



ETHNOMEDICINALLY IMPORTANT PLANTS USED BY THE LOCAL PEOPLE OF AL GALABAT LOCALITIES, GEDAREF STATE, SUDAN

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Article DOI: <https://doi.org/10.36713/epra5968>

ABSTRACT

This research aims to document the medicinal plants used by the local people in two localities of El Gadaref state in eastern Sudan. Information was obtained during several visits using a semi-structured questionnaires in group discussions at herbal medicine practitioners homes, market, and healers shops. Most of the information was obtained from respondents of age 51 to 65 years. The study documented 79 species belonging to 36 families used to treat various ailments. The most utilized plant families were Leguminosae (45%) followed by Combretaceae (11%). 7% of the total plants used belongs to Asteraceae, Capparaceae, and Solanaceae. This study document the use of Martynia annua fruits to treat tumors and dysentery for the first time in Sudan. Common treated diseases are abdominal pains, unary tract infections, fever, and malaria. Further pharmacological research studies are recommended to identify the active chemical components in the reported plants.

KEYWORDS- Medicinal plants; local people; Gadarif state ; Sudan

1. INTRODUCTION

Ethnobotany explains the relationship between people of a given community or society, the environment and the plant diversity in that particular community (Osawaru, & Dania-Ogbe, 2010). Ethnobotanists focus primarily on how plants are used, managed and perceived across human societies. This includes use for food, clothing, medicine, dyes, construction, cosmetics and more (Acharya and Shrivastava, 2008). Modern ethnobotanical approaches are significant in highlighting locally important plant species, particularly for new crude drugs. They have been broadened to include data not only from anthropology

and botany, but also from pharmacology and phytochemistry (Cotton 1997). Documentation of the indigenous knowledge about medicinal values of plant species, provided various vital modern drugs (Cox and Balick, 1994).

In Sudan, medicinal plants used by local people of certain districts were documented as part of medicinal and aromatic plants and tradition medicine research institute (MAPTMRI) projects. Areas covered by MAPTMRI studies include Erkawit (El Ghazali, 1986), Nuba mountains (El Ghazali *et al*, 1987), White Nile (Ghazali, 1994), North Kordofan (Ghazali, 1997), and Ingassana (Ghazali, 2003). Musa *et al* 2011 and Gibreel



et al 2013 Studied the medicinal plants in the Blue Nile State, Haidar *et al.* 2013 documented the medicinal and aromatic plants in Jabel El dair national reserve, and Ahmed *et al* 2014, reported the ethnomedicinally important plants in Ga'ab El Lagia Oasis in the northern Sudan. Ahmed *et al* 2020 documented the traditional use of medicinal plants among the Barti tribe community in Fangoga area in Sennar State. This study is confined to Galabat localities of El Gedaref state in eastern Sudan. There is no previous ethnobotanical reports documented for this area which is inhabited by ethnic groups representing different tribes.

2. MATERIALS AND METHODS

2.1. Study area

This study was conducted in two localities of El Gadaref state which is a regional state located in the eastern part of Sudan (longitudes 33–36° E and latitudes 13–16 °N). It is bordered by Ethiopia to its East, Kassala and Khartoum State to the North, El Gezira State to the West and Sennar State to the South. The total area of the State is approximately 71,000 km². El Gadaref State is divided into ten administrative localities which include Gadaref, Central Gadaref, Alrahad, Alfaw, Eastern Algalabat, Western Algalabat, Alfashqa, Albutana, Galaa alnahal and Alquresha (OCHA, 2012). This study is confined to Eastern Algalabat and Western Algalabat localities (Figure 1). According to the vegetation cover map of Sudan, wooded Gadaref state is located in the zone of low rainfall woodland savanna (Harison and Jackson, 1958). The rainfall ranges between 300 mm in the North to more than 800 mm in the South. (Sulieman and Elagib, 2012). Highest temperature is recorded in April when the mean daily is 40 °C (Elsafori, 2000). The total population exceeds 4.3 million people, with an annual growth rate of 3.87%. 80.5% of the population lives in rural areas (Sulieman and Buchroithner, 2009).

