ABSTRACT

Epidemiological studies consistently indicate that the consumption of fruits, vegetables and herbs rich in phytochemicals lowers the incidence of diseases in humans. This beneficial effect is mainly due to the presence of polyphenolic compounds. As plants produce a lot of antioxidants to control the oxidative stress caused by UV and oxygen, they can represent a source of new compounds with antioxidant activity. The interest in polyphenols has grown considerably because of their high capacity to entrap the free radicals associated with different diseases. Recently, there has been an increasing interest in determining relevant dietary sources of antioxidant phenolics. Assessment of biological properties of plant extracts remains an interesting and useful task in identifying new sources of natural antioxidants which can be used as nutraceuticals.

In this context an attempt was made to study the antioxidant properties of regional *Cordyline terminalis* and *Myristica fragrans* and identified the polyphenols by HPLC ESI-LC-MS. The LC-ESI-MS data were useful to identify the potential polyphenols compounds and their subclasses. It was striking to find out that different types of polyphenolic compounds were present in the form of different subclasses of main class—‘flavonoids’, within the category of ‘polyketides’, as per Lipid Metabolites and Pathways Strategy consortium (LIPID MAPS). *Myristica fragrans* seem to possess relatively a higher content of ‘isoflavonoids’, ‘chalcones and dihydrochalcones’ and ‘other polyketides’ subclasses, whereas the subclass ‘flavones and flavonols’ seem to be more abundant in *Cordyline terminalis*.

Polyphenols are generally prone to degradation on storage. Hence encapsulation of the polyphenols in *Cordyline terminalis* and *Myristica fragrance* extracts using Casein beads were carried out. In addition to this, it was found that the both the extracts possess alpha amylase inhibitory effect and antibacterial activity. In this study, we have developed an encapsulation procedure which retains the antioxidant properties and polyphenol contents from two novel plants stable over a period of one year at room temperature at non-toxic level. The stability of the encapsulated extracts was studied over
a period of 12 months. We observed that the polyphenols content and antioxidant activity remained stable in the encapsulated beads compared to the unencapsulated extracts. Sodium-caseinate beads prove to be a promising technique for food supplementation with natural antioxidants.