

# CONDITIONING OF *AGASTACHE FOENICULUM* (PURSH) KUNTZ SEEDS, USING THE METHOD OF SIEVE SEPARATION

**Marian O., Cristina Firuta Matei, M. V. Muntean**

*University of Agricultural Sciences and Veterinary Medicine, Faculty of Agriculture,  
3-5 Manastur St., Cluj-Napoca 400372, Romania; ovidiu.marian@usamvcluj.ro*

**Abstract.** High hyssop comes from North America and Canada, where they used a tea from the leaves of plants to cure colds, flu and respiratory disorders. Measurements were made regarding the amount of seeds on the sieve with diameter of 0.44 mm. Experience was conducted in the laboratory of Transfer Phenomena and Unit Operations in Food Industry of Department III Mechanization of Veterinary Medicine Cluj-Napoca.

**Keywords:** mint family, separation machine Retsch, food for bees

## INTRODUCTION

High hyssop comes from North America and Canada, where they used a tea from the leaves of plants to cure colds, flu and respiratory disorders (Burke D., 2005, J. Gardner, 2005). *Agastache foeniculum* (Pursh) Kuntz is part of the mint family, is used in the preparation of various recipes (James M. Rippe, Rippe MD, 2000). It can be used in salads, in preparation of digestive tea after a substantial meal.

It is a high perennial who prefers the sunny places. Fresh leaves can be used in salads, or can be added to milk giving him a flavor of ice cream (Amy Pennington, 2010). It is a plant with blue flowers that bloom in mid-summer (Jennifer R. Bartley, 2010).

Hyssop is considered to be the largest culinary commercially plant. Sometimes is found in commercial tea blends (Galambos et al., 1992, quoted by E. Small, 2006). *Agastache foeniculum* (Pursh) Kuntz is sometimes grown as food for bees. Several strains were selected in Canada for essential oil containing methylchavicol (Anon A., 1992, quoted by E. Small, 2006). It attracts insects more than other species. Seeds are small, MMB = 4.4 g (Fălticeanu Marcela and N. Munteanu, 2010).

## MATERIAL AND METHOD

Experimental factors included in the study were:

Factor A- Separation time-with graduations:

-a1 - 1 minute

-a2 - 3 minutes

-a3 - 5 minutes

Factor B- Separation magnitude - with graduations:

-b1 - 2.2 mm

-b2 - 1 mm

-b3 - 0.2 mm

The biological material used was the dried seeds of *Agastache foeniculum* (Pursh) Kuntz (Fig. 2) harvested in 2011 in amount of 11g/probe.

For conditioning it was used a separation machine, equipped with variable amplitude control and timer. Using this separation machine Retsch AS 300 (Fig. 1) it was attempted to separate big seeds from the small seeds for *Agastache foeniculum* at (Pursh) Kuntz species. The machine has a set of sieves, according to table 1. Measurements were made regarding the amount of seeds on the sieve with diameter of 0.44 mm.

**RESULTS AND DISCUSSION**

Results on the influence of time sifting on the amount of material obtained on the sieve with diameter of 0.44 mm<sup>2</sup> are presented in Table 2.

As shown in Table 2 sifting time has no influence on the amount of material collected. None of times experiment exceeded the witness (1 minute). Regardless of the sifting time, the difference is not significant compared to the control (0.20 g). So we can say that sifting time does not affect the amount of small of seed collected on the second sieve.



Fig. 1. RETSCH AS 300 separation machine



Fig. 2. *Agastache foeniculum* (Pursh) Kuntze seeds collected from 2<sup>nd</sup> sieve

Table 1

AS 300 sieves used to separate the *Melissa officinalis* L. seeds from inflorescences

No.	Sieve number	Sieve opening (mm)
1	Sieve 1	1
2	Sieve 2	0,44
3	Sieve 3	0,25
4	Sieve 4	0,1
5	Collector	-

Table 2

The influence of the sieving time on the quantity of small seeds of *Agastache foeniculum* (Pursh) Kuntze collected on the second sieve (Ø 0,44 mm) (Cluj-Napoca, 2012)

Time (min.)	Seed quantity (g)	Differences		Signification	Duncan Test
		(%)	(g)		
1	0,53	100,0	0,00	Mt	A
3	0,62	117,1	0,09	-	A
5	0,55	105,5	0,03	-	A
DL (p 5%) 0,20		DL (p 1%) 0,33	DL (p 0.1%) 0,62	DS 0,20	

Results regarding the influence of the amplitude of sifting over the quantity of seeds collected on sieve 2, are shown in Table 3.

As can be seen from Table 3 sifting amplitude can or cannot influence very significant the amount of small seed collected on the sieve.

Thus the maximum amplitude of 2.2 mm, the difference is not significant compared to the control.

Using the amplitude of 0.2 mm, the difference is very significant compared to the control, the amount of seed obtained from sieve increased by 0.43 g

Therefore we can say that the amplitude of 0.2 mm decisively influence the amount of seed remaining on the sieve 2 (Ø 0.44 mm).

Table 3

The influence of the sieving amplitude on the quantity of small seeds of *Agastache foeniculum* (Pursh) Kuntze collected on the second sieve (Ø 0,44 mm) (Cluj-Napoca, 2012)

Amplitude (mm)	Seed quantity (g)	Differences		Signification	Duncan Test
		(%)	(g)		
2,2	0,46	100	0	Mt	A
1	0,36	78	-0,10	-	A
0,2	0,48	194,1	0,43	***	B
DL (p 5%) 0,17 DL (p 1%) 0,23 DL (p 0.1%) 0,33					DS 0,17

## CONCLUSIONS

Regardless of the sifting time, the difference is not significant compared to the control (0.20 g). It can be said that sieving time does not affect the amount of small seed obtained on screen 2. In the case of maximum amplitude of 2.2 mm, the difference is not significant compared to the control. At the amplitude of 0.2 mm, the difference is very significant compared to the control, the amount of seed obtained from sieve increased by 0.43 g So the amplitude of 0.2 mm, decisively influences the amount of seed remaining on the sieve diameter of 0.44 mm<sup>2</sup>.

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