USAMVB Timisoara
"YOUNG PEOPLE AND MULTIDISCIPLINARY RESEARCH IN APPLIED LIFE SCIENCES"
27 November 2020

"Young people and multidisciplinary research in applied life sciences"

Vegetal extract from spontaneous Romanian flora with bioinsecticidal action

G. M. Daraban[1], M. Badeanu[2], L. Rusu[3], C. Zaharia[1], D. Suteu[1*]

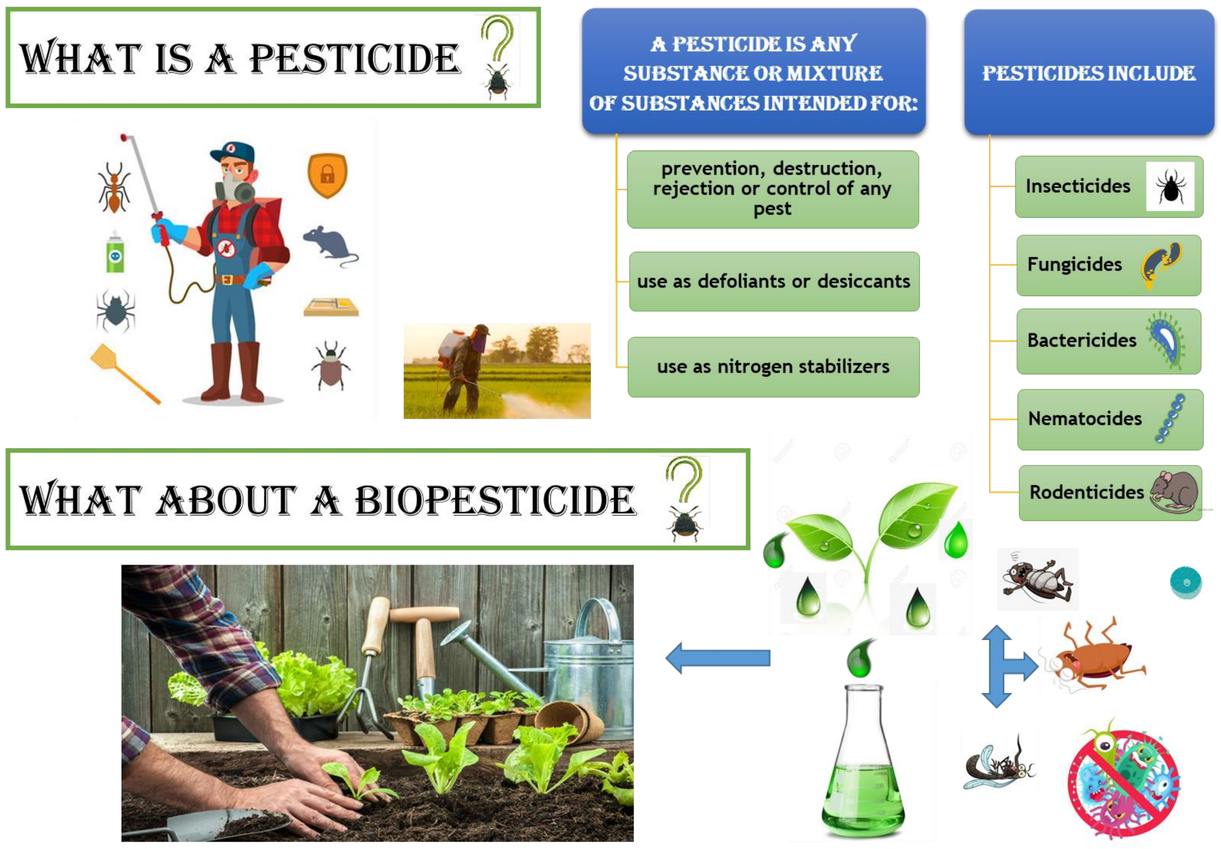
[1]*"Gheorghe Asachi" Technical University of Iasi, Faculty of Chemical Engineering and Environmental Protection "Cristofor Simionescu", Department of Environmental Engineering and Management, 73 Prof. Dr. Docent D. Mangeron Str., 700050 Iasi, Romania*
[2]*"Ion Ionescu de la Brad" University of Agricultural Sciences and Veterinary Medicine of Iasi, Faculty of Horticulture, Department of Horticultural Technologies, 3 Mihail Sadoveanu Alley, 700490 Iasi, Romania*
[3]*" Vasile Alecsandri" University of Bacau, Faculty of Engineering, 157 Calea Mărășești, 600115 Bacau, Romania*

