PN AEM-520

AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

DATE: 7/25/88

MEMORANDUM

TO: AID/PPC/CDIE/DI, room 209 SA-18

FROM: AID/SCI, Victoria Ose VO

SUBJECT: Transmittal of AID/SCI Progress Report(s)

Attached for permanent retention/proper disposition is the following:

AID/SCI Progress Report No. C5-208
Second 6 mo report Jan-Jun 88

Attachment

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State of Israel
Ministry of Agriculture

AGRICULTURAL RESEARCH ORGANIZATION
THE VOLCANI CENTER
INSTITUTE FOR TECHNOLOGY & STORAGE
OF AGRICULTURAL PRODUCTS

May 23, 1988

Development of tropical fruit juices by enzymatic maceration (second 6 months report: January - June 1988). Project C5-208 CDR

Noach Ben-Shalom and Aharon Levi

Objective: to examine the effect of the pectolytic enzymes which already selected on the endogenous substrate of the tropical fruit.

Materials and Methods:

1) 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 selction

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. Commerical enzymes: Pectinex 3x and Ultrazyme from Novo and Rohapact, TF from Rohm. Units of activity of polygalacturonase, pectin lyase and pectin esterase of each enzyme were determined. Alcohol insoluble solids were prepared from the raw pulp and from the juice and the pulp after enzymatic maceration. Pectic substances of the Guava were analyzed. Alcohol-insoluble solids (AIS) were prepared from the untreated and the blanched tissue by repeated extractions with 70% and 96% alcohol. soluble pectin was prepared by sequential extraction of the AIS with water at room temperature until no galcturonic acid appeared in the extract. Calcium pectate was extracted from the washed pellet of the soluble pectin with 0.2% EDTA and Tris-HCl (0.02 M, pH 6.2), dialyzed against water, and freeze-dried. Proto pectin was analyzed after its extraction with 0.05M NaOH.

Preliminary results:

Ultrazyme Pectinex 3x and Rohapect TF were found to have differences in their activity with pectinlyase polygalacturonase and pectinesterase. Ultrazyme have the highest pectinlyase activity, Rohapect TF the highest polygalacturonase activity and Pectinex 3x have the highest pectinesterase and relative high content of the two other enzymes.

The effect of the commercial enzymes on the pectic substances of the Guava show that they mainly increase the soluble pectin fraction as the protopectin decreased. More then 90% of the pectic substances found to be soluble after the enzyme treatment. Specific changes which were occured in the pectic substances after the enzyme treatment are studied by gas chromatograph.

Detailed results about our pilot plant experiments will be given in the next report when Aharon Levi will be back from Costa Rica. Aharon will spend some time in Costa Rica in order to organize the machinary and to help the people to set up the pilot plant experiments.

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