A note on oil extracted from serendipity berry (*Dioscoreophyllum cumminsii* Diels)

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SUMMARY

Gas liquid chromatographic analysis of the fatty acid composition of the oil obtained from the seeds of serendipity berry (*Dioscoreophyllum cumminsii* Diels) shows that the oil contains none of the fatty acids associated with toxicity. Due to the high level of unsaturation, and the high content of oil in the seed (50%), the berry is likely to have greater commercial value than has so far been placed on it.

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RÉSUMÉ

ATA, J. K. B. A.: *Note sur l'huile extraite des baies porte-bonheur* (Dioscoreophyllum cumminsii *Diels*). L'analyse chromatographique (gaz-liquide) de la composition des acides gras contenus dans l'huile extraite des graines de baies porte-bonheur (*Dioscoreophyllum cumminsii* Diels) montre que cette huile ne contient aucun des acides gras associés avec une toxicité. A cause du haut degré de non saturation des acides gras et du pourcentage élevé d'huile contenue dans les graines (50%) il est probable que ces baies auront une valeur commerciale plus grande que celle qui lui est attribuée actuellement.

Introduction

The fruits of serendipity berry (*Dioscoreophyllum cumminsii* Diels), a tropical plant, has attracted much attention because of the sweet taste that persists on the tongue when it is eaten. This effect has been known for many years as reported by Daniell (1852). Morris & Cagan (1972), Morris *et al.* (1972) and Cagan (1973) have examined the sweet principles, identified and characterized it as a protein called 'monellin'.

Much of the effort has so far been on the fleshy mesocarp of the berry. There is very little information about the oil contained in the seed as well as on the defatted meal. This work, gives a preliminary report of the oil obtained from the serendipity berry.

Materials and methods

Percentage seed in fruit

Ripe serendipity berries were harvested from Kade Oil Palm Research Centre, Ghana, where they are also grown under experimental conditions. These were dried immediately in a draught oven at 100° C overnight. The dried fruits were then split to separate the seed from the coat. The percentage seed in the dried fruit was calculated from several batches of the dried fruits.

Extraction of oil from seed

The seeds were placed in a Soxhlet extraction outfit and, using hexane as solvent, the oil was extracted. The amount of oil in the seed was calculated after recovery.

Characteristics of the oil

The extracted oil was analysed for free fatty acid, volatile matter, iodine value, saponification value and unsaponifiable matter. The methods used were as determined by BS.684: 1958. The oil was also examined for its percentage fatty acid composition by gas-liquid chromatography.

Results and discussion

The results of the various determinations are given in Tables 1 and 2. From the results, it is

TABLE 1

Characteristics of the Oil in Serendipity Berry

Item	*Value*
Percentage seed in dried fruit	30
Percentage oil content of seed	52–54
Iodine value (Wijs %)	89
Saponification value (mg KOH g^{-1} oil)	188
Percentage unsaponifiable matter	1·5
Refractive index at 20°C	1·469
Refractive index at 40°C	1·465

TABLE 2

Fatty Acid Composition of Serendipity Oil Compared with Corn Oil and Sunflower Oil

Acid	*Percentage of acid*		
	Serendipity oil	*Corn oil*	*Sunflower oil*
Palmitic	1·4	8·0	4·0
Palmitoleic	0·9	—	—
Stearic	4·9	3·5	3·0
Oleic	84·7	46·0	33·0
Linoleic	8·0	42·0	59·0
Total	99·9	99·5	99·0

observed that the seeds of the fruit are very rich in oil and the seeds constitute a fair proportion of the dry fruit. The results of fatty acid composition show that the oil contains the normal fatty acids that do not present toxic hazard. The oil is particularly rich in unsaturated fatty acids. The oil is liquid at a temperature of 10°C and, therefore, has great potential for being used as an oil for direct consumption and also as an ingredient for the manufacture of edible products. From the method of extraction of the sweet principle, monellin, from the mesocarp of the fruit as described by Morris & Cagan (1972), the seed remains undestroyed which makes it available for extraction of the oil.

This preliminary study has shown that there is good potential in the development of the seeds of the serendipity berry for vegetable oil for direct consumption. This should enhance the interest that has so far been generated in the berry due to its sweetness.

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