2.2. Ethnobotanical data collection survey

Eethnobotanical information was obtained during several visits in the period 2014-2016. using a semi-structured questionnaires and from group discussions organized at herbal medicine practitioners homes, market, and healers shops with the assistance of some local people known to the authors. Documentation was taken from a total of 31 informants. Most of the information was obtained from respondents of age 51 to 65 years. Informants were asked about the plants and

the harvested parts they use to cure the prevalent diseases, methods of preparing the herbal remedy, and administrative details.

1. Results and discussion

In this study, 79 species belonging to 36 families were documented as medicinal plants used by the local people who are mostly relay on traditional medicine in their healthcare system Table1. The local people show high knowledge of understanding of the local vegetation and knew the proper time and places to collect the medicinal plants from their natural habitats. Analysis of the information showed that most of the medicinal plants used in this area belong to the Leguminosae (45%) with six species belong to genus *Acacia*, followed by Combretaceae (11%) , and equal number of species from the families Asteraceae, Capparaceae, and Solanaceae were reported as 7% of the total plants. Figure 2. Ahmed *et al.*, (2020) conducted a similar study in Fangoga area in Sinnar state and reported that Leguminosae have the highest number of medicinal plants species used by the local people. It is reported by many authors that fruits decoction of *Acacia nilotica* is an effective remedies to treat cough, sour throat, and fever in different areas in Sudan (El Ghazali 1986; El Ghazali *et al.* 1987; Musa *et al.* 2011; and Ahmed *et al.* 2014). Treatment of diarrhea by eating of the fruits of *Adansonia digitata* and using of root decoction of *Hydnora abyssinica* to treat dysentery were also reported for the local people in northern Kordofan (Ghazali, 1997). Eating of the whole plant of *Aristolochia bracteolate* to treat stomach pains is also reported by El Ghazali *et al* 1987 for the local people in the Nuba mountain area. Using of bark decoction and poultice, followed by the whole plant (as raw) were the most treatments used frequently by the locals. Seeds were rarely used. Figure3. These results were in agreement with previous studies conducted in this region by Bayafers, 2000 and Endalew, 2007. The main preparation methods of herbal remedies used in this study were decoction (37%), maceration (26%) followed by Powder (15%), poultice (14%), burnt and using of whole plant as raw (4%) figure 4 . Some applications were also prepared as a mixture of plants with other ingredients such as salt, sugar and pepper as additives to improve the taste. The commonly occurred ailments and parasitic diseases in the study area were abdominal pains, unary tract infections, fever, rheumatism, malaria and tapeworm. This study documented for the first time in Sudan, the use of *Martynia annua* fruits decoction and maceration to treat dysentery and tumors respectively.

