Chemical composition and antifungal activity of essential oils of *Tagetes minuta* (Asteraceae) against selected phytopathogenic fungi

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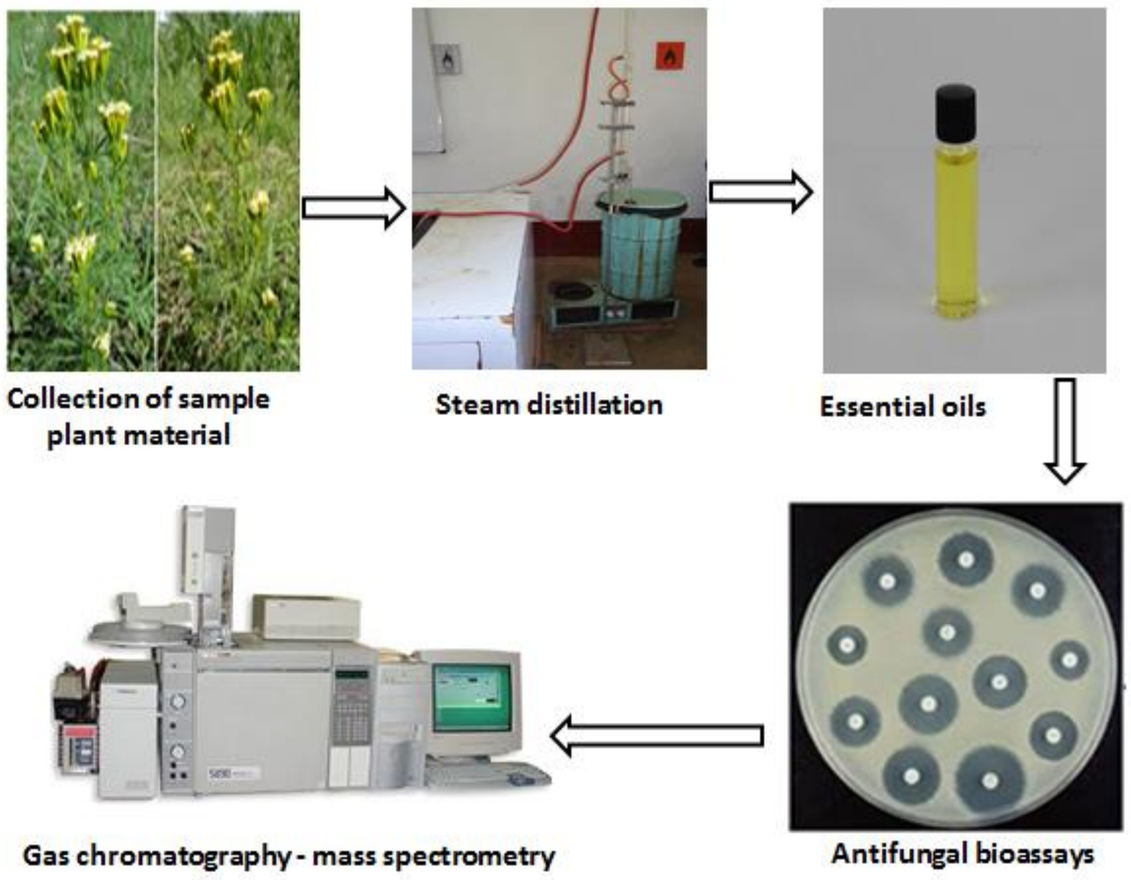
INTRODUCTION

- Phytopathogenic fungi cause enormous agricultural losses and are an important constraint to the attainment of food security.
- Management of plant pathogenic fungi has primarily relied on synthetic chemical fungicides.
- The is an urgent need for safe, affordable and eco-friendly alternatives to hazardous synthetic chemical fungicides.

METHODOLOGY



OBJECTIVES

Main objective:

To determine the percentage yield and identity of the chemical composition of *Tagetes minuta* essential oils (EOs) and to evaluate the antifungal activity of the EOS against selected phytopathogenic fungi.

Specific objectives:

- To determine the percentage yields of crude essential oils extracted from leaves, flowers and stems of *Tagetes minuta*.
- To assess the antimicrobial effect of crude essential oils of *Tagetes minuta* against selected phytopathogenic fungi and bacteria.
- To characterize the chemical composition of the essential oils of *Tagetes minuta*.

