REPTILIAN COMMUNITIES OF HABITAT ISLANDS IN THE WESTERN DESERT OF EGYPT

A THESIS

Submitted in partial fulfillment of the requirements for the Master Degree of Science (in Zoology)

BY

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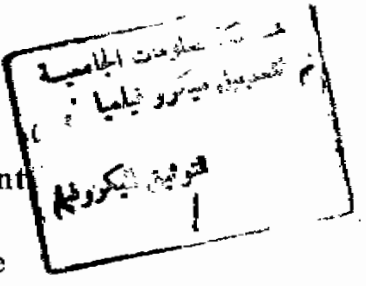

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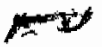

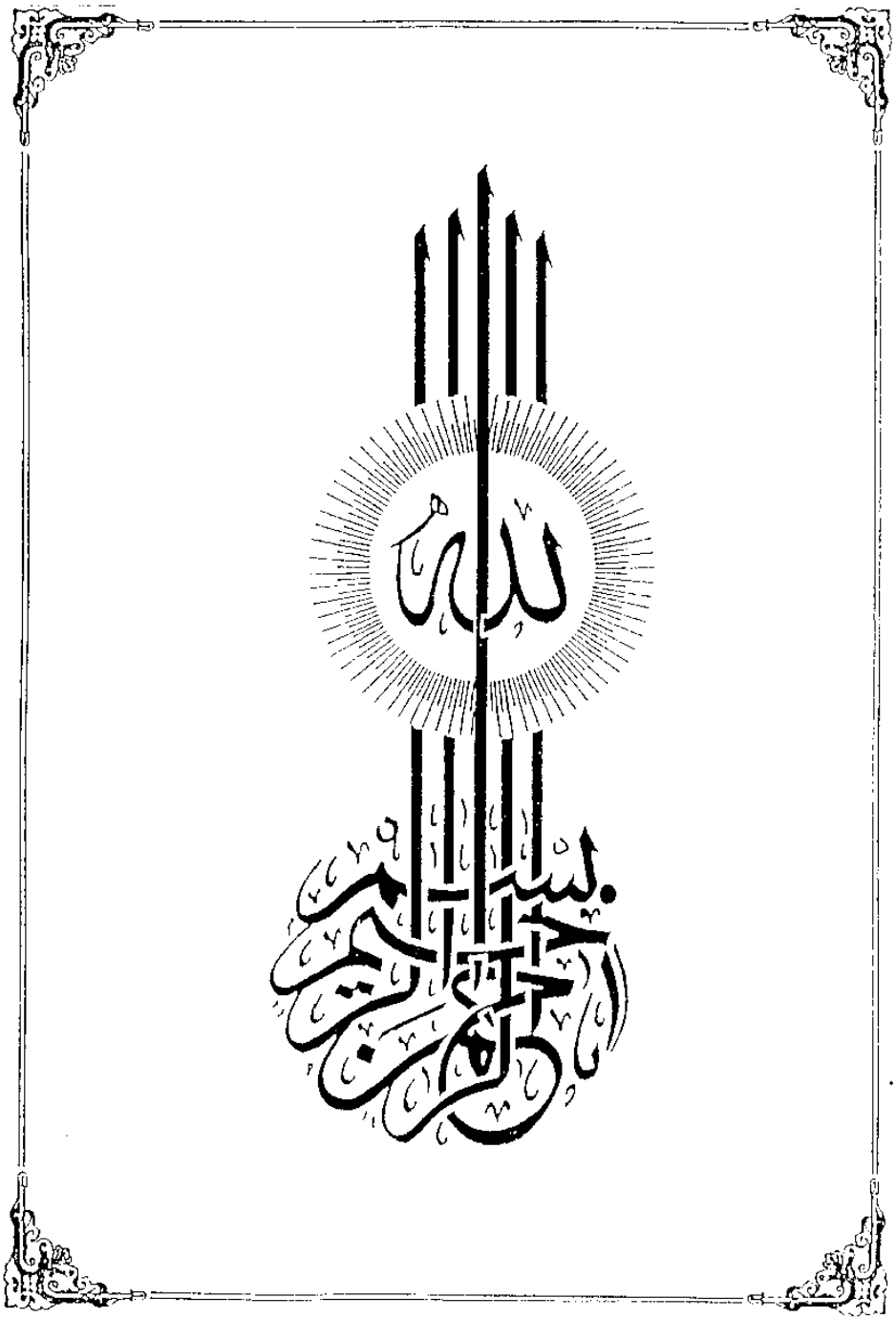

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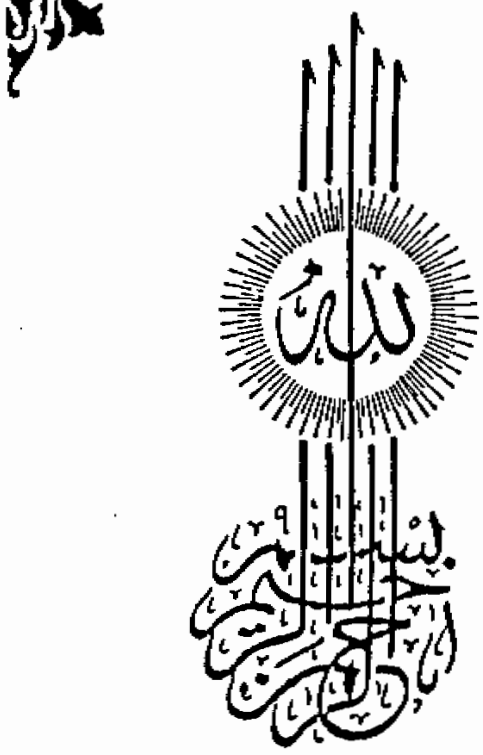

بسم الله الرحمن الرحيم

قالوا سبحانك لا علم لنا إلا ما
علمتنا إنك أنت العليم الحكيم.

صدق الله العظيم
البقرة - ٣٢


جامعة عين شمس
AIN SHAMS UNIVERSITY

TO

My Father
&
My Mother


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ABSTRACT

In this study, the theory of island biogeography was applied on the reptilian communities inhabiting patches of scattered habitats representing typical habitat islands in the Western Desert of Egypt. These habitat islands vary in area, topographic features and structural diversity, vegetation structure and distance from sources of faunal exchange. According to this theory a number of variables play key roles in determining the number of species inhabiting these habitat islands. Thirteen sites were studied; these include three larger sites of high structural diversity (Wadi El-Natrun, Wadi El-Raiyan and El-Maghra), eight isolated groves of *Acacia raddiana*, and two small patches of desert shrub vegetation. Areas, topographic features and structural diversity, soil type, vegetation cover structure density and type, general climatic conditions and degree of isolation of each island were investigated. A variety of collection techniques were employed to collect all reptilian species inhabiting each habitat island. The results showed that the number of reptilian species of a habitat island is directly proportional to its area. The relationship between log area and log number of reptilian species was positively and strongly correlated ($p<0.001$). Positive correlation between structural diversity and number of reptilian species was found. This relationship, however, was not significant ($p>0.05$). Similarly, the relationship between the number of

reptilian species and number of plant species was positive but not significant ($p>0.05$). However, the relationship between the number of reptilian species and percentage vegetation cover was positive and very highly significant ($p<0.001$). On the other hand, the relationship between the number of of reptilian species and distance from sources of faunal exchange was negatively correlated and very highly significant ($p<0.001$). The nearest habitat islands to sources of faunal exchange have larger number of reptilian species. To study the effect of isolation on populations of reptilian species standard morphometric measurments of *Acanthodactylus scutellatus* collected from three habitat islands were examined. The results showed that the populations of these lizards appear to have undergone significant morphological differentiation as a result of their long isolation. But a larger sample number and more extensive study is still needed to reach a more definitive conclusion regarding the subspecies status of the three populations. It may be concluded that the theory of island biogeography seems to be valid when applied to reptilian communities of the desert habitat islands covered in this study.

Key words : Acacia groves, Egypt, Geographic isolation, Habitat islands, Island biogeography, Reptilian communities, Western Desert.

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