SUMMARY

CORRELATION OF PALMYRAH FRUIT MORPHOLOGY WITH FLABELLIFERINS AND BITTERING TECHNIQUE.

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Scientific Background & Scope

Palmyrah Fruit Pulp (PFP) is an underutilized resource. Its utilization is linked to the presence of flabelliferins (steroidal saponins). At least two of these are bioactive and affects commercial utilization. Viz., F-II bitter, Na^+/K^+ pump inhibitor. F_B - anti yeast and bacteria (including growth and fermentation).

The original objective was to attempt to correlate external visual characteristics with flabelliferin profile, to facilitate end use.

Experimental Method

Collected specimens of palmyrah fruit from around the country, maintained photographic record. Examined pulp for bitterness, colour, carotenoid content and flabelliferin profiles of each collection. Studied debittering (by use of enzymes, naringinase termamyl, amyloglucosidase) and fermentation (by use of a strain of *Saccharomyces cervisiae*) in order to predict best end use. Separate flabelliferins chromatographically and elucidate structures by derivatisation of sugar moiety and by spectroscopic analysis.

Results

There was no correlation between fruit morphology, bitterness, carotenoid content and colour with flabelliferin profile. There was some correlation of flabelliferin profile with location of collection. A major outcome of the study was the recognition that are plethora of flabelliferins existed. There is no unique technique for their separation. Depending on profile the following techniques can be used, flash chromatography, solvent gradient chromatography, the chromatotron, selective solvent extraction and medium pressure liquid chromotography (MPLC). MPLC was the most versatile technique. 5 new flabelliferins were isolated. They were 2 triglycosides, 1 monoglucoside and 2 diglycoside. The structures of the algycone of all flabelliferins (β sitosterol) was worked out. The structures of the antimicrobial flabelliferin was also worked out.

Utilization of PFP depends on (1) debittering and (11) fermentation. Most common sources of PFP produce material that can be fermentated. Those not fermentable are high in F_B. Very bitter PFP's can be debittered using heat stable α- amylase, which is a cheap commercial enzyme. Naringinase a more expensive enzyme can debitter all bitter PFP's.

Conclusions.

Nearly 90% of PFP available can be fermented at a good rate and efficiency. Very bitter PFP can be debittered by an α - amylase. This provides routes for utilization of more PFP types as a fermentation base or fruit products.

Paper / Abstract Published

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3. D.P. Vandebona, S.C. Wijeyaratne, E.R. Jansz and N. Ileperuma (2000). Studies on alcoholic fermentation of difference types of fruit pulp from palmyrah (*Borassus flabellifer*) *Proc. SLAAS.* **56** (1) Section D.

4. D.D. Ariyasena, D. Vandebona, E.R. Jansz and A.M. Abeysekara (2000). Preliminary investigations on flabelliferin varities and enzymatic hydrolysis using Palmyrah fruit pulp from different locations. *Chemistry in Sri Lanka* **17**, 28.