Corresponding author: danasuteu67@yahoo.com

• Abstract

The use of biopesticides in the cultivation and growth of plants is part of the concept of "sustainable agriculture". More and more research shows that an increasing number of essential oils and plant extracts have been tested against a wide range of pests with promising results. Thus, it has been shown that various biologically active compounds from plant sources have high efficacy, multiple mechanisms of action, low toxicity to mammals, which has led to the accelerated growth of interest in using them as biopesticides in a stabilized and easy to handle form. The paper aim is to present the results of the experimental researches regarding the investigation of the effectiveness as bioinsecticidal effect of alcoholic plant extracts from spontaneous flora of Moldavia and Bucovina (Romania) (i.e. Artemisia absinthium; Primula veris; Origanum vulgare; Achilleia millefolium) in the pests control during the seeds storage (insect bean-Acanthoscelides obsoletus). Obtaining of the plant extracts was achieved by two extractive techniques: Maceration (M) and ultrasound assisted extraction (UAE) + Maceration (M). The efficiency of the processes (expressed as the degree of extraction) was investigated considering several physical parameters, such as solid / liquid ratio: 1/10, 1/15 and respectively, 1/20, extraction time: 10 minutes and 15 minutes, temperature: 35°C and 45°C. The extracts obtained are considered environmentally friendly since they do not affect the crop plants, but instead they protect it.

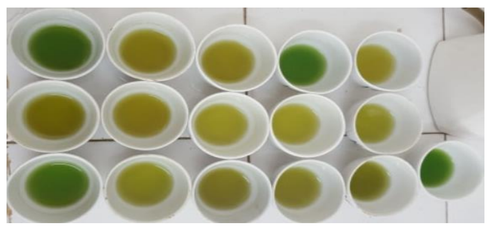
• Introduction

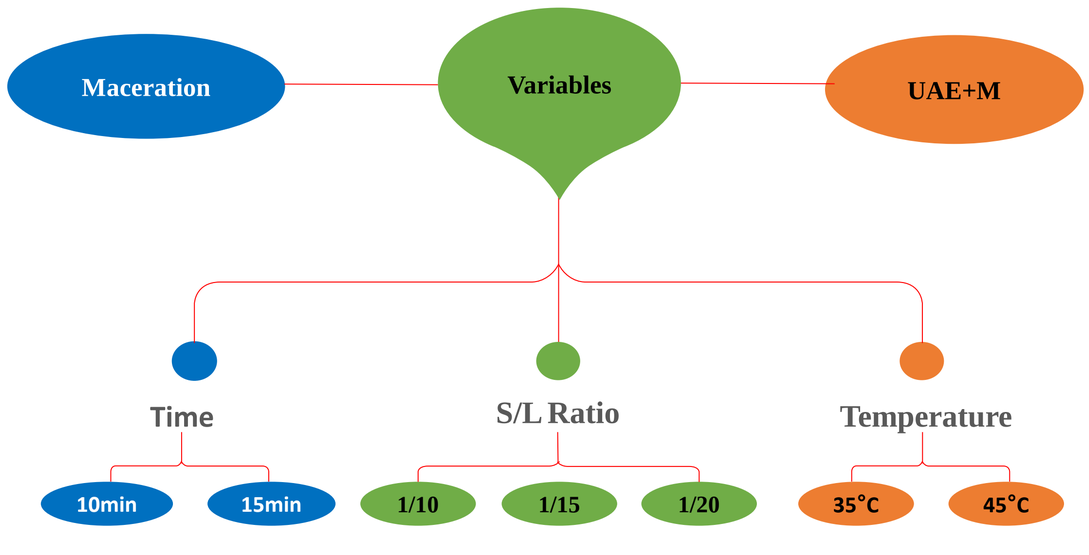


• Material and method

Material characterisation

Alcoholic extracts specific to the plants selected from spontaneous flora from Moldova area.