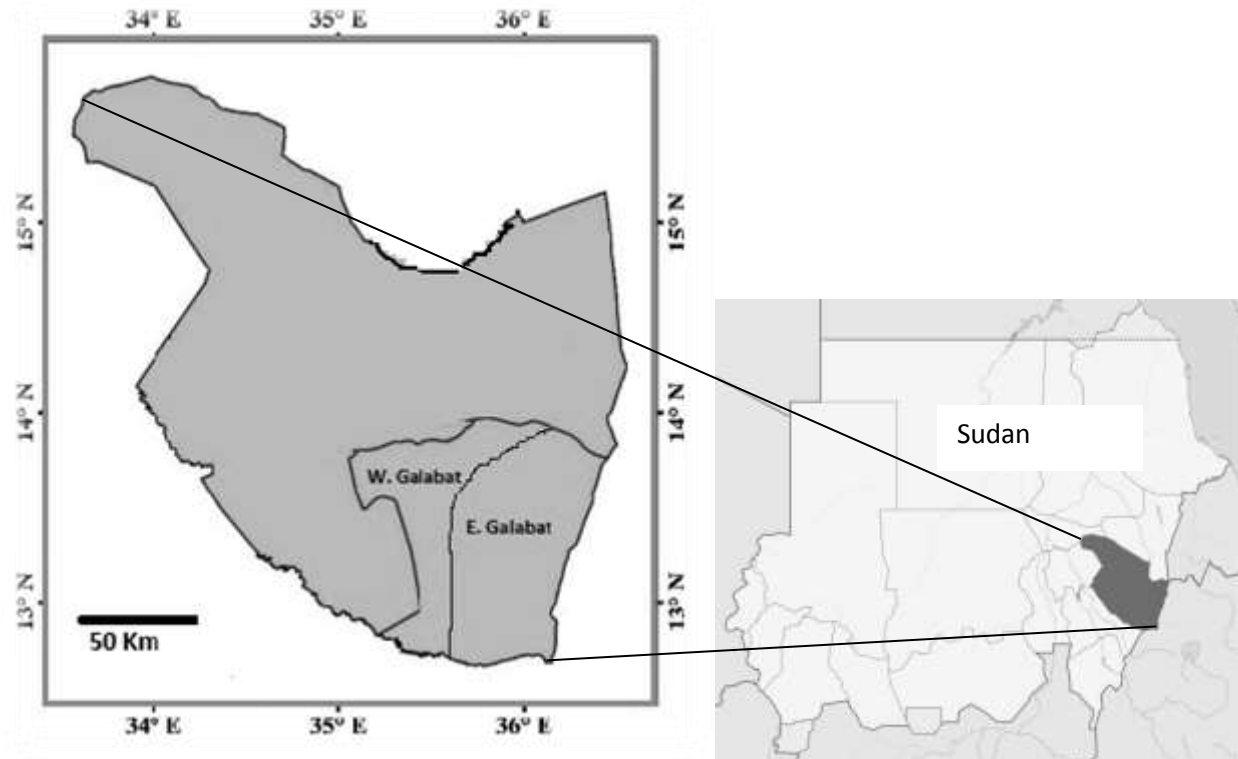


Figure 1. Location of eastern and western Galabat localities, Gadarif state, Sudan

Table 1: List of Medicinal plants used by local people in Galabat localities, Gadarif state, Sudan

Species name	Family name	Part used	Preparation	Medicinal use
<i>Acacia nilotica</i>	Leguminosae	Fruits	Decoction	Fever
			poultice	Joint pain& cough& fever
			Burnt	Fever
<i>Acacia oerfota</i>	Leguminosae	Bark	Decoction	HIV
<i>Acacia polyacantha</i>	Leguminosae	Roots	Decoction	Urinary tract infections
<i>Acacia seyal</i>	Leguminosae	Bark	Decoction	Colic
			Poultice	Hemorrhoids.
			Powder	Wound healing
<i>Acacia sieberiana</i>	Leguminosae	Bark	Maceration	Abdominal pains & infections
			Decoction	Fever
<i>Adansonia digitata</i>	Bombacaceae	Bark	Poultice	Rheumatism
		Fruits	Raw	Diarrhea
<i>Aerva javanica</i>	Amaranthaceae	Whole plant	Powder	Anthelmintic
<i>Albizia amara subsp. sericocephala</i>	Leguminosae	Bark	Decoction	Chest infection
<i>Albizia amara</i>	Leguminosae	Bark & Leaves	Decoction	Jaundice
<i>Anogeissus leiocarpus</i>	Combretaceae		Decoction	Stomach pains& Cough& Inflammations.



