

## **"Exploring Ethnomedicinal Traditions: A Comparative Analysis of Medicinal Plant Use in Namibia and Angola"**

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### **ABSTRACT**

Plants have been used for several thousands of traditional medical purposes to date and are generally based on the uses of local and natural products related to the indigenous people's perception and way of life. Rainfall across Namibia varies considerably, increasing from 0 mm in the southwest in the Namib desert to 600 mm to the northeast in the Caprivi strip. The data for medicinal plants used for studying medicinal purposes in Namibia and Angola was obtained using a comprehensive review of medicinal plant species in Namibia and Angola and published works ie online databases such as Pub Med Central, Web of Science, Science Direct and Google Scholar. The authors have collected data on the medicinal properties of the plants and the typical ailments/diseases related to their applications. The diseases commonly encountered n daily life are treated with medicinal plants are Headaches, flu, stomach pains, malaria, epilepsy, and wounds/burns. The common parts of the plants are the roots, bark leaves, fruits, and pods. In addition, the common ways of application are steaming, topical application, and ingestion. The main objective of this study highlights in Namibia and Angola to identify the potential of traditional drugs to cure which is very vital to evaluate the research findings which are of utmost importance for the development of healthy and educated communities. The medicinal plant species documented are used to treat a variety of ailments, and several diseases.

**Keywords:** Medicinal Plants, Ethnomedicinal, Namibia, Angola.

### **1. Introduction**

The use of traditional medicine or medicinal plants as a basis for the maintenance of good health, plays an important role in the healthcare delivery system of developing countries, especially in rural areas. Plants have been used for traditional medical purposes for several thousands of years to date and are generally based on the uses of local and natural products that are related to the native people [1]. Apart from that, these plants play a critical role in the development of human cultures around the world. Treatment with medicinal plants is a traditional method used by several years. Nature has been a source of medicinal agents for thousands of years and an impressive number of modern drugs have been isolated from traditional plants. Many of these isolations were based on the uses of the agents in traditional medicine [4]. The plant-based, traditional medicine systems continue to play a key role in health care, with about 80% of the rural area inhabitants relying mainly on traditional medicines for their primary health care. According to the World Health Organization “a medicinal plant” is any plant, that possesses substances that can be beneficial for therapeutic purposes or which are useful precursors for the synthesis of drugs [5]. The medicinal properties of plants are usually based on the antioxidant, antimicrobial antipyretic effects of the phytochemicals [8]. Therefore, such plants should be investigated to better evaluate their properties, safety, efficacy and toxicological studies [7]. Because information on the use of plant species for therapeutic purposes has been passed from one generation to the next through oral tradition, this knowledge of therapeutic plants has started to decline and become obsolete through the lack of recognition by younger generations because due to of a shift in socioeconomic challenges the world is facing post COVID19 and after COVID19 [6]. Namibia has some of the most extraordinary vegetation, all adapted to harsh desert environments and savannah dry lands. Due to areas of differing rainfalls and nature of soil, there are varieties of medicinal plants from the desert and semi-desert vegetation to the subtropical species [2]. Local communities / indigenous tribes in Namibia possess an in-depth knowledge of medicinal plants and their environment [1]. However, local communities use diverse medicinal plants to treat different symptoms such as flu, colds, diarrhea, and rashes on the body. The use of these medicinal plants may differ from tribe to tribe but the application of it remains the similar. Medicinal plants contribute significantly to the livelihoods of poor local households in these local communities; however, these benefits are often lost when these resources are commercialized [1]. Plants possess hundreds of different functions including defense against insects, fungi, diseases, and herbivorous mammals. Medicinal plants are considered as rich resource of metabolites/phytochemicals that can

