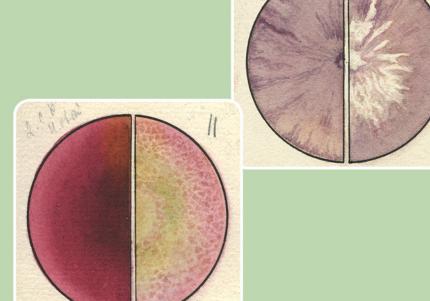
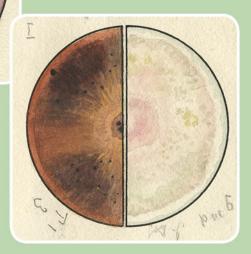


вестник ЗАЩИТЫ РАСТЕНИЙ

PLANT PROTECTION NEWS

2025 том 108 выпуск 2





Санкт-Петербург St. Petersburg, Russia OECD+WoS: 4.01+AM (Agronomy); 1.06+QU (Microbiology)

https://doi.org/10.31993/2308-6459-2025-108-2-17081

Mini-review

OVERVIEW OF THE DISEASES OF *DRACAENA TRIFASCIATA* (ASPARAGALES: ASPARAGACEAE)

M.M.R. Alberca†, T.M. Cuenca†, G.O. Morta†, Y.F. Ocaña†, Y.L.D. Peneyra†, M.A.O. Balendres*

Department of Biology, College of Science, De La Salle University, Manila, Philippines

*corresponding author, e-mail: mark.angelo.balendres@dlsu.edu.ph

†These authors contributed equally

Ornamental plants play a vital role in everyday life, offering joy and appreciation to people from all walks of life. Decorative plants have become a familiar sight, which helps add life and color even in the smallest of spaces. Among these plants, the snake plant *Dracaena trifasciata* is trendy among households. Despite its reputation as a hardy plant, *D. trifasciata* is still susceptible to leaf and root diseases, damaging its overall health and aesthetic value. In tropical regions, where frequent rainfall and high humidity produce ideal proliferation conditions for bacterial, fungal, and viral pathogens, plant diseases can become important problems that could affect the plant's aesthetics and health. This paper reviews the diseases of *D. trifasciata* and other *Dracaena* species, their current management, and perspectives on using already-known disinfectants for indoor management of *D. trifasciata* diseases. Leaf spots, leaf blight, anthracnose, viral, and bacterial diseases are the common diseases reported to be associated with *D. trifasciata*. In addition to pruning, managing *Dracaena* diseases includes sterilizing tools and equipment to prevent cross-contamination. Finally, this paper discusses the significance of generating knowledge on the diseases of *D. trifasciata* and their associated pathogens, which benefits relevant stakeholders. The knowledge could help consumers understanding common leaf diseases found in snake plants, allowing them to make better decisions whenever they purchase these plants. Plant health research encourages better plant care practices within households, which helps promoting flourishing gardens across the country.

Keywords: anthracnose, leaf blight, leaf spot, ornamental plant, Sansevieria

Introduction

Snake plant *Dracaena trifasciata* (Prain) Mabb., also known as Saint George's sword, mother-in-law's tongue, or viper's bowstring hemp, is a popular ornamental plant cherished for its decorative and air-purifying properties (Dadang et al., 2020; Praptosuwiryo, 2003). It has exceptional water-storing abilities, making it highly resilient in various environments, especially tropical climates (Babu, Prabhu, 2024). Despite its reputation as a hardy plant, *D. trifasciata* is still susceptible to leaf diseases, damaging its overall health and aesthetic value. In tropical regions, where frequent rainfall and high humidity produce ideal proliferation conditions for bacterial, fungal, and viral pathogens, plants are under threat by the effects of plant diseases.

The ornamental plant industry is an economically important sector, with various households and urban planning incorporating *D. trifasciata*, not only for decorative purposes but for improved air and soil quality (Pamonpol et al., 2020). Furthermore, the leaves have been used traditionally as an emollient in some country (Praptosuwiryo, 2003). However, research on plant diseases affecting *D. trifasciata* is limited, underscoring the need for localized studies. Leaf diseases in *D. trifasciata* manifest as necrotic spots, wilting, lesions, and yellowing on the foliage, which generally are symptoms of abiotic factors of overwatering or low lighting conditions (Kee et al., 2018; 2020). Moreover, bacterial pathogens, such

as the plant pathogenic *Burkholderia cepacia*, thriving in humid environments cause leaf blighting (Choi et al., 2020). This indicates an overlap of symptomology as *D. trifasciata* can thrive in poor light conditions and is drought-tolerant, complicating accurate diagnosis, which can delay effective disease control treatments. However, there seem to be no reports found in several countries where this plant thrive, suggesting a lack of understanding of specific microorganisms responsible for leaf diseases in *D. trifasciata* (Zhang et al., 2020).

