Research, Society and Development, v. 13, n. 2, e2213244930, 2024
(CC BY 4.0) | ISSN 2525-3409 | DOI: http://dx.doi.org/10.33448/rsd-v13i2.44930

Scientometrics of the use of toxic medicinal plants as a treatment and health risk

Cientometria do uso plantas medicinais tóxica como tratamento e o risco à saúde

Cienciometría del uso de plantas medicinales tóxicas como tratamiento y riesgo sanitario

Received: 01/23/2024 | Revised: 02/02/2024 | Accepted: 02/05/2024 | Published: 02/07/2024

Dioelen Virgínia Borges Souza de Aquino Coelho
ORCID: https://orcid.org/0000-0001-5916-2993
State University of Mato Grosso do Sul, Brazil
E-mail: dioelen.coelho@uems.br
Bianca de Aquino Maciel
ORCID: https://orcid.org/0009-0004-9851-9739
State University of Mato Grosso do Sul, Brazil
E-mail: biamaciel25032005@gmail.com
Rhannielly Rodrigues Ribeiro
ORCID: https://orcid.org/0009-0008-9225-0969
State University of Mato Grosso do Sul, Brazil
E-mail: rrhanniellyy@gmail.com
Giovanna Carrara de Oliveira
ORCID: https://orcid.org/0009-0007-8209-3739
State University of Mato Grosso do Sul, Brazil
E-mail: 04576100181@academicos.uems.br
Eduarda Ribeiro Leite
ORCID: https://orcid.org/0009-0001-1442-1127
State University of Mato Grosso do Sul, Brazil
E-mail: 07459836184@academicos.uems.br

Abstract
Objective: Through a literature review, we sought to identify and discuss the main characteristics of the theme related to poisoning by medicinal plants in species that have hallucinogenic properties. Methods: A literature review was carried out using the following databases: Online Medical Literature Search and Analysis System (MEDLINE/PUBMED), Nursing Database - Brazilian Bibliography (BDENF), Web of Science and Cochrane Library (SCOPUS), CAPES Journals and Latin American and Caribbean Health Sciences Literature (LILACS). The search was carried out using descriptors diversely recombined with the aid of the Boolean operator "and". Results: It was found that plants classified as toxic are so named because they contain bioavailable substances capable of causing metabolic alterations. Cases of poisoning cause serious inconvenience and, in more serious cases, death. The epidemiology of plant poisoning in Brazil is a public health problem, with the vast majority of reported cases occurring as a result of the presence of these plants in public environments, caused mainly by the population's ignorance of the toxic potential of a plant species. Conclusion: The lack of encouragement to better understand Alternative and Complementary Practices is due to unreliable information about the correct use of these species. Based on scientific publications, products derived from medicinal plants are considered safe for human health, provided they are used appropriately.
Keywords: Medicinal plants; Poisoning; Toxic plants.

Resumo
Objetivo: Verificar através de revisão de literatura procurando levantar e discutir as principais características da temática relacionadas às intoxicações por plantas medicinais nas espécies que possuem propriedades alucinógenas. Métodos: Realizou-se uma revisão literária por meio dos bancos de dados: Sistema Online de Busca e Análise da Literatura Médica (MEDLINE/PUBMED), Base de Dados de Enfermagem - Bibliografia Brasileira (BDENF), Web of Science e Biblioteca Cochrane (SCOPUS), Periódicos CAPES e Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS). A pesquisa foi realizada a partir de descritores diversamente recombinados com o auxílio do operador booleano “and”. Resultados: Constatou-se que as plantas classificadas como tóxicas são assim denominadas por apresentarem substâncias biodisponíveis capazes de causar alterações metabólicas. Os casos de intoxicação apresentam sérios transtornos, em casos mais graves o óbito. Constituindo-se em um problema de saúde pública a epidemiologia das intoxicações por plantas no Brasil, em seus casos notificados, na grande maioria ocorrem em decorrência da presença destas plantas em ambientes públicos, causados principalmente por insipiência da população sobre o potencial tóxico de uma espécie vegetal. Conclusão: O parco fomento para se entender melhor Práticas Alternativas e Complementares, segue-se de informações não fidedignas sobre o uso correto dessas espécies. Dialogando no concerne das publicações científicas, produtos derivados de plantas medicinais são considerados seguros para a saúde humana, desde que sejam utilizados de forma apropriada.
Palavras-chave: Plantas medicinais; Intoxicações; Plantas tóxicas.

