with hyaluronidase shows no alteration in the staining intensity with alcian blue at pH 2·5 nor is the metachromasia lost with Azure A at high pH. Thus the mucous cells elaborate neutral, sulfo- and sialomucins.

During pregnancy the mucous cells show the same histochemical reactions as those of the non-pregnant bat, but the intensity of the reactions with PAS, AB (pH 1·0 and 2·5) and AF is increased than that observed during the non-pregnant condition. This indicates an increase in the concentration of mucins (Fig. 5).

Amongst the various bats studied, Bartholin's gland, which corresponds to the Cowper's gland of male, has been observed as separate entities only in two Pipistrellid bats *Pipistrellus dormeri*[1] and *Pipistrellus mimus mimus*[2] and in *Chalinolobus gouldi*[3]. The histological structure of tubuloalveolar gland of *Pipistrellus dormeri* is similar to that reported in human beings[6,7].

The presence of sialomucins has been reported in the bulbourethral gland of mice, rats and guineapig and in the vestibulares majores of human foetuses by Halbhuber and Gunther[8] and in cattles by Friess[9]. Sialomucins are also reported in the Bartholin's gland of this bat together with neutral and sulfomucins.

The epithelium of the greater vestibular glands of cat is found to be rich in mucin shortly before estrus and during the later half of pregnancy but declining during lactation[10]. Marked changes in the histological structure correlated with the reproductive cycle has been reported in the Bartholin's gland of hyaena[11]. In human beings, Bloom and Fawcett reported that this gland undergoes involution after the attainment of puberty[6]. Marked changes in the mucin content is observed in the bat studied here, the amount increasing progressively during pregnancy.

In human beings the Bartholin's glands pour out clean thin mucous secretion to lubricate the vulva at coitus[12,13]. Similarly, the mucin elaborated by the Bartholin's glands of bat may probably act as a natural lubricant of the vagina at coitus during sexual excitement, and during parturition.

The authors are thankful to Dr. A. Gopalakrishna for guidance throughout this work.

Department of Zoology, Institute of Science, Nagpur 440 001,
*August* 27, 1979.

(Mrs.) V. M. Sapkal.
M. M. Gadegone.

1. Sapkal, V. M., *Ph.D. Thesis* submitted to Nagpur University, Nagpur, 1973.
2. Gopalakrishna, A., Thakur, R. S. and Madhavan, A., *J. Zool. Soc. India*, 1975, Dr. B. S. Chauhan Comm. Vol. 225, 1975.
3. Kitchener, D. J., *Aust. J. Zool.*, 1975, **23**, 29.
4. Spicer, S. S., Leppi, T. J. and Stoward, P. J., *J. Histochem. Cytochem.*, 1965, **13**, 599.
5. Lillie, R. D. and Fullmer, H. W., *Histopathologic Technique and Practical Histochemistry*, 4th ed., McGraw-Hill, New York, 1976, p. 948.
6. Bloom, W. and Fawcett, D. W., *A Text-Book of Histology*, W. B. Sounders Company, Philadelphia, U.S.A., 1975, p. 904.
7. Ham, A. W., *Histology*, 3rd ed., J. B. Lippin Co., Campel, Philadelphia, U.S.A., 1957, p. 759.
8. Halbhuber, J. and Gunther, G., *Acta Histochem.*, 1965, **21**, 1/43, 143.
9. Friess, A. E., *Acta Histochemica*, 1972, **44**, 62.
10. Barrington, G. W., *Int. Mschr. Anat. Physiol.*, 1913, **30** (Quoted by Marshall, F. H. A., In *The Physiology of Reproduction*, 2nd ed., London, 1922).
11. Mathews, L. H., *Philos. Trans. B*, 1941 *a*, p. 230.
12. Clyne, W. D. G., *A Text Book of Gynaecology and Obstetrics*, Longmans, Green and Co., Ltd., London, 1963, p. 13.
13. Mallik, M. K., *Text-Book of Gynaecology*, Oxford and IBH Publishing Co., New Delhi, 1971, p. 3

## INTERFERTILITY STUDY OF *TRAMETES FLOCCOSA* BRES.

The type of mating system was considered by Nobles[7] as an important character for solving taxonomic problems of Polyporaceae and it is now widely accepted by the mycologists that fungi showing different types of interfertility cannot belong in the same genus[3,4,9]. Although the type of interfertility of several Basidiomycetes have been determined[2–6], *Trametes floccosa* Bres. has not been studied, so far, from this point of view. The present paper communicates the result of interfertility test of *T. floccosa*, a wood-rotting polypore of India.

The sporophore of *T. floccosa* was collected from Santiniketan, West Bengal, India, on a living tree of *Ficus religiosa* L. Twenty-five monosporous cultures were made from the spores of this sporophore following the usual dilution method. When each of the 25 monosporous cultures showed good growth they were checked carefully for clamp connections. The absence of clamp connections was taken as confirmation of their monokaryotic character. Finally 20 monokaryotic cultures were taken into consideration and were paired among themselves in all possible combinations on 2·5% malt agar slants. The culture tubes were then incubated at room temperature (28 ± 2° C) for about a fortnight and the inoculum from the line of contact between the paired mycelia was examined under a microscope. In some pairings clamps were noticed while in others no clamps were formed.