Several pathogens have likewise been identified with the wide distribution of *D. trifasciata* across all continents (Dewatisari, To'bungan, 2024). However, as of writing, no reports have been found on the plants' existing pathogens within the Philippines. The study by Madjos and Ramos (2021) about medicinal plants in Mindanao, Philippines, highlighted those that require further research, including the snake plant. A dearth of research on its pathology could lead to eventual harm among Filipino communities upon the use of infected parts. To illustrate, its leaves have indigenous medicinal purposes considering their anti-inflammatory, anti-diabetic, analgesic, and antioxidant properties (Dey et al., 2014; Berame et al., 2017; Lontoc et al., 2020). Tribes in the Zamboanga Peninsula chew on its leaves to prevent tetanus and have it infused into efficascent oil to avoid fever, *Ati* tribes in Malay, Aklan apply

© Alberca M.M.R., Cuenca T.M., Morta G.O., Ocaña Y.F., Peneyra Y.L.D., Balendres M.A.O., published by All-Russian Institute of Plant Protection (St. Petersburg). This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (http://creativecommons.org/licenses/by/4.0/).

its latex onto warts (Cordero et al., 2020; Madjos, Ramos, 2021), and residents of Tublay, Benguet Province apply poultice onto wounds (Doctor, Manuel, 2014).

This paper reviews the diseases of *D. trifasciata*, their current management, and perspectives on using already-known

disinfectants for indoor management of *D. trifasciata* diseases. Finally, this paper discusses the significance of generating knowledge on the diseases of *D. trifasciata* and their associated pathogens.

Dracaena trifasciata: Taxonomy, Biology, Distribution, and Value

Dracaena trifasciata, often known as mother-in-law's tongue or snake plant, falls under the order Asparagales and the family Asparagaceae (Babu, Prabhu, 2024). The order Asparagales is a large and diverse group of flowering plants that includes several families of great economic and ecological significance (Ji et al., 2023; Madrigal et al., 2017; Chen et al., 2013). Formerly classified under the Sansevieria genus, it has been reclassified into the Dracaena genus, which includes more than 120 species recognized for their distinctive growth patterns and striking foliage (Babu, Prabhu, 2024). The genus, Dracaena, is derived from the Greek word "drakaina," which means "female dragon" (Saraf, 2023). This most likely reflects the thick and robust appearance of most species within this genus. The species name "trifasciata" refers to its variegated leaves, marked by three distinct stripes or bands, usually in shades of green and yellow (Dewatisari, To'bungan, 2024). Species propagation relies on its rhizomes or leaf cuttings, as sexual propagation is limited due to rare flowering (García-Hernández et al., 2022). Dracaena trifasciata is widely recognized for resiliency in unfavorable environments. They have exceptional water-storing capabilities, making them highly drought-tolerant. They can thrive in low-light conditions, enhancing their popularity in indoor housing (Babu, Prabhu, 2024). This plant species has recently garnered scientific attention for its potential in phytostabilization of cadmium (Cd) contaminated soils. Dracaena trifasciata absorbs the cadmium in its roots and inhibits translocation to above-ground tissues (Li, Yang, 2020). This plant is not limited to phytostabilization alone but expands to phytoremediation. Studies show promising capacity to remove volatile organic compounds (VOCs) in indoor air (Pandiyarajan et al., 2024).

