# PREFACE

***C**urcuma longa* is a rhizomatous herbaceous perennial plant belonging to the family Zingiberaceae, which is native to tropical South Asia. *Curcuma longa* has a very long history of medicinal use dating back nearly 4000 years. Because of its yellow color, it is also known as "*Indian saffron*." Modern medicine has begun to recognize its importance, as indicated by the over 3000 publications dealing with *Curcuma longa* that came out within the last 25 years. Curcuminoids are quantitatively the major bioactive secondary metabolites of this plant. Several studies reveal that *Curcuma longa* is a potent antioxidant, anti-inflammatory, antimicrobial, antimutagenic, and anticancer agent. Extensive preclinical as well as clinical efforts made during past few decades have identified broad spectrum of therapeutically interesting pharmacological properties of diverse types of *Curcuma longa* extracts, curcumin, curcuminoids and other structurally unique bioactive constituents of such extracts. They have not only added experimental evidences in support of their medicinal and dietary uses in diverse traditionally known systems of medicine and health care, but also suggested that they are structurally and functionally unique drug leads, and that they could be potentially useful for prevention of diverse spectrum of psychopathologies and metabolic disorders. Despite of such advances though, many questions concerning their pharmacological sites and modes of actions are still remaining controversial and speculative only. In view of the situation, it has been suggested that numerous edible phytochemical can contribute to the psychological well-being of consumers, and that modulation or regulation of brain plasticity could be involved in their physical and mental health benefits. Therefore, we have identified, standardized and pharmacologically validated a mouse bioassay system for detecting metabolic as well as brain function modulating potentials of medicinal plant extracts and their known bioactive constituents. During such effort, it was observed that repeated daily treatments with the

metformin effectively suppresses diverse physiological stress responses in mice, and that its observed effects are quite analogous to several edible phytochemicals. Metformin is the antidiabetic drug of first choice for combating diverse spectrums of comorbidities commonly associated with diabetes. A few more recent reports have revealed that alterations of gut microbial ecology caused by this biguanide derivative is involved in its therapy relevant bioactivities and that it could also be useful for combating diverse spectrums of psychopathologies commonly associated with diabesity and other chronic diseases. It has since long been recognized that curcuminoids are also metformin like pleiotropic protective agents with anti-microbial activities. Recent reports on various clinical studies suggested that, turmeric with metformin could be used as adjuvant to meet diverse therapeutic demands of diabetic patients also suffering from diabetes associated psychopathologies. Therefore, it was of interest to experimentally verify the possibility that metformin like stress response modulating efficacies of curcuminoids are also involved in its therapeutically interesting bioactivities observed in animal models. The present research work was performed to compare four different extracts of *Curcuma longa* for selecting most effective in respect to its qualitative comparison with metformin and to explore its potential role in the management of comorbid anxiety and depression like disorders generally associated with diabetes followed by elucidation of their mechanism of action(s).