Alexandria University
Faculty of Agric. (Saba-Basha)

**EFFECT OF SOME POSTHARVEST TREATMENTS ON
PROPERTIES OF SPEAR AND PEPPERMINT HERBS
PREPARED FOR EXPORTATION**

A Thesis

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SUMMARY

The present study was carried out in Sabahia Horticulture Research Station, Alexandria, Egypt, through the two successive seasons of 2010/2011 and 2011/2012. Two storage experiments in ambient atmosphere were conducted using natural drying (ND) and artificial drying (AD) of spearmint and peppermint herbs. The packaging types were paper bag of one single layer (p.s), paper bag of double layer (p.d), paper bag of one single layer, lined with plastic layer in side (p.s+po) and paper bag of double layer, lined with plastic layer in side (p.d+po), were tested. The experiment started on 1 October 2010 and 1 October 2011 (12 months each). During each season of storage, the herb was sampled once every 3 months (5 samples). The essential oil % was determined by water distillation and the components of the oil were determined by (G.L.C).

Results of this study can be summarized as follow:

- 1- Artificial drying (AD) is far better to keep the essential oil of spearmint and peppermint herbs at the accept level (AL) in the storage.
- 2- AD kept the major components of herbs, carvon, menthone and menthol better than (ND). As well as the microbial load at low level.
- 3- ND saved α -pinene, β -pinene and limonene at high level than (AD).
- 4- Extended storage period resulted in the reduction of all the studied components of the two herbs.
- 5- Packaging containing polyethylene (po) showed superiority in their keeping capacities to their contents among all the tested ones.
- 6- (p.d+po) Packaging :
 - saved the spearmint and peppermint oil % in the (AL) for 6-9 months in (ND) method, and for 9-12 months using (AD).
 - α - pinene was saved for 6-9 months with (ND) and 9 months for the (AD).
 - β - pinene was saved for 6-9 months with (ND) and 6 months with AD.
 - Limonene kept at (AL) for 12 months with (ND) and 9-12 months with (AD).
 - Carvone was saved for 6-9 months with (ND) and 9 months with (AD).
 - Menthon was saved for 9-12 months with (ND) and 12 months with (AD).
 - Menthol was kept for 6-9 months with (ND) and 12 months with (AD).
 - In both (ND) and (AD) the packaging saved the microbial load (fungi and bacterias) in a low standard through the 12 months of the experiment.

7- (p.s+po) Packagings:

- Saved the spear and peppermints oil % at the (AL) for 6-9 months (spearmint) and 3-6 months in peppermint with (ND) and 9-12 months in (AD) for both.
- α -pinene was saved for 3-6 months with (ND) and 9-12 months with (AD).
- β -pinene was saved with both (ND) and (AD) for 6-9 months.
- Limonene was saved in (ND) and (AD) for 9-12 months.
- Carvon in spearmint in (ND) was saved for 3-6 months and with (AD) for 9 months.
- Menthone was kept at the (AL) for 6-9 months and 9-12 months with (AD) in peppermint.
- Menthol was kept for 3-6 months with (ND) and for 6 months with (AD).
- Microbial load was kept at the lowest level than the other packagings through the 12 months of the experiment.

8- (P.d) Packagings:

- saved the spearmint and peppermint essential oil % at the (AL) for 3-6 months with (ND) and for 6-9 months for (AD).
- Saved α -pinene for 3-6 months with (ND) and for 6-9 months with (AD).
- Kept β -pinene for 6 months with (AD) and (ND).
- Kept limonene for 9 months with (ND) and for 9-12 months with (AD).
- Kept carvon for 3 months only in both drying methods.
- Kept the menthone at the AL for 3-6 months with (ND) and for 6- 9 months with (AD).
- Saved the menthol for 3-6 months with (ND) and for 6 months with (AD).
- The microbial load was kept at the AL through the experiment for both drying methods.

9 - (P.s) Packagings:

- saved the essential oil % of spearmint and peppermint for 3 months with (ND) and for 6 months with (AD).
- Saved α -pinene for 3-6 months with (ND) and for 6 months with (AD).
- Kept β -pinene for 6 months with both (AD) and (ND).
- Kept limonene for 9-12 months for both drying methods.
- Kept carvon for 3 months with both drying methods.
- Kept the menthone for 3-6 months in both drying methods
- Saved the menthol for 3-6 months in both drying methods

- The microbial load was kept at the AL through the experiment for both drying methods.

From the above mentioned it could be recommended that;

- 1- Artificial drying of spearmint and peppermint herbs is recommended to store the herb for long time, more than (ND).
- 2- Using packaging containing polyethylene extended the storage period, kept the essential oil and its major components at the AL for longer time.
- 3- Medicinal herbs traders when they expect selling their commodities within 6 months, they can air dry the herbs but when they expect selling it after 9-12 months they can artificial drying it.