

Dracaena sanderiana: Beyond aesthetics: A review of its medicinal and cultural significance

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Abstract

This review explores into the cultivation and medicinal properties of *Dracaena sanderiana*, commonly known as Lucky Bamboo. As a versatile plant, it thrives in diverse environments, making it a popular choice for indoor gardening due to its ability to purify air by removing harmful substances like benzene. Cultivation practices emphasize its adaptability, requiring minimal sunlight and water, making it an easy-to-care-for plant. Medicinally, *Dracaena sanderiana* is recognized for its rich phytochemical composition, including tannins, saponins, and cardiac glycosides, which contribute to its therapeutic effects. Studies have shown that the plant exhibits antioxidant properties, which help combat oxidative stress, and has potential anti-inflammatory and antipyretic effects. Extracts from the plant have been explored for their ability to reduce fever and inflammation, highlighting its relevance in traditional medicine. The extracts of this plant have been used in commercial cosmetic products as emollients and skin conditioners, further showcasing its diverse applications. Despite these benefits, there is still a need for more in-depth research to fully understand the scope of its medicinal potential and to optimize cultivation practices for maximum yield of bioactive compounds. This review aims to provide a comprehensive overview of *Dracaena sanderiana* including cultivation techniques and its promising role in modern and traditional medicine.

Keywords: *Dracaena sanderiana*; Lucky Bamboo; Anti-ulcer activity; Emollient; Anti-inflammatory activity; Anti-oxidant activity

1. Introduction

Dracaena Sanderiana, commonly known as the lucky bamboo, is a popular indoor ornamental plant renowned for its ability to enhance indoor environments. Belonging to the *Asparagaceae* (previously *Liliaceae*) family, this plant rarely flowers and is appreciated for its elegant appearance. Despite the frequent use of "bamboo" in its common names, such as Sander's dracaena, ribbon dracaena, ribbon plant, curly bamboo, Chinese water bamboo, Goddess of Mercy's plant, and Belgian evergreen, it is taxonomically distinct from true bamboos. As a xerophyte within the monocot clade, *Dracaena Sanderiana* thrives in dry conditions and adds a touch of greenery to indoor spaces ^[1-4].

Interestingly, despite its common names suggesting origins in China or Belgium, *Dracaena Sanderiana* is actually native to Central and West tropical Africa, specifically from Cameroon to the Central African Republic, and south to Angola and the Democratic Republic of the Congo. This species was named in honor of Henry Frederick Conrad Sander (1847–1920), a renowned German-English gardener. It is often mistaken for *Dracaena braunii*, a related species from coastal

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West Africa. However, *Dracaena braunii* can be distinguished by its much smaller flowers, which are five times smaller than those of *Dracaena Sanderiana* [5-7].

As a succulent plant adapted to dry environments, *Dracaena Sanderiana* is celebrated for its low maintenance, ability to thrive in low light, unique resilience to arid conditions, aesthetic appeal, and reputed air-purifying qualities [8]. These attributes make it a popular choice for indoor decoration in both homes and offices. *Dracaena Sanderiana* is believed to effectively cleanse the air and promote a healthy environment by removing harmful chemicals and pollutants [9]. Research from the University of Atma Jaya Yogyakarta in Indonesia indicates that lucky bamboo can reduce CO₂ levels, thereby improving air quality and increasing oxygen levels [10]. Its distinctive appearance adds a sense of tranquility and serenity to any space [11].

The lucky bamboo plant boasts a rich 4,000-year history in Chinese culture, symbolizing good fortune and used in New Year celebrations and religious festivals. Recently, it has gained popularity in Western homes and workplaces [12]. Revered in Vaastu Shastra and Feng Shui, it is considered auspicious and believed to bring luck, fortune, and wealth to its surroundings. This charming, low-maintenance houseplant offers numerous benefits, making it a favorite worldwide [13]. In Feng Shui, lucky bamboo is thought to bring prosperity, positive energy, and good luck to the environment. It is often strategically placed to enhance the flow of chi, promoting harmony and balance. Known as 'Fu Gui Zhu' in Chinese, which translates to "rich, noble, and bamboo," it is also regarded as a symbol of endurance and longevity. The number of stalks can represent different kinds of luck, and the stems can be arranged in various shapes, such as twining stalks or spirals, to create specific Feng Shui elements [14-17].

