Acute and Sub-Acute Toxicological Evaluation of Ethanolic Leaves

Extract of *Prospis juliflora* (Fabaceae).

1Wambugu R.W., 1Karuru P.G., 1Mbaria J.M., 1Njoroge F.K., 1Nyaga G., 1Rechah S.O.
1Chemistry Department, Jomo Kenyatta University of Agriculture and Technology, Box 62000-00200, Nairobi, Kenya
2Research, Production and Extension Division, Jomo Kenyatta University of Agriculture and Technology, Box 62000-00200, Nairobi, Kenya
3College of Agriculture and Veterinary Services, University of Nairobi, Box 29053, - 00625 Kangemi
4E-mail: wambugu@jkut.ac.ke

Abstract

*Prosopis juliflora* (Sw.) DC. (Fabaceae), an exotic tree introduced in Kenya, is one of the World’s top 100 least wanted species due to its invasive nature and tendency to form impenetrable thickets. Goats that constantly feed on the plant’s sugary pods are known to lose their teeth. Pastoralists have previously taken the Kenya government to court due to possible death arising from starving animals which hardly feed. However, *P. juliflora* is known to contain tannins, alkaloids, saponins and other phytochemicals that can be exploited in the development of antihelminthic herbal drugs. Alkaloids and saponins have been associated with numerous other pharmacological activities such as anti-bacterial, anti-cancer, anti-inflammatory and anti-viral. This study investigated the toxicity and safety levels of *P. juliflora* with a prospect of exploiting its bioactive compounds in the development of herbal remedies. Acute toxicity of *P. juliflora* ethanolic leaves extract was evaluated using *Swiss albino* rats. Oral dosages used were 175 mg/kg, 550 mg/kg, 1750 mg/kg, 2000 mg/kg and 5000 mg/kg body weight respectively. All clinical signs and symptoms were recorded within 24 hours. Toxicity symptoms were moderately observed and post mortem did not show any major gross effects on the internal organs.

Key words: *Prosopis juliflora*, acute toxicity, clinical signs, doses, symptoms.

INTRODUCTION

1.0 General Introduction

For many years, man has used natural herbs and potions as medicines, but it is only since the mid-nineteenth century that serious efforts were made to isolate and purify the active principles of these remedies. Since then, a large variety of biologically active compounds have been obtained and their structures determined e.g. morphine from opium, cocaine from coca leaves, and quinine from the bark of the cinchona tree (Graham et al., 1995). Owing to growing demand for herals, the current need is to intensify research in the field of medicinal herbs and to get authentic information on the subject. Herbal products are often questioned for quality control and assurance. Preclinical trials are essentially toxicity and other biological tests carried out on tissue samples, animals and sometimes organ cultures to determine whether it is safe to test the drug on humans. The animal tests investigate the effect of the drug on various body systems such as the respiratory, nervous and cardiovascular systems. They are carried out under both in vivo (in the living organism) and in vitro (in an artificial environment) conditions. These preliminary tests provide information concerning the drug’s pharmacokinetic properties and its interaction with other drugs and over-the-counter medicines.

*Prosopis juliflora* is an evergreen tree native to northern South America, Central America and the Caribbean (Pasiecznik et al., 2004). It is fast-growing, nitrogen-fixing and tolerant to arid conditions and saline soils (Anonymous 2003, Pasiecznik et al., 2004). In Kenya *P. juliflora* was first planted in the beginning of the 1970s to rehabilitate a quarry in Bamburi near Mombasa (Ebenson & Grafton 1980, Maghembe et al., 1983). In the early 1980s it was introduced in the Lake Baringo area through the Fuelwood Afforestation Extension Project (FAEP) (Karuki 1993, Lenachuru 2003). The major objectives of the project was to involve the local people in tree planting to overcome problems such as lack of firewood and overgrazing (Karuki 1993, Lenachuru 2003).

In the initial introductory stages, the tree was appreciated due to its ability to grow where nothing else seemed to be able to grow. It was easy to plant, prevented soil erosion and sandstorms, provided shade and its pods served as a source of food for livestock (Lenachuru 2003). After about ten years, problems with *P. juliflora* started to occur. It started to spread rapidly and its ability to survive cutting by coppicing made it uncontrollable. However, the