

STUDY OF HEATED JUICES AND TINY PARTICLES OF FRUITS BY MICROSCOPE AND SCANNING ELECTRON MICROSCOPE

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ABSTRACT

Aim to study the influence of heated juices and tiny particles of ground root fruits. Beetroots, sweetpotatoes and carrots cultivated in some places of Maharashtra, India. These fruits are rich sources of carbohydrate and vitamin. Carbohydrates are the most abundant organic compounds in the beetroots and sweetpotatoes. Vitamin of carotene as β -carotene is abundant organic compounds in the carrots. Carbohydrates such as sugar and starch are the organic compounds from the juice of beetroots and sweetpotatoes. Juice of eatable fruit contains chemical energy; we obtained carbohydrate and vitamin raw as well as cooked. Sugar from beetroots is known as table sugar. Starch from sweetpotatoes used in laboratory. Vitamin is the essential for human being and obtained from fruits and plants. Carbohydrates are

The well-known and they are composed of monosaccharides, disaccharides and polysaccharides. The organic chemistry of glucose, starch and carotene resembles that of alcohols, aldehydes and carotenes.

KEYWORDS: Juices, tiny cellulose, methanol, microscope, scanning electron microscope.

1. INTRODUCTION

Ground root fruits beetroots, sweetpotatoes and carrots are most necessary for living organisms. Carbohydrates are that most abundant organic compounds in the fruits, beetroots and sweetpotatoes.^[1] Vitamin is the also most abundant organic compounds in carrots and fruits. They are primary botanical means of chemical energy. Preparation of solids, (sugar, starch and carotene) heated juices and solids are described in this experiment.^[2,3] The

prepared juices were characterized by microscope and scanning electron microscope. We obtained carbohydrates such as sucrose and starch from beetroots and sweetpotatoes. Vitamins of carotene as β -carotene gained from the carrots. The sucrose from the juice of beetroot is the important table sugar. The sucrose on hydrolysis against dilute acid or enzyme, yields glucose and fructose. The sucrose from beetroot juice which is the disaccharides, it is an important polysaccharides. The starch from sweetpotatoes juice is made up of glucose unit. It is the second abundant polysaccharides composed of cross-linked. The vitamin from carrot juice is the carotene of β -carotene.

2. EXPERIMENTAL

2.1. Materials

The beetroot, sweetpotato and carrot fruits are cultivating in some places of Maharashtra, India. These are available in local vegetables market. Fruits like beetroot, sweetpotato and carrot may consume raw and cooked. These are rich sources of carbohydrates and vitamins.

2.2. Preparation of semisolid cellulose mass

Three fresh ground fruits *viz.* beetroot, sweetpotato and carrot were selected for work. They were purchased from the local vegetables market. Fruits were cleaned and washed with tap water and again rinsed with distilled water to remove the earth. These fruits were kept in shadow.

Fruits were crushed by using home appliance. (Kishani) The wet cellulose mass of each fruit was collected in glass beaker. Each cellulose mass was squazed by hand, the juice and cellulose were separated. The juice of fruit was filtered through the tea filter gauze. The filtrates were collected in beakers.^[4,5] The colour of juices shown in table 1.

Table 1: Fruits and its colour of juices.

Sr. No.	Name of fruits	Colour of juices
1	Beetroot	Dark pink
2	Sweetpotato	Creamy/whitish
3	Carrot	Reddish

The juices were kept at overnight in glass beakers. The upper layer of juices were separated. The settled solids were collected in porcelain dishes.

The solids of sugar, starch and carotene dried in the shadow. Juices taken in watch glasses and heated on water vapours using water bath.

2.3. Preparation of tiny particles

A few wet cellulose mass of each fruit was taken in watch glass. These watch glasses heated on water vapours using water bath. After drying cellulose mass collected into mortar. Tiny particles were prepared by grinding dried cellulose mass.

2.4. Microstructures examination of specimens

Firstly carbon tape pasted on each aluminium stubs. Specimens were equipped on carbon tape. Tiny particles, heated juices and overnight settled solids observed by microscope. (Leitz made in USA).

