AGRICULTURAL RESEARCH ORGANIZATION
THE VOLCANI CENTER
INSTITUTE FOR TECHNOLOGY & STORAGE
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Development of tropical fruit juices by enzymatic maceration (first 6 months report: July 1987 - December 1987). Project C5-208 CDR

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I Objective

The initial objectives of the project were to develop a specific process and to select the commercial enzymes, giving optimum yields and quality characteristics of the respective juices - on a lab scale.

II Materials and Methods

1) Mango of the 'Maya' cv. and guava of the 'Bendov' cv.(mature, fully ripe sound fruits) were used as a raw-material for the experiments.

2) A process for preparation of mango and guava juices was developed as follows: (basic process steps only):

Washing and selection

Steam blanching

Removal of stones (mango)

Desintegration - raw pulp

Enzymatic treatment - time x temperature x enzyme concentration.

Separation between juice and pulp

Juice pasteurization.

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3) The following parameters for enzymatic maceration (affecting juice yield and quality), were assessed:

   a) Time vs. temperature vs. enzyme concentration

   b) Commercial enzymes (five pectolytic, one hemicelluloitic and one celluloitic), as follows: Pectinex 3x; Rohapect TF; Rapidase; Rohament; Ultrazyme; Biopetinex; Celluclast.

   c) Juices yields; total soluble solids (TSS), - ^{o}Bx; acidity, pH; ascorbic acid; turbidity and color characteristics; viscosity, flavor, etc.

   d) Alcohol insoluble solids (AIS) of the raw pulp, juice and pulp (after enzymatic maceration), of the enzymes, giving optimum yield and quality were prepared. The pectin degradation will be assessed in order to understand better the influence of the different enzymes on the fruit maceration.

III Preliminary results

1) The highest juice yields were obtained with:

a) For mango - Pectine 3x, Rohapect TF, Biopectinase;

b) For guava - Ultrazyme, Pectinex 3x.

2) Diferences in the quality characteristics of the respective juices were observed between different enzymes applied. The results will be discussed in more details in the first year report - probably after experiments with local fruit varieites in Costa-Rica.

3) A combined treatment with a pectolytic and a cellulotic enzyme, resulted in higher juice yield and different quality characteristics.

More detailed results, discussion and conclusions-for the pilot plant experiments, will be given in the yearly report.

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IV General Remarks

1. The project started in Israel only during July-August, because the first budget release was available for use only at the end of June.

2. The first transfer to Costa-Rica was realized (for technical-administrative reasons) only in December 1987, therefore no information on their work is presented.

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