Santolina chamaecyparissus L.: a brief overview of its medicinal properties

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Tiago Azevedo, Ana I. Faustino-Rocha, Lillian Barros, Tiane C. Finimundy, Manuela Matos, Paula A. Oliveira

- Plants have been used for **therapeutic purposes** for centuries, and many modern drugs are **derived from natural compounds**

- This presentation focuses on ***Santolina chamaecyparissus***, a plant native to the **Mediterranean region**, and reviews its **potential medicinal properties**, which have yet to be fully explored

- **Cotton-lavender** (*Santolina chamaecyparissus* L.) belongs to the Asteraceae family and is a small, compact evergreen plant with **greyish leaves** and **yellow inflorescences**

Santolina chamaecyparissus L. growing in the wild, captured in Vila Real, Portugal, in June 2022.

Analgesic, anti-inflammatory, antimicrobial, antioxidant, antispasmodic, hepatoprotective, anti-cancer, and antidiabetic properties have been reported in this plant's extracts, giving insights to its uses in folk medicine

Despite its potential, there is a lack of studies exploring the medicinal properties of this plant

To fulfil this, the present work aims to provide the readers with a review of the medicinal properties of *S. chamaecyparissus*, highlighting their importance as a potential source of compounds with therapeutic properties

ANALGESIC

Pain management is a major **challenge** in **modern medicine**, and there is a need for novel approaches to treat both acute and chronic pain

Several extracts of *S. chamaecyparissus* and a lyophilized infusion made from the plant's aerial parts were tested in thermic and mechanical analgesia tests on mice and rats

Hexanic and chloroformic extracts led to a significant increase in response time to both stimulus

Giner *et al.* (1988)

ANTI-INFLAMMATORY

Giner *et al.* (1988); Giner *et al.* (1989); Ríos *et al.* (1989); Cuéllar *et al.* (1998); Sala *et al.* (1999); Boudoukha *et al.* (2016); Djarmouni *et al.* (2018); Meriem *et al.* (2018)

- Inflammation is linked to many diseases like Alzheimer's and rheumatoid arthritis
- The extracts were effective in reducing inflammation induced by various methods including injections of carrageenan, PMA, and PLA_2

Review Paper

CNS depressant effects, anti-inflammatory activity and anti-cholinergic actions of *Santolina chamaecyparissus* extracts

R. M. Giner, J. L. Ríos, A. Villar

First published: March 1988 | https://doi.org/10.1002/ptr.2650020106 | Citations: 11

→ Chloroformic extract was more effective than phenylbutazone at the highest concentration

ANTIMICROBIAL

Suresh *et al.* (1997); Djeddi *et al.* (2012); Khubeiz and Mansour (2016); Chirane *et al.* (2019); AlMotwaa and Al-Otaibi (2022)

Antibiotic resistance and emergence of new disease-causing agents are global health concerns, and so developing new pharmaceuticals or alternative drug sources is necessary

Free access | Research article | First published online July 1, 2012

In vitro Antimicrobial Properties and Chemical Composition of *Santolina chamaecyparissus* Essential Oil from Algeria

Samah Djeddi, Khadidja Djebile, [...], and Helen Skaltsa (+3) View all authors and affiliations

All Articles | https://doi.org/10.1177/1934578X1200700735

S. chamaecyparissus essential oil strongly inhibited the growth of *Klebsiella pneumoniae* and *C. albicans*

Formulation design, statistical optimization and *in vitro* biological activities of nano-emulsion containing essential oil from cotton-lavender (*Santolina chamaecyparissus* L.)

Sahar M. AlMotwaa [*,1], Waad A. Al-Otaibi [1]

Department of Chemistry, College of Science and Humanities, Shaqra University, Shaqra, Saudi Arabia

The most sensitive bacteria strains were the gram-positive bacteria *S. aureus* and the methicillin-resistant strain, *MRSA*

ANTIOXIDANT

- Reactive oxygen species, like free radicals, can harm both humans and animals
- Researchers are searching for compounds that protect against their effects

Phytochemical Analysis and Hepatoprotective Activity of Algerian Santolina chamaecyparissus L. Extracts

Dalila Messaoudi ; Hamama Bouriche ; Ibrahim Demirtas ; Abderrahmane Senator

Annual Research & Review in Biology, Page 1-12
DOI: 10.9734/ARRB/2018/40346
Published: 20 March 2018

Restored hepatic superoxide dismutase and catalase activities in CCL_4 intoxicated rats

