Checklist of Poisonous Plants of Ibrak Nouta, Soussa, Al-Jabal Al-Akhdar, Libya

Rania F. M. Ali, Adam S. Adam, Sabah H. Lamlom
Department of Botany, Faculty of Science, University of Omar AlMukhtar, Albaida, Libya
Email: raniafarag2012m @gmail.com

Submission data: 11/12/2024 Electronic publishing data: 16/2/2025

Abstract: The study was carried out to list the poisonous plants in Ibrak Nouta, Soussa – Al-Jabal Al-Akhdar, Libya. This study was conducted over four seasons during 2021 and 2022. Data on 35 poisonous plant species were included; these plant species are belonging to 20 families and 28 genera. Dicotyledons are represented by 26 species across 20 genera and 4 families, while Monocotyledons include 8 species from 7 genera and 5 families. Gymnosperms are represented by two species, two genera, and two families. The plants were categorized based on their toxic parts. Information regarding their local name, botanical name, family name, life form and the toxic parts are enumerated in this checklist. The most prevalent life forms were Therophytes (13 species, 37%), followed by Geophytes (11 species, 31%), Nano-Phanerophytes (4 species, 11%), Chamaophytes (3 species, 9%), and Hemicryptophytes and Phanerophytes (2 species each, 6%). This research is regarded as the inaugural effort to catalog toxic plants within the region and to compile a comprehensive list, as these species have not been previously examined., and addresses a significant gap in knowledge regarding poisonous plants in the region.
Keywords: Therophytes, Chamaophytes, Geophytes, Hemicryptophytes, Phanerophytes.

Introduction:

Ibrak Nouta, Soussa consists of two lakes. It is located about 20 km west of the city of Soussa. Ibrak Nouta is another face of the beauty of nature in Libya. One of these lakes is the largest, with a diameter of approximately 350 meters and a depth of 60 meters. Its shape resembles a funnel, narrowing toward the bottom. It is noteworthy that the distance between the Ibrak Nouta lakes and the see does not exceed 300 meters, as they are separated by the western coast road between Soussa in the east and El Haniyeh in the west. In the lakes, there are rare types of diverse marine and wild life, such as sea snakes and small fish that feed on water weeds. The water of the lake mix between fresh and salty, and many types of wild birds live within its rocky gaps, and migratory wild geese take it as a station. Floristic investigations offer reliable data on the nomenclature, distribution, ecology, and utility of poisonous plant species. They also support sustainable management and conservation of plant resources. The study region is situated in the western part coast of Sousa. It lies around the cross point of Latitude 32° 54. 55 ′ N, and Longitude 21° 48. 42′ E. In the northeastern region, Al-Jabal Al-Akhdar.

The term "poisonous" encompasses a broad spectrum of reactions or consequences. Notable side effects include skin rashes or dermatitis resulting from direct or indirect exposure to allergenic or irritating substances, skin photosensitization brought on contact with such irritants, and internal poisoning resulting from the consumption of plants or their parts. Additionally, spores, pollen grains, hairs, or naturally occurring volatile compounds may also contribute to these adverse effects. can also cause allergic reactions. According to[1], there are four broad categories of poisoning and examples of the plants that cause them: foxglove, *Digitalis purpurea*; nerve poisoning (mushrooms); cardiac poisoning (wild cherry, *Prunus* spp.); and skin irritation (poison ivy, Toxicodendronradicans). The compounds that cause poisoning or toxic responses come from a variety of plant processes. Nonetheless, the majority of toxic substances are thought to be secondary metabolites or byproducts of the plant's vital processes[2]. While there are other hypotheses explaining why plants create these unnecessary compounds,[3] proposed that the reason for it is because the plants evolved to produce these compounds to keep animals from grazing on them and to keep insects from eating them.

There have consistently been poisonous plants in everyday existence. Plant poisoning almost reached epidemic proportions in the nineteenth century because people were frequently foraging natural plantingsHistorically, poisonous plants have posed risks, particularly during periods when humans relied heavily on wild plants for sustenance. These plants, ranging from trees and shrubs to ferns and herbs, often resemble their non-toxic counterparts, making them difficult to identify. While many toxic plants have unpleasant tastes that deter ingestion, others are deceptively palatable and can cause serious health issues if consumed in large quantities. This study aims to contribute to the understanding and documentation of poisonous plants in the Ibrak Nouta region, addressing a significant gap in knowledge.

