

Cistus sp.

Subjects: Plant Sciences

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Cistus is a Mediterranean native genus of shrubs belonging to the family Cistaceae. Species of this genus can grow during hot summers and after wildfires. Cistus species are most widespread in the Mediterranean region, whilst some of them are endemic. Cistus plants can grow under slightly different environmental conditions. Most species are very fragrant and sweet-smelling.

Keywords: sp. ; phytochemicals ; microorganisms ; antimicrobials ; multidrug resistance

1. Introduction

Nature is the source of natural remedies widely used by 80% of the world population ^[1]. In North America, Europe, and other developed regions, over 50% of the population has used traditional medicine at least once ^[2].

The World Health Organization (WHO) has a keen interest in documenting medicinal plants used by indigenous people from different parts of the world ^{[3][4]}. The use of plant derivatives as medicinal treatments gained popularity in the late 1990s ^[5].

The screening of phytochemical composition in medicinal and aromatic plants plays a significant role in many areas, such as the human diet, animal feed, pharmaceuticals, fragrances, and cosmetics, etc. ^{[6][7][8][9]}.

The Mediterranean basin, one of the hot spot biodiversity in the world ^{[10][11]}, is rich in vegetation, including medicinal plants ^{[12][13][14]}. One example is Cistus L. sp., which was intensively studied in terms of medicinal properties along with its chemical composition. In this sense, this work was conducted to gather data on Cistus L. regarding antimicrobial potential and chemical profiles.

References

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2. Biological Potent of Cistus Species

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- Each year diseases caused by parasites lead to hundreds of millions of infected people, particularly in tropical and subtropical regions, resulting in one million deaths [24]. At first report about the potential of *Cistus* against parasites, useful plants of the Reventino Massif tradition (Calabria region, Southern Italy). *Genet. Resour. Crop. Evol.* 2019, 66, 1027–1040. Fokialakis have demonstrated the significant antileishmanial activity of raw extract of *C. monspeliensis* and *C. creticus* [23]. Also, the authors tested pure and semisynthetic compounds from the same species against *L. donovani* promastigote (causative agent of visceral leishmaniasis). Obviously, among the eight natural compounds from *C. monspeliensis*, 18-acetoxy-cis-clerod-3-en-15-ol was the most active with an IC₅₀ value of 3.3 µg/mL, while *C. creticus* compounds were less sensitive ent-3β-acetoxy-13-epi-manoyl oxide active with an IC₅₀ value of 17 µg/mL. As far as we could observe, semisynthetic derivatives showed variable responses, changing from inactive to more active inflammatory and analgesic. As activities of *Cistus salvifolius* (L.) and *C. ladanifer* (L.) aqueous extracts, S. Afr. J. Bot. 2017, 113, 160–163. without any toxicity to the host cell, none of all compounds tested in this study was cytotoxic to mammalian cells up to the highest concentrations of 47 µg/mL.

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18. Promastigote Activity of *Cistus* and *Phytolacca* Extracts from the North-West of Morocco. *Int. J. Integr. Med.* 2016, 7, 1–7. IC₅₀ of Moroccan Plants Ethanol Extracts from the North-West of Morocco. *Int. J. Integr. Med.* 2016, 7, 1–7. lower than the control used (Glucantime,® IC₅₀ > 500 µg/mL) [24]. However, no toxicity tests were performed. Unfortunately, there is a high probability that the products that have been classified as active against a particular parasite *in vitro* are likely to be known toxins to host cells (Table 1).

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<i>Cistus</i> species	Collection Place	Part of plant	Type of Extract	Parasite	Technique	Concentration (µg/mL)	IC ₅₀ (µg/mL)	Mechanism	References
21. <i>C. monspeliensis</i>	Spain	Leaves	Pure compounds from C.	<i>L. donovani</i>	Culture of promastigotes	1.6–8.40	3.51	ND	[23]
22. <i>C. creticus</i>	Greece	Leaves	Extracts and semisynthetic derivatives	<i>L. donovani</i>	MTT assay	1.6–8.40	3.51	ND	[23]
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28. <i>C. creticus</i>	Greece	Leaves	Extracts and semisynthetic derivatives	<i>L. donovani</i>	MTT assay	1.6–8.40	3.51	ND	[23]
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30. <i>C. creticus</i>	Greece	Leaves	Extracts and semisynthetic derivatives	<i>L. donovani</i>	MTT assay	1.6–8.40	3.51	ND	[23]

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4. Antifungal Activity of *Cistus* Extracts

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- 6.25 mg/mL and 8–32 mg/mL with aqueous extract from Turkish samples. Interestingly the bio-guided extraction (fractionation with increasing polarity solvent) of Bouamama allowed a better activity localization. Butanol fraction and removed from each layer, were tested separately. This study showed that *C. glabrata* was the most sensitive while *C. krusei* was the most resistant to extracts [27][28]. However, the highest anti-candida activity was reported with phenolic extract of *C. ladaniferus*. MIC was lower 0.05 mg/mL for *C. albicans*, *C. glabrata*, and *C. parapsilosis* [29]. This extract was mainly made of phenolic compounds, which might explain its activity.

Karim did similar investigations to demonstrate the effectiveness of eight *Cistus* varying types of extracts. Obviously, for anti- *G. citri-aurantii* , water was the best extraction solvent, followed by methanol and chloroform. In both studies at a concentration of 5 mg/mL aqueous and methanolic, extracts of *C. creticus* , *C. albidus* , *C. laurifolius* , *C. monspeliensis* , *C. crispus* , *C. salviifolius* , and *C. populifolius* exhibited a total inhibition of arthrospore germination. However, among all extracts, aqueous ones of *C. salviifolius* and *C. monspeliensis* have strongly inhibited the fungi with MIC values low than 0.625 mg/mL.

To the best of our knowledge, little is shown about post-harvest citrus fungal pathogens. These studies have pointed out that *Cistus* extracts will widen the list of allelopathic plants to *G. citri-aurantii* growth.

A recent Moroccan report about the ethanolic extract from rockrose against *P. expansum* and *P. digitatum* : the research was done using agar dilution, and the results revealed the sensitivity of *P. digitatum* MIC 1 mg/mL while *P. expansum* was more resistant with MIC of more than 10 mg/mL. Also, the same study has evaluated the effect against unusual fungi such as *C. versicolor* , *G. trabeum* , *P. placenta* , and *C. puteana* , which is known to be wood decomposition. Most of them presenting a resistance against ethanolic extract. However, they were more sensitive against EO ^[30].