

STUDIES ON HETEROTHALLISM—III.

LENTINUS SUBNUDUS BERK. & *LENTINUS PRAERIGIDUS* BERK.

Investigations on the phenomenon of heterothallism in Agaricaceae has been reviewed quite extensively by previous workers like Whitehouse (1949), Quintanilha and Pinto-Lopes (1950) and Raper (1953). It appears that as far as the genus *Lentinus* is concerned very little work has been done in this direction. *Lentinus tigrinus* (Bull.) Fr., the only species of the genus, has been worked out by Quintanilha *et al* (1941) and they have reported it to be 'heterothallic' and 'tetrapolar'. It has already been mentioned in an earlier publication of Banerjee and Samadder (1957) that investigations concerning the sexual phenomena in Indian Hymenomycetes are now in progress in this laboratory. The results obtained so far on two other species of *Lentinus*, viz., *L. subnudus* and *L. praerigidus* are given below.

Polysporous cultures of both *L. subnudus* and *L. praerigidus* revealed the presence of numerous clamp-connexions while these are entirely absent in the mycelia originating from single spores. This induces the writers to think that they might be heterothallic in nature.

To determine the type of heterothallism and the number of sex groups present, twenty monosporous cultures of each fungus were made following the usual dilution method from spores obtained from a single sporophore. The sporophores were collected from a timber-yard of 'alcutta' while growing on logs of *Shorea robusta* Gaertn. f. Of the twenty monosporous cultures of each fungus lacking clamp-connexions, twelve were paired in all possible combinations on 2.5% malt-agar slants and they were allowed to grow under ordinary conditions of temperature (28°–30°C.) and diffused light of the laboratory. After one month, the line of contact between the paired mycelia was carefully examined for the presence of clamp-connexions. The results of this examination are recorded in Tables 1 and 2. The sign 'plus' indicates the presence of clamp-connexions and the sign 'minus' indicates their absence.

From Tables 1 and 2 it is evident that both the species are 'heterothallic' and sexually 'bipolar'. In both the cases, spores obtained from a single sporophore fall into two groups and they can only form clamp-connexions when members of one group unite with the members of the opposite group. It may be assumed that the sexual compatibility of these two species is governed by one pair of factors, Aa, located on the same locus of different chromosomes and behaves in a similar manner as do the heterothallic species of Mucorales.

Incidentally, three principal types of visually recognisable interactions between monosporous mycelia of both *L. subnudus* and *L. praerigidus* have been recorded which are as follows:

Neutral.—The two monosporous cultures meet freely to form a homogeneous mat so that the identity of the interacting mycelia is lost. There is no line of demarcation between the two uniting mycelia and no secondary mycelium with clamp-connexions is produced.

Compatible.—The two monosporous mycelia meet and intermingle in such a way that the identity of the interacting mycelia is completely obliterated. A homogeneous mat with typical secondary mycelium having clamp-connexions is also produced.

Table 1. *Pairings of 12 monosporous mycelia derived from a single sporophore of Lentinus subnudus.*

	1	2	4	5	7	11	12	3	6	8	9	10
1	—	—	—	—	—	—	—	+	+	+	+	+
2	—	—	—	—	—	—	—	+	+	+	+	+
4	—	—	—	—	—	—	—	+	+	+	+	+
5	—	—	—	—	—	—	—	+	+	+	+	+
7	—	—	—	—	—	—	—	+	+	+	+	+
6	—	—	—	—	—	—	—	+	+	+	+	+
12	+	—	—	—	—	—	—	+	+	+	+	+
3	+	+	+	+	+	+	+	—	—	—	—	—
6	+	+	+	+	+	+	+	—	—	—	—	—
8	+	+	+	+	+	+	+	—	—	—	—	—
9	+	+	+	+	+	+	+	—	—	—	—	—
10	+	+	+	+	+	+	+	—	—	—	—	—

Table 2. *Pairings of 12 monosporous mycelia derived from a single sporophore of Lentinus praerigidus.*

	2	3	4	5	6	12	1	7	8	9	10	11
2	—	—	—	—	—	—	+	+	+	+	+	+
3	—	—	—	—	—	—	+	+	+	+	+	+
4	—	—	—	—	—	—	+	+	+	+	+	+
5	—	—	—	—	—	—	+	+	+	+	+	+
6	—	—	—	—	—	—	+	+	+	+	+	+
12	—	—	—	—	—	—	+	+	+	+	+	+
1	+	+	+	+	+	+	—	—	—	—	—	—
7	+	+	+	+	+	+	—	—	—	—	—	—
8	+	+	+	+	+	+	—	—	—	—	—	—
9	+	+	+	+	+	+	—	—	—	—	—	—
10	+	+	+	+	+	+	—	—	—	—	—	—
11	+	+	+	+	+	+	—	—	—	—	—	—

Antagonistic.—The two monosporous mycelia meet but form a line of demarcation between them. Typical secondary mycelium with clamp-connexions is not produced.

Of the two species, *Lentinus subnudus* exhibits only the first two types of reactions, viz., neutral and compatible and hence behaves normally like a typical bipolar species. *Lentinus praerigidus*, on the other hand, presents all the three types of reactions, viz., neutral, compatible and antagonistic. In spite of the last named reaction, which is characteristically noticeable in tetrapolar species, *Lentinus praerigidus* is considered as a 'bipolar' one, based on the presence or absence of clamp-connexions in the paired cultures.

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