Materials and Methods:

i- Study Area:

The study area is situated on Soussa's western coast. It lies between Latitude 32° 54. 55 ′ N, andLongitude 021° 48. 42′, E In the northeastern region, Al-Jabal Al-Akhdar**.** Figure 1 shows study area.

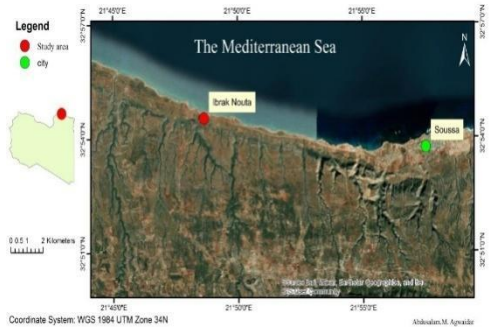

Figure 1: Illustrated The research region is located on the western coast of Soussa.

ii- Plants Collection and Identification:

Conventional field visits in various seasons of 2021-2022 The plants were organized systematically to ensure the collection of fully mature specimens. Field trips were more frequently done during the rainy seasons and springtime, where most of the plants are in flowering conditions. Plant samples were photographed before collection. Plants were collected during the flowering and fruiting period. Herbaceous plants wherever possible collected with underground parts. In case of woody plants, a branch about 25cm with leaves, fruits or flowers was collected [4]. The collected samples were dried for two weeks using a press and blotting papers, with the papers changed daily to ensure proper drying. Once dried, the specimens were mounted on herbarium sheets using glue. Dissection and identification of the plant samples were carried out at the Sylphium herbarium with the assistance of the herbarium team. Dissection tools and a microscope were used for detailed examination. Identification was performed using *Flora Libya* as the primary reference. Voucher specimens were then deposited at the Sylphium herbarium.

Results:

A study on the flora of Ibrak Nouta, Soussa was conducted over the course of four seasons in 2021–2022. The findings showed that there were thirty-eight genera and twenty families with thirty-five toxic species. Dicotyledons are represented by 26 species, 20 genera, 4 families, and monocotyledons represented by 8 species, 7 genera, 5 families. There were two species, two genera, and two families that comprise the gymnosperms (table 1). The plants were categorized based on the harmful parts of the plant. Therophytes were the most common life form, comprising 13 species (37%) of the toxic plants in Ibrak Nouta. Geophytes with 11 species (31%), Nano-Phanerophytes with 4 species (11%), Chamaephytes with 3 species (9%), Hemicryptophytes and Phanerophytes represented by 2 species (6%) (table 2, figure 2) The study also identified endemic poisonous plants, including *Arum cyrenaicum Hruby* and *Cyclamen rohlfsianum Aschers.*. Therophytes were the dominant life form, while the leaf spectrum analysis indicated the highest percentage of Nanophylls.

Table 1: List of poisonous plants in the study area with their families, local names, life form and toxic part of the plant.

Families and Species		Local name	Life form	Toxic part
Alliaceae				
	Allium ampeloprasum L.	Korrat	G	Leaves and Bulbs
	A. roseum L.	Ghazul	G	Bulbs
Amaryllidaceae				
	Narcissus tazetta L.	Nargis	G	Bulbs
Apocynaceae				
	Nerium oleander L.	Defla	N.Ph	The entire plant
Apiaceae				
	Thapsia garganica L.	Derias	Ch	The entire plant
Araceae				
	Arisarum vulgare O. Targ. Tozz.	Weden Essaloqi	G	Tuber
	Arum cyrenaicum Hruby.	Renish	G	Tuber
Asparagaceae				
	Drimia pancration (Steinh.) J.C. Manning & Goldblatt.	--	G	The entire plant, especially bulbs
	Ornithogalum divergens Boreau.	--	G	The entire plant, especially bulbs
Asteraceae				
	Senecio leucanthemifolius Poir.	Aloghwan	Th	Leaves
	Sonchus oleraceus L.	Tefaf	Th	Milky juice
Boraginaceae				
	Echium angustifolium Mill.	Henna alagrab	Ch	The barbed hairs are distributed widely most of the plant are an obstacle to grazing animals and contain alkaloids
Capparaceae				
	Capparis spinosa L.	Kabbar	H	Seeds

