ANTIMICROBIAL CAPACITY EVALUATION OF SOME SWEET BASIL *(OCIMUM BASILICUM)* EXTRACTS

EVALUAREA CAPACITĂȚII ANTIMICROBIENE A UNOR EXTRACTE DE BUSUIOC (*OCIMUM BASILICUM)*

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Abstract: *In the last period we notice a special interest for some microbiological studies, regarding antimicrobial activity of such natural extracts, the aim is to review some technologies often met in agro-food sciences, especially the use of some natural products in detriment of synthesis products. Samples of sweet basil* ***(Ocimum basilicum)*** *extract have been analyzed after they have been processed at 80°C temperature, for 3 hours, and the tested bacteria have been* ***Escherichia Coli, Staphyloccocus aureus*** *and* ***Candida albicans****. The used technique consisted in measurement of inhibition area diameter formed on plates with microbial cultures. In the mentioned conditions, we remarked an inhibition of development for* ***Escherichia Coli*** *and* ***Candida albicans****, in change* ***Staphyloccocus aureus*** *is resistant at the studied substance.*

Rezumat: *În ultima perioadă se remarcă un interes deosebit pentru unele studii microbiologice, privind activitatea antimicrobială a unor astfel de extracte naturale, scopul fiind revizuirea unor tehnologii adesea întâlnite în ştiinţele agroalimentare, anume utilizarea unor produse naturale în detrimentul produselor de sinteză. Au fost analizate probe de extract de busuioc* ***(Ocimum basilicum)*** *care au fost prelucrate la temperatura de 80°C, timp de 3 ore, iar bacteriile testate au fost* ***Escherichia Coli, Staphyloccocus aureus*** *şi* ***Candida albicans****. Tehnica utilizată a constat în măsurarea diametrului zonelor de inhibiţie constituite pe plăcile cu culturi microbiene. În condiţiile amintite, s-a remarcat o inhibare a dezvoltării pentru* ***Escherichia Coli*** *şi* ***Candida albicans,*** *în schimb* ***Staphyloccocus aureus*** *fiind rezistent la substanţa studiată.*

Keywords: *ocimum basilicum, antimicrobial*
Cuvinte cheie: ocimum basilicum, busuioc, antibiotic

INTRODUCTION

Recent studies, regarding the antimicrobial activity of sweet basil extracts indicates positive effects regarding the development of various micro organisms. Taking in count the variety of technological processes from agro-food industry, it is useful to know if these properties are also kept in others conditions (thermal, different manners of extractions, different solvents for extraction etc.).

A very ample study (ADIQUZEL A., *2005*), realised for a total number of *146 micro organisms* is notable. The extracts have been analysed with hexane, ethanol and methanol at temperatures below the boiling point, the concentration being made in vacuum at *40°C*, then the storage at *-80°C*. Also in this case, the indicators of antimicrobial activity have been the diameters of inhibition areas determined by vegetal substances.

The conclusions clearly indicates a positive activity of sweet basil extracts, against some micro organisms [1].

In the present study have been analyzed samples that have been adjusted at 80°C temperature, for 3 hours and finally, have been kept for 6 days at 3°C temperature.

Sweet Basil *(Ocimum basilicum)* is a plant from Ocimum genus, Lamiaceae family, grassy plant from tropical Asia. The basil term comes from Greek language βασιλευς

(basileus), meaning "king". Generally, it reaches heights between 20-60 cm height, having the leaves light green coloured, silky, with lengths between 1,5-5 cm and having a breadth of 1-3 cm. The flowers have white colour, set in a termination named raceme. Unusually for Lamiaceae family, the four stamina and the pistil do not emerge from superior border of corolla, and they support on inferior border. The pollination is entomo-phylical (with the aid of insects), after what the corolla fall and then four akenes are developing in the inner part of bilabial calix. The plant has a strong odour, sweety acrid. The cold sensitiveness of basil is very high, the favourable environement for development is in warm and wet conditions. There are common varieties of basil considerated as being annualy plants, and also other perennial, as blue african basil and saint thai basil. Taking in count the special qualities from theirs protection characteristics point of view and as a condiment, the basil enjoy a real consideration from the part of gastronomic books authors.