Resumen
Objetivo: A través de una revisión bibliográfica, se buscó identificar y discutir las principales características de la temática relacionada con la intoxicación por plantas medicinales en especies que poseen propiedades alucinógenas. Métodos: Se realizó una revisión bibliográfica utilizando las siguientes bases de datos: Sistema de Búsqueda y Análisis de Literatura Médica en Línea (MEDLINE/PUBMED), Base de Datos de Enfermería - Bibliografía Brasileña (BDENF), Web of Science y Biblioteca Cochrane (SCOPUS), Revistas CAPES y Literatura Latinoamericana y del Caribe en Ciencias de la Salud (LILACS). La búsqueda se realizó utilizando descriptores diversamente recombinados con el auxilio del operador booleano "and". Resultados: Se encontró que las plantas clasificadas como tóxicas se denominan así porque contienen sustancias biodisponibles capaces de causar alteraciones metabólicas. Los casos de intoxicación causan graves molestias y, en los casos más graves, la muerte. La epidemiología de las intoxicaciones por plantas en Brasil es un problema de salud pública, siendo que la gran mayoría de los casos reportados ocurre como consecuencia de la presencia de estas plantas en ambientes públicos, causada principalmente por el desconocimiento de la población sobre el potencial tóxico de una especie vegetal. Conclusiones: La falta de estímulo para conocer mejor las Prácticas Alternativas y Complementarias se debe a la falta de información fiable sobre el uso correcto de estas especies. Según las publicaciones científicas, los productos derivados de las plantas medicinales se consideran seguros para la salud humana, siempre que se utilicen adecuadamente.
Palabras clave: Plantas medicinales; Envenenamiento; Plantas tóxicas.

1. Introduction

The methods of using medicinal plants and their properties have been used for many years as one of the main medicinal practices in different regions of the world, varying according to the culture and religion adopted in the place, but they are the same in the aim of achieving successful treatment, prevention and even the cure of illnesses. The search for quality of life brings these ancient customs back to life when there is a search for resources from nature to be used as an alternative to today's medicines, with medicinal plants being the fundamental raw material for the creation of herbal medicines and drugs. They are also used on their own in teas, after maceration and cooking, acting therapeutically (Braga, et al, 2021).

Popularly, medicinal plants are used as a home remedy, without any kind of industrial process, and can be completely carried out by an individual at home. Studies indicate that more than 70% of the world's population uses some kind of medicinal plant to reduce pain and symptoms of illness. The use of these plants is a consequence of the easy access that the population has, both for local and financial reasons, and also because they are considered harmless in the eyes of the general population (Zeni, et al, 2017).

As described in RDC No. 26/2014, medicinal plants, due to their variable properties, are part of groups of plant species that have a rich potential that can be used for therapeutic purposes. However, medicines considered to be phytotherapic, medicines that come from plants but have undergone some kind of industrialization in their creation process, have a prophylactic purpose, coming from active plant raw materials, without the use of isolated substances. Depending on the number of plant species used in the composition of the remedy, it can be considered simple or compound (Brasil, 2014).