Cupressaceae				
	Cupressus sempervirens L.	Al-sarow	Ph	Leaves
Ephedraceae				
	Ephedra altissima Desf.	Alandi	Ph	Leaves and stems
Euphorbiaceae				
	Euphorbia dendroides L.	Taghma	N.Ph	Milky juice
	E. peplus L.	Lebbena	Th	The entire plant, especially milky juice
	Mercurialis annua L.	Halbob	Th	Milky juice and volatile oils
Fabaceae				
	Lathyrus aphaca L.	Bega	Th	The entire plant, especially seeds
	Lotus corniculatus L.	--	H	The entire plant
Myrsinaceae				
	Cyclamen rohlfsianum Aschers.	Rakaf	G	Tubers
	Lysimachia arvensis (L.) U.Manns & Anderb.	Eshbet Iraay, Ain-Al- Gatuus	Th	Roots and leaves
Papaveraceae				
	Papaver dubium L.	Eslya, Bugraum, Talma	Th	The entire plant
	P. hybridum L.	Eslya, Garun Bugraum	Th	Milky juice, Unripe fruits
	P. rhoeas L.	Zeghalil	Th	Seeds, Capsules
Poaceae				
	Cynodon dactylon (L.) Pers.	Najem	G	The aerialparts
Ranunculaceae				
	Adonis aestivalis L.	Zeghalil	G	The entire plant
	*A.dentata*Delile	Zeghalil	Th	The entire plant
	A. microcarpa DC.	Ain- El-Buma	Th	Flowers, leaves and roots
	*Ranunculusasiaticus*L.	Harir	G	Succulents
	*R.cyclocarpus*Pamp.		Th	--
Solanaceae				
	Datura innoxia Mill.	Fadda, Datura	Ch	The entire plant
	Nicotiana glauca Graham.	Akuz musa	N.Ph	The entire plant
Thymelaeaceae				
	Thymelaea hirsuta (L.) Endl.	Metnan	N.Ph	--
Urticaceae				
	Urtica pilulifera L.	Horreiq	Th	The bristles touched the body

Al-Snafi(2016), Blumenthal (2003),Mezogi*etal.*, (2020),Veronika (2010)

Table 2: Life- form spectrum of poisonous plants in Ibrak Nouta, Soussa.

Life form	No. of species
Therophytes	**13**
Geophytes	**11**
Nano-Phanerophytes	**4**
Chamaephytes	**3**
Hemicryptophytes	**2**
Phanerophytes	**2**

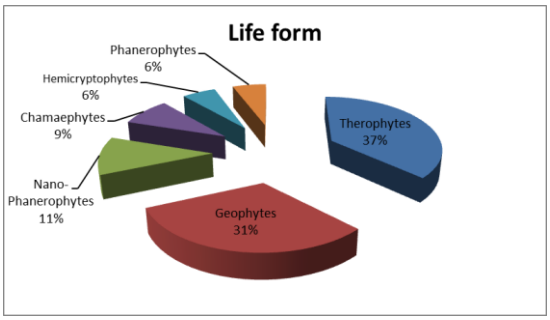

Figure 2: Life forms of poisonous plants in Ibrak Nouta, Soussa.

