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The reduction of mimosine content in *Leucaena leucocephala* (petai belalang) leaves using ethyl methanesulphonate (EMS)

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ABSTRACT

A study was conducted to reduce the mimosine content ofLeucaena leucocephalaleaves by using ethyl methanesulphonate (EMS). The seeds were treated with three different doses of EMS (i.e., 0.1%, 0.3% and 0.6%) aiming at reducingthe mimosine content and improving the nutritive value of L. leucocephala. The mimosine content, crude protein and crude fiber were decreased with the increasing of EMS doses. The effect of 0.6% EMS treatment was much more beneficial as compared to 0.1% EMS or 0.3% EMS in the reduction of the mimosine content in L. leucocephala leaves. Mimosine content was successfully reduced from 1.6% to 0.2% or a reduction of 87.5% obtained in 0.6% EMS treated samples.This result has led to the identification of a new L. leucocephala clone with reduced mimosine contentfrom the 0.6% EMS treated samples.Livestock feed should not contain more than 30% of L. leucocephala as the mimosine can cause hair loss and stomach problems in animals. This limitation can be overcome by using this newly identifiedL. leucocephala clone. The livestock feed now can contain more than 30% of L. leucocephala leaves and still have all the Leucaena benefits. However, treatment with 0.6% EMS decreased the nutritive values of L.leucocephalaleaves, but the crude protein of 0.6% EMS treated samples (18.69%) was still higher than Medicago sativa (alfalfa)with 14.83% crude protein. With this clone, it assists the foresters or farmers to reduce the livestock feed price significantly in future.

Keywords: *Leucaena leucocephala*, ethyl methanesulphonate (EMS), mimosine, mutagenesis, nutritive value, clone

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INTRODUCTION

Leucaena leucocephala (Lam) de Wit. or locally known as petai belalang belongs to family leguminosae. It is a perennial leguminous tree native to Central America with a wide distribution in the tropics and subtropics, and suitable for growing in marginal and sub-marginal lands with a wide assortment of uses. It is cultivated for multipurpose uses, e.g. forage or fodder, lumber, fence posts, fuelwood, charcoal, pulp and to soil improvement [1]. *L. leucocephala* has been planted widely in agroforestry applications. It is useful for forming erosion barriers, windbreaks, for shade and support, green manure and cut fodder. The seed is used to derive various medicines like stomach diseases, use of contraception and abortion. All parts of the plant are edible to animals, including leaves, young stem, flowers, young and mature pods, and seeds [2]. *Leucaena* foliage (leaflets plus stems) contains both nutrients and roughage and makes a ruminant feed roughly comparable to alfalfa forage. It is a rich source of protein (15-38%), produce up to 20 metric tons of dry matter per ha and the foliage is highly digestible (60-70%) [3]. The leaves are also a rich source of carotenoids and vitamins. *L. leucocephala* is often being described as the alfalfa of