Antimicrobial activity of ethyl acetate extract of an endemic Centaurea glaberrima Tausch (Asteraceae)

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INTRODUCTION

A great interest in the pursuit of bioactive compounds from plants that can be antimicrobial drugs has been triggered due to multidrug resistance in pathogenic microorganisms and undesirable side effects of certain antibiotics [1]. Many Centaurea species are traditionally used for treatment of various ailments in people and animals, as well as for nourishment, while extracts obtained from Centaurea exhibit wide range of biological activity [2] with a numerous studies concerning antimicrobial activity. Centaurea glaberrima Tausch (Asteraceae), Circum-Mediterranean Clade sensu Hilpold et al. 2014 [3], is an endemic plant species that inhabits fields as well as a rocky cliffs and waste places in the West Balkans [4].

There is no information on biological activity of C. glaberrima, hence the aim of this study was to investigate antimicrobial potential of ethyl acetate extract of this endemic species.

MATERIALS & METHODS

Plant material of C. glaberrima (BEOU accession no. 38660) was collected in August 2021 at the Orjen Mountain (Montenegro). Dried aerial parts (10 g) were extracted three times by maceration combined with ultrasonication using 150 mL of ethyl acetate.

Antimicrobial potential of extract was investigated on four bacterial strains (Escherichia coli ATCC 35210, Klebsiella pneumoniae ATCC 13883, Pseudomonas aeruginosa Paol, and Staphylococcus aureus ATCC 6538) and three Candida strains (Candida auris ATCC 11903, Candida parapsilosis ATCC 22019, and Candida tropicalis ATCC 750) using microdilution method.

RESULTS & DISCUSSION

- Ethyl acetate extract of C. glaberrima showed moderate antibacterial and antifungal activity.
- E. coli and P. aeruginosa were more susceptible to the extract (MICs 0.5 mg/mL) than K. pneumoniae and S. aureus (MICs 1 mg/mL).
- Extract exhibited the strongest antifungal activity against C. parapsilosis (MIC 0.25 mg/mL) while C. auris and C. tropicalis were equally susceptible (MICs 1 mg/mL).
- A few previously investigated Centaurea species from Circum-Mediterranean Clade demonstrated antimicrobial activity as well. Capitula and aerial parts extracts of C. kilaea inhibited the growth of P. aeruginosa at lower concentrations than MIC from current study. Extract of aerial parts of C. canescens inhibited the growth of S. aureus [5] more than C. glaberrima extract. Extracts of C. cariensis ssp. maculiceps and C. carius subsp. microlepis were active against E. coli and S. aureus [6] in concentrations higher than those obtained in this study. C. virgata exhibited activity against E. coli as well [6].
- To the best of our knowledge, this is the first study concerning biological activity of C. glaberrima and outcome encourages further investigation.

References


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