

CHROMATOGRAPHY

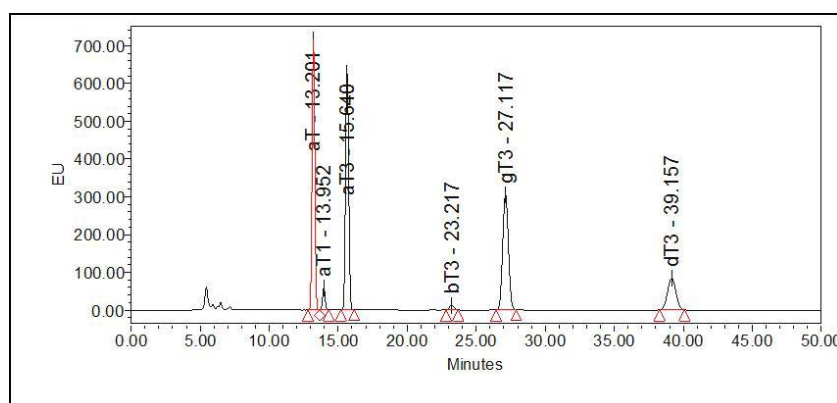
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Chromatographic analyses of tocots in palm in the absence of authentic standards

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Natural tocots, which is a powerful antioxidant, are classified into two major homologues series, the tocopherols and tocotrienols. Each of these homologue consists of α -, β -, γ - and δ - isoforms. While tocopherols are more commonly found in natural plants, the availability of tocotrienols is more limited. Studies have found that both tocopherols and tocotrienols are present in palm oil. In fact, palm oil is known to contain highest amount of natural tocotrienols. Earlier studies documented that palm tocots consist of α -tocopherol (α -T), α -tocotrienol (α -T3), γ - tocopherol (γ -T), γ -tocotrienol (γ -T3) and δ -tocotrienol (δ -T3). Studies in later years reported the presence of α -tocomonoenol (α -T1) in palm oil. Accuracy and reliability of analyses for tocots have always been a cause for concern. This is due to the fact that the tocots are highly potent antioxidative compounds and thus, are easily susceptible to oxidation or degradation. The most debated question remained the use of individual standards for the analyses of α -, β -, γ - and δ -tocotrienols. The question on the concentration of the standards were often raised as the tocotrienols, especially δ -tocotrienol is easily susceptible to oxidation. The scarcity of tocotrienols and tocomonoenol standards also contributed to the difficulty in analyses and calibrations. Official AOCS method recommended the use of α -tocopherol as reference in the absence of the tocotrienols standards, which is a common practice. However, this is often not accepted by the industry players mainly due to the question on the different response of the individual tocopherols and tocotrienols in UV spectroscopic analyses. In addition, the concentration of α -tocomonoenol is often not reported although its presence is quite significant in palm oil. Moreover, to date, there is no reliable official method and authentic standards for such analyses. The American Oil Chemists' Society (AOCS) has documented a method for the analyses of tocopherols and tocotrienols, however, the method is deemed useful only when the standards for the individual tocopherols and tocotrienols are available for calibration. The present paper reports on a comprehensive and reliable method for the HPLC analyses of tocopherols, tocomonoenol and tocotrienols in palm oil, taking into consideration the limit of detection, limit of quantitation, linear range of analyses as well as the calibration of the tocots in the absence of authentic standards.

**Figure1:** Chromatogram of tocots in palm oil

Biography

Ng Mei Han is a Principal Research Officer at Malaysian Palm Oil Board (MPOB). MPOB focuses on the research and development for the wellbeing of the oil palm industry. She primarily focuses on the green processing of the palm oil downstream products and developing methods for the analyses of palm oil minor components.

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