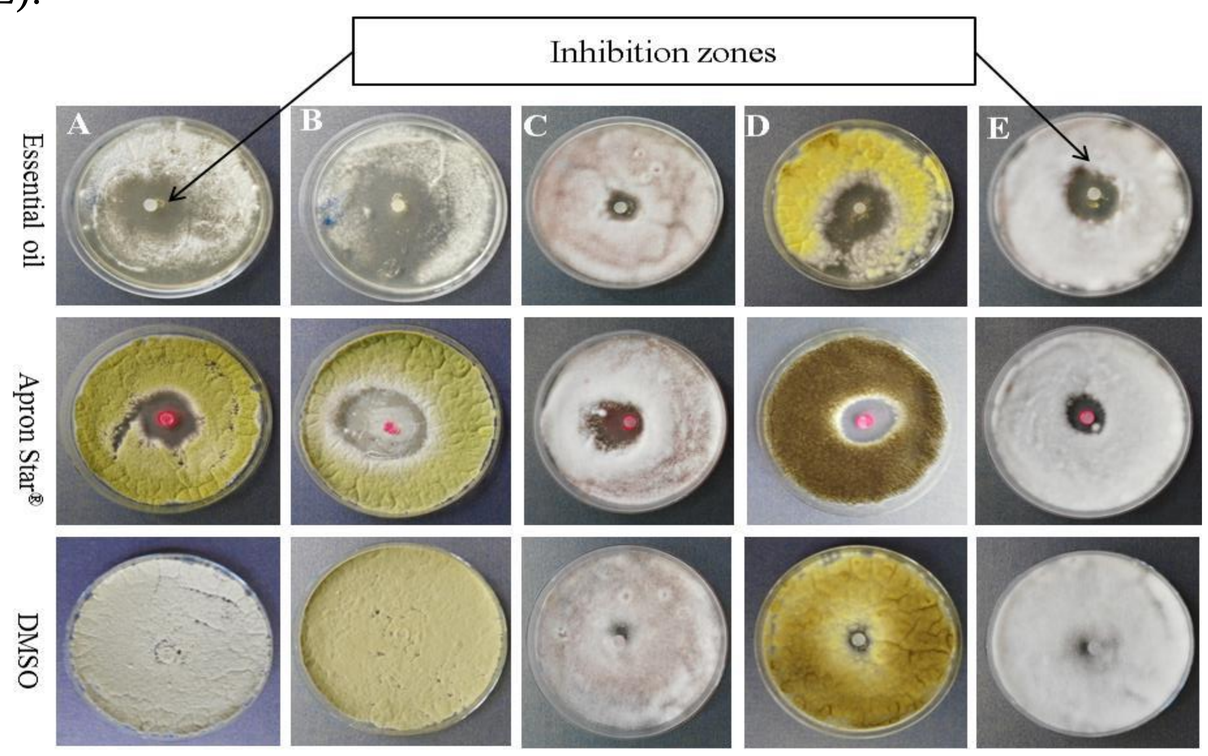
RESULTS

1. Percentage yield of *Tagetes minuta* essential oils

Batch No.	Weight of plant material (Kg)	Weight of essential oil (g)	Percentage Yield (% w/w)
1	4.38	2.5883	0.0591
2	4.23	2.5416	0.0601
3	4.60	2.7383	0.0595
4	4.10	2.4115	0.0588
			Mean = 0.0594±0.0003

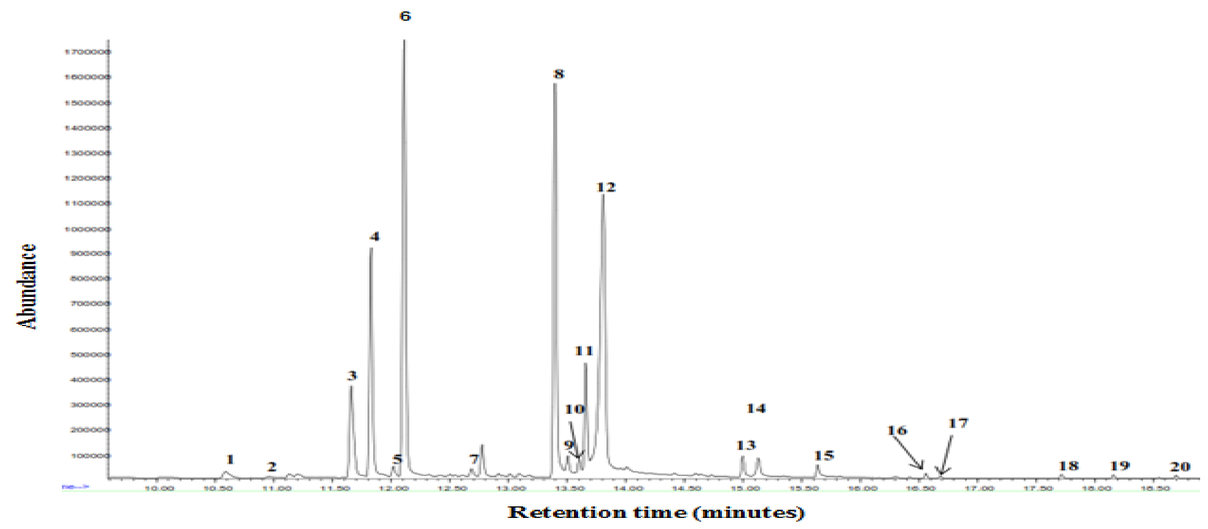
2. Activity of the essential oils on fungal pathogens

Tagetes minuta EOs showed potent antifungal activity against the test fungal species namely: *Aspergillus flavus* (A), *Aspergillus parasiticus* (B), *Fusarium solani* (C), *Aspergillus niger* (D) and *Fusarium oxysporum* (E).



3. Chemical composition of the essential oils of *Tagetes minuta*

- Twenty compounds corresponding to 96% of the total essential oil and constituting a mixture of monoterpenes (70%) and sesquiterpenes (30%) were identified.
- The most abundant components were: (E)-Tagetone (11.8%) dihydrotagetone (10.7%), Allo-ocimene (8.8%) and (Z)-β-Ocimene (7.0%).
- Two sesquiterpenes; Elixene and Silphiperfol-6-ene are being reported for the first time in EOS of *T. minuta.*



CONCLUSION

- The study demonstrated promising antifungal activity of *T. minuta* essential oils against the test fungi.
- The EOs have potential use as biopesticides and as alternative to synthetic fungicides.
- Further studies required to evaluate the applicability of the EOs in management of phytopathogenic fungi under field conditions.

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