Beyond its ornamental and Feng Shui uses, *Dracaena Sanderiana* has several practical applications. It is frequently employed in aqua scaping, the art of arranging plants and other elements in aquariums [18]. Lucky bamboo can thrive in submerged conditions and is renowned for its ability to absorb excess nutrients, thereby improving water quality. It enhances the underwater landscape's beauty and creates a natural habitat for fish and other aquatic creatures [19].

Dracaena Sanderiana also serves as a food source for certain animals. This nutritious plant is consumed by herbivorous reptiles, such as tortoises and iguanas. The leaves of lucky bamboo are high in fibre and provide essential vitamins and minerals, making it a valuable addition to their diet for ensuring overall health and well-being [20].

Additionally, lucky bamboo can significantly reduce stress and tension. Studies have shown that houseplants increase pleasure and alleviate stress. Therapists often incorporate plants into therapeutic horticulture to aid patients. Interacting with lucky bamboo can provide a sense of accomplishment and foster a positive outlook, enhancing overall health and happiness [21].

2. Growth and nutritional factors

Dracaena Sanderiana is commonly cultivated as a houseplant in non-tropical regions. To grow lucky bamboo successfully, it is important to provide the right conditions. Lucky Bamboo (*Dracaena sanderiana*) can be propagated primarily through stem cuttings.

The optimal temperature range for *Dracaena Sanderiana* is between 15 to 22°C (59 to 72°F). These plants are adaptable to average indoor humidity levels and do not require additional humidity. They thrive with moderate warmth, good illumination, and regular watering with intermittent dry periods. Preferring bright, well-ventilated areas, this robust plant tolerates dry air and does not require constant misting [22-25].

Lucky bamboo is often grown in vases or containers filled with water and pebbles, providing support and stability for the stems. Use filtered water or let tap water sit overnight to remove chlorine and other chemicals. Change the water every two to four weeks to prevent bacterial buildup. It thrives in partial shade outdoors or bright, indirect light indoors. Direct sunlight can cause the leaves to yellow and burn. When grown in water, it is advisable to change the water weekly and rinse the roots to remove any debris or algae that may have accumulated [26].

When planted in the ground, *Dracaena Sanderiana* loses its bamboo-like appearance and develops a more typical leaf-like shape, resembling other dragon trees. For optimal growth, use well-draining potting soil specifically formulated for indoor plants, avoiding heavy clay soils that can trap excess moisture and cause root rot. Adding pebbles to the bottom of the container provides support and stability for the stems and aids in root growth. This resilient plant is remarkably difficult to destroy, endearing it to plant enthusiasts everywhere [27].

Yellowing leaves may indicate overwatering or underwatering, while brown tips suggest insufficient humidity [28]. Monthly application of a balanced liquid houseplant fertilizer during the growing season (spring and summer) will provide the necessary nutrients for healthy growth and vibrant green foliage [29]. To maintain its shape and appearance, trim the tops of the stalks with clean, sharp scissors or pruning shears just above a node to promote branching and new growth [30].

Dracaena Sanderiana is generally resistant to pests but can occasionally be affected by mealybugs or spider mites. Regularly inspect your plants for signs of infestation and treat them with insecticidal soap or neem oil if necessary [31].

3. Botanical Description

3.1. *Dracaena sanderiana*

It is a slender evergreen one of a group of small perennial shrubby plant, branched at the base with slender erect stems and flexible strap-shaped leaves that can reach a height of 100 -150 cm (39 inches). It features thick, slightly twisted, bright green or grey-green leaves that are spaced widely along its upright stem, contributing to an open and airy appearance [32]. The leaves can grow up to 23 cm (9 inches) long and 1.5-4 cm broad at the base. The plant is harvested from the wild, grow in rainforests as an upright shrub that can be up to 1.5 m tall. The plant's fleshy stem sets it apart from bamboo. This species rarely flowers when cultivated indoors. Propagation is typically achieved by cutting a section of the stem just above a node. This can be done throughout the year [33].



