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Commentary

Role of *Pennisetum Glaucum* Extract (PGE) on Thrombotic Disorder

Devaraja Sannaningaiah*

Department of Biochemistry, Tumkur University, India

ABSTRACT

Thrombotic Disorders (TD) increase the risk of cardiovascular/cerebrovascular complications and represent a major health problem worldwide. Although, anticoagulant, antiplatelet and fibrinolytic agents have been widely used, their life threatening side effects limits their usage. The objective of this study is to evaluate the protective role of *Pennisetum Glaucum* Extract (PGE) on thrombotic disorder. Both in-vitro and in-vivo experiments were carried out to establish the anticoagulant, antiplatelet and antioxidant properties of PGE. The parameters such as plasma recalcification time, Prothrombin Time (PT), Activated Partial Thromboplastin Time (APTT) and agonist induced platelet aggregation assays were employed. PGE was also analysed for its efficacy on oxidative stress as well.

Keywords: *Pearl millet*; Anticoagulant; Antiplatelet; Protease

INTRODUCTION

An increasing life-expectancy and world population explosion has been associated with communicable and non-communicable diseases worldwide. While Oxidative stress is the key contributing factor involved in the pathogenesis of atherosclerosis, hypertension, diabetes mellitus, ischemic diseases, malignancies, and thrombosis. Cardiovascular disease is a major non-communicable disease leading to death and disability. The key pathology involved in three major cardiovascular disorders such as, ischemic heart disease, stroke and venous thromboembolism is the thrombosis. Thrombosis is nothing but the formation of unusual clot in veins and arteries, involves unregulated way of activation of several coagulation factors and platelets. Target specific anticoagulant and antiplatelet therapy is the currently available remedy. Several synthetic and natural drugs are available in the market; however, their life threatening side effects (internal bleeding, nausea, miscarriage and vomiting) limits their usage. Therefore, identification of novel anticoagulant and antiplatelet drug with zero side effects from the natural sources is the big challenge to the researchers. Since ancient times, natural products from animals, microbes, plants and marine source have been extensively used in the treatment of several diseases. The wisdom of our ancestors on folk medicine is the base for modern drug discovery process. The key thirst for scientist to look into natural product could be due their tremendous chemical and structural diversity. According to the documentation by WHO about 80% of the world's population is devoted to folk medicine prepared from the plants for primary health care. Recent data suggests that only 5%-15% of terrestrial plant species have been explored pharmacologically. About 25% medicines which are commercially available today in the market are derived from plants origin. Morphine was the first commercialized plant-derived medicine isolated from Papaver somniferum. Subsequently several compounds have been isolated and commercialized. As life style diseases tremendously increasing especially in developing countries, there has been a food revolution over the past few years. Thus, people are rethinking about using millets as the major staple food by replacing ragi, rice and wheat. Though, Pennisetum glaucum (pearl millet) has been widely cultivated in Africa and Asian continent, India is the largest producer. Pennisetum glaucum are cereal crops they have been widely used from prehistoric period due to their umpteen health benefits. They are the richest source of macro and micro nutrients with high quantity of dietary fibers. They found to exhibit immense health benefits as they are capable of curing coronary heart diseases, diabetes, constipation, jaundice and high blood pleasure. Despite, immense therapeutic applications of Pennisetum glaucum, its beneficial role on thrombosis and oxidative stress was not explored. Thus, the current study aims to identify the beneficial role of protein constituents of Pennisetum glaucum (pearl millet) on thrombosis and oxidative stress.

Eventhough, pearl millets (Pennisetum glaucum) are the store house

Correspondence to: Sannaningaiah D, Department of Biochemistry, Tumkur University, India, Email: sdevbiochem@gmail.com

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of high quantity of nutritional and nutraceutical components, they are the most underutilized groups of cereals. Infact, they are yet considered as food of low income group. Researchers were documented the presence of proteins, unsaturated fatty acids, dietary fiber and secondary metabolites attributed in the prevention of many diseases such as, cardiovascular, diabetes and cataractogenesis. However, there are no reports on the beneficial role of proteins/proteolytic enzymes from the pearl millet. Hence, this study throws a light on the anticoagulant, antiplatelet and antioxidant properties of Pennisetum glaucum (pearl millet) protein extract. Oxidative stress is the one of the key contributors that causes hyper activation of coagulation factors and platelets results in thrombosis. Thrombosis is the key culprit in the pathophysiology of cardiovascular and cerebro vascular complications. Anticoagulant and antiplatelet agents have been extensively used in the treatment of thrombosis. While, fatal side effects such as, nausea, vomiting, headache, internal bleeding and birth defects limits their usage. Therefore, identifying the novel drug from natural sources with no side effects could help in the better controlling of thrombotic disorders. Thus, the current study deals with the anticoagulant and antiplatelet properties of PGE.