INTRASPECIFIC VARIATION IN ALLOZYME FREQUENCIES IN THE COWPEA SEED BEETLE, CALLOSOBRUCHUS MACULATUS (F.) (COLEOPTERA: BRUCHIDAE)

A Thesis
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For the Award of the Degree of
Doctor of Philosophy (Entomology)

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وَعَلَّمَكَ مَا لَمْ تَكُنْ تَعْلَمُ

وَكَانَ فَضْلُ اللَّهِ عَلَيْكَ عَظِيمًا

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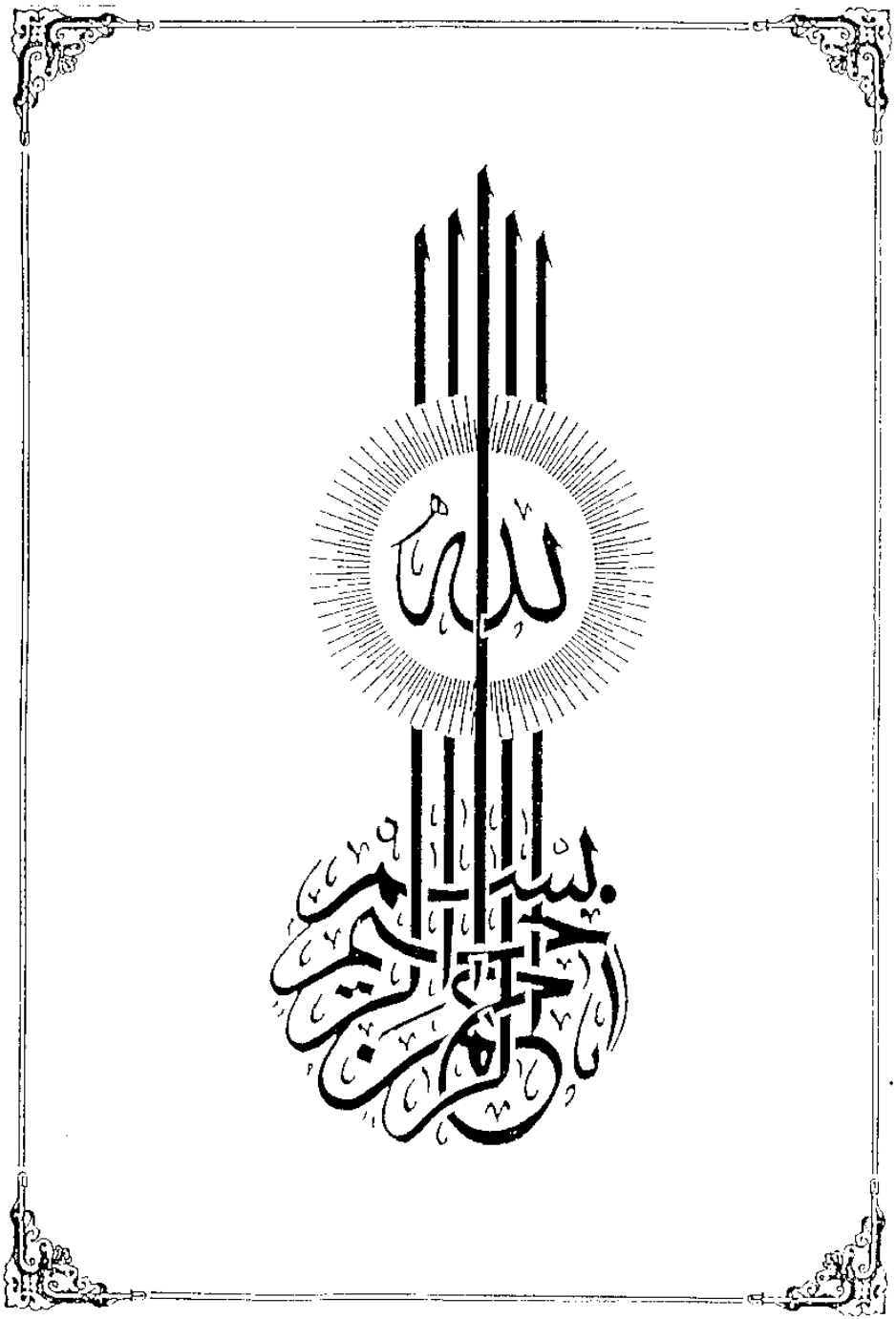

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DEDICATED WITH LOVE

TO MY FATHER AND MY MOTHER

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LIST OF ABBREVIATIONS USED IN THE PRESENT INVESTIGATION

ADK	= adenylate kinase
ADP	= adenosine diphosphate
AMP	= adenosine monophosphate
ATP	= adenosine triphosphate
CA	= cellulose acetate
CTH	= constant temperature and humidity
DNA	= deoxyribose nucleic acid
EDTA	= ethylendiamine tetracetic acid
G-6-PDH	= glucose 6-phosphate dehydrogenase
h	= hour
Hcl	= hydrochloric acid
IITA	= International Institute for Tropical Agriculture
IDH	= isocitrate dehydrogenase
$MgCl_2$	= magnesium chloride
MDH	= malate dehydrogenase
ME	= malic enzyme
M	= mole
MTT	= methyl thiazolyl blue
NAD	= nicotinamide adenine dinucleotide
NADP	= nicotinamide adenine dinucleotide phosphate
NaoH	= sodium hydroxide
PGM	= phosphoglucomutase
PMS	= phenazine methosulphate
R.H.	= relative humidity
TDRI	= Tropical Development and Research Institute

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I. INTRODUCTION

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The cowpea weevil, or the cowpea seed beetle as it is more accurately referred to, Callosobruchus maculatus (F.), is the principal post harvest pest of cowpea seeds. It occurs wherever the crop is grown; and frequently infests up to 100% of the stored seeds within 3 to 5 months under ordinary storage conditions (Singh, 1980).

Adults of C. maculatus are known to occur in two forms: active and normal (Caswell, 1960). The two forms differ not only in their morphological characters, which are used to identify them, but also in their physiological characters and behaviour as well (Taylor and Agbaje, 1974). Caswell (1960) suggested a genetic factor to produce the active form, because laboratory populations gradually lose the ability to produce active beetles even when crowded.

The term biotype is defined by Diehl and Bush (1984) as a temporary and provisional designation for cases where biological differences have been observed between organisms, but where the genetic basis and evolutionary status of the differences have yet to be ascertained.

It may also represent evolutionary transient in the process of speciation; and develop through natural selection