NATURAL POPULATIONS
OF THE POLYMORPHIC LANDSNAIL
CEPAEA NEMORALIS (L.)

FACTORS AFFECTING THEIR SIZE AND THEIR GENETIC
CONSTITUTION

by

H. WOLDA
Zoological Laboratory, University of Groningen, Haren (Gr.), The Netherlands

CONTENTS

I. Introduction ................................. 382

II. Procedures ................................ 385
   1. Classification of the snails ................. 386
   2. The Island population .................... 387
      A. Description of the habitat ............. 387
      B. The initial snail population .......... 388
      C. Sampling procedures .................. 388
   3. Cages .................................. 392

III. The adults ............................... 393
   1. Decrease in number and its causes ....... 394
   2. Changes in morph frequencies .......... 395
   3. Predation ................................ 399
      A. Climate and thrush activity ........... 399
      B. Selection by thrushes ................. 401
   4. Migration ................................ 408
      A. Selective emigration .................. 409
      B. Habitat selection .................... 411
   5. Conclusions ............................. 413

IV. Reproduction ............................. 414
   1. Mating .................................. 415
      A. Mating system ......................... 415
      B. Mating frequency ..................... 416
   2. Oviposition in the Island population .... 419
      A. Oviposition frequency ................. 420
      B. Clutch size ........................... 423
I. INTRODUCTION

In the last hundred years an increasing number of biologists, stimulated by the work of DARWIN have become interested in the forces at work in natural populations of plants and animals. Many of them, the population dynamicists, concentrate on population size, while others, the population geneticists, pay special attention to the genetic composition of populations. These two characteristics of a population, size and genetic constitution, are not independent and may be closely linked because size may partly determine the outcome of natural selection (WRIGHT, 1931; BIRCH, 1960) and because the genetic constitution of a population may influence its size (HALDANE, 1956; PIMENTEL, 1961). The latter point is clearly demonstrated by the fact that population size is used by some geneticists as a measure of population fitness (BUZZATI-TRAVERTS, 1959; CARSON, 1961).

In this paper a “population” of sexually reproducing organisms is defined as a group of interbreeding individuals which is more or less isolated reproductively from other such groups.