		Bark	Powder	Rheumatism
			Poultice	Rheumatism
		Fruits	Decoction	Inflammations & Jaundice&Dysentery
			Maceration	Flatulence & Stomach pains
<i>Aristolochia bracteolata</i>	Aristolochaceae	Whole plant	Decoction	Malaria & stomach pains & wound healing
			Powder	Rheumatism
			Poultice	Skin diseases
			Maceration	Stomach pain
<i>Azadirachta indica</i>	Meliaceae	Bark & seeds	Decoction	Fatigue
		Bark	Decoction	Tumors & Throat pains
		Seeds	Poultice	Rheumatism
<i>Azanza garckeana</i>	Malvaceae	Fruits	Raw	Tapeworm
<i>Balanites aegyptiaca</i>	Zygophyllaceae	Fruits	Maceration	Dysentery
		Seedling	Decoction	HIV
<i>Bauhinia reticulata</i>	Leguminosae	Leaves	Powder	Abdominal diseases & Constipation
<i>Boscia senegalensis</i>	Capparaceae	Whole plant	Powder & poultice	Tumors
<i>Blumea aurita</i>	Asteraceae	Whole plant	Poultice	Fungal infections & Skin diseases
			Decoction	stomach pains
<i>Calotropis procera</i>	Apocynaceae	Fruits	Poultice	Measles
			Ash poultice	Prostate infections
<i>Camellia sinensis</i>	Theaceae	Leaves	Powder	Wound healing
			Maceration	Eye infections
<i>Capparis decidua</i>	Capparaceae	Whole plant	Decoction	Jaundice
			Decoction	Fungal infections & Jaundice
			Maceration	Jaundice
<i>Cassia arereh</i>	Leguminosae	Bark	Maceration	Stomach pains
			Maceration	Urinary tract infections
<i>Cissus quadrangularis</i>	Ampelidaceae	Whole plant	Powder	Wound healing
<i>Citrullus colocynthis</i>	Cucurbitaceae	Roots&Fruits	Maceration	Stomach pains
<i>Clerodendrum capitatum.</i>	Verbenaceae	Roots	Eaten	Tonic
<i>Combretum collinum</i>	Combretaceae	Bark	Decoction	Dysentery
<i>Combretum hartmannianum</i>	Combretaceae	Bark	Powder	Wound healing
		Bark& Gum& Stem	Decoction	Urinary tract infections
			Powder& Poultice	Rheumatism
		Gum	Burnt	Headache
		Bark&wood	Burnt	Rheumatism
<i>Commiphora africana</i>	Burseraceae	Bark & gum	Decoction	Chest infection
			Burnt	Inflammation
		Bark	Decoction	Tuberculosis



<i>Cucumis prophetarum</i>	Cucurbitaceae	Fruits	Decoction	Stomach infections
<i>Cucurbita maxima</i>	Cucurbitaceae	Seeds	Raw	Worms
<i>Cymbopogon nervatus</i>	Poaceae	Whole plant	Decoction	Fever
			Maceration	Kidney infections & Gallstone
<i>Cymbopogon schoenanthus</i>	Poaceae	Whole plant	Maceration	Fever
<i>Dalbergia melanoxydon</i>	Mimosaceae	Roots	Maceration	Fever
		Bark	Decoction	Fever
<i>Dichrostachys cinerea</i>	Mimosaceae	Leaves	Powder	Fungal infection
		Bark	Maceration	Wound healing
<i>Ficus sycomorus</i>	Moraceae	Leaves	Decoction	Facilitates delivery
		Bark	Decoction	Female infertility
<i>Gardenia lutea</i>	Rubiaceae	Roots	Decoction	Fever
		Bark	Maceration	Chest diseases
<i>Grewia sp</i>	Tiliaceae	Fruits	Poultice	Snake bites and scorpion sting
<i>Glycyrrhiza glabra</i>	Leguminosae	Whole plant	Decoction	Wound healing
<i>Gueira senegalensis</i>	Combretaceae	Leaves	Decoction	Snake bites
<i>Vernonia sp</i>	Asteraceae	Whole plant	Decoction	Abdominal disease & Urinary tract infections
			Maceration	Stomach pains & Colic
			Poultice	Rheumatism
<i>Hibiscus sabdariffa</i>	Malvaceae	Leaves	Maceration	Urinary tract infections
<i>Khaya senegalensis</i>	Meliaceae	Bark & roots	Maceration with sugar	Malaria & Stomach pains
		Bark & Leaves	Decoction	Hemorrhoids

