

## INTRODUCTION TO SYSTEMATIC BOTANY IN EAST AFRICA

It is a well known fact that systematic botany or plant taxonomy was not invented in any school or by any philosopher. Indeed, it is everywhere as old as language. Along the history of mankind, some man somewhere first gave a name to some plant and classified it as suitable for human food. Thus systematic botany began, because taxonomy is a classification of things, especially of plants and animals, and classification presupposes the existence of names. Since then, the development of systematics has witnessed the coinage of a multitude of new names, and the elaboration of more complete and exceedingly intricate systems for the classification. Slowly and sometimes painfully the primitive man, through trial and error, learned the uses of more and more plants, especially those that served for food. Plant parts such as seeds, roots, leaves, fruits and nuts were added to our list of study, and were given names for ready reference. It is through similar experiments that many discovered that other plants that the early man made into various concoctions and decoctions for the treatment of illnesses, poultices of parts of certain plants he found to be astringent, able to stop bleeding, and many other uses.

The primary objective in systematics is the recognition of the exceedingly variable components of the mantle of vegetation that adorns our areas, with a terminology which can be understood by all the people within the region or country. The two basic aims are therefore, first to identify all kinds of plants in East Africa, and second to arrange the kinds of plants into a scheme of classification that will show their true relations. The principal tool used in systematics is the collection of dried plant specimens called the herbarium. The herbarium is also a special type of museum

where such dried plant specimens are kept. In brief, a modern herbarium is a great filing system for information about plants, primary in the form of actual plant specimens, and secondary in the form of published information, pictures and recorded notes. In Kenya we have two notable herbaria: the East African Herbarium (EA) founded in 1902 and it is also the second largest in terms of specimen numbers in Africa, and the Nairobi University Herbarium (NAU). While the former is purely a research institution, the latter is a teaching section of the University.

In summary, the two herbaria have been the major source of information being presented in this thesis, and are the only two employers of the author to date. Research in systematic botany in East Africa dates back to 1949 when the British Government through its colonial administration, provided funds to build a new wing of the then Coryndon Museum in Nairobi, the East African Herbarium. The new herbarium became an amalgamation of the Coryndon Museum Herbarium and the Tanganyika's Amani Research Herbarium. However, the herbarium although located at the Museum grounds, was actually part of the East African Agriculture & Forestry Research Organization (EAAFRO). As an undergraduate Agriculture student, the author first joined the Herbarium during his long vacation on temporary employment in 1964. At the time of his graduation in June 1966, Kokwaro was immediately recruited as a Research Officer (Botanist) at the E.A. Herbarium and assigned the duty of revising the family Valerianaceae. Being the first Kenyan graduate at the Herbarium, his interest and command of systematics were found to be excellent, and was immediately recommended by the then Chief Botanist, Mr. J. B. Gillett, for postgraduate training in systematic botany at prestigious University of Uppsala in Sweden. Uppsala University is the home University of the father of systematics, Carolus Linnaeus (1707-1778). The main research project at the E.A. Herbarium was

the revision of the Flora of Tropical East Africa in collaboration with the Kew Herbarium in the U.K. The flora is actually prepared by the Royal Botanic Gardens, Kew Herbarium in collaboration with the E. A. Herbarium (National Museums of Kenya, Nairobi), and in liaison with the Universities of Nairobi, Dar-es-Salaam and Makerere. The flora covers the seed-bearing and vascular cryptogamic plants of Kenya (582, 642 sq. km.), Tanzania (941,997 sq. km.) and Uganda (243,408 sq. km.). The altitude in the region ranges from sea level to 5,870m. on Mt. Kilimanjaro. The flora is a descriptive account of the flowering plants and ferns native and naturalised in the region, together with some mention of exotic, ornamental and crop plants. All taxa are keyed out and described concisely. The descriptions are supplemented with line drawings which illustrate at least one species per genus. The synonyms and bibliography are adequately detailed to simplify the nomenclature and taxonomic circumscriptions within a broad regional context. The flora has been published family by family since 1952, as the typescript become available for printing irrespective of systematic order. Of the estimated 225 families in the Flora of Tropical East Africa, the email received from Kew Herbarium by the author on July 2007, show that slightly over 200 families have to-date been revised, the rest are being revised or in press. Notable local contributors (East African botanists) are led by J. O. Kokwaro of University of Nairobi (4 families fully published in 1968, 1971, 1982 and 1986) followed by C. Kabuye of E. A. Herbarium (1 family, 1971), G. Sangai (2 families, 1968 and 1971), E. Omino (1 family, 2002), G. Mwachala and P. Mbugua (1 family, 2007).

The book **Flowering Plant Families of East Africa** (1994) being an introduction to plant taxonomy for undergraduate students, has been one of Kokwaro's major contributions to the development of systematics in East Africa. It is most suited for

the training of botanists because the principles are supplemented with local plant examples. It has an excellent historical botanical exploration of East Africa from 18<sup>th</sup> to 20<sup>th</sup> centuries. In fact, it serves as a replacement of the now out of print, **Common Flowering Plants of Uganda** authored by Makerere University staff.

Kokwaro's approach to research in systematic botany in East Africa has somehow been different from his European counterparts. In his approach to basic systematics, he revised the four families for the Flora of tropical East Africa and published new taxa in international journals. He simultaneously developed a keen interest in applied systematics by undertaking research and publishing extensively in economic botany and ethnobotany of the region. Man's dependence on plants for the essentials of his existence has been a paramount importance in his life since the human race began. The three great necessities of life: food, clothing and shelter plus a host of other useful products, are supplied in great part by plants. This subject of economic botany has therefore, been exploited by the author in the region for many years. The study of ethnobotany has undergone changes and has been significantly amplified during the last century since the term was first used in 1895. Ethnobotany is the study of plant-human inter-relationships embedded in dynamic ecosystems of natural and social components. The use of plants and plant human relationships are shaped by history, physical and social environments, and by inherent qualities of the plant themselves. An ethnobotanical text evolves around a human community's use and management of the vegetation in its area. Kokwaro's interest on medicinal plants in the region dates back to 1964 when he first joined the East African Herbarium in Nairobi. He travelled extensively, collecting herbarium specimens and data on plant uses in Kenya, Tanzania and Uganda. His active plant collection records had reached 4,500 specimens by 1990, the highest number ever collected by indigenous East Africans.

His ethnobotanical study culminated on the publication of the first édition of the Medicinal Plants of East Africa in 1976. A revised second edition was printed in 1993 while the third edition is expected in 2008. It is one of the most popular publications on medicinal plants from the continent, widely quoted in relevant publications throughout the world.

The entire thesis is divided into the following three sections: Medicinal plants and traditional medicine; Taxonomic revision of the East African flora; and Agricultural, forest and other economic plants.