

PROCESS KNOW HOW FOR PREPARATION OF ZERUMBONE CRYSTALS

INTRODUCTION

Zingiber Zerumbet Smith or "Zingiber aromaticum" (Zingiber officinale Roscoe) is a tall upright ginger growing up to 3m tall with long, narrow leaves grown in Southeast Asia, but has been widely cultivated in tropical and sub tropical area around the world. It has cone shaped bracts. After a few weeks, the first green cone turns red and then flowers appear in the cone. Polynesians carried this variety of Ginger throughout the islands of the Pacific, from Taiwan where the indigenous population to Hawaii where it is known as "awapuhi". Zerumbet Ginger is used in cooking for flavour, in the treatment of swellings, strains and bruises as a poultice, as a decoction for settling upset stomachs, for toothache as an anesthetic, for the treatment of cuts and sores, and for tinea and ringworm. The clear liquid contents of the cones are used as a shampoo and hence, it is called as "shampoo ginger". The parts used are the rhizome, the leaves and the cone. Zerumbone is a sesquiterpene phytochemical from "Zingiber Zerumbet Smith" or "Zingiber aromaticum" and has been subjected for biochemical studies because of its high medicinal values. Zerumbone is currently being explored for its effects on cancer in general, Leukemia in particular, as well as HIV. Medicinal Properties of Zerumbone suppresses free radical generation; anti-inflammatory

Product characteristics are

The product is generally light to off white in colour and is used as functional food, hence, there is not much nutritional value. However, it is a facile process for the preparation of pure Zerumbone crystals, which results in the pharmaceutical benefits such as anti-tumour, anti-inflammatory, anti-pyretic, analgesic the product.

- i) Product can be packed in Amber glass bottles to hold about 5g, 10g, 25 g, 50g, 100g, are suitable.
- ii) The base product can also be packed in HMHDPE containers of 50 L capacity

RAW MATERIAL

Freshly harvested Zerumbet ginger is the major raw material require. It is preferable to obtain authentic variety fully matured in nature and rich in volatile oil content which is usually in the range of 0.25 - 0.30 % volatile oil on raw basis. The rhizome must be of good quality, free from mould growth, insect infestation and discoloration. The other raw materials required in lesser quantity are gelatin and solvents for washing Zerumbone crystals

PLANT AND MACHINERY

List of equipment's

Principal equipment's: Soaking tanks, Steam distillation still (stainless steel) with Oil-water separator, and Cabinet dryer

Auxiliary equipment: Preparation tables, Boiler, Trolleys, weighing machine, Holding vessels and miscellaneous items.

PROJECT COST – FIXED COST – WORKING CAPITAL (in Rs. '000) (estimate for a model project)

a)	Land & Land development (500 m ²)	125.00
b)	Building and civil works (100 m ²)	120.00
c)	Plant and machinery	3800.00
d)	Miscellaneous fixed assets	50.00
e)	Pre-operative expenses	350.00
	Total fixed capital	4550.00
	Working capital margin	400.00
	Total Project cost	4950.00
	Total working capital required at 15% of turnover	688.00

Means of finance

- Promoters contribution	1806.00
- Term loan	3145.00

PRODUCTION CAPACITY-(estimate)

Suggested economic capacity: 1 Kg /day (1000kg raw material)

Working : 1 shift/day, 200 working days/year

Capacity : 200 kg /annum

Optimum utilization capacity: 70%

TECHNOLOGY/MANUFACTURING PROCESS – Availability

The technology for the manufacture of Zerumbone crystals has been developed at CFTRI, Mysore, using appropriate equipment for optimal product recovery of right quality. The CFTRI has the necessary expertise to provide technical assistance and guidance for setting up the project. The CFTRI can offer further technical assistance for project implementation under technical consultancy arrangements.