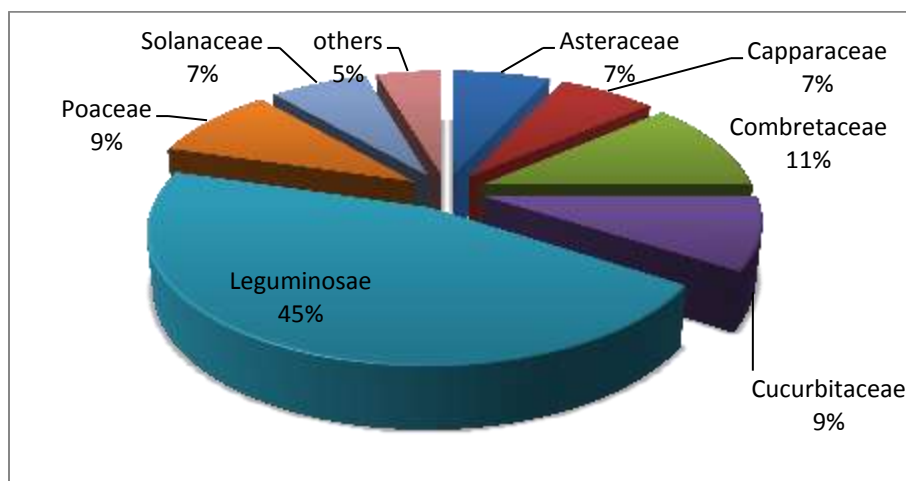


Figure 2. The percentages of medicinal species in each family

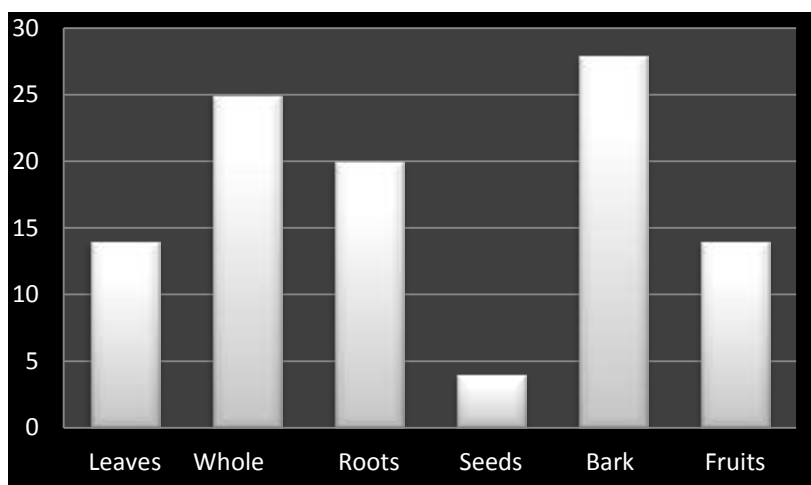


Figure 3. Different plant parts used from the medicinal plants of the study area

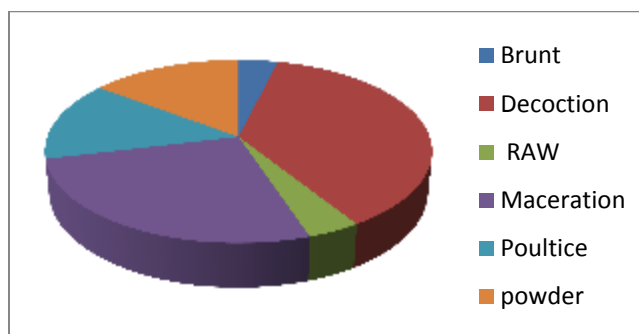


Figure 4. The main preparation methods of herbal remedies used in the study area

REFERENCE

1. Acharya, D. & Shrivastava, A. (2008) *Indigenous Herbal Medicines: Tribal Formulations and Traditional Herbal Practices*. Aavishkar Publishers Distributor. Jaipur, 440.
2. Ahmed I. M., Tahir, Y. F., Nour, S.M. & Suliman, M. A. (2020) *Traditional use of medicinal plants among the Barti tribe community in Fangoga area, Sennar State, Sudan*. *Tropical Plant Research* 7(2): 517–521
3. Ahmed, I. M. , Tahir, Y. .F & Nour, S. M. (2014) *Ethnobotanical study of medicinal plants used by El Kababish tribe in Ga'ab El Lagia Oasis, West Dongla (Sudan)*. *Nyame Akuma Bulletin* 82: 91–99
4. Cotton, C.M. (1997). *Ethnobotany, Principles and Applications*. Wiley & Sons, UK
5. Endalew, A.(2007). *Use and Management of Medicinal Plants by indigenous People of Ejaji Area (Chelya Wereda) West Shewa, Ethiopia: An Ethnobotanical Approach*. M.Sc. Thesis. Addis Ababa, Ethiopia.
6. El Ghazali, G.E.B. (1986) *Medicinal Plants of Sudan Part I. Medicinal Plants of Erkowit*. Khartoum: National Council for Research.
7. El Ghazali, G.E.B., Bari, E.A., Bashir, A.K & Salih, A.(1987) *Medicinal Plants of Sudan Part II. Medicinal Plants of Eastern Nuba Mountains*. Khartoum: National Council for Research.
8. El Ghazali, G.E.B., El Tohami, M.S. & El Egami, A.A.B. (1994) *Medicinal Plants of the Sudan Part III. Medicinal Plants of White Nile Province*. Khartoum: National Council for Research.
9. El Ghazali, G.E.B., El Tohami, M.S., El Egami, A.A., Abdalla, W.E. & Galal, M.(1997) *Medicinal Plants of the Sudan Part IV. Medicinal Plants of North Kordofan*. Khartoum: National Council for Research.
10. El Ghazali, G.E.B., Khalid, H.E., El Tohami, M.S., Abdalla, W.E. & Yagi, S.M.A. (1998) *Medicinal*



