

Investigation of Antipseudomonal Activity of *Brassica Napus* L.

Katayoon Dastan¹, Akram Tehranifard², Mahdi Vazirian³

^{1,2}Department of Biology, Islamic Azad University branch Lahijan

³Department of Pharmacognosy, Faculty of Pharmacy, Tehran University of Medical Sciences, Tehran, Iran

E-mail: akram.Tehranifard95@gmail.com

Abstract. Glucosinolate and their breakdown products (Isothiocyanates; R-N=C=S) are present in Cruciferae family (e.g. cabbage, Brussels sprout, kali, kohlrabi, cauliflower, horseradish, mustard, turnip and rutabaga). They are produced under action of Myrosinase (Thioglucoside glucohydrolase EC 3.2.3.1) on Glucosinolates during tissue injury. Several published studies have described strong anti-microbial of these compounds. Nowadays because of widespread micro-organism resistance to chemicals, using natural antimicrobial products has been increased due to fewer adverse effects and ease of utilization. In this research, the antimicrobial activity of methanol, ethanol, n-hexane and chloroform extracts of turnip was evaluated with bacteria. Alcoholic extracts of turnip were prepared and their antimicrobial activity was tested using an agar diffusion method. The highest antimicrobial activity was observed by methanolic on *pseudomonas aeruginosa* was sensitive to this extract.

Key words: Glucosinolate, *pseudomonas aeruginosa*, turnip, plant extract

1. Introduction

The turnip was a daily staple in Europe before potato were. Native to western Asia, The turnip has served as food for humans and their livestock for centuries. In folk medicine the powdered seed is said to be a remedy for cancer and breast tumors, while a salve derived from the flower is said to help skin cancer.

The use of plant compounds for pharmaceutical purposes is gradually increasing².

The antibacterial activity of turnip roots has long been purposed in folk medicine and in traditionally cure for common cold. Turnip, also known as *Brassic rapa* and sub sp. *rapa* is cultivated for its tuberous taproots, sometimes is considered as a weed³.

Different diversities from the China-Japan, Eurosiberia and Mediterranean centers have been reported to tolerate aluminum, bacteria, disease, frost, fungi, extreme pHs, smog, sulfur dioxide virus and weeds³. Bioassays directed fractionation of the most active crude extracts of different plants have isolated and identified the compounds responsible for the antimicrobial activity⁴.

Several research works have revealed that amending the soil with plant of *Brassica* spp. can reduce the disease incidence or inoculum level of *Macrophomina phaseolina* (Tassi) Goid. *Pythium ultimum* Trow, *Fusarium oxysporum* Schl. F. sp. *cumini* Patel^{6,7}. The mechanism, involved in the disease control or suppression of a pathogen is considered to be the production of allyl isothiocyanate (AITC) by the tissues of *Brassica* spp⁸. AITC can show its antimicrobial activity on fungal propagules by vapor action, thus acting as a fumigant⁹⁻¹¹. This volatile compound is produced in an aqueous medium through enzymatic hydrolysis of sinigrin, which is the predominant glucosinolate in the tissue of *Bassica* spp. Among the *Bassica* spp. The highest concentrations of AITC are found in some mustard (*Bassica juncea* L.), horseradish [*Armoraraci* (Mey). & Scherb] and wasabi (*Wasabia japonica* Matsum) species, with considerable variation among the cultivars of the same species⁸.

The purpose of the present work was, therefore, to examine the antibacterial effect of crude extracts of turnip species grown in northern Iran on *pseudomonas aeruginosa*.

2. Materials and Methods

2.1. Materials

Bacteria sample were taken from collection of microbiology lanoratory in Lahijan University.

2.2. Preparation of turnip extracts

Different parts of turnips were dried and grounded into fine powder, added to each extracting solvent,mixed and left for 48 hours.The resulting solutions were filtered and the solvent were evaporated. Extraction was accomplished by 80% Methanol.

2.3. Antimicrobial activity

Different concentrations of extract were prepared and standard strains of *Pseudomonas aeruginosa* were purchased commercially. Examination was repeated in three consecutive days by disc diffusion method 2.12, was used to study the antimicrobial activity of turnip extracts.The bacterial cultures were grown on nutrient agar at 35°C. After 18 hours of growth, the colonies of microorganism were then added to 8 ml of broth culture medium. The culture media were incubated at 35°C for another 18 hours . 0.1 ml of each medium was added to new nutrient broth culture media at35°C. The culture were incubated for 2-3 hours at 35°C and then placed on the surface of nutrient agar plates(Spread plate cultur method) at a concentration of 10⁶ cells/ml. Subsequently, bank paper disks(6 mm in diameter) saturated with 400 ml solvent was placed on surface of each plate. The plates were then incubated at 37°C for 18-24 hours. The inhibition zones were visible after this period. Then well assay methods and Gentamycine used as standard medicine.The procedures mentioned above were exactly repeated after 8 months of storage the crude extracts at 4°C in order to examine the stability of active chemical compounds present in alcoholic extracts.

3. Results and discussions

According to the results obtained from this study, the alcoholic extracts of turnip showed antimicrobial activity against *pseudomonas aeruginosa*.

In disc diffusion test and concentrations of 0.5, there was inhibition zone of 2, 8 and 6 mm in three consecutive days, respectively. There was no significant effect in well assay.The results of activity measurement for the 8 months old extracts were exactly similar.

4. Conclusion

Alcoholic extracts of roots of turnips were potent antimicrobial activity against *pseudomonas aeruginosa*. Antipseudomonal inhibition zones for alcoholic extract of *Brassica napus* L. was investigated. This characteristic of turnips has received attention in folk medicine and turnips are used for treatment and pre-cautions of bacterial infection especially in winter and fall.

The evidence for this observation was confirmed when the crude extracts was examined after 8 months storage and the same results obtained .

5. References

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