MORPHOLOGICAL AND PATHOGENICAL STUDIES ON SOME MEMBERS OF FAMILY SOLANACEAE IN EGYPT

By

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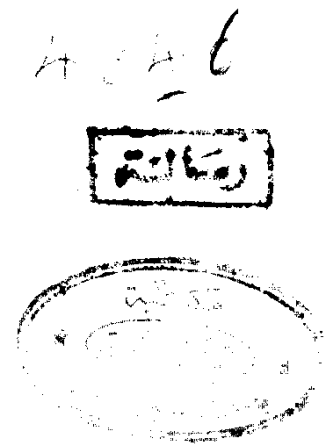

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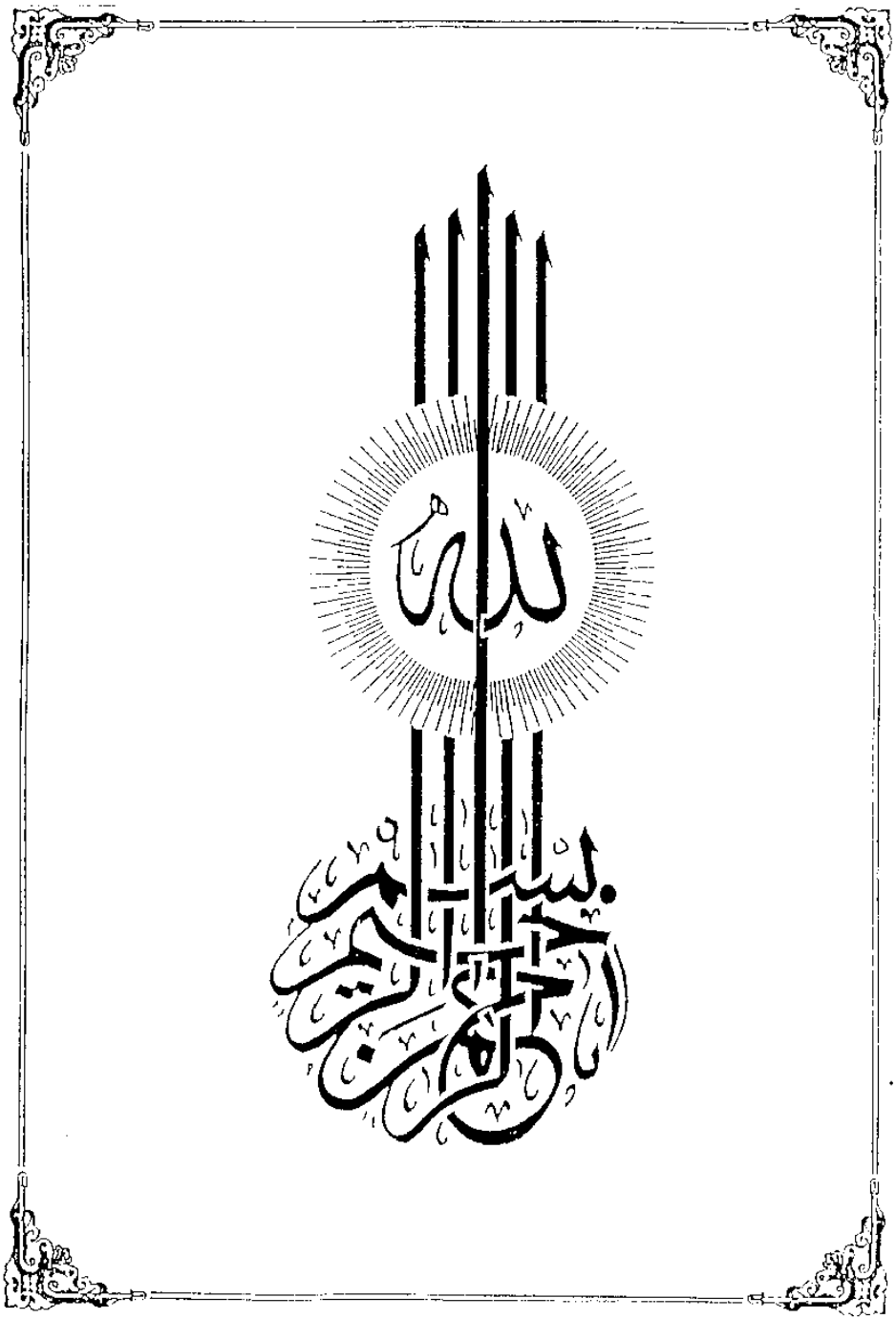

This THESIS has not been submitted for a degree at this or any other University.

