ABSTRACT

The main objective of this project was to develop an effective extraction procedure for the main pungent principles from the ginger (*Zingiber officinale* Roscoe) rhizomes.

The extraction procedure was examined in two areas:-

(a) Laboratory 'bench-top' scale.

(b) Pilot oleoresin extraction Plant.

In these two areas, the following extraction conditions were used to extract the oleoresin from the ginger rhizome:

i) Ethanol extraction, using non-steam distilled, sliced ginger rhizomes [ETOH I].

ii) Acetone extraction, using non-steam distilled, sliced ginger rhizomes [ACE II].

iii) Ethanol extraction, using steam distilled, sliced ginger rhizomes [ETOH III].

iv) Acetone extraction, using steam distilled, sliced ginger rhizomes [ACE IV].

The pungent principles under these conditions were monitored using High Pressure Liquid Chromatography on gingerol and shogaol fractions obtained from Liquid Column Chromatographic separation of the oleoresin samples.

Based on 100 g (dwb) ginger rhizomes, and using the laboratory scale extraction apparatus, the results showed that after 200 hours of extraction time the following weights of oleoresin were extracted:

i) ETOH I = 4.769 g

ii) ACE II = 4.702 g

iii) ETOH III = 9.304 g

iv) ACE IV = 8.072 g

Similar values were obtained using the Pilot Plant extraction apparatus.

Therefore, of the four conditions investigated, it can be concluded that ethanol extraction of steam distilled material extracts the largest amount of the main pungent principles of ginger. Cytochemical analysis of the three different (fresh, solar dried and steam distilled) ginger tissues, indicated that steam distillation led to rupture of the cell walls and release of the oleoresin, thereby increasing the latter's extractability.