# Homothallism in *Nectria galligena*[1]

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*Cylindrocarpon heteronema* (Berk. & Br.) Wollenw. was obtained from perithecia of *Nectria galligena* Bres. which occurred on the bark of galled branches of *Swietenia mahagoni* Jacq. collected in Fort Lauderdale, Florida. Hyphal tips were taken from germ tubes of single cells from multiseptate macroconidia and from each cell of germinating ascospores. Nuclear staining revealed that the cells of the macroconidia and ascospores are uninucleate. All hyphal tips produced perithecia on carnation leaf pieces resting on water agar. This study establishes the homothallic nature of this fungus.

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Le *Cylindrocarpon heteronema* (Berk. & Br.) Wollenw. a été obtenu à partir de périthèces de *Nectria galligena* Bres. récoltés sur l'écorce de branches galleuses de *Swietenia mahagoni* Jacq. dans la région de Fort Lauderdale, en Floride. Des extrèmités d'hyphes ont été prélevées à partir des tubes germinatifs des cellules individuelles de macroconidies multiseptées ainsi que de chacune des cellules d'ascospores en germination. La coloration des noyaux révèle que les cellules provenant des macroconidies et des ascospores sont uninucléées. Toutes les extrémités d'hyphes ont conduit à la production de périthèces sur des morceaux de feuille d'oeillet reposant sur de l'eau gelosée. Cette étude confirme la nature homothallique de ce champignon.

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## Introduction

In October 1982, superficial perithecia of *Nectria galligena* Bres. were observed on the bark of galled branches of *Swietenia mahagoni* Jacq. These perithecia yielded the imperfect state *Cylindrocarpon heteronema* (Berk. & Br.) Wollenw. Because the literature on this fungus does not appear to contain any information on its sexual characteristics, this study was undertaken to ascertain the homo- or hetero-thallic nature of *N. galligena.*

## Materials and methods

With fine-pointed, flamed forceps, perithecia were picked and transferred to a drop of sterile deionized water on a flamed slide. The perithecia were washed in a series of such drops, placed on sterile filter paper, blotted dry. and allowed to grow on acidified potato dextrose agar (APDA). The potato dextrose agar (PDA) was prepared from the broth of 200 g of freshly peeled, diced, and boiled Irish potatoes supplemented with 20 g dextrose, 1 g $KH_2PO_4$, and 18 g Difco bacto agar, and made up to 1 L with deionized water. Sixty drops of 50% lactic acid were added to 1000 mL of cooled (50°C) PDA. Single conidia were obtained using the method of Hansen and Smith (3). Thirty hyphal tips taken from distal end cells of 15 multiseptate germinating macroconidia, and 6 hyphal tips taken from 2 additional germinating macroconidia (3 hyphal tips per conidium) were individually placed on carnation leaf water agar (CLA) as described by Fisher et al. (2). Single ascospores were also obtained using the method of Hansen and Smith (3). Ten hyphal tips were taken from each cell of five germinating ascospores and individually placed on CLA. Carnation leaf pieces were previously sterilized by propylene oxide fumigation (4). The cultures were grown at 26.5 ± 0.5°C, and exposed to fluorescent light (Westinghouse F20T12/CW) at an intensity of approximately 3000 1x for 12-h intervals.

TABLE 1. Macroconidia measurements

| Macroconidia | Length, μm | Width, μm |
|---|---|---|
| 1-septate | | |
| 2-septate | | |
| 3-septate | | |
| 4-septate | | |
| 5-septate | | |
| 6-septate | | |
| 7-septate | | |

A rapid staining technique employing 1% aniline blue in 50% glycerin as described by Tu and Kimbrough (7) was used to study the nuclear condition of this fungus.

## Results and discussion

All hyphal tips produced fertile perithecia on CLA within 3–4 weeks. Perithecia occurred in greater numbers on carnation leaf pieces than on the surrounding water agar. Nuclear staining revealed that the cells of the macroconidia and ascospores were uninucleate. This study establishes the homothallic nature of this fungus.

Perithecia exuding ascospores were measured. One hundred and eight specimens were (288–) 465 (–695) μm high by (219–) 327 (–417) μm diam. One hundred and sixty ascospores were measured under oil immersion. They were (13.9–) 18.2 (–23.8) μm long by ( 4.0–) 5.0 (–6.9) μm wide at the septum, which comes close to the measurements of Lohman et al. (11.0–) 16.4 (–25.0) μm × (4.0–) 6.7 (–9.0) μm) (5) for *Nectria galligena,* the mean ascospore length and width measured by Richter (16.4 × 6.6 μm and 18.0 × 6.8 μm for *N. galligena* Bres. and *N. galligena* Bres.

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var. *major* Wollenw., respectively (6)), and the mean ascospore length arranged according to host by Ashcroft (1).

Microconidia hyaline, oval to ellipsoid, 0−1 septate, measuring (3.5−) 6.5 (−13.2) μm × (1.5−) 2.4 (−5.3) μm and (10.4−) 13.5 (−16.8) μm × (3.0−) 3.5 (−4.0) μm for the 0- and 1-septate microconidia, respectively.

Macroconidia hyaline, straight or curved with rounded ends, with measurements as indicated in Table 1.

The culture of *C. heteronema* was deposited in the American Type Culture Collection, 12301 Parklawn Drive, Rockville, Maryland, 20852, as ATCC 48896; and in the Florida Type Culture Collection, 1911 S.W. 34th Street, Gainesville, Florida, 32608, as FTCC 996; and the voucher material was deposited at the herbarium, Department of Botany, University of Florida, Gainesville, Florida, 32611, as FLAS F53510.

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