Typhula Tour '97

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I am going to tell you a story about Typhula Tour '97, my 3,000+ mile pursuit of the evil snow mold pathogens *Typhula incarnata* and *T. ishikariensis* across the beautiful state of Wisconsin. Typhula snow molds have been damaging golf courses even before the O.J. Noer Era. Since the Noer Era there have been tremendous improvements in our understanding of Typhula snow molds. This research will add to our current knowledge base and will hopefully help prevent extensive damage to valuable turf and reduce fungicide usage.

The aim of the 'Typhula Tour' is to determine the distribution of the snow mold fungi throughout Wisconsin, to characterize some of their differences and to determine if these two diseases should be managed differently. The following summary of 'Typhula Tour' is condensed from my research proposal.

Title: Distribution of Typhula species in Wisconsin golf courses

Need for research:

Based on a biogeographical analysis of *Sclerotinia sclerotiorum* (cause many row crop diseases) Reichert (1958) suggested that fungal plant pathogens are geographically limited. Reichert considered this approach useful in describing the ecology of the pathogen and found this information useful in disease management. A biogeographical description of a fungi's distribution pattern can be useful in locating unfavorable environments for disease and predicting disease development. It is commonly believed that *Typhula* species are geographically limited by climate. Furthermore, *T. incarnata* and the *T. ishikariensis* complex respond differently to the environment and to the chemicals used to control them (Matsumoto, 1992, Tani and Beard, 1997). Speckled snow mold (caused by *T. ishikariensis* complex) has been reported as more difficult to control than gray snow mold (caused by *T. incarnata*) in Wisconsin (Worf, 1988a and 1988b). In Wisconsin, it is imperative to the successful management of gray and speckled snow molds that we know which pathogens are present and where they are located.

Research Methods

Objective: Determine the distribution *T. incarnata* and the *T. ishikariensis* complex in Wisconsin golf courses.

Hypothesis: *T. incarnata* is found throughout Wisconsin while the *T. ishikariensis* complex is mainly found in the northern half of the state.

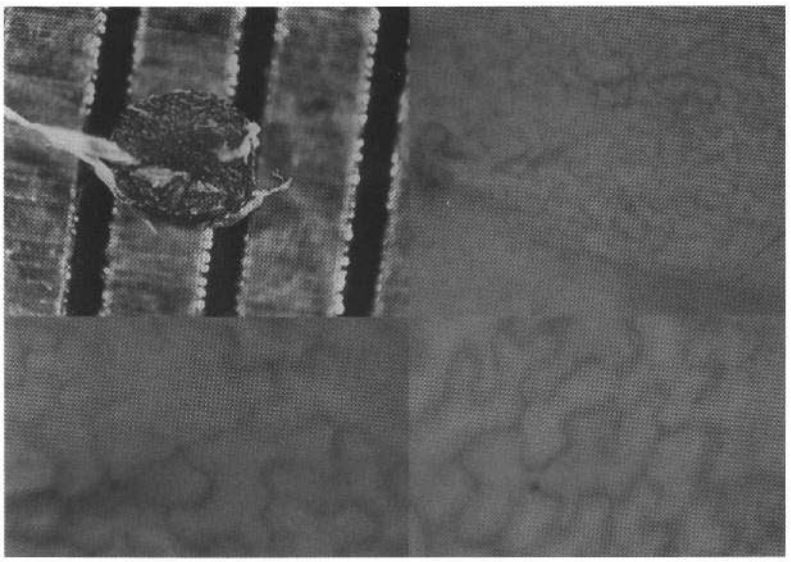

FIGURE 1 A.

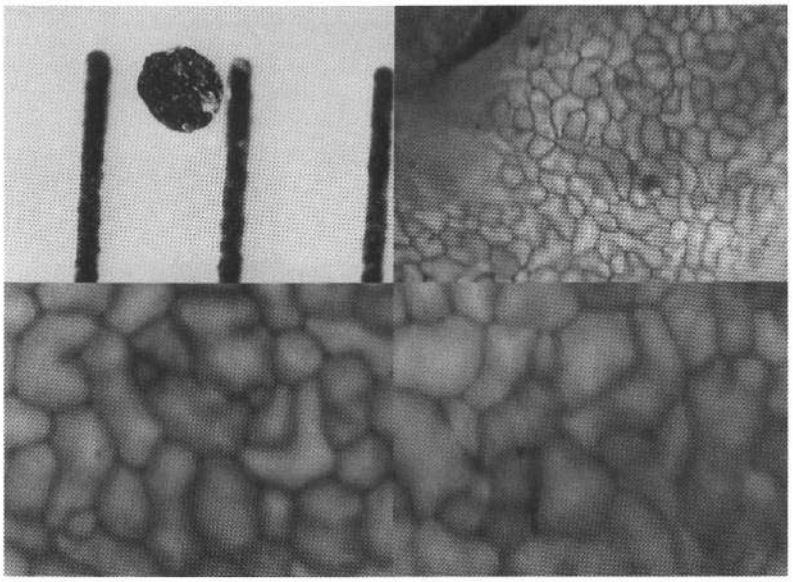

FIGURE 1 B.

Figure 1. Sclerotia of *T. incarnata* (A) and *T. ishikariensis* (B). Upper left scale is in millimeters and going clockwise are the rind cell patterns of 400x, 1000x and 1000x. *(Courtesy J. Gregos).*

Rationale: Matsumoto et al. (1982) found that the distribution of *T. ishikariensis* is strongly restricted to areas with prolonged snow cover duration. It is generally believed that *T. incarnata* is distributed throughout Wisconsin and that the *T. ishikariensis* complex is found in the northern half of the state. My research will document the distribution patterns of these fungal pathogens.

Experimental approach: A systematic random sampling technique was used to estimate the distribution of *Typhula* species. The sampling frame divides the State into three climate zones which is based on annual snowfall, USDA plant hardiness zones, estimated annual snow cover days and frost depth zones. Within these three zones, seven golf courses within a 70 kilometer radius from Madison (zone 1), Stevens Point (zone 2) and Woodruff (zone 3) were randomly selected to survey. Five snow mold samples were taken from four different holes for a total of twenty samples per course. Sclerotia are being taken from these samples to identify the species and biotypes. One way to identify these species is by their sclerotia (Figure 1). The sizes, color and sclerotial skin cell patterns (rind cells) aid in identification. Sclerotia of *T. incarnata* start out pale when the snow melts, turn pink, darken to a reddish-brown, are globular to flattened, usually firmly attached to plant tissue, smooth when fresh, wrinkled when dry, 0.5 to 5mm in diameter and gelatinous and resilient in texture when soaked in water. The sclerotia of *T. ishikariensis* are abundantly produced, readily detached from plant tissue, globose to slightly flattened, light brown to almost black and 0.2 to 2 mm in diameter.

Impact on future research: Hopefully this research will reveal what species we have, where these species are found, how they behave and how they should be managed. Another important impact is that this gained knowledge will be used to help locate future representative management trial sites.

'Typhula Tour' highlights: I got to drive Jeff's T-Bird, saw American bald eagles soar at Dan's, saw a red pine in the middle of a green at Mike's, visited the northernmost golf course in Wisconsin and met a lot of cool people. But most of all, I collected more than 460 samples in 21 days. Please tune in next time for the exciting results of this survey.

Literature cited

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