be used in drug development either pharmacopeia, non-pharmacopeia, or synthetic drugs. Numerous phytochemicals with potential or established biological activity have been identified [1-3]. However, since a single plant contains widely diverse phytochemicals, the effects of using a whole plant as medicine are uncertain. In addition, the phytochemical content and pharmacological actions of many plants having medicinal potential remain with advancement in the field of medicines, synthetic medicines gradually started replacing natural medicines irrespective of the fact that the former has some side effects. Medicinal plant remedies are less expensive than synthetic drugs and the majority of people in rural areas, use traditional medicines due to their beliefs [4-5]. With continuous development in the traditional knowledge of many valuable plants for medicine in the past and the interest currently growing, it is crucial to revive the valuable knowledge of developing the traditional medicinal plants sector [6]. Medicinal plant remedies are not only useful for the treatment of different diseases but are also widely used for enhancing beauty and curing skin-related issues and cosmetic industry will also benefit [6-7]. Therefore, instead of looking at synthetic drugs for the cure of any disease, we must consider natural drugs that can reduce the side effects, and toxicities of synthetic counterparts and will maximize therapeutic consequences with the most effective and dynamic healing effects. Hence this article highlights to study of various traditional medicinal plants used in Namibia and Angola, to determine the perception of the use of traditional medicine in the treatment of different ailments, to provide appropriate methods to facilitate the development of traditional medicine, and to transfer the knowledge to local communities will benefit from the uses of these traditional medicines.

### **3. Research Methodology**

#### **3.1 Research Design**

A list of known plant species with medicinal properties was obtained. The list included the medical conditions treated with the plant, as well as the part of the plant used to treat different diseases/ailments. Furthermore, the literature data preparation of the plant reveals its pharmacological active ingredients which are potent in the form of digital available data online.

#### **3.2 Research Procedure**

The study targeted both genders of men and women in Namibia and Angola who are practicing

the use of medicinal plants for traditional purposes. The research work would make use of questionnaires and interviews aiming at making respondents express their views freely and give their reasons for a particular response. Both methods would be conducted to cover the specific objectives of the study. This research is conducted based on prior knowledge of medicinal plant uses in the rural areas of Namibia and Angola.

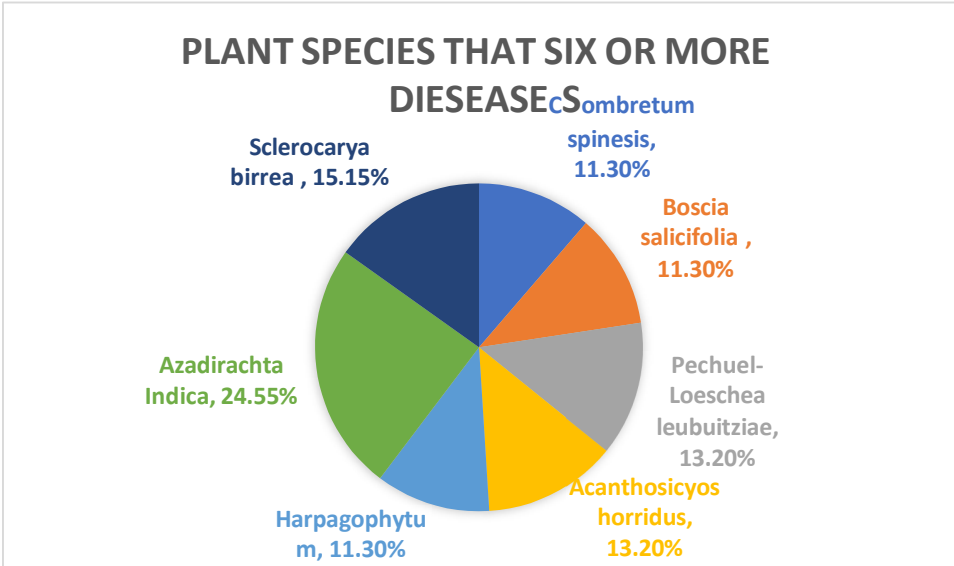
#### **4.0 Results and discussion:**

The data for medicinal plants used for medicinal purposes in Namibia and Angola was obtained using a comprehensive review of medicinal plant species in Namibia and Angola of published works through online databases. After compiling a database for the medicinal species, a comparison would be drawn between the use of medicinally active plants in Namibia and Angola, and the different types of medical conditions treated with the same plant species and its preparation.

Table 1 represents 23 medicinal plant species from 17 families, used to treat various diseases in Namibia. These medicinal plant species are used in the treatment of low-risk diseases such as toothache, to high-risk diseases like malaria, cancer, tuberculosis. The most common parts of the plant used are leaves, roots, bark, fruit, and seeds, which contain pharmacological metabolites that alleviate disease conditions. A herbal decoction is prepared by boiling the respective plant part, which can be ingested, used for steaming, or applied topically. The Following are reported to treat six or more disease forms, which are: *Combretum spines*, *Boscia salicifolia*, *Harpagophytum* [6], *Acanthosicyos horridus* [7], *Pechuel-Loeschea leubuitziae* [7], *Sclerocarya birrea* [8], *Azadirachta Indica* [13].

