

Relationship between *Merulius lacrymans* and *M. himantioides*

THE relationship between the brown-spored species under *Merulius* is not certainly known. The two species, *M. lacrymans* (Wulf.) Fr. and *M. himantioides* Fr., are regarded by Cooke¹ as morphologically alike but distinguishable on the basis of physiological activity and habitat. He therefore considers them as varieties under the same species. He has, however, stated that "more than one species may be indicated if unsuccessful monospore culture pairings are used as indicators of specific barriers". This criterion is used for studying the relationship between *M. lacrymans* and *M. himantioides*.

M. lacrymans was collected from wood of *Pinus sylvestris* in buildings in Denmark at Kibaek, Jutland and at Copenhagen. The latter collection was flown over to Dehra Dun for study. In both our Institutes, the fungus was brought to polyspore and monospore cultures. The spores germinated within 12–15 days after they were planted on 2.5 per cent malt agar at pH 5.0 at 18° C. During germination, the spore usually put out a vesicle which finally produced a germ tube. Clamp connexions, which were common in the polysporous mycelium of *M. lacrymans*, were absent in the monospore mycelium of the fungus, in the hyphae of which simple septa were present. When two compatible monospore mycelia were paired, clamps developed on the mating hyphae. In incompatible matings, clamps did not develop. By pairing the monospore mycelia in all possible combinations, they were found to fall into four sexual groups. *M. lacrymans* was thus found to be heterothallic and tetrapolar.

M. himantioides was collected from the open forests in the Western Himalayas (above 6,000 ft.) in India growing on bark of conifers (*Cedrus deodara* and *Picea morinda*). In Denmark, the fungus was collected from floor boards of pine (*P. sylvestris*) in a house at Hundested, North Sealand. Polyspore and monospore cultures of the fungus were obtained from fruit bodies collected from both localities. Germination of spores occurred freely within two days on 2.5 per cent malt agar at pH 5.0 at 18° C. On germination, the spore put out a germ tube directly. In this it differed from *M. lacrymans*, where the spore usually germinates by production of a vesicle. In *M. himantioides*, the single-spore cultures did not possess clamps in the hyphae, which occurred only in polyspore cultures. The spores fell into four sexual groups, and the fungus is heterothallic and tetrapolar.

Crosses were then made between the monospore cultures of *M. lacrymans* and *M. himantioides* by pairing the four sexual strains of the former with those of the latter in all possible combinations. In this test, the Jutland and Copenhagen collections of *M. lacrymans* were paired respectively with North Sealand and Indian collections of *M. himantioides*. Clamps did not develop in any of the pairings, proving that the two fungi are mutually intersterile.

M. lacrymans differs from *M. himantioides* in habitat, the former being usually domestic and the latter wild. The two fungi also differ in the morphology of the sporophore and in culture, particularly in the texture and colour of the mat and formation of profuse liquid drops in *M. himantioides* and their absence in *M. lacrymans*. In culture the optimum growth of *M. lacrymans* occurs at about 18° C., while with *M. himantioides* it is at about 28° C., at which *M. lacrymans* ceases to grow. These

differences are believed to be sufficiently diagnostic for identifying the two fungi as distinct species, and this is confirmed by genetic studies as reported above. A detailed account of this work will be published later.

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¹ Cooke, Wm. B., *Mycologia*, 49, 197 (1957).

Occurrence of Spermatophores in the Genus *Dolops* (Crustacea : Branchiura)

ACCORDING to all those who have defined the group, one of the diagnostic characteristics of the Branchiura is the absence of spermatophores. Indeed, the mating habits of members of the genus *Argulus* are sufficiently well known to enable it to be stated that here no such structures are involved in sperm transfer, and recent unpublished observations on various species of the genus *Chonopeltis* (some as yet undescribed) indicate that here also no such structures are found. On the other hand, the existence of spermatophores in the genus *Dolops* has recently been established.

These structures were first observed in Africa during the course of an examination of specimens of *Dolops ranarum* (Stuhlmann), which is the only known African representative of an essentially South American genus. Later, when an opportunity was taken to examine the rather small collection of South American species of *Dolops* in the British Museum (Natural History), a single female of *D. geayi* (Bouvier) was found to be carrying a spermatophore, thus suggesting that the employment of these structures may be a regular feature of the reproductive process throughout the genus.

The following remarks apply particularly to *D. ranarum*; but the spermatophore of *D. geayi* appears to be essentially similar to that of its African relative.

Spermatophores, which bear a most striking resemblance in form, colour and lustre to pearls, are attached singly in the mid-ventral line of the female at the base of, and just behind, the fourth pair of legs. Their size appears to vary according to the size of the male which produced them, and possibly according to other and, as yet, unknown factors. The length of the longest axis of these subspherical structures may be as much as 560 μ .

Transference of spermatophores from male to female has been observed, and is a relatively simple process, as might reasonably have been inferred from the almost complete lack of accessory copulatory organs in *D. ranarum*, which contrasts strongly with the presence of extremely complex organs in the males of all known species of *Argulus* and *Chonopeltis*.

While the purpose of this communication is essentially to announce the discovery of spermatophores, a note of caution must be sounded to those who would cite their existence as evidence of a close relationship of this taxonomically enigmatical group to the Copepoda. It is true that the possession of spermatophores by *Dolops* suggests that the Branchiura is quite distinct from the Branchiopoda with which some would group it. On the other hand, however, spermatophore formation need not necessarily represent the