Figure 1 Whole plant of *Dracaena sanderiana*

3.2. Scientific classification

Kingdom	Plantae
Phylum	Streptophyta
Class	Equisetopsida
Subclass	Magnoliidae
Order	Asparagales
Family	Asparagaceae
Subfamily	Nolinoideae
Genus	<i>Dracaena</i>
Species	<i>D. sanderiana</i>

3.3. Binomial name: *Dracaena sanderiana* Mast.

3.4. Synonyms:

Pleomele sanderiana (Mast) N.E.Br.

Dracaena poggei Engl.

Dracaena vanderystii De Wild

Pleomele poggei (Engl.) N.E. Br

3.5. Phytochemistry

Dracaena sanderiana leaves showed the presence of flavonoid, Phenol, steroid, saponin, terpenoids and showed the absence of alkaloid, tannins. GC-MS of the leaf extract revealed the presence of glycerol, 2,3-dihydro-3,5-dihydroxy-6-methyl-(4H)-pyran-4-one, n-dodecanoic acid, tetradecanoic acid, (n-) hexadecanoic acid, and n-octadecanoic acid [34].

3.6. Ethnomedical uses of *Dracaena sanderiana*

In addition to its decorative, feng shui, aqua scaping, and animal feeding uses, *Dracaena Sanderiana* also has medicinal applications even if that is not much explored.

- **Diarrhoea and ulcer:** Known locally as the hanjuang plant, *Dracaena sanderiana* is commonly used in Cihanjuang Village of Indonesia to treat ulcers and diarrhoea. The leaves are boiled in clean water, and the resulting decoction is consumed [35].
- **Emollient and skin conditioner:** Extracts of the leaves as well as stems of *Dracaena sanderiana* are used as an ingredient in commercial cosmetic products as an emollient and skin conditioner [36].
- **Removal of benzene from the atmosphere:** When grown as a house plant, this species has been shown to remove significant quantities of benzenes from the atmosphere [36].
- **Antioxidant and hydrating properties:** *Dracaena sanderiana* stem and leaf extract are recognized for their potent antioxidant and hydrating properties. These extracts play a crucial role in protecting the skin from environmental stressors, enhancing moisture retention, and supporting the integrity of the skin barrier, thereby promoting overall skin health [37].
- **Nutritional value:** Lucky bamboo has nutritional value. It has rich amounts of amino acids, fibre, magnesium, phosphorus, iron and other nutrients. It is rich in silica, which helps in fighting digestion problems, helps in purifying blood stream and helps in maintaining cholesterol levels [37].
- **Anti-inflammatory property:** the plant itself was found to have a property of reducing the production of enzymes that cause inflammation due to the presence of flavonoids, phenolic acids, and terpenoids [37].
- **Edible:** Its shoots are edible and can be consumed. It is an ingredient in Chinese cuisine [37].

4. Pharmacological profile

Mei Gee Ong *et al.*, (2016) evaluated the Pharmacognostical and antioxidant properties of *Dracaena sanderiana* leaves using the 2,2-diphenyl-1-picrylhydrazyl (DPPH) assay. The total phenolic and flavonoid contents were measured. The classes of secondary metabolites were evaluated through pharmacognostic studies, and active compounds were identified by gas chromatography mass-spectrometry (GC-MS). All ethanol-water extracts and *Dracaena sanderiana* leaf powder were positive for tannins, saponins, terpenoids, cardiac glycosides, and quinones. Flavonoids were present in 100%, 80%, 60%, and 40% ethanol extracts (E100, E80, E60, and E40). E100 showed the highest total flavonoid content, whereas E60 extract showed the highest antioxidant activity and total phenolic content [34].

Pavani C H *et al.*, (2020) studied the antipyretic activity of *Dracaena sanderiana* indoor and outdoor by using Brewer's yeast method. The yield percentage of outdoor is 8.56% (DMI) and fruit percentage was 5.96% (DMO). These two doses are used to check the antipyretic effect. It leads to hyperpyrexia for 12 hours after the yeast was taken and continue until for 3 hours before starting the trail and later increase an average of 3-5 degrees. When saline was given to the normal group, it doesn't show reduced temperature until 4 hours; it should be left elevated. When extract and standard drug paracetamol was taken, it shows lowered temperature after 3 hours in the rectum. When the extract was taken after 1 hour, the change in temperature is not significant. Rats show extract delays in the gastric medium. Hence, paracetamol was a powdered tablet, taken after 1hr show the analgesic and antipyretic effect. Indoor shows higher activity than outdoor in plant parts. Proportional dose effect has both the extracts, one is when extract high dose was

increased in action was identified and other is when fruit compared with outdoor, it shows increased activity and is noted. When compared with a normal vehicle, this isn't different. Later, outdoor shows relative chemical constituents which are having an antipyretic effect. The *Dracaena* shows same activity with the paracetamol drug. Plants perform better activity whereas fruit shows significant anti-pyretic effect [38].