• Results and disscusion

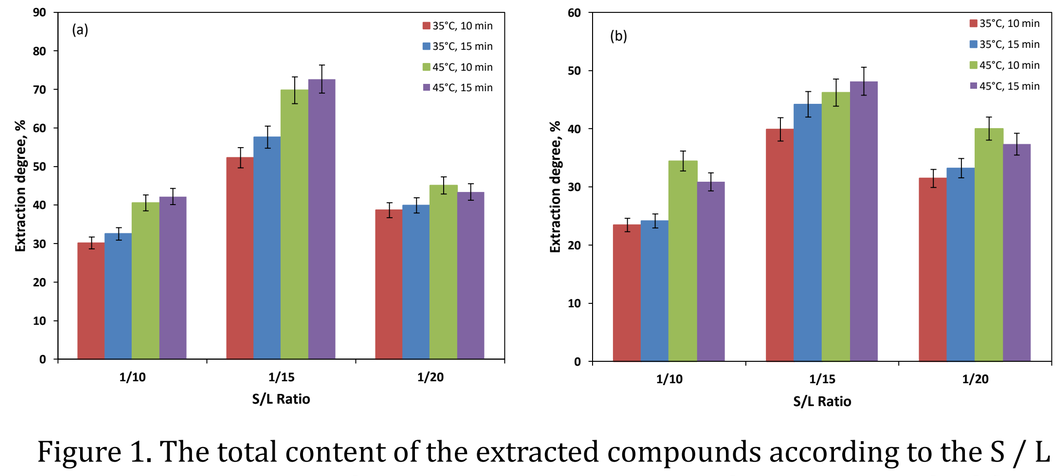


Figure 1. The total content of the extracted compounds according to the S / L ratio, temperature and sonoextraction time using the **UAE+M** method for *Artemisia absinthium* (a) and *Origanum vulgare* (b)

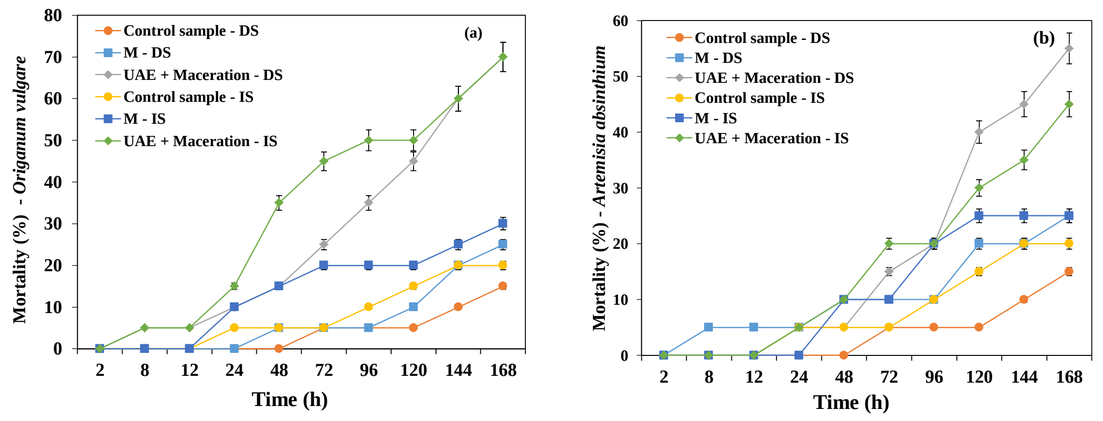


Figure 2. The bioinsecticidal action of *Origanum vulgare (*a) and *Artemisia absinthium* (b) extracts (using the direct and indirect spraying technique) obtained by maceration and combined method maceration and sonoextraction.

• Conclusions

The experimental results showed that the most efficient method of obtaining plant extracts with a high content of bioactive substances is the combined method ultrasound assisted extraction (UAE) + Maceration (M).

For all plant species the highest degree of extraction was obtained according to optimal parameters: S/L ratio 1/20, the temperature of 45°C and the extraction time 15 min.

In the case of the control sample, there are no abnormal manifestations, the individuals feed constantly and naturally.

Regarding the effectiveness of plants in controlling pests of the species *Acanthoscelides obsoletus*, the descending order is the following: *Origanum vulgare*, *Artemisia absinthium*, followed by *Achilleia millefolium* and *Primula veris*, whose efficiency is almost identical.