In a study carried out by Coelho et al. (2022), a list was presented, taken from the Ministry of Health's National Program for Medicinal and Herbal Plants, which lists 71 species of medicinal plants, eight of which appeared more frequently for their use in herbal treatments. The rest of the plants had a smaller number of citations, but their use and importance are not inferior to those of folk medicine. Plant species such as the popularly known lemon balm, sweet grass, barbatimão and whale grass, as well as others mentioned in the list, are also included in the National List of Medicinal Plants of Interest to the SUS (RENISUS). It is worth emphasizing how important research and studies on the plant species that make up this group are, as the Unified Health System (SUS) directly reflects the needs of the population (Coelho, et al, 2023).

When talking about intoxication, its concept refers to the clinical occurrences exposed by a living organism as a result of some kind of interaction it has had with a chemical compound that may be harmful. Every year in Brazil, many cases of poisoning, which can number in the thousands, are recorded. These cases have multiple origins that can be included in the investigation of how the individual suffered intoxication, which may be due to medication, pesticides used on crops, consumption

of contaminated food, improper use of cleaning products, use of medication to treat domestic animals, among others (Vasconcelos, et al, 2009; de Melo, et al, 2021).

In the field of medicinal plants, many of them can produce chemical substances that result in a variety of biological practices, including some popular therapeutic resources (Campos et al, 2016). Plants that are considered toxic for some reasons tend to have bioavailable substances that have the ability to alter an individual's metabolism, thus harming their well-being and causing damage, more seriously resulting in various disorders and even death. The severity of the case varies according to the quantity of substances, the type of substance that has been ingested and the manner in which this substance was ingested by the individual (Da Silva, et al, 2021).

Species are considered toxic when their compounds, specifically secondary metabolites, cause alterations that are seen as harmful in the metabolism of humans and animals. According to studies by de Medeiros Pereira Macieli, et al, (2018) and da Silva Teixeira, et al, (2020), the so-called bioactive compounds most commonly found in Toxic Plants (TP) are cardiotonic and cyanogenic glycosides, tannins, saponins, calcium oxalate, toxialbumins and especially alkaloids. The level of toxicity of a plant can often be related to a number of factors, such as the individual themselves, the environment around them, the way in which the plant was cultivated during its growth and environmental factors such as temperature and seasonality. Even if there are no immediate complications after ingesting a medicinal plant or herbal medicine, some complications may occur after a few minutes, the most frequent of which are signs of tachycardia, sweating, cyanosis, asthenia, hypotension and circulatory collapse (Campos, et al, 2016).

According to data from the National System of Toxicological and Pharmacological Information - SINITOX (Almeida, et al, 2020), it is clear that the data on the number of individuals who are victims of plant poisoning is, in a way, being left aside due to the "inactivity" of the bodies that are responsible for recording the rates of toxicological cases throughout the country, the so-called Toxicological Information and Assistance Centers (CIATs). Therefore, even though the most recent data on the subject shows a considerable drop in the number of cases, it is questionable, as it is data from the years 2016 and 2017 and cannot be used to represent the real situation in which the country finds itself (Pezzini, et al, 2020).

In view of the above, some questions were raised: "How can the improper use of hallucinogenic medicinal plants pose health risks?" and "Can treatment with these species be considered a form of treatment?" We delved into the species that have hallucinogenic properties, such as *Datura metel*, *Datura stramoniun*, *Cestrum nocturnum* (L.) and *Brugmansia suaveolens*.

2. Methodology

It was carried out by means of an integrative literature review, with a broad approach to bibliographic reviews, bringing together ideas and theoretical data from different studies to define concepts and evidence about the research problem (Souza et al., 2010). The research was carried out in the following databases: Online Medical Literature Search and Analysis System (MEDLINE/PUBMED), Nursing Database - Brazilian Bibliography (BDENF), Web of Science and Cochrane Library (SCOPUS), CAPES Periodicals and Latin American and Caribbean Health Sciences Literature (LILACS). Descriptors were used according to the list of Health Sciences Descriptors (DeCS): Medicinal plants, Toxic plants and Poisoning by medicinal plants. In order to answer the study's objective. This data was then cross-referenced using the Boolean "and". The search and selection of these articles was carried out between the months of September/2023 and January/2024. For the inclusion and exclusion criteria, an evaluation of the texts found was first carried out and studies with free access, available online, complete, in English/Portuguese/Spanish were selected for this study and those that did not fit the aforementioned descriptions were excluded.