Known for its remarkable adaptability, D. trifasciata has spread to various parts of the world, demonstrating its ability to thrive in multiple environments. This species is distributed in tropical and subtropical areas, extending from Africa to Southeast Asia and the islands of the Indian Ocean (Dewatisari et al., 2021; Umoh et al., 2020). Dracaena trifasciata is a hardy and low-maintenance plant easily cultivated indoors and outdoors. It prefers well-drained soil and moderate sunlight, thriving in partially shaded areas that receive about two to six hours of direct sunlight daily (Dewatisari, To'bungan, 2024; El Mokni, Verloove, 2022; Denk et al., 2014). Dracaena trifasciata can be propagated through various methods, including seeds, leaf segments, and rhizomes (García-Hernández et al., 2022; Mudgal, 2021). Dracaena trifasciata, despite being commonly known as an ornamental plant, has greater benefits outside of decoration. In traditional medicine, D. trifasciata juice or decoction has been used in various Asian and African communities to treat ailments like respiratory issues, earaches, and skin conditions(Hematharshini, Seran, 2019). In Asian countries such as Myanmar, this plant's root juice and honey relieve a chronic cough. Additionally, D. trifasciata decoction was used primarily to treat snake bites in China (Babu, Prabhu, 2024). As history has utilized D. trifasciata in various traditional ailments, modern medicine is conducting further studies to develop healthcare. Findings suggest that there have been health-benefiting activities observed in the plant: hepatoprotective, antidiabetic, and antioxidant, to name a few, according to Babu, Prabhu (2024). A study by Raslan et al. (2021) found D. trifasciata root extract to inhibit liver fibrosis due to its bioactive compounds, such as phenolics, terpenoids, and steroidal saponins that alleviate oxidative stress and inflammation, decreasing liver damage. These health-benefiting activities found in D. trifasciata suggest the potential of this plant in nutraceutical applications. Moreover, D. trifasciata can be utilized for external medicinal uses. Its leaf extracts incorporated into hydrogel formulations can become a wound-healing drug as they reduce swelling and have fast wound-healing properties (Yuniarsih et al., 2023). This plant's latex has properties that make it a natural antibiotic and an effective insect repellent (Sharma et al., 2023; Umoh et al., 2020). Overall, Dracaena trifasciata is a plant with diverse medicinal, nutritional, and health benefits found in many countries, including its native Cameroon, Central Africa, Gabon, Nigeria, and Tanzania (www.kew.org).

Dracaena trifasciata is popular because of its durability and low maintenance. It can thrive in different environments and does not need much care, which is ideal for people with busy lifestyles. In addition, its long, upright, attractive leaves make it an excellent choice for decorating homes and offices. The significance of snake plants extends beyond their ornamental use. Research shows that placing these plants in poorly ventilated working environments can minimize CO² levels by as much as 10.47-19.29%, improving air quality indoors while reducing energy consumption (Pamonpol et al., 2020). In addition, they can be used to remove toxic heavy metals like chromium and nickel from wastewater, serving as environmentally friendly solutions for pollutant management (Tarig et al., 2017). In addition, studies show that they also help absorb electromagnetic wave radiation, protecting against electronic device-released radiation (Lestari et al., 2023). Furthermore, the *D. trifasciata* is of great economic importance. It produces fibers that can be used as raw materials for textiles and has become one of Indonesia's export commodities (Tallei et al., 2016). This fiber is characterized by its low cost, wide availability, high specific strength, renewability, and low density, making it suitable for reinforcement in polymer composites (Adeniyi et al., 2020). Additionally, it can be used to produce ropes and other traditional products, showcasing their versatility and potential in various applications (Wantahe, Bigambo, 2023).

Common Leaf Diseases in Dracaena species

The extensive uses of *Dracaena* in the cultural, ornamental, and medicinal fields imply the importance of maintaining its health and quality. Unfortunately, several diseases induced by various pathogens can infect the plant and display symptoms in its stem, root, or leaves, decreasing its agricultural or commercial value. This section examines the diseases commonly observed in the leaves of *Dracaena* spp., primarily leaf blights, leaf spots, anthracnose, viral, and bacterial diseases.

Leaf Spot

One of the commonly reported symptoms of diseases in *Dracaena* spp. is leaf spots (Figure 1) caused by several fungi. Upon infection by a spot-inducing pathogen, small yellow or brown spots with reddish-brown margins appear on the leaves. With gradual exposure to the pathogens, the spots become larger and paler and may eventually become lesions (Nayak, Mallick, 2021; Kee et al., 2018). The following are considered leaf spotcausing fungal agents in *Dracaena* species: *Lasiodiplodia*

