APPROVAL SHEET

This thesis entitled :-

STUDIES ON THE EFFECT OF FREEZING ON THE PHYSICAL AND CHEMICAL CHARACTERISTICS OF CERTAIN FRUIT JUICES

For M. Sc. Degree

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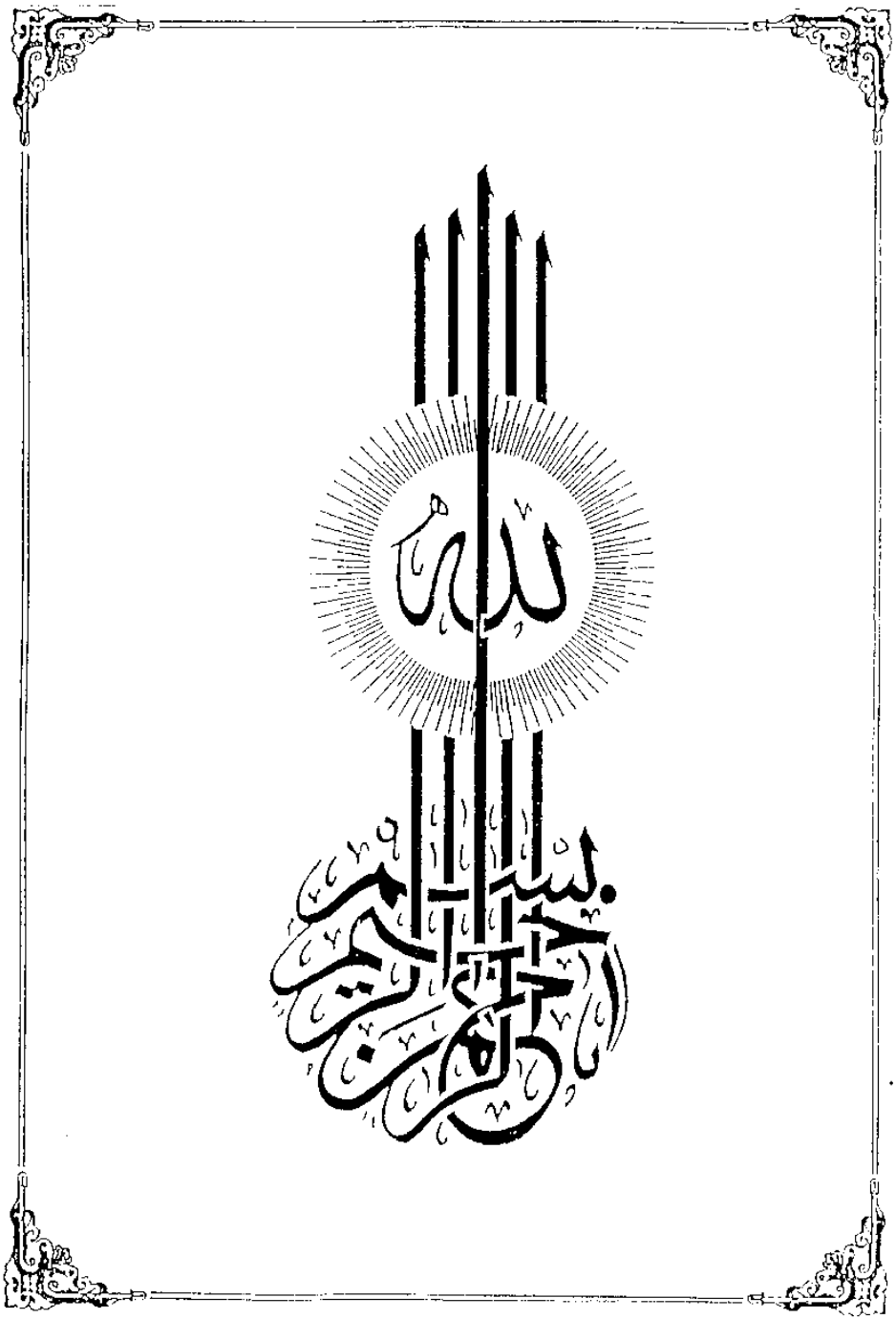

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INTRODUCTION

Fruit juice from the industrial point of view is the liquid expressed or extracted from sound ripe fruits. Originally, it is the cell sap largely obtained from the vacuoles of generally distributed cells or cells of localized areas. The juice in some cases is subjected to the removal of insoluble matters by filteration, depending on the type of the juice, Tressler and Joslyn (1961).

The relative desirability of fruit juices has been largly related to industrial experience, practical tests, and the methods of preservation.

The desirable properties of the juices, i.e. flavor, color, consistency, stability and nutritive value should be kept by the precessing and preservation. The conventional methods for fruit juices preservation are canning, freezing, use of chemical preservatives, ... etc.

Fruit juices, are known to be high in sugars, low in protein and fats, and can be considered an excellent source of vitamins and minerals. Common fruit juices although acidic in nature, exert (upon digestion) an alkaline effect on the urine, Tressler and Joslyn (1961).

