PART-B

EVALUATION OF TAMARIND SEED EXTRACT FOR ANTIHYPERTENSIVE ACTIVITY IN DOCA SUPERIMPOSED TYPE 2 DIABETIC RATS
1. Introduction

Diabetes mellitus and hypertension are two of the most common diseases in Westernized, industrialized civilizations, and the frequency of both diseases increases with increasing age. It has been estimated that 35-75% of diabetic complications can be attributed to hypertension (Bild & Teutsch, 1987). Hypertension, one of the most prevalent cardiovascular diseases, has been widely linked to insulin resistance and compensatory hyperinsulinemia (Reaven, 2003). Thus, the efficient antihypertensive therapy in diabetic patients would be positively beneficial as far as the progression of cardiovascular complications of diabetes is concerned. Endothelial dysfunction, which is characterized by impairment of nitric oxide (NO) bioavailability, is an important risk factor for both hypertension and cardiovascular disease and may represent a major link between these conditions. It has been demonstrated that impairment of barrier function of endothelium is involved in diabetes and atherosclerosis by retaining an increased oxidation of low density lipoproteins (LDL) in subintimal space (Giannotti et al., 2007). Oxidized LDL initiates a vicious cycle for atherosclerotic lesion formation, hypertension and cardiovascular impairment (Ross, 1999).

Diabetic hyperglycemia can result in chronic sympathetic stimulation and activate rennin angiotensin aldosterone system (RAAS), which plays a key role in balancing blood pressure and electrolyte by synthesizing bioactive factor angiotensin-II through angiotensin converting enzyme (ACE). It has been repeatedly reported that angiotensin-II receptor blockers (ARBs) and angiotensin converting enzyme inhibitors (ACEIs) can improve insulin sensitivity in rodent models of type 2 diabetes associated with insulin resistance (Shiuchi et al., 2004). These data suggest that abnormal angiotensin activation may further provoke insulin resistance and contribute to the development of cardiovascular damage.

Due to clinical side effects of ARBs and ACEIs, it is of significance to identify and characterize the natural medicinal compounds that are able to modulate angiotensin-II pathway in a metabolic and circulatory system.