Discussion:

Plant toxicity varies widely and is often categorized as high, moderate, or low [1, 3, 5]. However, because the amount of dangerous substances in plants changes depending on the victim's age and other factors like the habitat and stage of growth, it is challenging to classify plants according to their toxicity, and a person's health status, in relation to the amount of plant ingested. [6]. Many plants have medicinal uses, but they can become toxic when consumed in excessive quantities or used incorrectly. According to [3], poisonous compounds fall into the following categories: (1) Alkaloids, which are nitrogenous compounds with a complex taste, physiological activity, and a tendency to be insoluble in water. (2) Glycosides: these substances, which are typically colorless, bitter, crystalline solids, produce one or more poisonous glycones and one or more sugars known as glycones. (3) Minerals: refers to the high concentrations of specific minerals in the soil or atmosphere that are then absorbed by plants; these minerals build up to toxic levels in the plants; lead, copper, and arsenic are among the minerals that are frequently linked to toxicity. (4) Oxalate: this group includes soluble oxalates and oxalic acid; poisons are

thought to be caused by tiny crystals of insoluble calcium oxalate that irritate the mouth When consumed (5), photosensitizing compounds: these are psoralens, which, after exposure, cause the skin to become extremely sensitive to the sun or other light sources. (6) Phytotoxins, also known as toxalbumins, are poisonous protein molecules that resemble bacterial toxins in both structure and mode of action. (7) Amines and Polypeptides: these are nitrogenous substances that include tyramine and phenyl ethylamine. Resins are substances that share certain physical properties but are frequently very different chemically. They are easily melted or burned, devoid of nitrogen, and soluble in organic solvents but insoluble in water. The most prevalent life forms most of the existing plants are annual plants that have the ability to adapt to the high temperatures Mediterranean region, and this study is consistent with previous studies conducted in different regions of the AL-Jabal AL-Akhdar[7],[8] There exists a notable resemblance between this ecological spectrum and those found in other areas of the Mediterranean basin . The primary living form, Therophytes, is perfectly suited to the summer because annuals finish their life cycle in just one season. According to[9], Therophytes constituted the majority of life forms in dangerous plants at the study location, accounting for 36% of the spectrum. With three in the research region, the Asteraceae, Fabaceae, and Boraginaceae families exhibited the highest number of documented genera, with these three families leading the findings. Apiaceae, Asparagaceae, and Myrsinaceae, each the analysis involved two genera and two species, derived from a comprehensive review of the geographic distribution of the species. One genus and one species were selected to exemplify multiple families. Prior research concerning the vegetation in the valleys of Al-Jabal Al-Akhdar indicated that the Asteraceae family is prominent comprising 46 species, was the most common family in Wadi Al-Ager[10]. The Sedy Boras region was home to the largest family, comprising 130 species [11]. Our findings agree with those of [12],[13]. who conducted a thorough investigation of the Wadi Al-Kouf vegetation and found that several poisonous plant species, including *Euphorbia peplus* L., *Thapsia garganica* L., and *Neriumoleander* L., were also identified in this study. Numerous studies have similarly highlighted the varieties of toxic plants identified in our present research [14],[15]. Several of these toxic plants are recognized for their medicinal applications in Folk Medicine [16];[14]. Toxic plants can be categorized according to the specific chemicals they contain, including alkaloids and glycosides. [17]. Plant toxicity depends not only on chemical composition but also on environmental factors, including temperature, precipitation, and soil conditions [14]. This dual role of plants as both toxic and medicinal highlights their ecological and cultural significance.

Conclusion:

Al-Jabal Al-Akhdar, with its abundant vegetation fuelled by ample rainfall, is one of Libya's most ecologically significant regions. However, some poisonous plants, once highly valued for their medicinal properties, are now threatened due to overexploitation. This highlights the urgent need to develop conservation strategies to protect these species while raising public awareness, especially among younger generations, about their toxicity. Further research is essential to deepen our understanding of the complex mechanisms of action of the toxic compounds present in these plants and to explore sustainable management strategies for these species while leveraging their potential medicinal properties.

