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Monitoring and Classification of Plant Species in Some Wadies of Sinai Peninsula Using Remote Sensing Applications

A Thesis Submitted for the Degree of Doctor of Philosophy of Science in Botany
(Taxonomy of Flowering Plants)

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالُوا سُبْحَانَكَ لَا عِلْمَ

لَنَا إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ

الْعَلِيمُ الْحَكِيمُ

(البقرة آية 32)



Dedication

To My Dear **Father & Mother**

My Husband

My Brothers

and

My Son

For their pray, help, advice, support, endurance and

love



ghada Ali

Approval sheet

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This thesis has not been previously submitted for
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Abstract

Absorption of light in the electromagnetic spectrum by plant pigments and other types of molecules produces a unique spectral reflectance signature. The aim of the present study is to assess the use of morphological and hyper-spectral remote sensing in taxonomy of flowering plants. This study included the investigation of the morphological attributes of some taxa *viz.* whole plant, stem & leaf anatomy & epidermal characteristics (LM & SEM) and hyper spectral wave length to clarify the diversity and the diagnostic importance of these characters. The studied taxa represented 19 genera and 20 species. The character states of morphological criteria (317 attributes), hyper spectral attributes (31 wave length) and the sum of both (348 attributes) of the investigated taxa were each subjected to a numerical analysis using NTsys-pc program (version 2.2). The resulted dendrograms interpreted the similarities and dissimilarities between the investigated taxa. The specific and infra-specific relationships were discussed and compared with some of the current systems of classification. The produced wavelength by hyper spectral techniques considered as fingerprints in terms of

number and position; useful in identification of the studied taxa.

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