In A.R.E. there are several local varieties of fruits, most of them are suitable for the production of

high quality juices. Mangoes "Mangifera Indica" and apricot "Prunus armeniaca" are examples of such fruits.

Aim and scope:

The present investigation was carried out to study the effect of freezing and frozen storage alone or accompained with other treatments, i.e. pasteurization, whipping (for sherbet making), adding chemical preservatives such as sodium benzoute and SO_2, and the addition of sugars (4 % and 8 %) on the chemical properties and organoleptic tests of mango and apricot juices. Besides the effect of type of packaging namely, cans and polyethene bags is also studied.

REVIEW OF LITERATURE

a. Composition of fruits:

1. Mango:

Bahgat and Mohsen (1951) stated that the percentage of pulp was 80 % in each of the "Pairi" and "Mabrouka" varieties, whereas in "Company"it was 75% and only 60 % in the "Hindi Sinnara" variety. Siddappa and Bhatia (1956) in a study on mango reported that the percentage of peel, stone, and pulp ranged between 14.6 - 19.2, 12.2 - 17.5, and 63.3 - 73.2 respectively in the varieties investigated. Hassan (1962) found that the percentage of peel, stone, and pulp was 16.22, 19.55 and 63.91, respectively in Baladi variety. Also Asker (1966) reported that the percentage of peel, stone, and pulp in Baladi variety was 13.6, 19.3, 66.9 respectively.

2. Apricot:

Aref and Soliman in Egypt (1960) found that the percentage of pits of Fayomi apricot ranged between 14 and 16. Sarhan (1970) found that the percentage of juice, peel and pits were 69 %, 13.5 % and 16 % respectively.

B. Chemical composition:

1. Moisture and total soluble solids:

1-1. Mango:

Mustard and Lynch (1945) reported that the moisture content of mango was 81.4 % in Rajpury variety and 84.8 % in Caraboo variety. Juan et al., (1957) showed that the moisture content of mango ranged from 79.2 % to 80.8 %.

In the Egyption mango varieties the moisture content ranged from 73.20 % to 80.67 % as stated by Hassan (1962). Bruno and Gold (1963) mentioned that the moisture in mango ranged from 78.1 to 82.1 %. Asker (1966) found that moisture content of mango was 83.15 % in Baladi variety.

1-2. Apricot:

Vonloesecke (1942) found that the moisture content and total solids of apricot packed as apricot juice were 87.3 % and 12.7 % respectively. Also, McCance and Widdowson (1946) reported that the moisture content of apricot was 79.8 %. Nakajima and Yamazaki (1956) found that apricot fruits of some varieties contained 83.92 % moisture. Minicone (1962) reported that the average value of the moisture content and total solids of apricot were

83.91 % and 16.09 % respectively. However Abd El-Baki and Fahmy (1962) found that the moisture content of the Egyption yellow green and yellow apricot were 83.0 % and 84.1 % respectively. They added that the total soluble solids of yellow green and yellow apricot were 13.6 % and 13.8 % respectively.

2. Ascorbic acid:

2-1. Mango:

Mustard and Lynch (1945) showed that the ascorbic acid content of some mango varieties (Amini, Bennet and Kent) was 36.5, 50.9 and 21.0 mg. per 100 g. respectively. Bahgat and Mohsen (1951) stated that in some local mango varieties the ascorbic acid content was 59.7 mg/100 g. Hassan (1962) showed that the ascrobic acid content of Egyptian mangoes, ranged from 21.9 to 77.2 mg/100 g. also Bruno and Goldberg (1965) mentioned that ascorbic acid in mango was 53.4 - 98.6 mg/100 g. In another study Asker (1966) found that the ascorbic acid content was 14.9 mg/100 g. in Baladi mango variety grown in U.A.R.

2-2. Apricot:

In many studies on vitamin C content of some fruit juices Gomolyake (1939) reported that apricots,

peaches and plums varied in their vitamin C content from 5.2 to 12.9 gm/100 g. of the edible portion of the fresh fruit. Quinones et al., (1944) reported for a lower ascorbic acid content in canned apricots i.e. 3.0 mg/100 g. On the otherhand , Guerrant et al., (1948) reported somewhat higher values of ascorbic acid content of canned apricots which ranged from 4.4 mg/100 g. to 5.8 mg/100 g. In another study it was found that the Vitamin C content of apricot fruits ranged between 3.5 and 6.5 mg/100 g. as reported by Nakajima and Yamazaki (1956). However, it was noticed that "Kaiska" apricots contained a higher value of 8.1 mg/100 g. ascorbic acid (1965). Moreover, El-Sayed and Luh (1967) mentioned that the ascorbic acid content in canned Blenhein apricot ranged between 3.1 gm/100 g. and 3.3 mg/100 g. The highest value of vitamin C in apricots was reported to be 10.6 - 14.4 mg/100 g. as mentioned by Bespechalnaya et al., (1969). In Egypt. Aydan and Maximes (1969) mentioned that the ascorbic acid in apricot was 4.0 mg/100 g.

3. Acidity:

3-1. Mango:

Mustard and Lynch (1945) showed that the acidity as citric acid was 0.47 % and 0.65 in Rajpury