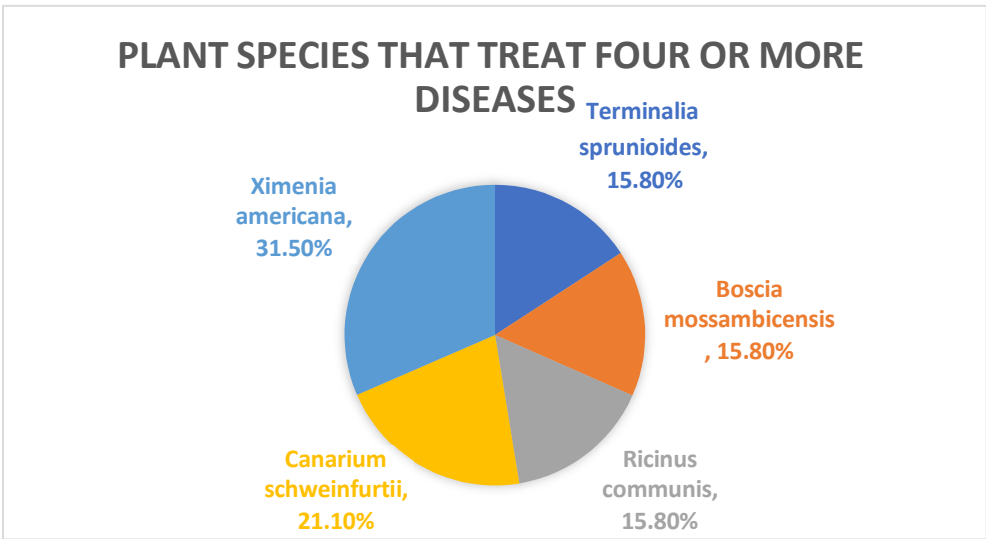
Table 3 represents medicinal plant species used for medicinal purposes in Angola. The vernacular names of the plant species are documented in the native language of Angola. Most of the plant species are used to treat diarrhea, venereal diseases, and stomach-associated conditions. The following plant species are used to treat four or more diseases such as: *Canarium schweinfurtii* [4], and *Ximenia americana* [5]. A herbal decoction is prepared by boiling the respective plant part, which can be ingested, used for steaming, or applied topically, to alleviate diseases/ailments as well.

Figure 1 represents the plant species that treat diseases in Namibia. Azadirachta Indica (24.55%) treats the most number of diseases such as Harpagophatum, Boscia salicifolia, Combream spinesi (11.30%) treats the least number of diseases.



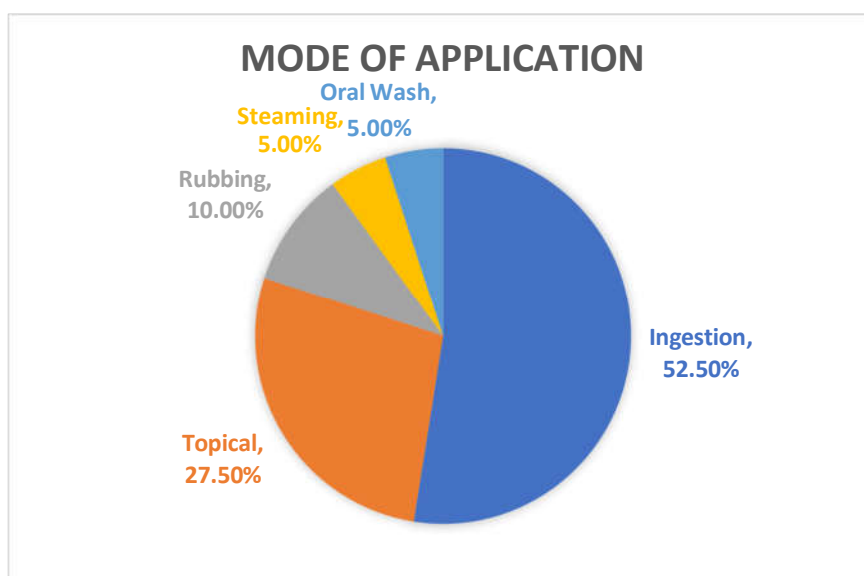
**Figure 1:** Plant species that six or more forms of disease in Namibia.