In the following table are presented the main substances with proved role or only susceptibil to have an antibacterial effect and/or antiseptic.

Table 1

The main substances with proved role or only susceptible to have an antibacterial effect and/or antiseptic

Antibacterial and/or antiseptic substances	
1,8-cineole	ascorbic-acid
acetic-acid	beta-ionone
aesculetin	beta-sitosterol
alpha-bisabolol	methyl-eugenol
alpha-pinene	methyl-isoeugenol
alpha-terpineol	borneol
alpha-thujone	caffeic-acid
anethole	eriodictyol
apigenin	safrole
tannin	ursolic-acid
terpinen-4-ol	caryophyllene
thymol	cis-ocimene
neral	nerolidol
nerol	oleanolic-acid
quercetin	rosmarinic-acid
geraniol	luteolin
isoquercitrin	menthol
kaempferol	menthone
limonene	esculetin
linalool	citral
delta-cadinene	citronellol
p-coumaric-acid	eugenol
rutin	

Source [1]…[6], [8]

MATERIALS AND METHODS

The reference culture is obtained through micro-organism preparation from a collection culture type.

The primary medium for development: we use a nonselective agar for micro-organisms development after moisture. These are: *Plate count agar dishes* that contains: *casein enzymatic hydrolysis, dextrose, agar,* and for *Escherichia coli, Staphylococcus aureus* and Sabouraud dextrose agar that contains: *peptone, dextrose, agar,* for *Candida albicans.*

Using proceedings: the micro organism moisturizes, they are labelled an insignificant environment with data, identified stem, the denomination and then wet till saturation the tampon with hydrated solution and they transfer the suspension on the surface of primmer unselective agar labelled environment; it is applied with low pressure and the tampon is rotated on primary agar environment on a 25 *mm* diameter surface. With a sterile anse they breakdown on inoculated surface.

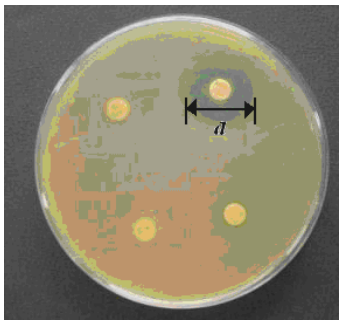

Figure 1
Inhibition areas

They incubate the inoculated medium at the environment and temperature conditions requested by laboratory protocol. With a sterile tampon wetted with specific enriching environment, they sow the inoculation on respective culture environment in the same time rotating the tampon in different directions to cover the entire environment surface.

After 24 hours of incubation, we remark a diameter (d) of inhibition areas (figure 1).

The quantity of 100 g vegetal material has been extracted (the stem and leafs) from thyme and basil gathered in the maturity phase. The added water quantity has been 200 g, the mix been stored in closed air-sealed recipients at 30^{o}C temperature, being agitated regularly and strongly. After 48 hours, the liquid part is separated and submitted to concentration at 80^{o}C temperature, for 3 hours.

The concentrated products are stored for 6 days at refrigerated, at 3^{o}C temperature till the moment the microbiological study is realized.

RESULTS

Escherichia coli, after 24 hours of incubation, presents a diameter of inhibition areas of 0.5 mm. The reference stem of E*scherichia coli*, lot 422741 ATCC 35421, MEDI MARK EUROPE – France was been found.

Staphylococcus aureus, after 24 hours of incubation, not present an inhibition area. It had been used the reference stem of *Staphylococcus aureus*, lot 173012 ATCC 12600, MEDI MARK EUROPE – France.

Candida albicans, after 24 hours of incubation, presents a diameter of inhibition areas of 0.3 mm.

CONCLUSIONS

We remark resistance of *Staphylococcus aureus* at tested extract in the mentioned conditions. In change, the other samples indicate the existence of antimicrobial activity (*Escherichia coli, Candida albicans)*, the efficiency being pronounced in first bacteria case.

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