theobromae (Pat.) Griffon, Maubl. (syn. Botryodiplodia theobromae Pat.), Fusarium graminearum Schwabe, F. proliferatum (Matsush.) Nirenberg ex Gerlach, Nirenberg, F. verticillioides (Sacc.) Nirenberg, Gibellulopsis nigrescens (Pethybr.) Zare, W. Gams, Summerb., Colletotrichum sp., Physalospora dracaenae J. Sheld., Hendersonia dracaenae Ponnappa, Phyllosticta sp., and Sphaerulina taxi (Oudem.) Massee (Katakam et al., 2023; Hilal et al., 2016). However, across the genus, several species have been reported to be infected by other spot-inducing pathogens in various countries. Dracaena trifasciata displayed leaf spots caused by the fungal pathogen Stemphylium lycopersici in Malaysia (Kee et al., 2018). In India, the species *D. aletriformis* (Haw.) Bos was found to have sunken leaf spots caused by the fungus Aspergillus terreus Thom (Nayak, Mallick, 2021). In addition, a report stated that, in D. sanderiana Mast., Colletotrichum gloeosporioides (Penz.) Penz., Sacc. was the most common and aggressive pathogen within the leaf spots (Abdel-Rahman et al., 2020).





Figure 1. Common symptoms of leaf spot (A) and leaf blight (B)

Рисунок 1. Общие симптомы листовой пятнистости (А) и ожога листьев (В)

Leaf Blight

In leaf blight-infected plants (Figure 1), yellow dried spots may appear on *Dracaena* leaves (Kee et al., 2020a). As the disease progresses, these spots gradually enlarge or elongate, leading to grayish- or yellowish-brown lesions with dark-brown margins (Monteles et al., 2020; Kee et al., 2020a; Ahmadpour, Poursafar, 2018). A report from India by Banerjee et al. (2017) states that the fungus *L. theobromae* caused leaf blighting on the *D. fragrans* (L.) Ker Hawl. or cornstalk plant.

Chlorosis often accompanies leaf blight (Choi et al., 2020). On *D. trifasciata*, leaf blight symptoms are associated with several fungal pathogens. These are *Fusarium* species reported in Malaysia (Kee et al., 2020a), *Neoscytalidium dimidiatum* in Brazil (Monteles et al., 2020), and *Stemphylium vesicarium* (Wallr.) E.G. Simmons in Iran (Ahmadpour, Poursafar, 2018). For *D. sanderiana*, few reports of leaf blight were said to be caused by the fungal pathogen *Rhizoctonia solani* J.G. Kühn and bacterial pathogens *Pantoea stewartii* subsp. *indologenes*

Mergaert et al. and *Burkholderia cepacia* (Palleroni, Holmes) Yabuuchi et al. (Abdel-Rahman et al., 2020; Choi et al., 2020; Zhang et al., 2020). Furthermore, a study reports the first appearance of the disease in *D. fragrans* from India caused by *L. theobromae*, a fungal plant pathogen (Banerjee et al., 2017). These previous reports suggest the widespread occurrence of leaf blight in *Dracaena* in different parts of the world due to bacterial and fungal agents.

Anthracnose

Anthracnose is a plant disease characterized by dark yellow or brown sunken, spore-containing lesions on its stems and leaves. One of the major causes is the fungal genus Colletotrichum, which is known to infect a wide variety of crops (Elshahawy, Darwesh, 2023). Some species under this genus infect specific plants (i.e., key lime anthracnose by C. acutatum J.H. Simmonds, tomato fruit anthracnose by C. coccodes (Wallr.) S. Hughes) (Morsy, Elshahawy, 2016). Among Dracaena plants, anthracnose was reported to be caused by C. gloeosporioides, C. dracaenophilum D.F. Farr, M.E. Palm, and C. dracaenicola Sacc., Trotter (Katakam et al., 2023). Specific reports have been made on C. gloeosporioides, C. sansevieriae, and C. dracaenophilum infecting D. reflexa Lam., D. trifasciata, and D. sanderiana, respectively (Brand, Wichura, 2023; Banerjee et al., 2017; Morsy, Elshahawy, 2016).

