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Pattern of Spore Discharge Over Hymenial Surfaces

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ABSTRACT: Considerable variations in spore productivity were detected within the area of single hymenial surfaces of certain polypores. The hymenium has in irregular patterns, areas of low as well as high spore production, common both in the periphery(young) as well as in the inner(old) part. These have been recorded as isospore diagrams showing that the basidia all over the hymenia are at different stages of development.

KEYWORDS: Polypores, Isospore diagrams, Basidia

Spore prints of certain basidiomycetes, especially the agaricales, are commonly used by mycologists for taxonomic purposes. They are useful in the study of gill arrangement and spacing. Buller(1909) observed that radiating lines in a spore deposit under an agaric sporophore correspond to the spaces between the gills. Ingold(1979) in his studies on the detailed structure of the agaric spore print or spore bands, observed that the resulting spore lines are not uniformly dense. Each spore line is much denser near the edge thus giving it a much "firmer" outline. Buller(1922) observed the mottling 6 of gills in *Panaelus campanulatus*. He found that the areas with the more advanced spore-bearing basidia are relatively darker than those with less advanced spore-bearing basidia. He further observed that the sum of the darker areas always exceeded by a considerable margin, the sum of the lighter areas.

Apart from these observations there is virtually no information in the literature to the pattern of spore production over the surface of the hymenium. Some of the questions that need to be answered regarding the pattern of spore discharge over the surface of the hymenium include:

a) Is spore productivity over the whole of the hymenial surface uniform.

b) If there is variation in productivity is it associated with variation in age of different areas of the hymenium?

This experiment was set up as an attempt to examine the pattern of spore production over the surface of the hymenia of selected basidiomycetes.

Materials and Methods

Use of attached sporocarps

Fresh specimens of *Coriolus versicolor* Fr, *Piptoporus betulinus* Fr and *Pleurotus dryinus* attached to their logs were positioned over a graph paper and their outlines recorded by drawing around the specimens. A series of silicone coated slides were placed over the graph paper outlines for the purpose of collecting spores and the specimens were maintained in a draught free humid atmosphere for the duration of the sampling.

Spores were subsequently counted along parallel "horizontal" traverses, across the areas of the outlines, at 2mm intervals, using a x 40 objective. The width of the traverse varied between the specimens according to the density of their spore productivity. Variations in the numbers of spores counted over the outline areas were recorded in the form of isospore contours.

Use of detached sporocarps

Fresh detached sporocarp of *C. versicolor* was placed over a series of silicone-coated slides positioned on graph paper on which the outline of

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the sporocarp was drawn. The whole set up was maintained during sampling in a closed damp chamber. Slides were removed for examination after 18h and spores counted along traverse as described above.

Results and Discussion

With *C. versicolor*(Fig.1) considerable(up to ten-fold) variations in spore density were recorded and there were no uniform gradations of density in relation to the growth and development of the fruit.

Similarly, areas of 'peak' discharge or deposition were not persistent in their positions, indicating that they do not represent a reconginisable pattern of maturation in the fruit associated with the ageing process(Fig.1). *P. betulinus*(Fig.2) showed far less variation in spore density than was recorded for *C. versicolor.* Again there was no uniform gradation in the variations which might be attributed to age and position of the area in relation to the development of the fruit as a whole. This was also found with detached sporocarps.

With *P. dryinus* dense spore deposits were obtained which showed a relatively small(C.5 fold) variation over the whole area of the fruit. The isospore contours indicated a relatively large area of lower spore production, corresponding to the older parts of the fruit and smaller, more peripheral(and therefore younger) areas of greater spore production.

In all the polypores investigated spore production over the surface of the hymeniun is not uniform. High spore density areas were recorded in both peripheral(young) and inner(older) areas of the fruit, and the distribution pattern varies from time to time, even within the same sporocarp. Although the hymenial surface cannot be viewed in the same way as that of *Panaeolus,* nevertheless the indications are that hymenia in many fungi will show more or less irregular patterns of maturation, comparable with those which are recognised in the mottling effect of *Panaeolus* gill(Buller 1922).

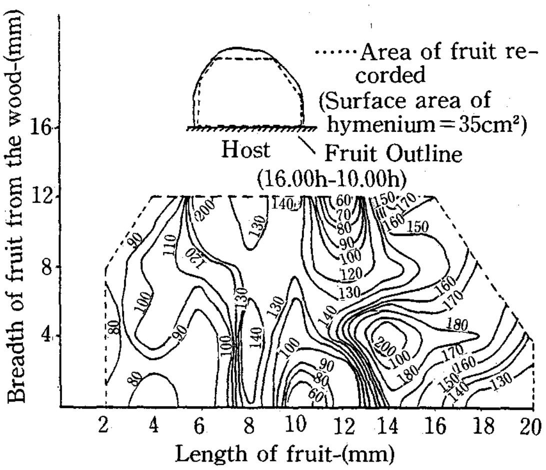

Fig.1. *Coriolus versicolor* fruit.

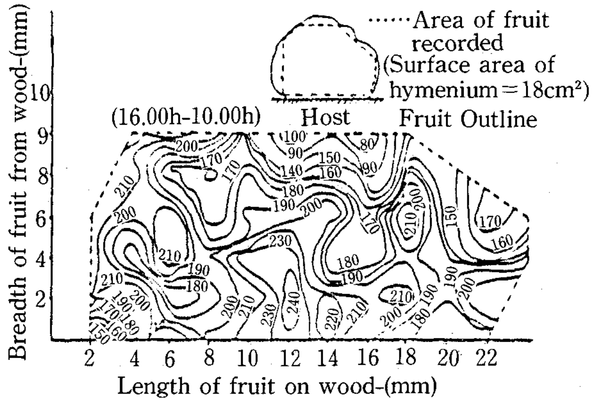

Fig.2. *Piptoporus betulinus* fruit.

The results show that high spore production is not restricted to any particular part of the hymeniun, indicating that the age of any part of the hymeniun does not necessarily determine the rate of spore discharge, even in a small and young fruiting body. It also shows that spore discharge begins soon after the hymenium begins development. This agrees with the observation of Buller(1909) that spore discharge begins soon after fruit bodies have expanded horizontally and the hymenium begins its development.

With detached sporocarps the pattern of spore production was similar to those attached to their hosts. However spore production without the host is limited to a shorter period since the sporocarp needs water and nutrient supply from the host(Ingold 1971).

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