3. Results and Discussion

The use of phytotherapy has gradually been incorporated into public health services, Coelho et al. (2023) states that

even with the growing search for integrative medicine practices, studies on phytotherapy are precarious in Brazil. This makes further development in this area necessary in order to enrich and aid knowledge on the subject and make the implementation of medicinal plants safer and more effective.

The search for articles resulted in 89 articles, of which 26 were excluded because they did not fit the criteria, 64 were selected by reading the title, then the abstract and, finally, 35 were selected and read in full and included in this review. Of these articles, 15 make up a campus sample, as shown in Table 1.

Table 1 - Description of the studies found on toxic and hallucinogenic plants, highlighting the objectives and chemical considerations and bioactivities.

AUTHOR/YEAR	TITLE OF ARTICLE	ARTICLE'S OBJECTIVE	KEY FINDINGS OF THE TEXT
Fakai, et al, 2016.	Physico-Chemical Analysis and antifungal activity of *Datura metel* Seed Oil	Its main purpose is to tell methods of how the oil from *Datura metel* can be evaluated and used.	The results show that *Datura metel* seed oil has antifungal actions against the microorganisms studied in the article in question
Monira, et al. 2012.	Review on *Datura metel*: a Potential Medicinal Plant	A general review of the *Datura metel* plant, including all its biological, physical and chemical information.	The whole plant can be used for medicinal purposes, especially the leaves and seeds, which have anaesthetic, hallucinogenic, anti-asthmatic, anti-spasmodic, narcotic, bronchodilator, hypnotic and other effects.
Rashed, K. N. Z., 2013	Investigation of antioxidant acivity from *Cestrum nocturnum* L. stems and phytochemical content	"To evaluate the antioxidant activity of extracts of *Cestrum nocturnum* and also investigate the chemical content of the plant extracts."	The results found in the research could help discover new chemical classes of natural antioxidant substances that could serve as selective agents for infectious diseases
Pundir, S., et al, 2022	A comprehensive review on angel's trumpet (*Brugmansia suaveolens*)	To review *Brugmansia. suaveolens* on its traditional uses and various scientific factors, such as phytochemicals, botany, pharmacology and toxic effects.	*Brugmansia suaveolens* can be used in the treatment of various diseases and health complications, however, depending on its handling, it has a toxic effect that inhibits the production of acetylcholine in the body, resulting in numerous side effects..
Kumar, S., et al, 2020	Immunomodulatio-mediated anticâncer activity of a novel compound from *Brugmansia suaveolens* leaves	To study the immunomodulatory mediated anticancer activity of *B. suaveolens*, based on the idea that *Solanaceae* have anticancer activities.	The compound used for the study, isolated from the ethanolic extract of defatted *B. suaveolens* leaves, showed immunomodulation mediated anticancer activity.
Mai, N. T. 2019	Investigation on Chemical Constituents of the *Brugmansia suaveolens* Flowers	Investigating the chemical constituents of *Brugmansia suaveolens*.	In addition to the presence of the alkaloid scopolamine, the presence of four other alkaloids extracted from the flowers of *Brugmansia suaveolens* was found.
Petrecevich, V. L., et al, 2020	Chemical Compounds, Pharmacological and Toxicological Activity of *Brugmansia suaveolens:* A Review	It investigates the information updated on different search engines about the phytochemical, pharmacological and toxicological distribution of *Brugmansia suaveolens*, seeking to find new therapeutic potentials and open up new lines of research.	The toxicity concentration of *Brugmansia suaveolens* can vary according to the way this plant has lived, and changes in climate and weather are factors that influence these changes.
Nagar, H. K., 2016	Pharmacological Investigation of the Wound Healing Activity of *Cestrum nocturnum* (L.) Ointment in Wistar Albino Rats	To investigate the healing effect of the ethanolic extract of *Cestrum nocturnum* (L.) leaves using an excision and incision wound model.	Depending on the concentration, the ethanolic extract of *Cestrum nocturnum* has a wound healing effect.
Maharjan, R., Srivastava, P. K., Dogra, A., Mainali, M. K. & Mysore, P. N., 2019.	Medicinal Uses of Raat ki Rani (*Cestrum nocturnum* L.): An Anukta Dravya	Introduce *Cestrum nocturnum*, citing how it is used in different perspectives.	Studies show that the *Cestrum nocturnum* plant has antibacterial, antifungal, antidiabetic and analgesic potential.
Keshari, A. K., Srivastava, R., Singh, P., Yadav, V. B. & Nath, G., 2017.	Antioxidant and Antibacterial activity of Silver Nanoparticles Synthesized by *Cestrum nocturnum*	Synthesize silver nanoparticles using an aqueous extract of *Cestrum nocturnum* leaves and test their antioxidant and antibacterial activities	Silver nanoparticles are not toxic to eukaryotic cells, but they are highly toxic to prokaryotic cells such as bacteria, viruses and fungi