Likewise, the first account of anthracnose affecting snake plants, *D. trifasciata*, in Ohio was documented in September of 2021 (Valero David et al., 2023). Gray, circular lesions covered 25% to 50% of the sample's surface. Areas with blight were observed to have darkly-colored acervuli surrounded by circular rings (David et al., 2023). In India, Banerjee et al. (2017) reported a case of anthracnose disease caused by *Colletotrichum* species on *D. reflexa*, presenting as dark lesions on leaves leading to necrosis. Given the impact of the genus *Colletotrichum* alone in the pathology of important crops, further research on its identification and prevention must be made. With numerous reports on leaf spots, leaf blights, and anthracnose among *Dracaena* plants, identifying the primary agents that cause these diseases is necessary for their control and management.

Viral Diseases

According to an article by Baker and Jeyaprakash (2014), viral pathogens causing *Dracaena* leaf diseases, namely *Dracaena* mottle virus (DrMV), are challenging to remove. This viral agent of the *Badnavirus* genus causes mottling and chlorotic patches on leaves, as previously seen in infected *D. sanderiana* and *D. braunii* (Bhat et al., 2016). As per Baker

and Jeyaprakash (2014), only the Dracaena species are the hosts infected by the virus, and studies suggest avoiding stressing the plant habitat to prevent further infection of the disease. Kim et al. (2022) found chlorotic and mild mottling symptoms on *Dracaena* foliage in a greenhouse in Gwangju, Korea, particularly D. braunii. The study further investigated, through molecular testing, the virus identified as Pepper mild mottle virus (PMMoV), the most common pathogen for pepper plants and not previously reported in Dracaena species, suggesting a potential for cross-host infections of PMMoV infecting a broader range of plant hosts than previously known. There seems to be limited literature about viral agents causing leaf diseases in the *Dracaena* species, as bacterial and fungal agents are more rampant and prominent. Despite this, Kim et al. (2022) highlight the importance of monitoring plants for emerging viral threats circulating amongst Dracaena.

Bacterial Diseases

Several bacterial pathogens are known to cause significant leaf diseases in Dracaena, all of which often manifest in leaf spots, blights, or wilts. According to Vidaver et al. (2006), bacterial pathogens are common in warm and humid environments. They are spread through water, soil, or equipment contamination, entering through wounds or natural openings, where the bacteria multiply and release enzymes that lead to infection and disease. Commonly found pathogen Pseudomonas syringae van Hall, a prominent bacterium of many plants, including Dracaena sp., causes leaf spots that may coalesce and spread, blights, and cankers, leading to leaf necrosis (Fletcher et al., 2014). In addition to this, Pantoea stewartii subsp. indologenes (Zhang et al. 2020) has been identified as a significant pathogen for the Dracaena sp., causing leaf blight wilt. Burkholderia cepacia, another notable bacterial pathogen documented as a cause of blight in D. sanderiana, infects the plant with small, dark lesions that eventually develop into large areas of necrotic tissue, damaging the foliage (Zhang et al., 2020). Moreover, findings suggest that B. cepacia proliferates in humid environments, predominantly through infected soil or water, affecting the plant's overall health (Choi et al., 2020). The studies by Zhang et al. (2020) and Choi et al. (2020) emphasize the importance of monitoring bacterial agents causing diseases in Dracaena species to determine preventative measures in potential widespread outbreaks, particularly in nursery conditions, as plant density favors the rapid growth of bacterial infections. Proper sanitation measures are critical to mitigate the spread of these bacterial agents due to limited knowledge of proper permanent treatment.

Management Practices for Dracaena Diseases

Cultural and Physical Methods

Overwatering leads to root rot in *Dracaena* species. A major problem in commercial nurseries and homes, known as root rot, usually results from fungal pathogens. Various fungal species associated with *Dracaena* root rot have been identified as *Fusarium* spp. and *Phytophthora* spp. (Uchida et al., 2003). Excessive moisture is an environment favorable for pathogens to grow, wherein the roots of *Dracaena*

plants become oxygen-starved. This leads to rotting of root tissue, compromising the plant's ability to uptake water and nutrients, and eventual decline and potential death. Ghaderi (2023) also noted *Phytophthora occultans* Man in 't Veld, K. Rosend. as a root rot causative agent, though in *Sansevieria*, a close relative. Root rot has significant effects, including stunted growth, chlorotic leaves, and even plant death, with economic consequences to commercial growers and the

aesthetic appeal of *Dracaena* plants cultivated as ornamentals. While often used with cultural practices, physical methods directly address the disease or its symptoms through pruning. Removing diseased plant parts, such as yellowing, brown, or wilted leaves, can help prevent the spread of pathogens within the plant (Hilal et al., 2016). In addition to pruning, physical methods for managing *Dracaena* disease include sterilizing tools and equipment to prevent cross-contamination. Studies have shown that pathogens can survive on contaminated tools, which increases the danger of disease transmission among plants. For instance, Hilal et al. (2016) found that the pathogenic bacteria Erwinia amylovora (Burrill) Winslow et al. can survive on pruning shears. Therefore, the disease can be unintentionally disseminated if an individual cuts healthy plants using the same equipment they used to cut infected plants. To lower this risk, the researchers emphasized the significance of cleaning pruning instruments.

