1. ACKNOWLEDGEMENTS

I wish to record my sincere thanks to Dr.(Mrs). L. Jayalakshmi, M.A., Ph.D., Principal, Sri.G.V.G. Visalakshi College for Women, Udumalpet for her kind consent for admission into this part-time Ph.D., course.

I would like to express my thanks to Dr. M. Singara Vadivelu, B.A(Hons.), M.A., Ph.D., Principal, Government Arts College (Autonomous), Coimbatore for his kind permission to do this research work.

I owe a debt of gratitude to Dr. C.K. Kandaswamy, M.Sc., Ph.D., Head of the Department of Zoology, Government Arts College, Coimbatore for providing necessary facilities to carry out this research work.

I wish to express my deep sense of gratitude to Dr. G.M. Natarajan, M.Sc., M.Phil., Ph.D., F.A.Z., F.Z.S.I., Cert. in fish utilization, S.G.Lecturer/Reader in Zoology, Government Arts College, Coimbatore, the benign guide and research supervisor for having suggested the area of investigation and for his valuable guidance and diligent encouragement through out the course and for having put lot of brain into this work without which this work could not have been accomplished.
The experimental set-up designed by my supervisor for bimodal oxygen consumption was highly commended and critically evaluated by Dr. George M. Hughes, Research unit for Comparative Animal Respiration, Bristol University, Great Britain. Specific acknowledgement is due to my supervisor for the permission to use these instruments and to reproduce some of his photographs.

It is a pleasant duty to acknowledge the help of Dr. A.E. Ellis, Department of Agriculture and Fisheries for Scotland, Marine Laboratory, Aberdeen for his interest and sincerity in interpreting the blood cells.

I have profited greatly by the invaluable assistance and help rendered by various Professors and Researchers especially Drs. Kjill Johansen (Late), Professor of Zoophysiology, Aarhus University, Denmark; Malcolm S. Gordon, Director of Environmental Physiology, University of California, Los Angeles; D.J. Randall, Professor of Zoology, University of British Columbia, Vancouver, Canada; H. Morii, Faculty of Fisheries, Nagasaki University, Japan; Antti Soivio, Professor of Physiology, Helsinki University, Finland; D. L. Kramer, Professor of Zoology, McGill University, Canada; Jeffery B. Graham, Associate Professor of Zoology, University of California, San Diego.
I wish to record my sincere gratitude to Dr. F. Ollevier, Zoological Institute, Leuven, Belgium; Dr. Klaus H. Hoffmann, Abig Allegemeine Zoologie, Universitat Ulm-89069, ULM, Germany; Dr. G. Zaccone, University of Messina, S. Agata, Italy; Prof. K. H. G. Mangala De silva, Department of Zoology, University of Peradeniya, Peradeniya, Sri Lanka and Dr. Vivekananda Banerjee, Head, Department of Zoology, Patna University, Bihar for going through the synopsis and contributing information and criticism and directing attention to occasional errors.

Greatful acknowledgement is made to Dr. J. N. Cameron, The University of Texas at Austin, Texas-78373, U.S.A; Dr. M. J. C. Rozemeijer, Environmental and Toxicological Chemistry, W. Amsterdam, The Netherlands; Eva. Danualt, University of Hamburg, Germany; Dr. J. Davenport and Dr. M. D. J. Sayer of Animal Biology group, Marine Science laboratories, U.K; Dr. K. L. M. Martin, Natural Science Division, Pepperdine
The present work could not have been conducted without the willing assistance of my department colleagues and many Zoology Professors at Govt. Arts College (Autonomous), Coimbatore where I undertook this work besides my regular teaching work at Sri. G.V.G. Visalakshi College for Women, Udumalpet. The present investigations were conducted only during spare-time and semester holidays and consequently not more than this could be carried out, however much it was desired.

The skilful technical assistance rendered by my supervisor's post-graduate students like Miss. R. Devika, Sreekala, Ravindran and R. Shanthini merit my deep appreciation.

The invaluable biochemical analysis done by Mr. R. Rajalingam, Department of Immunology, All India Institute of Medical Sciences, New Delhi deserves sincerest acknowledgement.

I am much obliged to Mr. R. Kathiresan and the Proprietor of 'Veral Farm' at Mettupalayam for their timely co-operation and kindness in undertaking many field trips.
The immense pains, my better-half Er.P.Sivanesan has taken throughout this research, his boundless help to the maximum in all possible ways, his love and psychological support during my 'lows' and tensions, the clinical aspects, my beloved daughter S.Narmatha Yangtse, a medico has extended enthusiastically are worthy to be mentioned here to make this acknowledgement complete.

My sincere thanks are due to Ms. Manimekalai and Mr.Durai lab-technicians for their clinical assistance and Mr.Suri, Coimbatore for photographing the haematological slides.

My heartful thanks are also due to M/s. SOFTBASE COMPUTERS, Palani for computerised printing of this thesis.

At the conclusion of this work of over five years, it is difficult to pay proper tribute to many people who have helped me in one way or the other. Lastly I must assume responsibility of some typographical and other errors that have crept in into this thesis inadvertently inspite of my best efforts. The depth and clarity of discussion part could have been improved still more, but for certain unforeseen circumstances. I request charity for the imperfections seen in the thesis in view of the labor involved.