to be essential.

The author expresses his gratefulness to Dr S. N. Banerjee, University of Calcutta, for his guidance and for making the facilities available to the author to conduct the present work in his laboratory.

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(Accepted for publication 28th July 1963)

PLATE I

- Fig. 1. Wood block cultures of *Trametes lactinea* Berk. showing upper surface of fruit-body forming knobs are exposed to open air on a Petridish containing a moist cotton pad.
- Fig. 2. Wood block culture of the same showing a small fruit-body with distinct pore-tubes.