Biological Control Methods

An in vitro analysis of the performance of bacterial biocontrol agents against *Dracaena* leaf spots by Hilal et al. (2016) found them capable of impeding the growth of the colony of the leaf spot fungi, spore germination, and the length of the germ tube. Stenotrophomonas maltophilia (Hugh ex Hugh and Ryschenkow) Palleroni and Bradbury consistently displayed inhibition effects by decreasing the disease incidence and disease index, followed by the bacterium Pythium ultimum Trow, Bacillus subtilis (Ehrenberg) Cohn, and B. megaterium de Bary. The same study tested the effectiveness of fungal biocontrol agents, including Trichoderma spp. Trichoderma harzianum Rifai was observed to have the most significant inhibiting effect against the *Dracaena* leaf spots. At the same time, T. album Preuss was best at curbing spore germination and generating germ tubes in germinated spores. Based on the report of Abdel-Rahman et al. (2023), which focused on the control of the fungus R. solani in D. sanderiana, the bioagents Clonostachys rosea (Link) Schroers, Samuels, Seifert, W. Gams, B. circulans, B. siamensis Sumpavapol et al., and Ochrobactrum anthropi Holmes et al. may be considered as potential inhibitors of the spread of R. solani in the lucky bamboo plant. Ochrobactrum anthropi displayed the highest inhibitory effect on the overall growth of the colonies, followed by C. rosea, B. siamensis, and finally, B. circulans. It was established through these bioagents that methods of hindering plant disease progression can be explored while circumventing the negative impact of chemical control.

Overall, the use of microorganisms such as bacteria to combat fungal diseases has been well documented by Jayaraj et al. (2004) and Stamenković et al. (2018), stating that these plant growth-promoting microorganisms (PGPM) are capable of having antifungal capabilities through the production of siderophores, such as in the case of *Pseudomonas* sp., which have been documented to hinder fungal development (Manwar et al., 2004). Meanwhile, *B. cereus* is a prospective biocontrol agent for rice fungi (Etesami, Alikhani, 2017).

Chemical Control Methods

According to Elshahawy and Darwesh (2023), chemical protection is the central route of action for plant disease control. Therefore, in their study, which experimented with the effectiveness of six systemic fungicides against C. dracaenophilum and C. gloeosporioides in a laboratory setting, it was established that thiophanate-methyl and difenoconazole+azoxystrobin inhibited pathogen development at less than 15 ppm. At less than 20 ppm, tebuconazole and flusilazole also wholly inhibited the growth of the pathogen. However, iprodione and cyprodinil+fludioxonil performed worse, having a lesser effect. The *in vivo* process with D. sanderiana revealed that a mixture of difenoconazole, azoxystrobin, and thiophanate-methyl at a dose of 20 ppm slowed down the progression of anthracnose. Nevertheless, it was also established that tebuconazole and flusilazole were phytotoxic to the plants.

Another test study of the inhibitory effects of six widely used fungicides, Dithane M45 (a.i. mancozeb), Kocide 200 (a.i., copper hydroxide), Ridomil Gold Plus (a.i., copper oxychloride), Score (a.i., difenocon famaxadone), Equation Pro (a.i. cymoxanil famaxadone), and Kemazed (a.i., carbendazim), was conducted in Northern Egypt with D. marginata Aiton leaf spots as samples (Hilal et al., 2016). These fungicides were all found to negatively impact colony growth, with Dithane M45 being the most efficient in hindering spore germination. Kemazed, on the other hand, was observed to be a potent inhibitory agent of germ tube development in vitro and decreased the incidence of Dracaena leaf spot disease in vivo.