2.5. Surface morphology by SEM-EDX

After microscopic examination, same samples were mounted in SEM. These specimens also were examined for the surface morphology. (VEGA 3 LMU/EDX made in USA) By addition of methanol drops, samples were examined under microscope and surface morphology by SEM.

3. RESULTS AND DISCUSSIONS

3.1. Separation of juice and cellulose

Three ground root fruits were selected for analysis and examination. The tiny particles, heated juices and dried solid substances obtained from the fruits.

They were examined and analyzed by microscope and scanning electron microscope. These same samples were characterized by microscope and SEM, blank and addition of methanol.

3.2. Sampling of tiny particles

The pieces of carbon tape pasted on aluminium stubs Tiny particles of cellulose directly equipped on carbon tape. Each aluminium stub was mounted in sample holder of microscope. The characteristic features of the tiny particles shown in “Fig. 1a, 1b and 1c”.

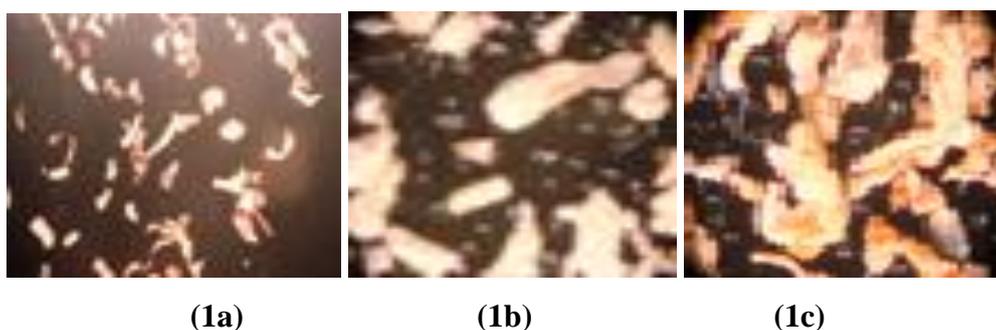


Fig. 1a, 1b and 1c: Microscopic structures of tiny particles.

Tiny particles of cellulose directly equipped on carbon tape. Addition of drops of methanol each stub was mounted in microscope. The characteristic features of tiny particles by added methanol shown in “Fig. 2a, 2b and 2c”.

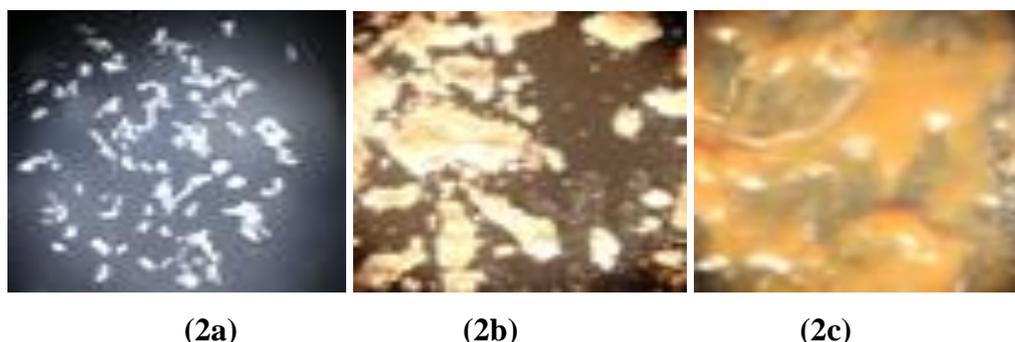


Fig. 2a, 2b and 2c: Microscopic structures of tiny particles with methanol.

3.3. Sampling of overnight settled solids from each juice

The solids of juices directly equipped on carbon tape The piece of carbon tape pasted on aluminum stubs. The characteristic features of settled juices are shown in “Fig. 3a, 3b and 3c”.

