

EFFECT OF MATURITY ON SOME CHEMICAL CONSTITUENTS OF TURMERIC (*CURCUMA LONGA L.*)

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Abstract : The effect of maturity on rhizome yield, essential oil content and composition, and curcumin I, II and III of the main Sri Lankan cultivar of *Curcuma longa L.* is reported. The optimum time of harvest for maximum rhizome yield, was found to be 9 months. The oil content in bulbs was higher than that of finger rhizomes. The optimum time for harvest for maximum yield of turmeric oil was found to be 7.5 - 8.0 months. Essential oil composition varied with maturity, sesquiterpenes (*ar-turmerone* and *turnerone*) increased while monoterpenes (1,8 cineole and α -phellandrene) declined in both bulbs and finger rhizomes. Monoterpene content was lower in the mother sets during the early stages of growth. Curcumin (curcumin, demethoxy-curcumin, bis-demethoxycurcumin also termed curcumin I, II and III respectively) content was monitored using t.l.c.-uv spectrophotometry and a technique based on t.l.c.-uv densitometry which was developed during this study. Curcumin I content was highest, however curcumin III content was more than curcumin II. Maturity did not affect the ratio of curcumins to any great extent. Advanced maturity resulted in a decline in total curcumin content. Maximum curcumin per bush was attained about 9 months after planting.

1. Introduction

Curcuma longa L. (Zingiberaceae) known as Turmeric, is cultivated widely throughout the tropics. The rhizome of this plant is conspicuous by its yellow pigment comprising the curcumins. It is an important food adjuvant and is used in indigenous medicine.¹

Although turmeric rhizome is used the world over as a spice and food colour, the effect of maturity on essential oil content and ratio of curcumins has not been reported in any detail in the literature. According to Krishnamurthi *et al.*⁵ the maximum colour varies with maturity and falls to nearly half its value if harvest is delayed.

The objectives of this study were to determine the effect of maturity on:— (i) curcumin content, (ii) the ratio of curcumins, (iii) volatile oil content, and (iv) volatile oil composition, in order to determine the time of optimum harvest considering volatile oil and curcumin yield.