Figure 2 represents the plant species that treat diseases in Angola. Ximena Americana (31.50%) Terminalia sprunioides (15.80%), Ricinus communis (15.80%), Boscia mossambiencis (15.80%), treats the least number of diseases.



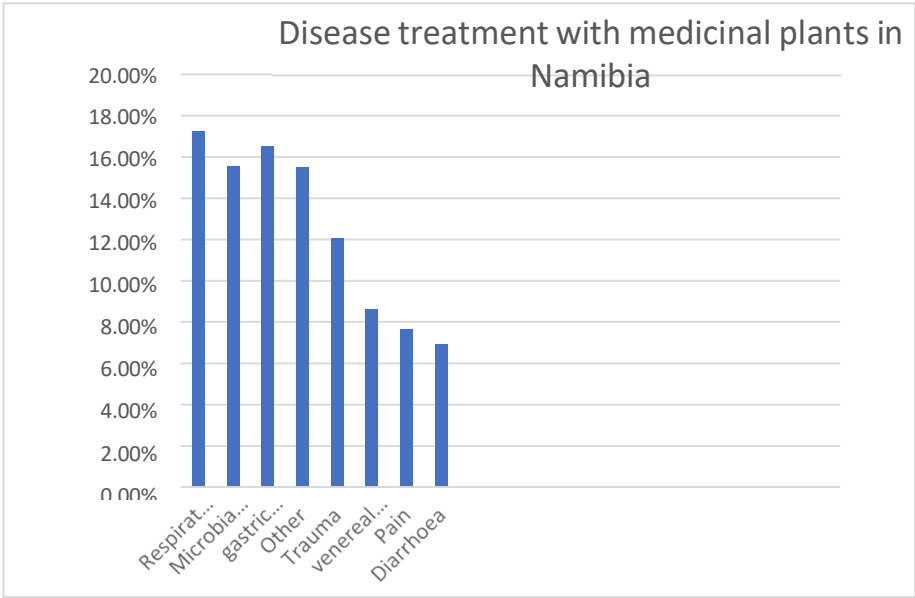
**Figure 2:** Plant species that four or more forms of disease in Angola.

Figure 3 represents the frequency of application of herbal remedies to alleviate diseases in Namibia and Angola. Ingestion (52.50%) is the most used mode of application, and oral wash (5.00%) and steaming (5.00%) is the least used mode of application for disease alleviation In Namibia and Angola collectively [4-13].



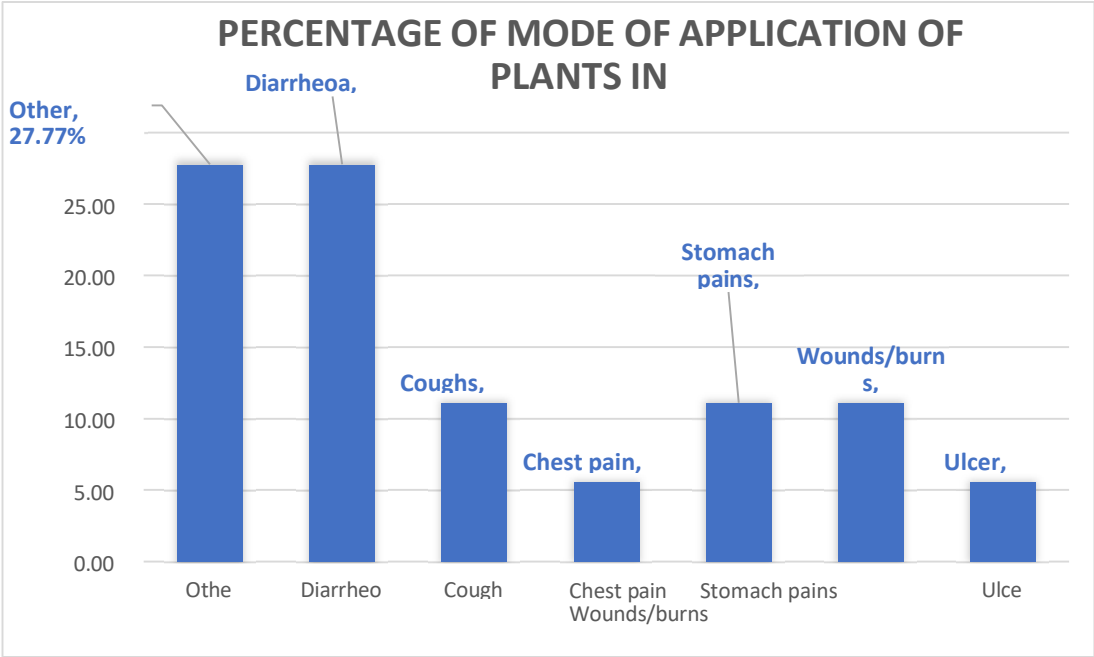
**Figure 3:** Percentage of mode of application of medicinal plants in Namibia and Angola

