



The 8th International Electronic Conference on Medicinal Chemistry (ECMC 2022)

01-30 NOVEMBER 2022 | ONLINE

Chemical Characterization and Antibacterial Activity of *Artemisia herba-alba* Asso Essential Oil from Southwestern Algeria (Naâma)

Chaired by **DR. ALFREDO BERZAL-HERRANZ**;
Co-Chaired by **PROF. DR. MARIA EMÍLIA SOUSA**



pharmaceuticals



**Derouiche Salima^{1,*}, Hatite Ikram Nour El Imane¹, Benchikh Mohammed Amin¹
and Aissaoui Nadia¹**

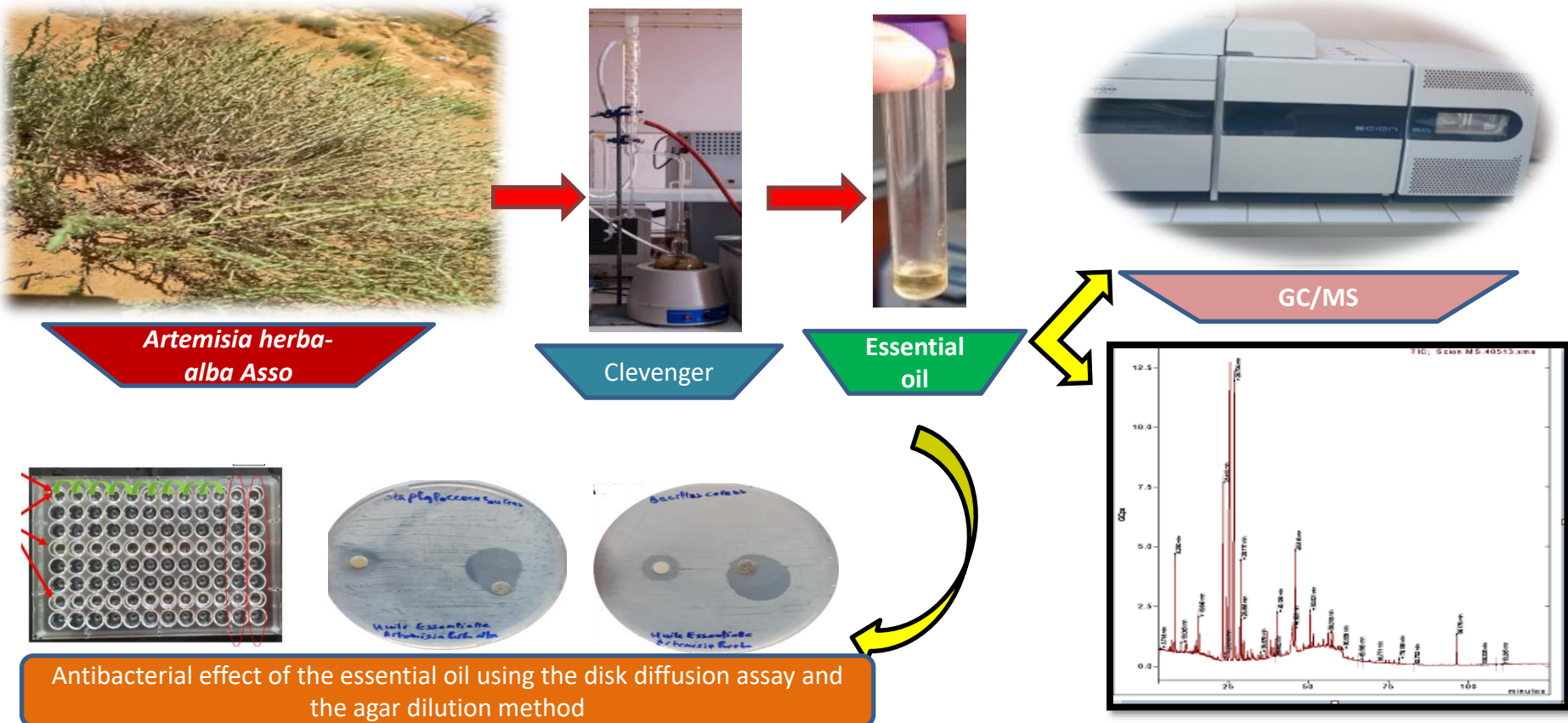
¹ Laboratory of Sustainable Management of Natural Resources in Arid and Semi-Arid Zones, Salhi-Ahmed University Center, P B 66, Naâma 45000, Algeria;

* Corresponding author: derouiche-salima@hotmail.fr



Chemical Characterization and Antibacterial Activity of *Artemisia herba-alba* Asso Essential Oil from Southwestern Algeria (Naâma)

Graphical Abstract



ECMC
2022

The 8th International Electronic
Conference on Medicinal Chemistry
01-30 NOVEMBER 2022 | ONLINE

Abstract:

The purpose of this study was to elucidate the chemical composition and to evaluate the Antibacterial activity of the Algerian *Artemisia herba-alba* Asso (Asteraceae) essential oil (EO) from arid region (Naâma, Algeria). Volatile components of *Artemisia herba-alba* Asso essential oil obtained by hydrodistillation were analyzed by gas chromatography coupled with mass spectroscopy (GC-MS). The Antibacterial activity was assessed against four bacterial strains referenced by the ATCC (American Type Culture Collection) using the disk diffusion assay and the agar dilution method. Detailed analysis of the essential oils led to the identification of 80 components amounting to 99.44 % of the total oil. Chrysanthenone (22.99%) followed by camphor (18.72 %), α -thujone (9.85%), camphene (3.25%), 1, 8-cineole (3.19 %) and β -Thujone (3.05%) are found to be the major compounds. The antibacterial effect of the essential oil of *Artemisia herba alba* shows high sensitivity to most bacteria used at 5 μ l of pure EO and at 10 μ l except for *Pseudomonas aeruginosa*, which proved to be resistant. The minimum values of the inhibitory concentration (MIC) varied between 3.12 to 6.25 % (v/v). This plant can be used as potential alternative remedies for the treatment of many infectious diseases.