Devi, M. R., Bawari, M., Paul, S. B. & Sharma G. D., 2011.	Neurotoxic and Medicinal Properties of *Datura stramonium* L. – Review	Demonstrate that all parts of *Datura stramonium* are toxic, but that it can be used to cure and treat various diseases.	It has anti-inflammatory properties throughout the plant, stimulates the central nervous system, is a respiratory decongestant, used to treat skin and dental infections and alopecia.
Sayyed, A. & Shah, M., 2014.	Phytochemistry, pharmacological and traditional uses of *Datura stramonium* L. review	Do a review of *Datura stramonium*, looking at phytochemical and pharmacological factors and how it is used traditionally.	The alkaloids found in *Datura stramonium* can be used to treat various diseases. Atropine, for example, can be used to treat Parkinson's, peptic ulcers, diarrhea and bronchial asthma.
De Sousa Martins, E., Ono, B. H. V. S., Monteiro, B. M. M., Menezes Neto, J. B. & Souza, J. C., 2021.	Consumption of *Brugmansia suaveolens* (angel's trumpet) and psychic disturbance.	Analyze and discuss the consumption of *Brugmansia suaveolens* and its potential for psychic disorders, used in ritualistic, healing, recreational practices, etc.	*Brugmansia suaveolens* has antinociceptive, negative and muscle relaxant properties and the toxicity of its consumption is dose-dependent, with high risks due to its hallucinogenic potential.
Al-Snafi, A. E., 2017.	Medical Importance of *Datura fatuosa* (syn: *Datura metel*) and *Datura stramonium* – A review	Discuss the chemical constituents and pharmacological effects of *Datura fastuosa* (syn: *Datura metel*) and *Datura stramonium* for their use in various treatments.	Various parts of *Datura stramonium* can be used for different disease treatments, even though they contain alkaloids, which appear at different levels depending on the age of the plant.
Parker, A. G., 2006.	The popular use of *Brugmansia suaveolens* (g.don.) *Solanaceae* plants for therapeutic purposes. Experimental investigation into the mechanism of action of antinociceptive activity.	It provides a natural source of important chemical compounds for obtaining new drugs.	Most of the plant can be used to treat a number of diseases and also has analgesic potential.

Source: Authors (2023).

Medicinal plants have various chemical characteristics in their bodies that are mainly used to obtain herbal medicines. When they come into contact with an individual's body, if administered improperly or incorrectly, these plant chemicals may or may not result in side effects, both internal and external. These reactions can be positive or negative, while they can also interact with other medicines previously consumed by the individual, most of the time resulting in the opposite effects to those expected, such interactions combined with intoxications, are the main risks of their improper use (Teixeira and Santos, 2011; Teixeira, et al, 2012).

