apples were treated with sucrose and acetate labelled with carbon-14.

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Is *Nectria haematococca* Berk. and Br. the Perfect Stage of *Fusarium oxysporum* Schl. forma *pisi* (Lindf.) S. and H.?

IN a recent communication[1], Dr. E. W. Buxton reported the discovery of mature perithecia in a nutritionally deficient mutant isolate of *Fusarium oxysporum* Schl. forma *pisi* (Lindf.) S. and H. after ultra-violet irradiation. These perithecia were shown to be the perfect stage of this particular isolate and were identified as *Nectria haematococca* Berk. and Br. (=*Hypomyces solani* Rke. and Berth. emend. S. and H.).

As *Nectria haematococca*[2,3] has long been known to be the perfect stage of another species of *Fusarium*, namely, *F. solani* (Mart.) App. and Wr. emend. S. and H., classified in the section Martiella, I was surprised to learn that this same *Nectria* sp. had been found to be the perfect stage of *F. oxysporum* f. *pisi*, classified in the section Elegans. Furthermore, this phenomenon was quite unexpected as it has always been assumed by *Fusarium* taxonomists that, should a perfect stage be formed by a representative of the section Elegans, it would be a *Gibberella* sp. This assumption is based on the fact that the perfect stage characteristic of each of the sections, Lateritium and Liseola, which are most closely related to the section Elegans, is a *Gibberella*.

As isolates of *Fusarium* species that form their perfect stage in culture have been of particular interest to me for several years, duplicate subcultures of the homothallic isolate of *F. oxysporum* f. *pisi*, in which mature perithecia of *Nectria haematococca* were found by Dr. Buxton, were obtained for the purpose of observation and study from the Commonwealth Mycological Institute, Kew, England, through the courtesy of Dr. C. Booth. When they were received by me they appeared to be identical and in each of them the red perithecia characteristic of *Nectria haematococca* could be distinguished readily.

I followed my usual procedure in examining and identifying isolates of *Fusarium*[4]. Several transfers, using the mass culture method, were made from one of the sub-cultures to slants of potato sucrose agar. Numerous monosporous cultures were established by transferring single macroconidia of the *Fusarium* stage present in one of the sub-cultures as received, and others by transferring single ascospores taken from the mature perithecia of *Nectria haematococca* present in the sub-culture. After these various cultures had been kept at room temperature in the laboratory for about ten days, they were examined macroscopically and microscopically and all were identified as *F. solani*, not as *F. oxysporum*.

Hildreth[5] reported recently that he sometimes found it difficult to distinguish between certain isolates of *F. oxysporum* f. *pisi* race 2 and *F. solani* f. *pisi*. Close similarities in the virulence and development of symptoms exhibited by these two species of *Fusarium* were evident to him. For example, *F. solani* f. *pisi* invaded the upper stem of the pea plant with vascular penetration resembling that accomplished by *F. oxysporum* f. *pisi* race 2. Similarly, *F. oxysporum* f. *pisi* produced a root rot accompanied by severe cortical decay in certain varieties of peas identical with that effected by *F. solani* f. *pisi*.

It is my opinion that the culture in which perithecia of *Nectria haematococca* were found by Dr. Buxton, is an isolate of *F. solani* f. *pisi* (Jones) S. and H. that is apparently capable of vascular penetration similar to that produced by *F. oxysporum* f. *pisi*. As the perfect stage of *F. solani* f. *pisi* has not been known previously, its occurrence has been reported for the first time by Dr. Buxton.

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CYTOLOGY

Nuclear Phenomena in *Trametes cingulata* Berk.

INITIATION of dikaryophase has been studied in considerable detail by a number of workers[1] on various species of hymenomycete. I have studied the nuclear phenomena in the life-history of *Trametes cingulata* Berk.

For the study of the nuclear conditions in the basidia, small rectangular pieces (5 mm. × 5 mm.) of fresh fruit bodies of *T. cingulata* with well-developed pore-tubes were fixed while growing on the living host in Nature. Different killing and fixing reagents were tried. Of these, the Bouin–Allen fixative gave the most suitable preparations. The materials were fixed in two lots and during different intervals of time, one between 12.30 and 2.30 p.m. and the other between 12 and 1 a.m. Washing, dehydration and embedding were done by following the standard schedule. Sections of 8–10μ in thickness were cut and were found to be suitable for observations. Of the stains, Heidenhain's iron–hæmatoxylin gave the most satisfactory result. Nuclear conditions in spores, germinating spores and in the primary and secondary mycelia were studied from whole preparations on slides, following Kniep's[2] agar-film technique.

A mature basidium is always found to be tetrasterigmatic, quadrisporous and broadly clavate in shape. The young basidia, on the other hand, show all stages of transition from slightly inflated terminal hyphal cells to broadly clavate mature ones. At the beginning, they are always binucleate and the two small unpaired nuclei are found lying one above