Keywords: antibacterial activity; *Artemisia herba-alba* Asso; essential oil; GC/MS; hydro-distillation.

Introduction

Recently, natural products from aromatic and medicinal plants represent a fertile ground for the development of novel antibacterial agents. Plants essential oils have come more into the focus of phytomedicine. The major family of the flowering plants, *Asteraceae* consists of 13 tribes, 1000 genera and 23,000 species. *Artemisia herba alba* Asso greenish-silver perennial herb belongs to the family of *Asteraceae*. It is a medicinal and aromatic dwarf shrub that grows wild in arid and semi-arid areas of the Mediterranean basin, extending into northwestern Himalayas.

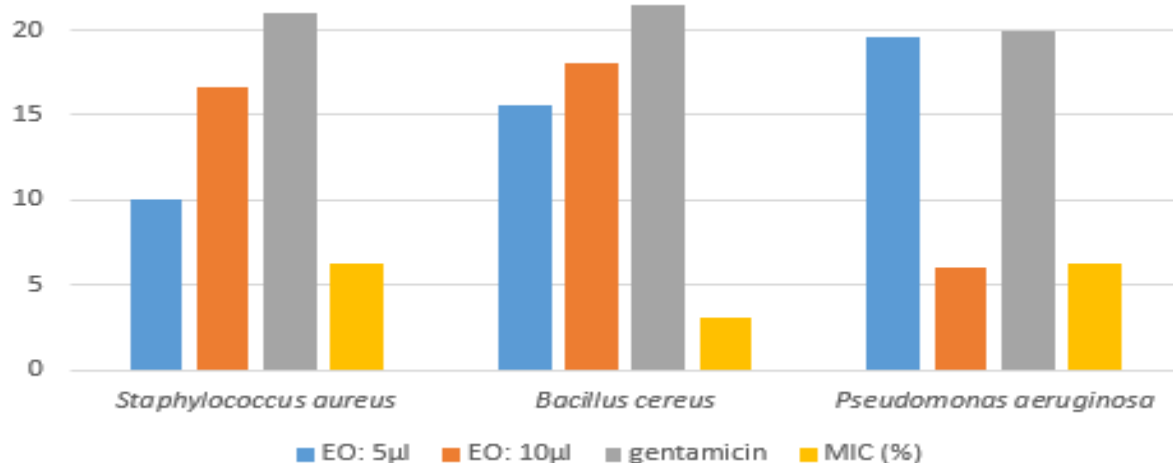
In Algeria, this plant commonly known as the white wormwood in Arabic as “shih” has been used in traditional and modern medicine to treat colds, coughing, bronchitis, intestinal disturbances, diarrhea, neuralgias arterial hypertension and/or diabetes.

The aim of the present investigation was to characterize the chemical composition of essential oils of *Artemisia herba Alba* Asso from the Naâma region and to evaluate their antibacterial activities against three bacterial strains. volatile compounds were determined to deduce which components are likely to contribute to antibacterial activity.

Results and discussion

The oil yield was 0.56 %. The chemical composition of the oil was investigated using GC/MS technique. From the data obtained, 80 compounds were identified, representing 99.44% of the oil. Monoterpenes constituted the main chemical class of the oil,

For further comparison, the composition of *A. herba alba* essential oil dominated by Chrysanthenone was found in Tunisia (Thala) (Dhifallah et al., 2021), Algeria (Boussâada, Mascara) (Ouchelli et al., 2002) (Boukhenoufa et al., 2019). Essential oil is endowed with important antibacterial activity with all bacterial strains; except *Pseudomonas aeruginosa* which were resistant even to the highest concentration of essential oil. This activity is probably related to the high content of oxygenated monoterpenoids with well documented antibacterial properties



RT	Compound	%	RI
8.25	camphene	3.25	1053
15.65	1, 8-cineole	3.19	1168
23.42	α -thujone	9.85	1228
24.38	β - Thujone	3.05	1247
25.39	Chrysanthenone	22.99	1267
26.75	camphor	18.72	1293

RT : retention time, RI : retention index on HP 5MS

Conclusions

The composition of the essential oil of *Artemisia herba-alba* Asso growing in Algeria has been analyzed and its antimicrobial activity investigated. This essential oil may be suggested as an effective inhibitor of foodborne pathogens, and for potential pharmaceutical applications. Further toxicological and clinical studies are required to prove the safety of the oil as a medicine.

ECMC
2022

The 8th International Electronic
Conference on Medicinal Chemistry
01-30 NOVEMBER 2022 | ONLINE

Acknowledgments

Authors would like to thank Dr. Gordo. B (University of Nâama, Algeria) for the identification of the plant material.

**ECMC
2022**

**The 8th International Electronic
Conference on Medicinal Chemistry**

01-30 NOVEMBER 2022 | ONLINE