When you decide to use medicinal plants for therapeutic purposes, you need to be aware that external and natural factors can alter the chemical composition and the effects that a particular plant can have on an individual's body. These factors, such as temperature, seasonality and the way in which the plant was grown, have the ability to alter how much the plant can help and how it can be used, which can result in risky and ineffective therapy (Silveira et al., 2008; Coelho et al, 2023).

Due to the improper use of Medicinal Plants (MP), abortifacients and hallucinogenic plants, adults end up being the age group most affected by their complications, specifically between 20 and 34 years of age. Some examples of toxic plants that appear most often in cases of poisoning in adults are *Brugmansia suaveolens*, popularly known as white skirt or trumpet, and *Luffa operculata*, known as bush, known for its abortive effect on pregnant women (Santos, et al., 2019; Abreu Silva, et al., 2018; Santos, et al, 2022).

Several factors are taken into account when developing a herbal medicine, such as how effective the plant is, the number of risks it can present, the validity of its quality and its accessibility both in terms of location and financial cost. In addition, studies and analyses of the components coming from the plant that will be used are also necessary, in order to prevent possible complications from being caused to the body (Bonil & Bueno, 2017). Coelho et al. (2022) points out that most of the plants indicated can be used without a doctor's prescription. But we must emphasize that using them incorrectly can lead to serious problems, because as the popular saying goes, "the difference between medicine and poison is in the dose".

4. Conclusion

Based on an analysis of the literature, it is understood that products derived from medicinal plants are considered safe for human health, as long as they have a certain efficacy in proven treatments and cannot be misused. Even though some plants are toxic, they can be easily found in public places in various regions of Brazil.

Authors say that the right thing to do would be to promote actions that make the local population aware of the plants they have access to and the risks they can pose. One of the solutions considered would be educational activities that are easy for the general population to understand, in order to warn them about the risks of playing with these plants.

It is possible to conclude that inadequate guidance from health professionals on the consumption of medicinal plants as a form of treatment can result in the population misusing these plants, causing poisoning and other often unknown complications. It is clear that there is still a need for research into the use of these toxic and hallucinogenic plants, so that they can be used as herbal medicines without causing complications and adversities in the bodies of those who consume them.

Acknowledgments

State University of Mato Grosso do Sul and Federal University of Grande Dourados.

References

Abreu da Silva, A. C., & Botelho de Santana, L. L. (2018). Os riscos do uso de plantas medicinais durante o período gestacional: uma revisão bibliográfica. *Acta toxicológica argentina*, 26(3), 118-123.

Almeida, A. B. M., Uchoa, G. F., Carvalho, A. M. R., Vasconcelos, L. F., Medeiros, D. S., & Cavalcante, M. G. (2020). Epidemiologia das intoxicações medicamentosas registradas no Sistema Nacional de Informações Tóxico-Farmacológicas de 2012-2016. *Saude e pesqui.* 431-440.

Al-Snafi, A. E. (2017). Medical importance of Datura fastuosa (syn: Datura metel) and Datura stramonium-A review. *IOSR Journal of Pharmacy*, 7(2), 43-58.

Bonil, L. N., & Bueno, S. M. (2017). Plantas Medicinais: Benefícios e Malefícios. *Rev Científica UNILAGO* [Internet], 1, 12.

Braga, J. C. B., & da Silva, L. R. (2021). Consumo de plantas medicinais e fitoterápicos no Brasil: perfil de consumidores e sua relação com a pandemia de COVID-19. *Brazilian Journal of Health Review*, 4(1).

Brasil, & Agência Nacional de Vigilância Sanitária (ANVISA). (2014). RDC n. 26, de 13 de maio de 2014. Dispõe sobre o registro de medicamentos fitoterápicos eo registro ea notificação de produtos tradicionais fitoterápicos. Diário Oficial da União, 52-52.