- Plants of the Sudan, Part VI. Medicinal Plants commonly used in Khartoum State. Khartoum: National Centre for Research*
11. El Ghazali, G.E.B., Abdalla, W.E., Khalid, H.E., Khalafalla, M.M. & Hamad, A.A. (2003) *Medicinal Plants of the Sudan Part V. Medicinal Plants of Ingassana Area. Khartoum: National Council for Research.*
 12. Harrison, M. N. & Jackson, J.K. (1958). *Ecological Classification of Vegetation of the Sudan. Sudan Forest Department Bulletin (4): 45pp*
 13. Haidar, A.M., Khaled, H.S., Elsadiq, W & Salwa, M. (2013). *An ethnobotanical study of medicinal and aromatic plants in jabel el dair national reserve, Northern kordofan state, Sudan, 15th NAPRECA symposium, Khartoum, Sudan.*
 14. OCHA, 2012. *Sudan: Gedaref State – Administrative Map. September, from https://reliefweb.int/sites/reliefweb.int/files/resources/sud04_gedaref_state_referencemap_a1_16sep12.pdf.*
 15. Osawaru, M.E. & Dania-Ogbe, F.M. (2010). *Ethnobotanical studies of West African okra, Abelmoschus caillei (A. Chev) Stevels from some tribes of south western Nigeria. Science World Journal, 5(1): 36-42.*
 16. Musa, M.S., F.E. Abdelrasool, F.E. Elsheikh, E.A., Ahmed, L.A.M.N., Mahmoud, A.E. & Yagi, S.M. (2011) *Ethnobotanical study of medicinal plants in the Blue Nile State, South-eastern Sudan. Journal of Medicinal Plants Research 5(17): 4287-4297.*
 17. Gibreel, Haytham H., M.Y. Kordofani, Warrag & H.O. Ahmed (2013) *Medicinal value and ecotaxonomy of the flora of Blue Nile State. Journal of Chemical and Pharmaceutical Research 5(2):36-43*
 18. Elsafori, A.K. (2000). *A study on the flora of Al faw Hill Central Sudan, Sudan M.Sc. thesis, University of Khartoum, Khartoum, Sudan.*
 19. Sulieman, H. & Buchroithner, M. (2009). *Degradation and abandonment of mechanized rain-fed agricultural land in the Southern Gadarif region, Sudan: the local farmers' perception. Land Degrad. Dev. (20): 199-209. Retrieved from <https://doi.org/10.1002/ldr.894>*
 20. Sulieman HM & Elagib NA: (2012) *Implications of climate, land-use and land-cover changes for pastoralism in eastern Sudan. J Arid Environ (85): 132-141. Retrieved from <https://doi.org/10.1016/j.jaridenv.2012.05.001>*