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## Master Thesis Defense

Entitled

*PHYTOCHEMICAL SCREENING, ELEMENTAL COMPOSITION AND IN VITRO ANTIOXIDANT  
ASSESSMENT OF SELECTED UAE MEDICINAL PLANTS*

by

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Abstract:

Medicinal herbs have been used since prehistoric times to alleviate pain and to treat many different diseases. In recent decades, there has been a growing interest on natural product research, particularly on herbal plants and their bioactive constituents. The resurgence of interest in medicinal plants is primarily attributed to the inefficacy of synthetic medicines in combating many diseases as well as to their toxic and side effects. The flora of the UAE is rich with various medicinal plants that were utilized by the indigenous people for different therapeutic purposes. Unfortunately, there are still gaps of knowledge, research and development on the phytochemical and pharmacological aspects of the UAE medicinal plants. Therefore, this thesis is aimed to perform phytochemical screening, to determine the content of phenolic and flavonoid compounds, to determine the content of thirteen chemical elements and to evaluate the *in vitro* antioxidant activity of the crude extracts of six UAE medicinal plants. The medicinal plants examined in this work are: *Acridocarpus orientalis*, *Leptadenia pyrotechnica*, *Calotropis procera*, *Tecomella undulata*, *Euphorbia larica* and *Cyperus conglomeratus*. The phytochemical screening was performed using preliminary chemical tests. The total phenolic and flavonoid contents were determined by Folin–Ciocalteu and aluminum chloride colorimetric methods, respectively. The elemental analysis was performed using inductively coupled plasma-optical emission spectrometry (ICP-OES). The DPPH, ABTS and FRAP assays were used to assess the antioxidant activities of the selected medicinal plants. Results revealed the presence of phenols, flavonoids and terpenoids in all six medicinal plants. Different amounts of phenolic and flavonoid contents were recorded in

the different plant extracts. The phenolic content was found to be highest in *Acridocarpus orientalis* extract (506.42 mg GAE/g DE) and the lowest in *Cyperus conglomeratus* extract (61 mg GAE/g DE). Similarly, the highest total flavonoid content was revealed in *Acridocarpus orientalis* (454.37 mg QE/g DE), while *Cyperus conglomeratus* had the least total flavonoid content (9.54 mg QE/g DE). The average concentrations of macro-elements were ranged from 3175 to 37,596, 567.49 to 13,472, and 4452.16 to 15,562, 205.31 to 6837.46 mg/kg for Ca, Mg, K and Na, respectively. All the plants crossed the allowable levels set for iron, manganese, copper, chromium and aluminum. *Acridocarpus orientalis* showed the highest antioxidant activity with an IC<sub>50</sub> of 34 µg/mL and 45 µg/mL for the DPPH and ABTS radical scavenging assays, respectively. The reducing power of *Acridocarpus orientalis* was found to be dose dependent. The chemical content and the biological properties of the majority of the plants were studied for the first time in the UAE and therefore their uses in the traditional medicine against different diseases were scientifically validated.

**Keywords:** Phytochemicals, chemical elements, antioxidants, *Acridocarpus orientalis*, *Leptadenia pyrotechnica*, *Calotropis procera*, *Tecomella undulata*, *Euphorbia larica*, *Cyperus conglomeratus*.