Campos, S. C., Silva, C. G., Campana, P. R. V., & Almeida, V. L. (2016). Toxicidade de espécies vegetais. *Revista Brasileira de plantas medicinais*, 18, 373-382.

Coelho, D. V. B. S. A., Mueller, L. P., de Aquino, J. C. G., de Sousa Maia, A. M., Freitas, V. G., Bachega, T. G., & Oesterreich, S. A. (2022). Saúde pública e o uso de plantas medicinais como práticas integrativas. *Research, Society and Development*, *11*(14), e438111436432-e438111436432.

Coelho, D. V. B. S. A, do Carmo Vieira, M., Heredia-Zárate, N. A., de Oliveira Carnevali, T., Cardoso, C. A. L., & de Souza Carnevali, N. H. (2023). Organic residues influences the production and antioxidant activity of Campomanesia adamantium (Cambess.) O. Berg. 1. Revista Ceres, 70(3), 64-71.

da Silva Miranda, C. C., da Silva, É. M. T., Brito, A. O., Alves, M. H. P., Da Silva, M. S., de Araújo Sousa, L. L., & Lopes, E. L. (2021). Perfil epidemiológico das intoxicações por plantas notificadas no Brasil no período de 2010 a 2020. *Revista de Casos e Consultoria*, 12(1), e25929-e25929.

da Silva Teixeira, J. P., Macedo, A. P. V., da Silva Cândido, G., Magalhães, J. K. A., da Silva, M. W., Nunes, H. M. L., & da Silva, G. C. (2020). Perfil epidemiológico dos casos de intoxicação por plantas medicinais no Brasil de 2012 a 2016. *Brazilian Journal of Development*, 6(10), 82199-82209.

de Melo, D. B., de Macedo, L. M., de Almeida, I. O., Pereira, T. D. R. S., da Silva, T. M., Leal, M. M. T., ... & de Santana, L. L. B. (2021). Intoxicação por plantas no Brasil: uma abordagem cienciométrica. *Brazilian Journal of Development*, 7(4), 40919-40937.

de Medeiros Pereira Macieli, J. M., Carlos de Brito, R., Rodrigues de Sousa Júnior, E., & Bitu Pinto, N. (2018). Análise retrospectiva das intoxicações por plantas no brasil no período de 2000-2015. *RevInter*, 11(3).

de Sousa Martins, E., Ono, B. H. V. S., Monteiro, B. M. M., de Menezes Neto, J. B., & Souza, J. C. (2021). Consumo de Brugmansia suaveolens (Trombeta de Anjo) e perturbação psíquica. *Research, Society and Development*, 10(1), e11610111366-e11610111366.

Devi, M. R., Bawari, M., Paul, S. B., & Sharma, G. D. (2011). Neurotoxic and medicinal properties of Datura stramonium L.–review. *Assam University Journal of Science and Technology*, 7(1), 139-144.

Fakai, I. M., Bagudo, A. I., Aminu, H., & Isaac, M. (2016). Physico-chemical analysis and antifungal activity of Datura metel seed oil. *Int. J. Pharm. Biosci*, 3, 61-68.

Keshari, A. K., Srivastava, R., Singh, P., Yadav, V. B., & Nath, G. (2017). Antioxidant and antibacterial activity of silver nanoparticles synthesized by Cestrum nocturnum. *J Ayurveda Integr Med*. 10.1016

Kumar, S., Gupta, A., Saini, R. V., Kumar, A., Dhar, K. L., & Mahindroo, N. (2020). Immunomodulation-mediated anticancer activity of a novel compound from Brugmansia suaveolens leaves. *Bioorganic & Medicinal Chemistry*, 28(12), 115552.

Maharjan, R., Srivastava, P. K., Dogra, A., Mainali, M. K., & Mysore, P. N. (2019). Medicinal Uses of Raat ki Rani (Cestrum Nocturnum L.): An Anukta Dravya. *Indian Journal of Ancient Medicine and Yoga*, 12(1).