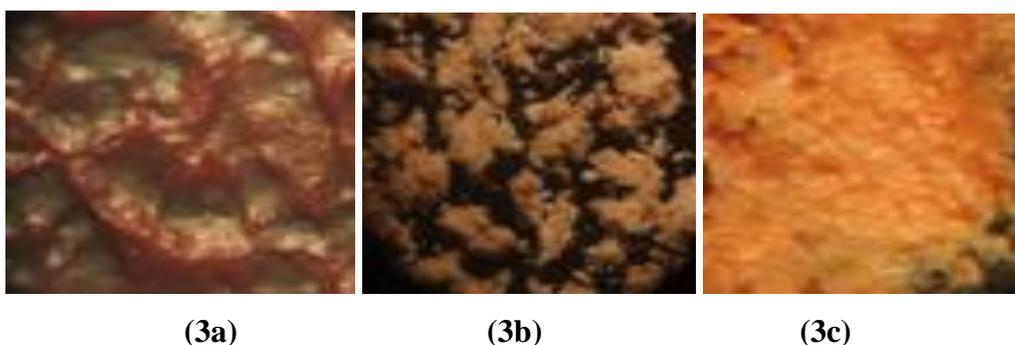


Fig. 3a, 3b and 3c: Microscopic structures of overnight settled solids.

3.4. Preparation of stub for heated juices

The scrapping of heated juices were directly equipped on stubs, pasted small piece of carbon tape. The stubs were mounted in scanning electron microscope (SEM) The surface morphology of heated juices shown in “Fig. 4a, 4b and 4c”.

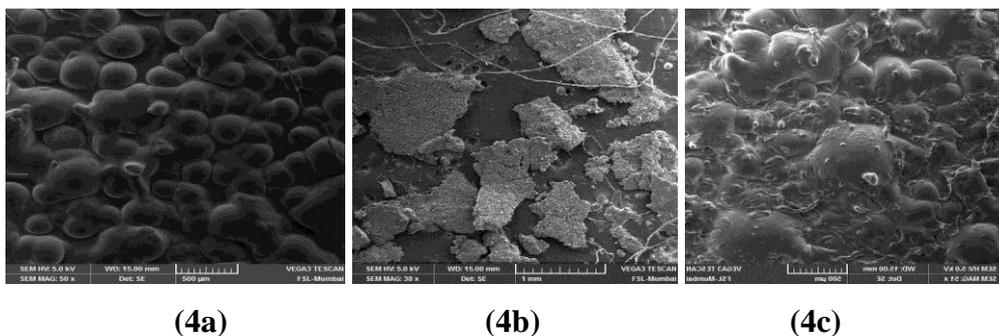


Fig. 4a, 4b and 4c: Surface morphology of heated juices.

Scrapping of dried juices directly equipped on carbon tape. Addition of methanol drops the stubs were mounted in scanning electron microscope. (SEM) The surface morphology of heated juices by adding few drops of methanol shown in “Fig. 5a, 5b and 5c”.

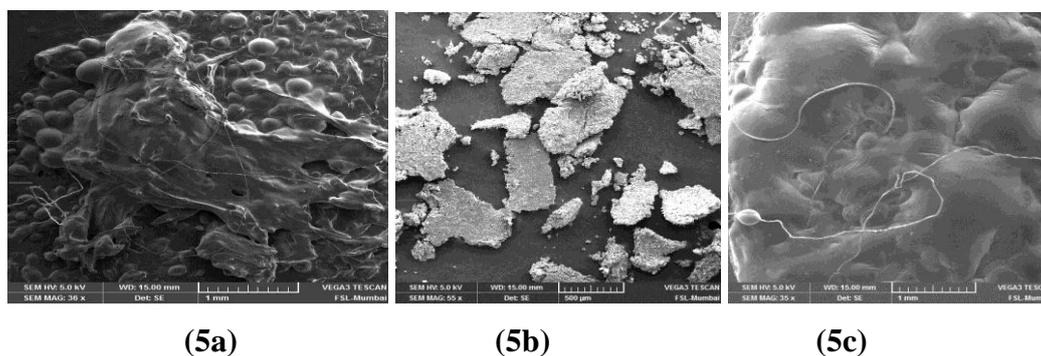


Fig. 5a, 5b and 5c: Surface morphology of heated juices with methanol.

The cannon EOS S50 D made in Japan camera was used for the microphotographs.

