PREFACE

Chronobiology encompasses an integrated study of time and life. It provides the necessary concepts and techniques for understanding many biological phenomena, such as population cycling, niche differentiation etc. An organism is tightly coupled with certain key factors of the physical environment. Change in any factor influences a change in the response of the organism. Rhythmicities in behaviour, overt and physiological activities, are studied in various animals. Among vertebrates, the studies on rhythms are mostly oriented towards LD cycles for locomotor and enzymatic aspects.

No systematic study has been done on amphibians in relation to compensatory changes of metabolism as influenced by fluctuations in the abiotic factors during the dial period. Since the rhythmicity studies are absolutely lacking, the selection of toad, as experimental animal in the present study suitly fits because it is a nocturnal animal. Hence, the present work was undertaken in order to observe the possible dial changes in the physico-chemical and physiological functions of the blood of the Indian toad, *Bufo melanostictus*. In order to study the various parameters selected during dial rhythms, regular time intervals (4 hrs) were choosen viz., 08.00 hrs, 12.00 hrs, 16.00 hrs, 20.00 hrs, 00.00 hrs and 04.00 hrs, to propose a biological clock model in this nocturnal animal.

The results of this work are composed into five chapters. The first chapter deals with the whole animal O₂ consumptionin relation to dial variations.

The second chapter contains the changes in the haematological parameters such as RBC, WBC, Hb, PCV, MCV, MCH and MCHC in relation to dial variations.
The third chapter deals with the inorganic and organic constituents of the blood as influenced by the fluctuations in the abiotic factors at regular intervals during 24 hours of a day.

The fourth chapter pertains to the role of metabolic enzymes viz. LDH, SDH, ICDH, G-6-PDH, GDH, Aldolase, phosphorylase 'a' and 'ab', AAT and ALAT during dial rhythms.

The fifth chapter is devoted to the physiological functions of the blood of toad, *Bufo melanostictus*, in relation to diurnal rhythmicity.

I sincerely regret for any typographical and other mistakes inadvertently crept in this script.

(N.Y. IENA RUTH)