TECHNOFRUITS2001.CIRAD.FR

FRuiTROP-

Table 2: Colorimetric and rheological characteristics of reference and 'flash-release' mango purees

	Reference purée	'Flash release' purée
Colour indices L, a, b	50.2 / 2.1 / 29.6	52.2 / 2.0 / 35.0
Bostwick consistency (cm in 30 sec)	8.5	4.5
Apparent viscosity (Pa.s)	0.4	1.1

Yields are the same or higher as those of a classic FMC method. The process thus makes it possible to use citrus peels that are of only small economic interest today.

Subsidiary applications

**Concentration** process. Approximately 10% of the fruit mass placed in the heating chamber is recovered in the form of aromatic waters (condensed evaporation waters).

**Deodorisation process.** Some vegetables smell very unpleasant during cooking because of the volatilisation of sulphur compounds (e.g. cabbage). The prior treatment of these vegetables using the 'flash release' process would make it

possible to trap all or part of the foulsmelling volatile compounds.

Facilitate the extraction of functional substances. Numerous fruits are rich in useful functional substances such as carotenes and lycopene. Fine disintegration and the bursting of part of the cells would increase the extraction yields of these substances ■



 $\mathbf{P}$ ineapple, the eighth fruit in terms of world production with nearly 13 million tonnes per year, is practically monovarietal with the Smooth Cayenne variety. With the aim of varietal diversification, CIRAD-FLHOR has been conducting a breeding programme for more than 20 years using in particular crosses between Smooth Cayenne on the one hand and the Colombian varieties Perolera and Manzana on the other. Of the 40,000 hybrids resulting from these crosses and displaying varied characteristics (agronomic performances, fruit morphology, suitability for cold storage and organoleptic characteristics) only about ten are currently in the final evaluation phase.

The CIRAD-FLHOR Chemistry-Technology laboratory analysed certain quality components (skin and flesh colour, flesh aromatic composition, flesh sugar content and titratable acidity) in seven selected genotypes resulting from the crossing of the parents mentioned above. The analyses were performed during maturation (from the green stage to the very ripe stage). The Smooth Cayenne parent served as reference.

The pigments responsible for skin colour (except for chlorophyll, that is to say after degreening) carotenoids (yellow to orangey) and anthocyanins (pink to purple)—were extracted and either assayed as a whole by measurement of optical density or separated and identified by h igh performance chromatography. The flesh aroma components were extracted, separated and identified by gas phase chromatography combined with mass spectrometry.

Skin colour at maturity results from a balance of varying proportions of carotenoids and anthocyanins. Thus, the reference parent (Smooth Cayenne) and one of the selected hybrids with the same carotenoid content (3 mg/g fresh weight) displayed very different skin colours at maturity, with Smooth Cayenne being orangey yellow and the hybrid purple/scarlet. The difference is explained by a 50% higher skin anthocyanin content in the hybrid. Likewise, the flesh of one of the selected hybrids was a distinctly more intense golden yellow than that of Smooth Cayenne as a result of a total carotenoids content 2.5 times higher than in the latter, making this hybrid an interesting source of carotenoids.

At the ripe stage, the flesh aroma components of the hybrids and the Smooth Cayenne parent were observed at similar concentrations (30 mg/kg). Whatever the genotype and the state of maturity, esters (e.g. methyl acetoxy-3-hexanoate), thioesters (e.g. methyl 3methylthiopropanoate) and furanones [e.g. dimethyl-2,5 hydroxyfuranone-3(2H)], typical components of the pineapple aroma, are dominant. Nevertheless, differences in relative proportions are observed, together with very distinct evolutions during the final phase of maturation [e.g. in one genotype the quantity of dimethyl-2,5 hydroxy-4 furanone-3(2H) decreases from 2 mg/kg to 0 from the ripe to the very ripe stage]. These variations that occur at the stage at which the fruit is eaten must be correlated with sensorial analysis