

PREFACE

I started my research work in 2014 which has been documented in this thesis entitled **“INSECTICIDE SUSCEPTIBILITY STATUS AND BIOCHEMICAL MECHANISMS INVOLVED IN RESISTANCE DEVELOPMENT OF MAJOR DENGUE VECTOR FROM SUB-HIMALAYAN WEST BENGAL INDIA”** under the supervision of Dr. Dhiraj Saha, Department of Zoology, University of North Bengal, Darjeeling.

Dengue fever caused by a flavivirus, is mainly transmitted by *Aedes aegypti* and *Aedes albopictus* and is an increasing serious public health problem in over 100 countries putting about 2.5 billion people at the risk of infection. *Aedes aegypti* occurs primarily in the tropical and subtropical regions of the world. Asian countries harbor 75% of the world's total *Aedes albopictus* population with the greatest population in the south-east Asia. In India, *Aedes aegypti* has been found to be endemic in the eastern plains (Bihar and Bengal basin), Assam Valley, Western plains (Thar desert), Northern plains (Punjab and Haryana), Indo-Gangetic plains and the coastal areas of Orissa. Sub-Himalayan West Bengal possesses the ambient environment (temperature and relative humidity) for the growth and proliferation of *Aedes* mosquitoes and the associated diseases.

The key strategy to reduce mosquito-borne diseases depends on efficient vector management due to the absence of protective vaccines and medicines for the treatment of the same. In India, insecticides like DDT, malathion, deltamethrin, cyhalothrin, cyfluthrin, alpha-cypermethrin, bifenthrin and bendiocarb are used as adulticides while temephos and mosquito larvicidal oil as larvicides. The extensive use of these