Anti-inflammatory and Xanthine Oxidase Inhibition Activities of Santolina chamaecyparissus Extracts

Meriem Djarmouni ; Abderrahmane Baghiani ; Moufida Adjadj ; Lekhmici Arrar

Annual Research & Review in Biology, Page 1-7
DOI: 10.9734/ARRB/2018/39084
Published: 25 January 2018

High inhibition of xanthine oxidase activity

Djarmouni *et al.* (2018); Messaoudi *et al.* (2018)

ANTISPASMODIC

Giner *et al.* (1988); Giner *et al.* (1989)

- Antispasmodic drugs are used to manage musculoskeletal tension and anxiety, which can affect quality of life

ELSEVIER

Journal of Ethnopharmacology
Volume 27, Issues 1–2, November 1989, Pages 1-6

Inhibitory effects of *santolina chamaecyparissus* extracts against spasmogen agonists

R.M. Giner [a], J.L. Ríos [a], A. Villar [b]

Antagonized rat duodenum contractions (acetylcholine-induced), guinea-pig ileum (histamine-induced), rat vas deferens (noradrenaline-induced) and rat uterus (serotonin-induced).

HEPATOPROTECTIVE

Messaoudi *et al.* (2018)

The liver is a vital organ that plays numerous important roles, including the metabolism of proteins, lipids, and carbohydrates

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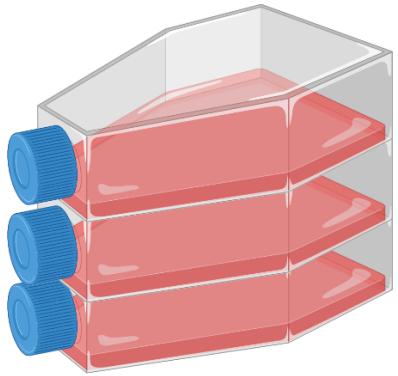
Reduced concentration of serum markers, which increase with liver damage induced by CCl_4 and protected against steatosis and hepatocytic necrosis

ANTICANCER

Finding effective and safe cancer treatments is a major goal in modern medicine, as many traditional treatments are toxic to both cancer and normal cells

S. chamaecyparissus' **extracts** and **essential oils**



HepG2, A549, SA7 and MCF-7 cell lines

High cytotoxicity against **cancer cells** and no cytotoxicity against normal cells

Elsharkawy (2014); Elsharkawy and Aljohar (2016); Saygideger *et al.* (2021); Ali *et al.* (2021); AlMotwaa and Al-Otaibi (2022)

ANTIDIABETIC

Ali *et al.* (2021)

Diabetes, particularly of type 2, is a rapidly increasing global issue, with numerous complications, such as cardiovascular disease, ischemic heart disease, peripheral vascular disease, retinopathy, neuropathy, and nephropathy

Original article

Chemical characterization, antidiabetic and anticancer activities of *Santolina chamaecyparissus*

Abuzer Ali [a], Amena Ali [b], Musarrat Husain Warsi [c], Wasim Ahmad [d], Abu tahir [e]

→ *In vitro* α-glucosidase assay

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Significant reduction of α-glucosidase activity

OTHERS

Giner *et al.* (1988)

Phytotherapy Research

Review Paper

CNS depressant effects, anti-inflammatory activity and anti-cholinergic actions of *Santolina chamaecyparissus* extracts

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Anti-ulcerous activity using a stress-induced female Sprague-Dawley rat ulcer model

Reduction of spontaneous activity of female mice using an Animex S counter

"Bioactive compounds have the potential to improve human health through regulating biological processes."

Banwo *et al*. (2021)

Banwo, K. *et al.* (2021) 'Functional importance of bioactive compounds of foods with Potential Health Benefits: A review on recent trends', Food Bioscience, 43, p. 101320.

- Medicinal plants, such as *S. chamaecyparissus*, have been used for a long time in folk medicine and are known to have a range of beneficial properties
- *S. chamaecyparissus* has shown a range of effects in both *in vitro* and *in vivo* studies
- More research is needed to understand the mechanisms behind these effects and to determine the potential clinical applications of *S. chamaecyparissus* for treating human diseases

THANK YOU FOR YOUR ATTENTION!

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CITAB Together for Excellent Science Inov4Agro

CIMO Centro de Investigação de Montanha

utad UNIVERSIDADE DE TRÁS-OS-MONTES E ALTO DOURO

ipb INSTITUTO POLITÉCNICO DE BRAGANÇA

FCT Fundação para a Ciência e a Tecnologia