Figure 4 represents the type of diseases treated with medicinal plants in Namibia. The disease categories are as follows: Pains {headache, toothache, Chest pain}, Trauma {Nervous discomfort, sore finger, burns, wounds, pancreatium, nipple soreness}, Microbial Diseases {malaria, TB, chicken pox candidiasis, schistomiasis}, Respiratory infections {cough, fever, cold, flu, asthma}, Venereal Diseases, Diarrhea, Gastric Tract {stomach-ache, swollen pancreas, nausea, ulcer, digestion issues}, and Other {sterility, epilepsy, anemia, dermititus, kidney}. Respiratory infections (17.24%) are treated with the highest number of medicinal plant species that are from different plant families and Diarrhoea (6.90%) is treated with the lowest number of medicinal plant species [14-18].



**Figure 4:** Disease treatment with medicinal plants in Namibia

Figure 5 represents the type of diseases are treated with medicinal plants in Angola. The diseases categories are: ulcers ( 5.55%), chest pains (5.55%), wounds/burns (11.11%), stomach pains (11.11%), coughs (11.11%), Diarrhoea (27.77%), and Other (27.77%). The “other” category of diseases are Scorbutic ulcers of the mouth Scurvy, venereal diseases, Anthelmintic, sexual stimulant for men, measles and anti-venom.



**Figure 5:** Disease treatment with medicinal plants in Angola

This research studies on the following species: *Sclerocarya birrea*, *Ricinus communis*, *Ficus sycomorus*, *Ziziphus mucronate*, and *Ximenia americana* are used for medicinal purposes in both Namibia and Angola, for curing diseases such as Diarrhea, respiratory tract infections skin allergies, venereal and *Sclerocarya birrea* diseases. Although is used to treat a variety of diseases in Namibia, it is used to prepare alcoholic beverages in Angola. This finding suggests that the *Sclerocarya birrea* can also be used as a food source [18]. Ethnobotanical surveys are one of the reliable approaches to drug discovery, and several active compounds have been discovered from plants based on ethnomedicinal information and used directly as patented drugs. Therefore, medicinal plants used in communities are not only important as an integral part of the traditional medical system of local people but could also play an important role as sources of pharmaceutical drugs in the future [18-27].

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**6. Conclusion:** The study revealed 31 medicinal plant species from 18 families that have shown potential. The number of medicinal plants used to treat a variety of diseases reflects the rich ethnomedicinal knowledge in Namibia and Angola. The preservation of this knowledge appears to be particularly secured due to the continuing reliance of local people on primary healthcare ensured by medicinal plant use and local healers. The fact that roots and leaves are most used to prepare medicinal remedies, may suggest that continuous collection of plants, as well as land clearing practices, might threaten local plant populations in the future. This study highlights the importance of proceeding with new ethnobotanical studies and transferring skills/knowledge to local communities/inhabitants using different types of plant species used to treat diseases in developing countries. The rich plant diversity in Namibia and Angola suggests a tremendous potential for the discovery of new medicine with considerable therapeutic value. Therefore, further research on the traditional use of plants by indigenous tribes must be carried out, which should include: (i) field surveys, (ii) interviews with local communities, (iii) a thorough review of medicinal data, (iv) by posting on radio, television, messages on cellphone and social media (v)



And NGOs can play important role by guiding the local communities who are deprived of this knowledge, (vi) international cooperation to document and recover previously lost knowledge associated with botanical collections.

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