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Editorial

Phytotoxic Effect of Fungal Culture Filtrates on Giant Sensitive Plant (*Mimosa diplotricha* c. Wright Ex Sauvalle)

Funmi Wuraola Ogundipe*

Federal College of Agriculture, Ibadan, Nigeria

***Corresponding Author:** Funmi Wuraola Ogundipe, Federal College of Agriculture, Ibadan, Nigeria.

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Many weeds, including *Mimosa diplotricha* C. Wright ex Sauvalle, also known as the giant sensitive plant, are poisonous and unappealing. They also produce burrs and thorns that contaminate harvests, lot of seeds at a young age, are fiercely competitive, hinder the use and management of desirable plants and are challenging to manually control (Chauhan and Johnson, 2008) [1]. Synthetic herbicides are being used more frequently and have shown to be effective at controlling weeds. However, due to the adverse effects of the use of synthetic herbicides on humans, animals and the environment, the use of fungal bioactive metabolites as a substitute for chemical control methods reduces the environmental impact on agricultural productions. These bioactive secondary metabolites have an intriguing role in the production of phytotoxins that cause disease symptoms or immune responses (elicitors). They are known for their high degree of weed specificity, biodegradability, and lack of impact on beneficial and non-target organisms. The management of herbicide-resistant weed populations is effective and residue buildup in the environment is avoided when using fungal secondary metabolites. These metabolites seem to be an abundant source of novel structures with a distinctive mode of action that could be used as commercial herbicides [2]. In order to delay herbicide resistance, produce food that satisfies consumer demands, and lessen the negative environmental effects on modern agriculture, the continuous development of novel weed control methods as an alternative method is essential in the ongoing conservation of agricultural yields.

The phytotoxic effects of the culture filtrates of fungal pathogens collected from the rhizosphere and vegetative parts of *Mimosa diplotricha* incubated for 7, 14, 21, 28, 35, 42 and 49 days in a liquid medium prepared according to Pitan., *et al*. (2017) [3] were evaluated on *Mimosa diplotricha*. The phytotoxicity was determined using a rating scale of 0–10 of healthy, no disease symptoms, no control to dead plants, complete control according to [4]. The mean of every data collected for each replicate were used in the analysis of variance. Analysis of variance was carried out on each data collected using SAS (2004) [5] and Duncan multiple range tests was used for detecting differences between the treatment means.

The result revealed that the phytotoxic effects of the different incubation days of *Lasiodiplodia theobromae*, *Colletotrichum graminicola* and *Corynespora cassiicola* were incubated on *Mimosa diplotricha* seedlings were not significantly different from one another respectively. The phytotoxic effect of 7 days old culture filtrate of *Curvularia lunata* (2.00) was significantly different from the phytotoxic effect of 42 days old culture filtrate of the same fungus on *M. diplotricha* seedlings (7.34). Also, 7 days old culture filtrate (1.34) of *Trichoderma harzianum* had a significantly different phytotoxic effect from 28-, 35-, 42- and 49-days old culture filtrates. The results obtained showed that the synthetic herbicide and the culture filtrates of *Trichoderma harzianum* incubated for 49 days controlled the weeds completely.

From the above discussion, the fungal crude culture filtrates impeded *Mimosa diplotricha* growth. This confirmed that the inhibitory effect on the targeted weed was due to the presence of active phytotoxic compounds released by the bioherbicidal fungi utilized in the study. Ahmad., *et al*. (2020) [6] also mentioned that the phytotoxins produced by fungal species are mostly responsible for the herbicidal impact of fungal filtrates. Weissmann., *et al*. (2003) [7]. discovered that microbial isolates had a phytotoxic effect on weeds by inhibiting their growth. The suppression of growth was a significant component in determining the action of a bioherbicide, according to Gronwald., *et al*. (2002) [8].

Due to the effectiveness of the phytotoxins produced by the fungal isolates on *M. diplotricha*, the use of cell-free culture filtrate in place of synthetic herbicides can be considered to control this weed. Although, more research should be carried out to identify the active compound responsible for the phytotoxic effect in the crude filtrates.

Incubation days	A	B	C	D	E
Ctrl	0.00d	0.00d	0.00d	0.00d	0.00d
SynH	10.00a	10.00a	10.00a	10.00a	10.00a
7 days	2.66bc	2.00bc	4.00abc	2.00bc	1.34c
14 days	4.66abc	4.00abc	5.34ab	4.00abc	4.00abc
21 days	4.66abc	5.34ab	5.34ab	4.00abc	4.00abc
28 days	4.00abc	5.34ab	6.00ab	4.66abc	5.43ab
35 days	2.00bc	6.00ab	6.00ab	6.00ab	5.34ab
42 days	6.00ab	6.00ab	6.66a	7.34a	7.34a
49 days	4.66abc	4.66abc	4.00abc	5.34ab	10.00a

Table 1: Phytotoxic effect of fungal species culture filtrates on the *Mimosa diplotricha* seedlings at 21 days after application.

Means with same letter (s) in a column are not significantly different at 5% level of probability by Duncan Multiple Range Test (DMRT)

A: *Lasiodiplodia spp;* B; *Colletotrichum graminicola;* C; *Corynespora cassiicola;* D: *Curvularia lunata*; E: *Trichoderma harzianum;* CTRL: Control treatment

SynH: Synthetic herbicide (Gramoxone).

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