

Evaluation of the sensitivity of selected ornamentals to four isolates of *Fusarium oxysporum* recovered from naturally infected ornamentals

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BACKGROUND

This research was conducted to evaluate the concept that *Fusarium oxysporum* f.sp. isolated from a naturally infected host could infect hosts other than which the original isolation was made. It has been considered a fact that a *Fusarium oxysporum* f.sp. isolated from one host was specific to that host and not able to infect other hosts not of the same species. In many cases the specific designation of forma specialis (f.sp.) was based upon a single isolation and no host range study to validate the f.sp. designation. The practice of identifying numerous f.sp. and associating them with a particular host does a disservice to the Nursery Industry because it often causes confusion as to the identity of the pathogen.

MATERIALS AND METHODS

Rooted cuttings and transplants of two varieties of Chrysanthemum, Lisianthus and China Aster were obtained and separated into groups of five replicates of five plants for each treatment. The chrysanthemums were transplanted into 6 inch pots filled with metro mix 300 potting medium. The Lisianthus and China Aster were separated into the needs groups of plants and not transplanted. The roots of all plants were injured by stabbing and then inoculated with 20 ml of a *Fusarium oxysporum* spore suspension containing 1×10^6 spores per ml. The plants were maintained in the greenhouse and monitored for the incidence of disease. After three weeks when no symptoms were observed saucers were placed underneath each pot of group of pots and filled with water to add additional stress onto the inoculated plants. After twelve weeks no signs of disease such as wilting or chlorosis were observed.

Treatments.

Chrysaanthemum- Shasta
Chrysanthemum- Hollister
China Aster
Lisianthus
Non-inoculated
Inoculate with Mum-15
Inoculate with 99-1754-B
Inoculate with 15-8
Inoculate with 01-1760

RESULTS

Evaluation of plant weight and plant height of two chrysanthemum varieties, a China Aster variety and a Lisianthus variety 12 weeks after inoculation with selected *Fusarium oxysporum* isolates

Table 1. Height in cm and weight in grams of four ornamentals inoculated with selected *Fusarium oxysporum* isolates .

	Mum-Shasta		Mum- Hollister		China Aster		Lisianthus	
	Wgt in Grams	Hgt in cm	Wgt in Grams	Wgt in Grams	Hgt in cm	Hgt in cm	Wgt in Grams	Hgt in cm
Untreated	121.32a	16.8a	19.1a	18.1a	19.1a	18.1a	13.26b	39.ab
Mum-15	80.2b	16.3a	10.16c	14.6b	10.16c	14.6b	9.6b	29.6bc
99-1754-B	64.4b	16.2a	10.54c	13.8b	10.54c	13.8b	11.9b	30.2bc
15-8	74.6b	15.4ab	14.22b	11.2b	14.22b	11.2b	18.42a	40.8a
01-1760	83.7b	13.2b	9.4c	14.6b	9.4c	14.6b	10.54b	25.8c

Isolate source: Mum-15- Chrysanthemum (Wade Elmer); 99-1754-B Caladium McGovern Collection; 01-1760 China Aster McGovern Collection; 15-8 China Aster (Wade Elmer).

Values followed by the same letter are not significantly different (P=0.05) according to Duncan's multiple range test using SAS 9.1.

CONCLUSIONS

The data presented in the table above indicate the following: The Shasta mums inoculated with any fusarium isolate tested showed a statistically significant reduction in plant weight in grams compared to the untreated check. A similar observation was made for all isolates inoculated onto Hollister mums except the China Aster isolate 15-8 was not significantly different from the untreated check. When examining the china aster inoculated with the fusarium isolates all isolates had significantly less growth than the untreated check and there were some differences between isolates. When examining the lisianthus cultivars versus the fusarium isolates the China aster isolate (15-8) enhanced the plant growth versus the untreated check and the remainder of the isolates produced growth that was not significantly different from the untreated check.

The chrysanthemum isolate, the caladium isolate and the China aster isolate (01-1760) all showed growth reductions compared to the untreated check in this inoculation test on two cultivars of Chrysanthemum and one cultivar of China aster. The Lisianthus cultivar tested showed no difference between the untreated check and chrysanthemum isolate, the caladium isolate and the china aster isolate (01-1760), the China Aster isolate (15-8) produced a growth enhancement compared to the untreated check.

Common knowledge indicates that a *Fusarium oxysporum* f.sp. *chrysanthemi* will not infect other ornamental hosts. The data in this study shows that this common knowledge is at the least not accurate. This new view of the infectivity of a forma speciales over a wide range of hosts can change disease management practices in a Greenhouse or Nursery operation. When a *Fusarium* is identified as the pathogen associated with disease losses in one crop. Instead of limiting the management practice to only the effected crop the operator can apply the management practice over the whole operation. This will reduce and possibly eliminate losses to this pathogen in other ornamental crops grown adjacent to the diseased crop.