

Studies on Tamarind Kernel Oil II¹: Analysis of Phospholipids

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ABSTRACT

Phosphatidyl choline, phosphatidyl ethanolamine, phosphatidyl serine, phosphatidyl inositol, phosphatidic acid, and lyso derivatives of phosphatidyl choline and phosphatidyl ethanolamine were identified from phospholipids of Tamarind kernel oil. Phosphatidyl choline and phosphatidyl ethanolamine were isolated and their fatty acid composition was determined by GLC.

INTRODUCTION

Tamarind kernel powder (TKP) is an important material for sizing of cotton yarns. Large quantities of TKP are used by the Indian textile industry for this purpose. It contains an oil (5-7.8%) (1) which has not been studied in detail. Earlier we have reported total fatty acid composition of Tamarind kernel oil (2). This communication deals with the analysis of phospholipids from the same oil.

RESULTS AND DISCUSSION

Phospholipids were separated from Tamarind kernel oil (TK Oil) by the acetone precipitation method. Two pure phospholipids were isolated from the phospholipid mixture by column chromatography followed by preparative TLC. Their purity was checked by TLC using different solvent systems against standard phosphatidyl choline (PC) and phosphatidyl ethanolamine (PE) (3,4,5). On the basis of mild alkaline hydrolysis, exhaustive acidic degradation and IR spectral analysis, the two phospholipids were identified as PC and PE. The fatty acid composition of PC and PE was determined by GLC and is shown in Table I.

Phosphatidyl serine, phosphatidyl inositol (PI), phosphatidic acid (PA), lysophosphatidyl choline, and lysophosphatidyl ethanolamine have been tentatively identified by thin layer chromatography (6) and also by paper chromatographic analysis of the hydrolysis products according to standard procedures (7,8,9,10).

PC and PE are major phospholipids present in the TK oil

TABLE I

Fatty Acid Composition of PC and PE from TK Oil

| Phospholipid | Fatty acid composition (% by wt) | | | | |
|--------------|-------------------------------------|------|-------|-------|-----|
| | C16 | C18 | C18:1 | C18:2 | C20 |
| PC | 55.9 | --- | 21.8 | 22.3 | --- |
| PE | 61.6 | 11.0 | 6.3 | 12.1 | 5.8 |

and constitute ca. 60% of the total phospholipids. Other phospholipids are present in relatively small amounts. Seed oils such as sunflower, cocoa, cotton, peanut, soya, castor and pine are rich in neutral lipids, but contain small amounts of polar lipids. Generally, PC and PE are the major phospholipids whereas PI and PA are found in relatively small amounts in seed oils. The composition of phospholipid of TK oil conforms to the general pattern of seed phospholipids, and no novel features have been observed.

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