DEVELOPMENT OF A TECHNOLOGICAL METHOD FOR MICROBIOLOGICAL DECONTAMINATION OF DRY CANNABIS FLOWERS

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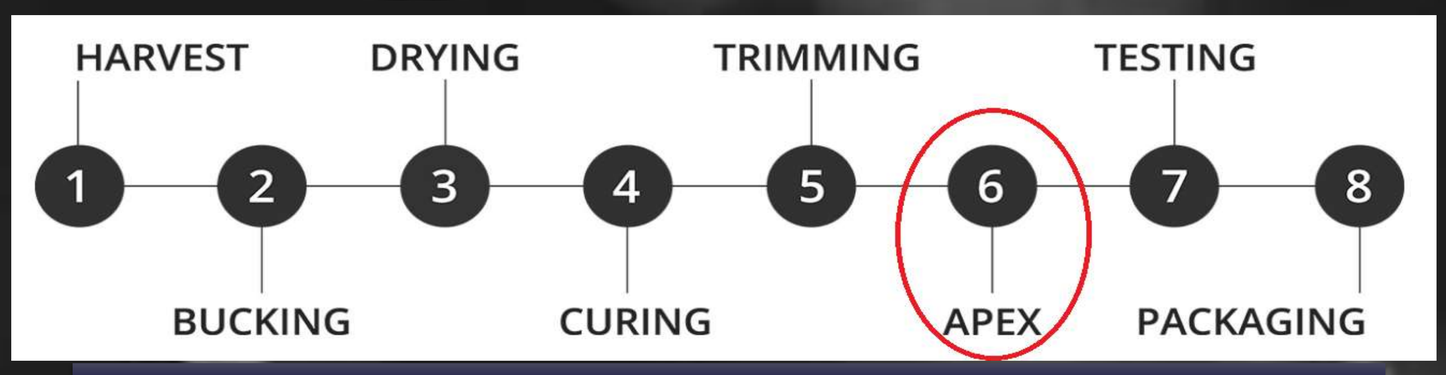
INTRODUCTION & AIM

In the countries with a National medicinal cannabis program, pharmaceutical regulations specify that herbal cannabis products must adhere to strict safety standards regarding microbial contamination. Treatment using non-hazardous radio frequency (RF) is non-ionizing, meaning it won't change the molecular structure of the cannabis flower.

Our goal was to develop a technological method for the decontamination of a dry cannabis flower, with the aim of reducing the count of some microorganisms in the flower itself, thus ensuring the health safety of the herbal product.

MATERIALS & METHODS

***Dry cannabis flower** – *Jack Kush* (THC variety), produced in TetraHip LLC Kocani, N.Macedonia;
***APEX7 irradiation machine** with packing bags "Ziel" (Ziel, San Francisco);
***Precision balances** (Kern & Sohn, Germany);
***Moisture measuring instrument** (OHAUS, USA);
***Microbiological analyzes** were performed in accordance with the **Ph.Eur. monograph 04/2019:50108** in external accredited laboratory.



Stages in the production of decontaminated dried cannabis flower

Microbiological quality of dried cannabis flower before its decontamination

Parameter	Results	Company's Specification
Total Aerobic Microbial Count (TAMC)	4600 CFU/g	10000 (max. 50000) CFU/g
Total Yeast and Mould Count (TYMC)	23000 CFU/g	100 (max. 500) CFU/g
Bile-tolerant gram-negative bacteria (BTG-)	<100 CFU/g and >10 CFU/g	100 CFU/g
Escherichia coli (EC)	absent	absent
Salmonella (SA)	absent/25g	absent/25g

Microbiological analysis carried out according to Ph.Eur. Monograph 04/2019:50108 "*Microbiological quality of herbal medicinal product for oral use and extracts used in their preparations*" at PHI Institute for Public Health – Skopje, N. Macedonia

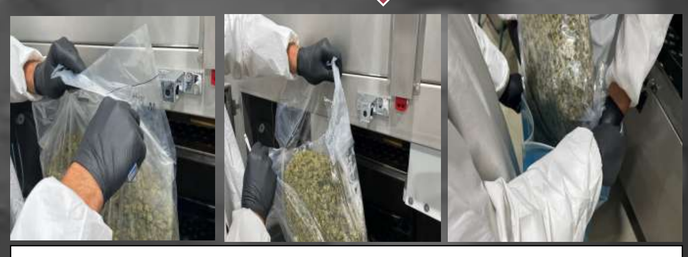
Placing a bag filled with cannabis dry flower in a plastic box

Touch Screen Interface for controlling and monitoring of the processes parameters and choosing an appropriate program

Transferring the prepared decontamination product to the RF chamber in the irradiation machine APEX7

Post APEX Processing

MC = 11,56%
(ref. 8-15% according to the SOP)



Opening of a treated flower & repacking in a blue bag after 24h

For the development of the technological process, three treatments of the dry flower were carried out, and accordingly three different decontamination programs were selected in the irradiation machine.

Program 1
90°C for 1 min

Program 2
95°C for 1 min

Program 3
98°C for 1 min

RESULTS & DISCUSSION

Program / Parameters	*TAMC*	*TYMC*	*BTG -*	*EC*	*SA*
Before treatment	4600 CFU/g	23000 CFU/g	<100 CFU/g and >10 CFU/g	absent	absent/25g
Program 1 treatment	6000 CFU/g	< 10 CFU/g	< 10 CFU/g	absent	absent/25g
Program 2 treatment	4000 CFU/g	< 10 CFU/g	< 10 CFU/g	absent	absent/25g
Program 3 treatment	4000 CFU/g	< 10 CFU/g	< 10 CFU/g	absent	absent/25g

Tabular presentation of the results of the microbiological analyzes after the decontamination treatments of the dried cannabis flower with a selection of different programs.

CONCLUSION: We can conclude that obtained method is effective in drastic reduce of the number of pathogenic microorganisms, especially in reducing of *TYMC* and *BTG-* and thus achieving a microbiologically safe final product, ready for use in medicinal purposes.

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