Morphological and Wood Anatomical Study on *Acacia nilotica* (L.) Willd. Ex Delile, Grown in Sudan

Haytham Hashim Gibreel[1], Hanadi Mohamed Shawgi Gamal[2]

[1] *University of Khartoum, Forest Silviculture, Sudan*
[2] *University of Khartoum, Fac. of Forestry; Forest Products and Industries, Sudan*

Abstract

Acacia nilotica (L.) Willd. ex Del. is a multipurpose leguminous species in the family Fabaceae. The species has an extensive and diverse natural distribution in Sudan. It is valuable mainly for timbers and fuel wood production; other benefits include environmental, tannin production and it has medicinal attributes. The diversity of site and climatic conditions under which *Acacia nilotica* grows led to the evolution of an extremely variable species. Thus, the taxonomic history and nomenclature of the species was puzzled.

In Sudan, *Acacia nilotica* is represented by three subspecies with wide range of distribution, namely the subspecies *nilotica*, *tomentosa* and *adstringen*. Additionally, a new group of *Acacia nilotica* trees were identified with new morphological characteristics of pods, seeds, leaves. This new group is not mentioned in the taxonomical key. However, with no doubt there is not a complete and clear picture of the pattern of variation within and among *Acacia nilotica* with it's currently known subspecies.

The overall objective of the present study is to update the taxonomy of *Acacia nilotica* and understand the level of morphological and anatomical diversity among its subspecies in the Sudan. Therefore, the taxonomic relationships among the three identified subspecies and the new group were studied by analysing some of the quantitative and qualitative morphological characteristics of mature trees and of the seedlings at early germination stages as well as after one year after germination. The anatomical characteristics among them were also studied in wood samples of one year old seedlings, using the stereological account technique. In total, thirteen variable study sites were selected as sample sources, this across the agro-ecological zones of the Sudan where *Acacia nilotica* populations are growing.

The results revealed significant variation in all of the studied morphological and anatomical characteristics among the new group and the three identified subspecies in this study. The study concluded that, *Acacia nilotica* population in the Sudan included three main subspecies namely subsp. *nilotica*, *tomentosa* and *adstringens* beside one newly identified morphological group intermediate between subspecies *nilotica* and *tomentosa*.

Keywords: *Acacia nilotica*, anatomical variation, morphological, taxonomy

Contact Address: Haytham Hashim Gibreel, University of Khartoum, Forest Silviculture, Khartoum, Sudan, e-mail: haythamgibreel@yahoo.com