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Introduction

Ca eine, 1,3,7-trimethylxanthine, is the major alkaloid ingredient in about 60 herbs, including *ea sinensis* (tea leaves), *Co ea arabica* (co ee beans), *eobroma cacao*, *Paulinea coppana* (guarana seeds) and *Cola nitida* (kola nuts), to which their CNS stimulant is attributed [1]. e pharmacological e ect of ca eine can be achieved when it is consumed in the form of herbal extract or pure ingredient added to various food products. Hot tea and co ee drinks are among the most popular sources for obtaining the desired e ect of ca eine, providing ca. 50 and 100 mg ca eine per cup, respectively [2]. Ca eine is also a common ingredient in many painkillers and antimigraine pharmaceuticals. With the recent reemergence of medicinal herbs as a major player in the global dietary supplement market, such new products containing ca eine have been introduced. e levels of ca eine in di erent matrices (e.g. biological, pharmaceutical and herbal) have been determined by numerous techniques, including spectroscopic and chromatographic methods [3-8]. High Performance in Layer Chromatography (HPTLC), coupled with densitometric detection, is among the various methods reported for the quality control of pharmaceutical products containing ca eine [9]. As such, HPTLC may be utilized as an e ective analytical tool for the quality control of ca eine-containing dietary supplements. In this report, a developed HPTLC method was validated for speci city, linearity of calibration, recovery, accuracy and precision (repeatability) and was used to determine the levels of ca eine in stimulant herbal products and power drinks on the Saudi market.

Dates (Phoenix dactylifera L.) have always been a valuable crop inarid and semiarid parts of the waT/mT,t-106(aT/mT,t-106(aT/mT,o6,av5T/m06,av314tn67ein)-163(crop)]TJ EMC /Span <</MCID 48 29

thoroughly. e Raw date seeds and dry heated (Roasted) seed samples were ground to a ne powder and stored in a separate screw cap bottle at 20°C before analysis.

Determination of ca eine content by HPTLC method

Standard solutions: A solution of ca eine standard was prepared by dissolving 2 mg accurately weighed, in 5 mL methanol (Merck, Germany) in a volumetric ask. is is the stock solution. It was further diluted for preparing six points calibration curves.

Sample preparation: One gram of the nely dried seed powdered of plant material was extracted two times with 25 mL of methanol on a water bath at 70ºC for 20 min. Each of the extracts from the same samples were combined, partially evaporated and concentrated to dryness under vacuum. A er that the extracts were re-dissolved in methanol. Prior to use, all the samples were ltered through 0.45 m lter.

High performance thin layer chromatography: A Camag HPTLC system equipped with an automatic TLC sampler, TLC scanner 3 and integrated so ware WINCATS version 1.4.1 was used for the analysis. Chromatrography was performed on 10 cm × 10 cm HPTLC plates coated with silica gel 60F254 (E.Merck) of 200 m layer thickness for the quanti cation of ca eic acid.. Standard and samples were applied to the plates as 8mm long bands, 8mm apart by use of a Camag Linomat (V) sample applicator equipped with a 100 l microsyringe and an automatic TLC sampler under a ow of Nitrogen gas.

Detection and estimation of ca eine: e linear ascending development was carried out in a Camag glass twin through chamber (20 cm × 10 cm) previously saturated with 20 mL mobile phase with ethyl acetate-acetic acid-formic acid-water (100:11:11:27, v/v/v/v) for 15 min at room temperature 25ºC. Plates were developed to a distance of 80 mm [13]. Subsequent to the development; the TLC plate was