

**VEGETATION OF AL-JABAL AL-AKHDAR
AND POPULATION ECOLOGY OF TWO
EBENUS SPECIES (LEGUMINOSAE)
ENDEMIC TO NORTH AFRICA**

Presented by

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**A Thesis Submitted
to
Faculty of Science**

**For the Degree of
Ph. D. in Science
(Plant Ecology)**

**Botany Department
Faculty of Science
Cairo University**

2010

ABSTRACT

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Title of the thesis: “Vegetation of Al-Jabal Al-Akhdar and population ecology of two *Ebenus* species (Leguminosae) endemic to North Africa”

Degree: Ph. D. of Science (Plant Ecology)

Abstract: The complex topography of Al-Jabal Al-Akhdar resulted in the heterogeneity of habitats and greatly affects the plant community establishment and species richness. Study of the population demography and dynamics of the endemic *Ebenus armitagei* reveals that obstacles for natural regeneration and conservation of the species even at the protected sites are significant losses of seeds due to insect predation, low percentage of seedling emergence and low reproductive value. The endemic *Ebenus pinnata* shows intra-population variations in the plant's functional types; Ephemeral, Moddular and Coppiced, as a plasticity mechanism for survival and existence under the environmental heterogeneity.

Key words: Libya, *Al-Jabal Al-Akhdar*, vegetation, species richness, ordination, classification, *Ebenus* species, life table, fecundity schedule, demography, phenology

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This thesis has not been previously submitted for a degree at this or any other university. The references in the text show how specifically the extent to which I have availed myself to the work of other authors.

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Acknowledgement

I express my sincere thanks, gratitude and appreciation to **Prof. Ahmad Kamel Hegazy** for suggesting the research topic, his support and guidance throughout the investigation from the initial planning and the field work to the manuscript revision. I appreciate his encouragement, advice, constructive criticism, patience and for igniting my curiosity about plant ecology.

I am thankful to **Prof. Loutfy Boulos** for his guidance in field work, identification of plant specimens and meticulous revision of the manuscript. His willingness to teach me will always be appreciated.

Special thanks to **Dr. Hanan F. Kabil** for her supervision, understanding support, guidance, unfailing enthusiasm and generosity of spirit. Her support and help during writing the thesis and related publications is highly appreciated. My sincere thanks to **Dr. Magdy I. El-Bana** for his help in running the computer programs for vegetation data analysis and interpretation.

Thanks to my friends and colleagues who gave me generously of their time and who were willing to help me whenever needed.

My gratitude and love to my wife and children who have supported and seen me through the best and worst times of this study.

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GENERAL INTRODUCTION

General Introduction

Vegetation

Few ecological studies were carried out on the biotic and abiotic components of desert ecosystems in Libya. Some parts of the country were studied in connection with other vast areas of the Sahara, North Africa or with subjects devoted to special topics, e.g., pasture, savannah and esparto lands (steppe or grazing land characterized by loamy soils and covered by the esparto grass, *Lygeum spartum*). Most of these studies are not published and only few were published (Scholz, 1974; Boulos, 1977; Schishov, 1980; Brullo & Furnari, 1994; Hegazy, 1999a & b; Le Houérou, 1997; El-Kady, 2000; Huerta-Martínez *et al.* 2004).

The landscape in Libya (The fourth-largest country in Africa) exhibits well defined landforms. The main geomorphological systems include sand formations, gravel and rocky desert depressions, salt affected lands, fallow lands, wadis, escarpments and mountainous landscape. Libya comprises three main phytogeographical areas (provinces): Tripolitania, Cyrenaica and Fezzan (Figure I.1). Tripolitania covers the north western corner of the country and contains the *Nafusah* plateau. Cyrenaica, the largest phytogeographical region, covers the entire eastern half of the country and houses *Al-Jabal Al-Akhdar* (the Green Mountain) Landscape. The Fezzan covers the land south of Tripolitania and considered the home of desert lands, including the Sahara.

Although there are numerous floristic studies, little attention has been paid to the ecology and vegetation beyond generalized descriptions of some sites in the Green Mountain region (Boulos, 1972; Johnson, 1973; Jafri & El-Gadi, 1977-1993; Brullo & Furnari, 1981; Zayed, 2005). Few