

Bioactivity of *Abrus precatorius* (L.) leaves

Marius Lébri ^{1,*}, Stéphanie Marianne Lagou Lébri ², N'guéssan Bra Yvette Fofié ³, Guédé Noël Zirihi ⁴, Calixte Bahi ⁵, Hafid Abderrafia ⁶ and Khouili Mostafa ⁶

¹ Laboratory of Microbiology and Biotechnology, Ecology Research Center, Nangui Abrogoua University, Côte d'Ivoire.

² UFR of Agroforestry, Jean Lorougnon Guédé University, Côte d'Ivoire

³ Laboratory of Pharmacognosy, Botany, and Cryptogamy, Faculty of Pharmaceutical and Biological Sciences, Félix Houphouët-Boigny University, Côte d'Ivoire.

⁴ Botany Laboratory, UFR Biosciences, Félix Houphouët-Boigny University, Côte d'Ivoire.

⁵ Health Biology Laboratory, UFR Biosciences, Félix Houphouët-Boigny University, Côte d'Ivoire.

⁶ Laboratory of Molecular Chemistry, Materials and Catalysis, Sultan Moulay Slimane University, Faculty of Science and Technology, Béni-Mellal, Morocco.

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Abstract

Abrus precatorius L. is a climbing plant of the Fabaceae family; its leaves are recognized in traditional medicine for treating various ailments and health conditions (fever, stomach disorders, asthma, bronchitis, childhood cough, and diabetes, as well as for facilitating childbirth). Several studies on the bioactivity of the leaves have been conducted, investigating toxicity, diabetes both *in vivo* in rats and *In vitro*, and cancer *In vitro* using cancer cell lines. This review article aims to present the results of studies on the bioactivity of *Abrus precatorius* leaf extracts.

Keywords: Bioactivity; *Abrus precatorius*; Toxicity; Diabetes; *In vitro* anticancer activity

1. Introduction

The plant *Abrus precatorius* (Fabaceae) is found in Africa, Madagascar, India, and Indochina [1]. The leaves of this plant are recognized in various countries for their numerous therapeutic properties. In India, these leaves are used to treat fever, stomach disorders, asthma, and bronchitis [2]. The sweet-tasting leaves are widely used in Madagascar and Senegal to treat coughs in children, owing to their antitussive effects [3]. In Nigeria, the leaves are used to treat diabetes [4]. In Côte d'Ivoire, *Abrus precatorius* leaves are used in the south of the country to facilitate childbirth [5]. Given the numerous therapeutic uses of the *Abrus precatorius* plant, several research teams have conducted studies on it regarding toxicity, diabetes, and *In vitro* effects on various cancer cells. Highly promising results have been obtained. This literature review aims to present the results of studies on the bioactivity of *A. precatorius* leaf extracts, specifically regarding *in vivo* toxicity studies, *in vivo* and *In vitro* diabetes studies, and *In vitro* cancer studies.

2. Study of bioactivity

2.1. *In vivo* toxicity study in rats: non-toxic effect

The study of the acute oral toxicity of the aqueous extract of *Abrus precatorius* leaves in rats consisted in observing the rats for 14 days after a single gavage at doses of 5 mg/kg, 50 mg/kg, 300 mg/kg, 2000 mg/kg, and 5000 mg/kg of body weight (bw) against a control, and to determine the LD₅₀ [6]. The results showed an LD₅₀ greater than 5000 mg/kg

* Corresponding author: Marius Lébri

body weight; no mortality or clinical signs of toxicity were observed in any of the animals. This study reveals that the aqueous extract of *Abrus precatorius* leaves is non-toxic when administered orally to rats. A subacute toxicity study was conducted over 21 days in rats (n=12). A group of six (6) animals was treated orally with two different doses (morning/evening) of aqueous extract (40 mg/mL) for 7 days, compared to a control group (n=6) receiving only distilled water. The rats were observed 14 days after the cessation of treatment, and certain biochemical parameters related to liver function (glutamic-pyruvic transaminase and glutamic-oxaloacetic transaminase) and kidney function (creatinine) were measured [7]. The results of subacute toxicity studies showed that the experimentally effective dose of aqueous extract did not cause significant changes in transaminases and creatinine levels in treated healthy rats, compared to the control group. Therefore, the aqueous extract of *Abrus precatorius* leaves does not cause any damage to the liver or kidneys [8]. Previous 21-day studies had shown that the aqueous extract had no effect on food intake or weight change in the treated rats [9]. All these results could confirm the safe use of the plant observed in humans during traditional medicine treatments.

2.2. Antidiabetic properties

Studies showed that the aqueous extract of *Abrus precatorius* leaves exhibits a potential antidiabetic effect *in vivo* in rats. This antidiabetic effect was investigated by assessing the extract's hypoglycemic activity in normal rats and in rats with orally induced hyperglycemia following the administration of 30% glucose [10]. The study results showed that the extract produced a dose-dependent reduction in orally induced hyperglycemia in normal rats after 6 hours. The effective experimental dose of 800 mg/kg body weight reduced induced hyperglycemia at 30-minute intervals over a period of two (2) hours.

Studies on diabetes shed light on the mechanisms by which the plant might exert its antidiabetic effect.