The *in vitro* attenuation of coagulation by *Dracaena sanderiana* was evaluated. Prothrombin time assesses coagulation factors in extrinsic pathway (factors VII) and common pathway (factors X, V prothrombin and fibrinogen), thus with the help of UNIPLASTIN reagent a protocol has been prepared to evaluate the anticoagulant activity of *Dracaena sanderiana*. It was observed that *Dracaena sanderiana* at different concentrations significantly prolonged the clotting time in a concentration dependent manner against the standard EDTA. Thus, it can be concluded that the ethanolic extract of *Dracaena sanderiana* possesses pharmacologically active anticoagulant component which might be helpful to for blood coagulation disorders [39].

5. Other relevant studies

Silas Yat Yau *et al.*, (2023) studied about the nitrogen-fixing endophytes in *Dracaena sanderiana*. According to this study, the root samples of the plant was surface-sterilized by the use of sodium hypochlorite before the process of maceration. This helped in the release of endophytic bacteria. The extracts prepared were spread on nitrogen-free M710 agar and any resultant colonies purified by passing on Luria agar before DNA extraction and sequencing. There are three isolates selected in this way and had proved to have the types of Nif operon, as well as some key genes known to be linked to the endophytic life cycle. This research had relevance in enhancing the yields and reducing the dependency on chemical fertilizers in the field of agriculture [40].

Ho Bich Lien *et al.*, (2023) aimed to find out the ability of *Dracaena sanderiana* to remove lead which can reduce the environmental pollution. It was done in four hydroponic systems and in three replicates. The results showed that the growth was more with lesser concentration of lead and the growth decreases with the increase in lead concentration. *Dracaena sanderiana* exhibited high lead treatment efficiency within the water. It also provides us with the information that the lead accumulation was more within the roots of *Dracaena sanderiana* than in the stem and leaf [41].

Chairat Treesubstorn, Paitip Thiravetyan *et al.*, (2012) carried out a study on screening of 8 ornamental plants from which it was found that *Dracaena sanderiana* had the highest ability to remove benzene from the air. It was a long-term study that contained both 24 hr. dark and 24 hr. light conditions. Benzene uptake by the plants under 24hr light condition was seen to have more intensity than 24 hr. dark condition in the 2nd to 4th cycle. The close of *Dracaena sanderiana* stomata was only found in 24 hr. dark condition. During the final cycle, the plant remained the same and the benzene uptake continued [42].

Junaid Aslam, Abdul Mujib, Maheshwar Prasad Sharma *et al.*, (2013) developed a protocol for the *in vitro* plant regeneration from a nodal explant of *Dracaena sanderiana* Sander ex Mast. The nodal explant had shown high callus induction potentially on MS medium supplemented with 6.78 μ M 2,4-dichlorophenoxyacetic acid followed by 46.5 μ M chlorophenoxy acetic acid. The medium supplemented with 7.84 μ M N⁶- benzyl aminopurine showed the highest frequency of shoot regeneration and number of shoots per explant. Rooting's were high on MS solid media when compared to liquid medium when added with 7.38 μ M indole-3-butyric acid. Fifty percent of the roots were also directly rooted as micro cutting on soil rite, peat mixture and sand [43].

6. Conclusion

Dracaena Sanderiana, commonly known as lucky bamboo, is a plant with potential medicinal properties that have been acknowledged in traditional medicine, particularly in regions like Cihanjuang Village where it is used to treat ulcers and diarrhoea. However, despite its traditional applications, *Dracaena Sanderiana* remains largely unexplored from a pharmacognostical, pharmaceutical and pharmacological perspective.

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest to be disclosed.

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