References:

1. Pammel, L.H., 2003. Manual of poisonous plants. Bishen Singh Mahendra Pal Singh.
2. West brooks, R.G. and J.W. Preacher, 1986. Poisonous Plants of Eastern North America. University of South Carolina Press, Columbia, SC.
3. Douglas, S.M., 2008. Poisonous plants. The Connecticut Agricultural Experiment Station.
4. Badshah, L., Hussain, F., & Sher, Z. (2013). Floristic inventory, ecological characteristics and biological spectrum of rangeland, District Tank, Pakistan. Pak. J/ Bot, 45(4), 1159-1168.Omar, N. O., A Alaib, M., G.
5. Al-Snafi, A. E. 2016. Chemical constituents and pharmacological effects of Cynodon dactylon-A review. IOSR Journal of Pharmacy, 6 (7), 17-31.
6. Blumenthal, M. 2003. FDA Proposes Strong Warnings for Ephedra, Releases Independent RAND Report on Ephedra and Efficacy. HerbalGram, (58).
7. Mezogi, J., Abusaida,H., El-Jaafari, H., Shibani, N,. Dali, A., Abuelkhair, K,. Shalabi, S,. Aburawi, S. 2020. Effect of Sub Toxic Dose of Ephedra AltissimaMethanolic Extract on Reproductive System of Male Albino Mice. *Al-Qalam Journal of Medical and Applied Sciences*, 3(1), 13-22.
8. Veronika, B., Scott, A. Weinsein, Julian, W., Michael, E. 2010. A review of the natural history, toxinology, diagnosis and clinical management of *Nerium oleander* (common oleander) and *Thevetiaperuviana* (yellow oleander) poisoning. Vol 56, Issue 3, Pages 273-281 ISSN 0041-0101.
9. Stary, F. and Z. Berger, 1995. Poisonous Plants. Magna Books, Prague.
10. Westerfield, R.R. and G.L. Wade, 2000. Poisonous plants in the Landscape. Cooperative extension service. University of Georgia College of Agricultural and Environmental Sciences.

11. Omar, N., Alaib, M., El-Mghrbi, N., & Alzerbi, A. (2020). Checklist of Flora and Floristic Study of Wadi Al-Hamar Region in Libya. Journal of Umm Al-Qura University for Applied Science.; 6 (2), 20-24.
12. Omar, N., El-Mghrbi, N. G., Rebeh, O. R., Alaib, M. A., & Abdul Hamid, K. A. (2021). Floristic Composition and Plant Diversity of Western Part of Wadi El-Enaghar, Libya. Species, 22(70), 204-217.
13. El-Mokasabi F. (2014).The State of the Art of Traditional Herbal Medicine in the Eastern Mediterranean Coastal Region of Libya. Middle-East Journal of Scientific Research. 21 (4), 575-582.
14. Alaib, M., El-Sherif, I. & Al-Hamedi, R. (2017). Floristic and ecological investigation of Wadi Al-Agarin Al-Jabal Al-Akhdar, Libya. Journal of Science and its applications **5**(1), 57–61.
15. Alzerbi, A., & Alaib, M. (2017) .Study of vegetation in Sedy Boras region in Al-Jabal Al-Akhdar-Libya. Journal of Environmental Science and Engineering.; 1(1), 67–72.
16. Alzerbi, A., & Alaib, M. (2016). Study of pastoral vegetation in Al-Koof Valley region in Al-Jabal Al-Akhdar-Libya. Journal of Science and Human Studies - Al Marj; (20): 1-20.
17. Alzerbi, A., & Alaib, M. .(2018). Study of vegetation in Al-Koof Valley region in Al-Jabal Al-Akhdar-Libya. The Fourth Scientific Conference on Environment and Sustainable Development in Arid and Semi-Arid Regions; 66-89.
18. Jamloki, A., Trivedi, V. L., Nautiyal, M. C., Semwal, P., & Cruz-Martins, N. (2022). Poisonous plants of the Indian Himalaya: an overview. Metabolites, 12(6), 540.
19. Benzeid H, Gouaz F, Touré A, Bouatia M, Idrissi M, Draoui M. (2018). Inventory of Toxic Plants in Morocco: An Overview of the Botanical, Biogeography, and Phytochemistry Studies. Journal of Toxicology. Volume 2018, Article ID 4563735.
20. Alzerbi, A. & Alaib, M. (2016). Study of vegetation in Sedy Boras region in Al-Jabal Al-Akhdar-Libya. Journal of Environmental Science and Engineering 1(1), 67–72.
21. Ahmad, S. (2012). A Study of Poisonous Plants of Islamabad Area, Pakistan: Poisonous Plants of Islamabad. Biological Sciences-PJSIR, 55(3), 129-137.