The literature mentioned hereafter shows how far I have availed myself of the work of the others.

Signed

(S.F. Khalifa)

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SCOPE OF THE THESIS

The consulted literature, so far, provides a single classification of the Solanaceae into its minor categories. This classification has been carried out by Wettstein as early as 1895, and since then no other attempt has been done. Wettstein's classification of this family, based on a few attributes, might be discredited since classification should better be made by presenting larger numbers of variation patterns.

In achieving character correlations, the variation patterns expressed by increased number of attributes provide an increasing difficulty when treated separately. Meanwhile, the consideration and evaluation of the pertinent information should be made more or less simultaneously. On the family level this would be rather difficult since the proliferation of characteristics provides too cluttered figures for easy and reliable correlation of variables.

With this idea in mind, and depending on as many attributes as possible, the re-classification of Solanaceae in Egypt is tried by analysing and correlating numerical

information provided by the computer. The information from the resulting analysis can then be arranged in the form of a dendrogram which indicates similarity between the taxonomic units by the relative positions of its branches.

Two more points seem to be in favour for the selection of Solanaceae. These are; first, the family has long been acknowledged for pharmaceutical substances contained in their herbage and which entitle them to the first rank among plants useful to man. Second; in the latest few years, the Egyptian medicine has been auto-industrialized and almost depending on local resources. Consequently, phytochemical studies become indispensable so as to annotate such chemicals of pharmaceutical value.

P R E F A C E

The cosmopolitan Solanaceae is represented in the wild Egyptian flora by the following 26 species (Montasir and Hassib, 1956; and Tackholm, 1956) :-

Solanum nigrum, S. aethiopicum, S. dubium, S. elaeagnifolium, S. albicaule, S. ungiculatum, S. incanum, Hyoscyamus pusillus, H. reticulatus, H. muticus, H. albus, H. aureus, H. desertorum, Datura stramonium, D. tatula, D. metel (occurrence uncertain), D. fastuosa, D. innoxia, Lycium vulgare, L. schweinfurthii, L. arabicum, L. europaeum, L. tschersonii, Withania somnifera, W. obtusifolia and Nicotiana rependa. Of these, nineteen species are either of very rare occurrence or rare and only 7 species (nearly one fourth) are either common or very common.

This poor representation of the Solanaceae in its wild aspect is almost compensated by the relative big number of cultivated members. Four genera of these flowers are truck crops and represented by Lycopersicum, Solanum, Capsicum and Physalis. The former three genera are known as distinct Egyptian field crops while the latter (Physalis) is of very little agricultural importance. The remainder

of the cultivable [illegible] medicinal, horticultural genera are represented by Datura, Salpichroa, Iochroma, Datura spp., Lycium spp., and Solanum L. Genera cultivated, under mesophytic conditions, include Atropa, Capsicum spp., Datura s.l., Solanum spp., in addition to recent trials to cultivate medicinal Hyoscyamus spp. in their natural habitats. In the latest years, variety and cultivar numbers have increased progressively due to local raising as well as to introduction from abroad. On the other hand, monotypic genera are represented by Atropa, Physalis, Iochroma, Petunia and Salpichroa.

In Egypt, the wild solanaceous members vary in their growth forms from chamaephytes to nanophanerophytes (Lycium arabicum L. europaeum). Most of them are bi- or multi-regional. However, monoregional species are exemplified by Solanum albicaule and S. nanuiculatum; both being confined to Gebel Elba phytogeographic region. The majority of the species belong to the mesophytic vegetation of the [illegible] are among the weed flora of the cultivated fields and irrigation channels.

[illegible]
medicinal value [illegible] of special [illegible]
interest in [illegible] towards their cultivation mainly
as a source for alkaloids production.

PART I

SECTION A :

HISTORICAL INTRODUCTION

SECTION B :

MATERIAL AND METHODS