Mai, N. T. (2019). Investigation on chemical constituents of the Brugmansia suaveolens flowers. *J. Multidiscip. Eng. Sci. Technol*, 6, 10021-10024.

Monira, K. M., & Munan, S. M. (2012). Review on Datura metel: A potential medicinal plant. *Global Journal of Research on Medicinal Plants & Indigenous Medicine*, 1(4), 123.

Nagar, H. K., Srivastava, A. K., Srivastava, R., Kurmi, M. L., Chandel, H. S., & Ranawat, M. S. (2016). Pharmacological investigation of the wound healing activity of Cestrum nocturnum (L.) ointment in Wistar albino rats. Journal of Pharmaceutics, 2016.

Parker, A. G. (2006). The popular use of the flowers of Brugmansia suaveolens (G. DON.), solanaceous, for therapeutic purposes. *Experimental investigation of the mechanism of action of antinociceptive activity* (Master's thesis).

Petricevich, V. L., Salinas-Sánchez, D. O., Avilés-Montes, D., Sotelo-Leyva, C., & Abarca-Vargas, R. (2020). Chemical compounds, pharmacological and toxicological activity of Brugmansia suaveolens: a review. *Plants*, 9(9), 1161.

Pezzini, T. R., Fernandes, P. S., Magalhães, L. R., Zaccariotto, D. B., Verone, B. A., & Merlini, A. B. (2020). Epidemiologia da intoxicação por carbamato no Brasil no período de 2010 a 2020.

Pundir, S., Shukla, M. K., Singh, A., Chauhan, R., Lal, U. R., Ali, A., & Kumar, D. (2022). A comprehensive review on angel's trumpet (Brugmansia suaveolens). *South African Journal of Botany*, 151, 266-274.

Rashed, K. N. Z. (2013). Investigation of antioxidant activity from Cestrum nocturnum L. stems and phytochemical content.

Santos, E. M., Gomes, K. M., Maior, L. P. S., Trajano, L. Q. C., Fonseca, S. A., Rocha, T. J. M., & dos Santos, A. F. (2019). Perfil dos casos de intoxicação por plantas em humanos no estado de Alagoas. *Diversitas Journal*, 4(1), 292-305.

Santos, J. R., da Silva, F. D. V., Santana, H. T. M., & Neulls, T. F. (2022). Plantas medicinais utilizadas para tratamento da sinusite no Brasil: uma revisão de literatura. *Scientia Generalis*, 3(1), 144-159.

Sayyed, A. (2014). Phytochemistry, pharmacological and traditional uses of Datura stramonium L. review. *Journal of Pharmacognosy and Phytochemistry*, 2(5), 123-125.

Silveira, P. F. D., Bandeira, M. A. M., & Arrais, P. S. D. (2008). Farmacovigilância e reações adversas às plantas medicinais e fitoterápicos: uma realidade. Revista Brasileira de Farmacognosia, 18, 618-626.

Souza, M. T. D., Silva, M. D. D., & Carvalho, R. D. (2010). Integrative review: what is it? How to do it? *Einstein*, 8, 102-106.

Teixeira, E. H., Arruda, F. V. S., do Nascimento, K. S., Carneiro, V. A., Nagano, C. S., da Silva, B. R., & Cavada, B. S. (2012). Biological applications of plants and algae lectins: An overview. IntechOpen.

Teixeira, J. B. P., dos Santos, J. V., & UFJF, T. (2011). *Fitoterápicos e interações medicamentosas.*

Vasconcelos, J., Vieira, J. D. P., & Vieira, E. D. P. (2009). Plantas tóxicas: conhecer para prevenir. *Revista Científica da UFPA*, 7(1), 1-10.

Zeni, A. L. B., Parisotto, A. V., Mattos, G., & Helena, E. T. D. S. (2017). Utilização de plantas medicinais como remédio caseiro na Atenção Primária em Blumenau, Santa Catarina, Brasil. *Ciência & Saúde Coletiva*, 22, 2703-2712.