3.5. Spectral analysis of heated juices

The spectra of heated juices of beetroot shown in “Fig. 6”.

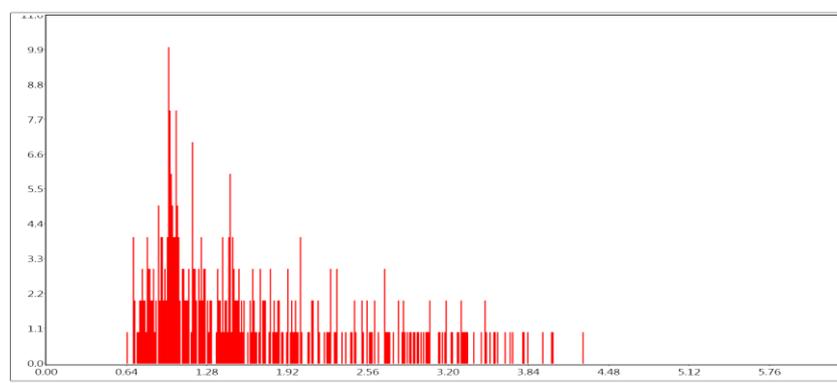


Fig. 6: Beetroot juice spectra.

The spectra of heated juice of sweetpotato shown in “Fig.7”.

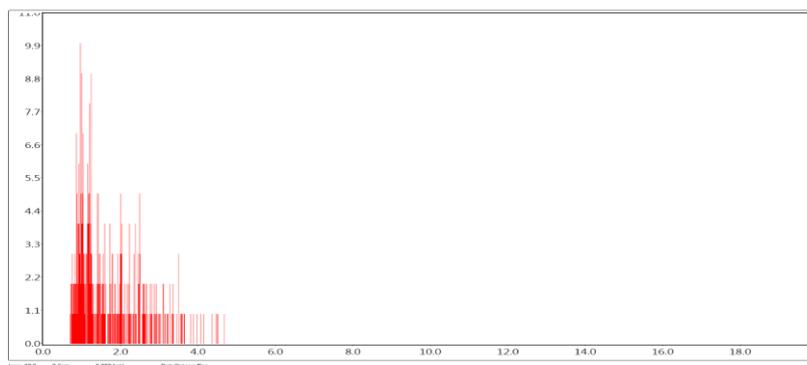


Fig. 7: Sweetpotato juice Spectra.

The spectra of heated juice of carrot shown in “Fig.8”.

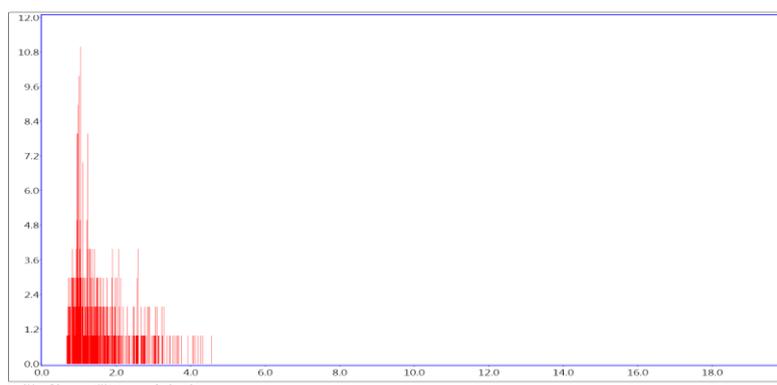


Figure 8: Carrot juice spectra.

4. CONCLUSIONS

In this study fruits were crushed. They were separated into juice and cellulose. Tiny cellulose particles observed by microscopic examination. Tiny cellulose particles also examined by addition methanol.

The surface morphology of juice samples were obtained by scanning electron microscope. (SEM) The dried juice samples of beetroot and carrot showing sand pebbles like surface morphology the heated juice of sweetpotato showing irregular flakes like surface morphology.

Addition of methanol reacts with dried juice samples disturbed the appearance.

The heated juices samples of sweetpotato showing changes by addition of methanol.

The spectra of heated three juices showing variation by EDX analysis.

The solids prepared from the filtrates observed under microscope showing different characteristic features.

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