

## PREFACE

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Ayurveda is the oldest known system of medicine still widely practiced in India and popularity of diverse therapeutic modalities mentioned in ancient Ayurvedic literature has continued to increase during recent decades. In Ayurveda, Rasayana herbs are always recommended for treating metabolic and neurologic conditions. Diabetes is a slowly and silently progressing metabolic disorder, which ultimately leads to structural and functional deteriorations of almost all bodily organs including those of circulating fluids and central and peripheral nervous systems. Diabesity has been associated with various co-morbidities including central nervous system (CNS) disorders such as depression, anxiety, cognitive dysfunctions, and neuropathic pain and inflammation. Treating mental health problems in diabetic patients however remains a challenging field in medical science. Many tonics or rejuvenators oftenly used in Ayurvedic system of medicine for prevention of psychiatric or neurologic comorbidities contain Ashwagandha concoctions as one of their major active ingredients and currently Ashwagandha is recommended by most of Ayurvedic practitioners for treating all such conditions. Ashwagandha (*Withania somnifera*) is a traditionally known rejuvenative herb of solanaceae family, and withanolides are quantitatively the major bioactive secondary metabolites of the plant identified and most currently commercialised *Withania somnifera* extracts or products are now often analytically characterised by their contents of total withanolides. Extensive efforts made during past few decades have identified not only broad spectrums of therapeutically interesting pharmacological properties of diverse types of *Withania somnifera* extracts obtained from different parts, but also of withanolides and other structurally unique bioactive constituents of such extracts. Amongst them the ones dealing with anti-stress, anticancer and anti-inflammatory activities of extracts

rich in withanolides, have attracted the most attention of modern researchers. Preclinical and clinical information now available on diverse types of *Withania somnifera* extracts and numerous of their known bioactive constituents strongly suggest that appropriate combinations of phytochemicals and other bioactive substances encountered in its extracts could as well be used for prevention of metabolic or environmental stress triggered diseases and their syndromes. Keeping in mind, the encouraging withanolides and the data available regarding the use of *Withania somnifera* in treating stress triggered diseases, present study was conducted to fully exploit the potential of *Withania somnifera* in this promising area. The present research work includes the pharmacologically validated rodent bioassays to verify whether parts of the plant other than roots could also be used for the prevention of metabolic or environmental stress triggered diseases and to identify plant metabolites potentially useful for prevention and cure of mental health problems accompanying, or caused by, metabolic diseases. Metabolic effects during stressful conditions using validated behavioural rodent models followed by elucidation of mechanism(s) of observed action(s) through biochemical estimations were evaluated. Observations made during such efforts strongly suggest that, *Withania somnifera* is an adaptogenic Rasayana herb with a uniquely broad psychopharmacological activity profile and could be herbal lead for prevention and treatments of stress triggered diseases commonly associated with metabolic disorders. Further efforts to identify the roles of diverse other known bioactive secondary metabolites of the plant are necessary for better understanding of Ayurvedic pharmacology of this plant.

