Diabetes mellitus is a chronic metabolic disorder characterized by excessive blood glucose levels due to imbalance of insulin levels. Conventional antidiabetes drugs are either unaffordable or unavailable or they may have some undesirable side effects. People in the underdeveloped and developing countries have depended on some form of traditional and herbal medicine. These ethnomedicinal plants are largely under-studied and under-utilized. Also the safety of long term use of many medicinal plants is unknown. The aim of this study was to determine the hypoglycemic activity and safety of aqueous plant extracts in mice. In addition, the presence of potential toxic components was also studied in the plant extracts. Five aqueous leave extracts of *Boscia angustifolia*, *Senna spectabilis*, *Lantana trifolia*, *Launaea cortuna* and *Olinia usambarensis*, one stem bark extracts of *Maytenus obscura* and one root bark extract of *Toddalia asiatica* were screened for their hypoglycemic activity in alloxan induced diabetic mice using the oral and intraperitoneal routes. The safety of these plant extracts was studied in mice that were orally or intraperitoneally administered with 1000mg/kg body weight daily for thirty days. Parameters studied included changes in body and organ weight, hematological and biochemical parameters and histology. Composition of elements in the plant extracts was estimated using total reflection X-ray fluorescence system (TRXF) and atomic absorption spectrometry (AAS) while the types of of phytochemicals present was assessed using standard procedures. Five plant extracts demonstrated hypoglycemic activity. *Launaea cortuna* and *Toddalia asiatica* demonstrated no hypoglycemic activity at the doses tested 50, 100 and 150 mg/kg body weight. *Boscia angustifolia* and *Senna spectabilis* when administered intraperitoneally demonstrated the best hypoglycemic activity. The intraperitoneal route was found to be more effective than the oral route in inducing hypoglycemic activity. A dose of 1g/kg body weight of mice of three plant extracts caused secondary polycythemia while the same dose of the other three plant extracts caused macrocytic hypochromic anemia. *Toddalia asiatica* at a dose of 1g/kg body weight caused immediate death to mice. The same dose in the other plant extracts caused enlargement, reduction or no change in some organ weights and an increase, decrease or no change in the biochemical parameters. Extracts of *Senna spectabilis*, *Lantana trifolia*, *Launaea cortuna*, *Olinia usambarensis*, and *Toddalia asiatica* administered intraperitoneally caused histological changes to various organs. Six plant extracts had varied levels of trace elements at lower than the recommended daily-allowances for these elements. In conclusion, this study has demonstrated hypoglycemic activity on five medicinal plants used in the management of diabetes in Mbeere subdistrict, Kenya. However, some of the seven plants in the study demonstrated toxicity and therefore negating their use as herbal medicines. The observed hypoglycemic activity and or toxicity might be attributed to some of the phytochemicals present in these plant extracts.