Thus, combined *In vitro* and *in vivo* studies showed that the ethanolic extract of *Abrus precatorius* leaves caused a decrease in blood glucose levels by increasing serum insulin levels. The decrease in blood glucose was also induced by a reduction in serum glucagon levels compared to the control group, that is rats rendered diabetic with alloxan. The same studies revealed a reduction in blood glucose levels through the dose-dependent inhibition of α -amylase and α -glucosidase [11]. Furthermore, it lowered blood glucose levels in a dose-dependent manner through the scavenging of DPPH radicals and nitric oxide (NO), and demonstrated enhanced ferric reducing antioxidant capacity (FRAC) compared to standards.

[12 - 13]. All these results could justify the alternative use of the plant in the treatment of diabetes.

2.3. *In vitro* anticancer effect

The *In vitro* anticancer effect of aqueous and ethanolic extracts of *A. precatorius* leaves was investigated by determining the cytotoxic effect of the extracts on the murine mastocytoma cell line P815 [12]. The cytotoxicity was sought by determining the percentage of lysis of cancer cells and the inhibitory concentration 50% (IC₅₀) by the MTT assay. A dose dependent cytotoxic effect of the extract was observed on the cancer cell line (P815). It was observed that the ethanolic extract has the best cytotoxic effect with an IC₅₀ of 43.94 μ g/mL different from aqueous extract which has a weak cytotoxic effect with an IC₅₀ of 200 μ g/mL against 2.5 μ g/mL for methotrexate. Our results suggest that *A. precatorius* leaves contain several chemical groups and possess a potential anticancer effect *In vitro* against P815 tumor cell lines. A study carried out on compounds identified from the acetatic extract of *Abrus precatorius* leaves proved that 1,4-dimethyl-4-pentenyl acetate could be used as an alternative in the management of breast cancer [13]. The leaves of *Abrus precatorius* L. could be of particular interest as an anticancer agent, as they contain various phytochemical compounds capable of inducing apoptosis in various types of cancer.

3. Conclusion

Studies on the bioactivity of *Abrus precatorius* leaves in relation to toxicity have demonstrated the plant's safe use for humans during treatments. Studies conducted on diabetes and cancer could validate its therapeutic effects on diabetes and its use as an anti-cancer agent.

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

- [1] Prenner G. Flower development in *Abrus precatorius* (Leguminosae: Papilionoideae: Abreae) and a review of androecial characters in Papilionoideae. South African Journal of Botany, 2013; 89: 210211.
- [2] Suralkar AA, Kasture SB.. Inhibitory effect of *Abrus precatorious* extract on bronchial hyper-reactivity induced by ovalbumin in experimental animals. Int.J. Pharm. Pharm. Sci. 2013; 5(1): 403-404.
- [3] Gairola S, Gupta V, Bansal P, Singh R, Maithani M. Herbal antitussives and expectorants. Int. J. Pharm. Sci. Rev.Res., 2010; 5(2): 5-6.
- [4] Ezuruike UF, Prieto JM. The use of plants in the traditional management of diabetes in Nigeria: Pharmacological and toxicological considerations. J. Ethnopharmacol. 2014; 155(2): 859-860.
- [5] N'guéssan K, Zirihi N, Boraud NKM.. Etude ethnopharmacologique des plantes utilisées pour faciliter l'accouchement, en pays Abbey et Krobou, au Sud de la Côte-d'Ivoire. Int. J. Biol. Chem. Sci., 2010; 4(4): 1009-1010.
- [6] Lébri M, Bahi C, Fofié, YBN, Gnahoué, G, Lagou, SM, Achibat, H, et a; Analyse phytochimique et évaluation de la toxicité aiguë par voie orale chez des rats de l'extrait total aqueux des feuilles de *Abrus precatorius* Linn (Fabaceae). International Journal of Biological and Chemical Sciences; 2015; 9(3):1470-1476.
- [7] Lébri M. and al.) Subacute toxicity assessment in rats of aqueous extract from *Abrus precatorius* Leaves (Fabaceae) a medicinal plant used in the treatment of diabetes. International Journal of Biology Sciences. 2023 ; 5(1):190-197
- [8] Lébri M. et al.Étude des effets *in vivo* de l'extrait aqueux des feuilles d'*Abrus precatorius* (Fabaceae), une plante à fort potentiel antidiabétique, sur la santé du foie, des reins et des glandes surrénales chez le rat. Journal of Applied Biosciences. 2025a ; 215: 22859 – 22866
- [9] Lébri M, et al. Évaluation de L'effet de l'extrait aqueux des Feuilles de *Abrus Precatorius* (Fabaceae) sur le Poids et la prise alimentaire chez des rats. European Scientific Journal/ Sciences naturelles/de la vie/médicales, 2020 ; 15(16):
- [10] Lébri M and al. Phytochemical screening and antidiabetic effect of aqueous extract of *Abrus precatorius* Linn (Fabaceae). Science et Technique, Sciences de la Santé. 2019. 42(2)
- [11] Boye A. and al. (2021). *Abrus precatorius* Leaf Extract Reverses Alloxan/Nicotinamide-Induced Diabetes Mellitus in Rats through Hormonal (Insulin, GLP-1, and Glucagon) and Enzymatic (α -Amylase/ α -Glucosidase) Modulation. BioMed Research International. 2021; 1-17.
- [12] Lébri M and al. Chromatographic Analysis and Cytotoxic Effect of Extracts of *Abrus precatorius* a Medicinal Plant with Strong Anticancer Potential. Der Pharma Chemica, 2021; 13(5): 1-6
- [13] Harishkumar B. and al. In silico analysis of bioactive compounds from leaves of *Abrus precatorius* (Rosary Pea) against breast cancer. Cureus .2024 ;16(8):e67808. doi: 10.7759/cureus.67808