TABLE I

*Pairings of 20 monosporous mycelia derived from a single sporophore of* Trametes floccosa *Bres.*

| | | $A_1B_1$ | | | | | | $A_2B_2$ | | | | | $A_1B_2$ | | | | | $A_2B_1$ | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 3 | 4 | 6 | 11 | 17 | 2 | 5 | 8 | 9 | 18 | 10 | 12 | 15 | 19 | 21 | 13 | 14 | 16 | 20 |
| $A_1B_1$ | 1 | − | − | − | − | − | − | + | + | + | + | + | − | − | − | − | − | − | − | − | − |
| | 3 | − | − | − | − | − | − | + | + | + | + | + | − | − | − | − | − | − | − | − | − |
| | 4 | − | − | − | − | − | − | + | + | + | + | + | − | − | − | − | − | − | − | − | − |
| | 6 | − | − | − | − | − | − | + | + | + | + | + | − | − | − | − | − | − | − | − | − |
| | 11 | − | − | − | − | − | − | + | + | + | + | + | − | − | − | − | − | − | − | − | − |
| | 17 | − | − | − | − | − | − | + | + | + | + | + | − | − | − | − | − | − | − | − | − |
| $A_2B_2$ | 2 | + | + | + | + | + | + | − | − | − | − | − | − | − | − | − | − | − | − | − | − |
| | 5 | + | + | + | + | + | + | − | − | − | − | − | − | − | − | − | − | − | − | − | − |
| | 8 | + | + | + | + | + | + | − | − | − | − | − | − | − | − | − | − | − | − | − | − |
| | 9 | + | + | + | + | + | + | − | − | − | − | − | − | − | − | − | − | − | − | − | − |
| | 18 | + | + | + | + | + | + | − | − | − | − | − | − | − | − | − | − | − | − | − | − |
| $A_1B_2$ | 10 | − | − | − | − | − | − | − | − | − | − | − | − | − | − | − | − | + | + | + | + |
| | 12 | − | − | − | − | − | − | − | − | − | − | − | − | − | − | − | − | + | + | + | + |
| | 15 | − | − | − | − | − | − | − | − | − | − | − | − | − | − | − | − | + | + | + | + |
| | 19 | − | − | − | − | − | − | − | − | − | − | − | − | − | − | − | − | + | + | + | + |
| | 21 | − | − | − | − | − | − | − | − | − | − | − | − | − | − | − | − | + | + | + | + |
| $A_2B_1$ | 13 | − | − | − | − | − | − | − | − | − | − | − | + | + | + | + | + | − | − | − | − |
| | 14 | − | − | − | − | − | − | − | − | − | − | − | + | + | + | + | + | − | − | − | − |
| | 16 | − | − | − | − | − | − | − | − | − | − | − | + | + | + | + | + | − | − | − | − |
| | 20 | − | − | − | − | − | − | − | − | − | − | − | + | + | + | + | + | − | − | − | − |

The result of pairings has been presented in Table I where (+) and (−) signs indicate the presence or absence of clamp connections respectively.

From Table I it will be evident that the single spore cultures from one sporophore of *T. floccosa* fall into four groups on the basis of their ability to form clamp connections which mean that the species has the tetrapolar type of interfertility with allelomorphs for heterothallism at two loci. The genetic constitutions of the four groups have been designated as $A_1B_1$, $A_2B_2$, $A_1B_2$ and $A_2B_1$. As expected in a tetrapolar species clamp connections occur only in pairings between $A_1B_1 \times A_2B_2$ or $A_1B_2 \times A_2B_1$, *i.e.*, between mycelia having no common allele.

It may be mentioned here that *T. floccosa* causes white rot[1]. Therefore, *T. floccosa* lends further support to the hypothesis of Nobles[8] that in the Polyporaceae, the species which possess bipolar type of interfertility are associated with brown rots, while the species showing tetrapolar type of interfertility cause white rots.

The author is greatly indebted to Dr. Anjali Roy, Lecturer in Botany, Visva-Bharati University, for her guidance and to the Council of Scientific and Industrial Research, New Delhi, for providing financial assistance by a Senior Research Fellowship.

Department of Botany, A. B. DE.
Visva-Bharati University,
Santiniketan 731 235 (W.B.),
*December 26, 1979.*

1. Bakshi, B. K., *Indian Polyporaceae (On Trees and Timber)*, I.C.A.R., New Delhi, 1971.
2. Banerjee, S. N. and Samadder, K. R., *Sci. and Cult.*, 1957, **22**, 578.
3. Burdsall, H. H. and Lombard, F. F., *Mem. N.Y. Bot. Gard.*, 1976, **28**, 16.
4. Ginns, J. H., *Can. J. Bot.*, 1970, **48**, 1039.
5. Nobles, M. K., *Canad. J. Res.*, 1943, **21**, 211.
6. —, *Can. J. Bot.*, 1951, **29**, 147.
7. —, *Ibid.*, 1958, **36**, 883.
8. —, In *Evolution in the Higher Basidiomycetes*, Ed. R. H. Petersen, The University of Tennessee Press, Knoxville, 1971, p. 169.
9. Van der Westhuizen, G. C. A., *Can. J. Bot.*, 1963, **41**, 1487.