Kemazed has also been utilized in another study that was aimed at gauging the significance of the fungicide against three aggressive fungi: *C. gloeosporioides*, *F. oxysporum*, and *Alternaria alternata* (Fr.) Keissl in *D. sanderiana* (Abdel-Rahman et al., 2020). After consistently inhibiting the growth of the fungal colonies, it was determined that the chemical fungicide was highly efficient in hindering fungal disease progression in *D. sanderiana*.

Conclusion

Plant diseases affect the aesthetics and health of ornamental plants, including *D. trifasciata*. Leaf spots, leaf blight, anthracnose, viral, and bacterial diseases are the common diseases reported to be associated with *D. trifasciata*. Identifying the correct pathogen causing the disease is

important to protect *Dracaena* plants from various diseases through appropriate and effective disease control approaches. Therefore, targeting and determining the causative agents of leaf diseases in *Dracaena* spp. is crucial to mitigating any disease outbreak.

Acknowledgments

The authors thank De La Salle University. The third author was supported by the Department of Science and Technology-Science Education Institute.

References

- Abdel-Rahman T, El-Morsy SA, Halawa A (2020) Occurrence of stem and leaf spots on lucky bamboo (Dracaena sanderiana hort. Ex. Mast.) plants in vase and its cure with safe means. *J Plant Prot Pathol* 11(12), 705–713. https://dx.doi.org/10.21608/jppp.2020.170648
- Abdel-Rahman TFM, Abdel-Megeed A, Salem MZM (2023) Characterization and control of *Rhizoctonia solani* affecting lucky bamboo (*Dracaena sanderiana* hort. Ex. Mast.) using some bioagents. *Sci Rep* 13(1), 6691. https://doi.org/10.1038/s41598-023-33628-8
- Adeniyi AG, Adeoye SA, Ighalo JO (2020) *Sansevieria trifasciata* fiber and composites: a review of recent developments. *Int Polym Process* 35(4), 344–354. https://doi.org/10.3139/217.3914
- Ahmadpour A, Poursafar A (2018) *Stemphylium vesicarium* causing *Sansevieria trifasciata* (viper's bowstring hemp) leaf blight in Iran. *Australas Plant Dis Notes* 13(1), 4. https://doi.org/10.1007/s13314-018-0288-3
- Babu K, Prabhu S (2024) *Dracaena trifasciata* (Prain) Mabb.: traditional use, pharmacognosy, phytochemistry, and pharmacology: a comprehensive review. *J Phytopharmacol* 13(3):235–241. https://doi.org/10.31254/phyto.2024.13307
- Baker CA, Jeyaprakash A (2014) *Dracaena mottle virus* in lucky bamboo. FL Dept Agric Cons Serv.
- Banerjee A, Panja B, Saha J (2017) Tip blight disease of Dracaena fragrans caused by *Lasiodiplodia theobromae*(Botryosphaeriaceae), from India. *Aust J Mycol* 26, 63–67.
- Berame J, Cuenca S, Cabilin D, Manaban M (2017) Preliminary phytochemical screening and toxicity test of leaf and root parts of the snake plant (*Sansevieria trifasciata*). *J Phylogenet Evol Biol* 5:3. https://doi.org/10.4172/2329-9002.1000187
- Bhat AI, Hohn T, Selvarajan R (2016) Badnaviruses: the current global scenario. *Viruses* 8(6):177. https://doi.org/10.3390/v8060177
- Brand T, Wichura A (2023) First report on *Colletotrichum* sansevieriae causing anthracnose of *Sansevieria trifasciata* in Germany. *Gesunde Pflanzen* 75(1):61–66. https://doi.org/10.1007/s10343-022-00777-1.
- Chen S, Kim D, Chase MW, Kim JH (2013) Networks in a large-scale phylogenetic analysis: reconstructing evolutionary history of Asparagales (Lilianae) based on four plastid genes. *PLoS ONE* 8(3):e59472. https://doi.org/10.1371/journal.pone.0059472
- Choi O, Lee Y, Kang B, Kim S, et al. (2020) Bacterial blight on *Dracaena sanderiana* caused by *Burkholderia cepacia*. *Australas Plant Dis Notes* 15(1):4. https://doi.org/10.1007/s13314-020-0373-2
- Cordero CS, Ligsay AD, Alejandro GJD (2020) Ethnobotanical documentation of medicinal plants used by the Ati tribe in Malay, Aklan, Philippines. *J Complement Med Res* 11(1):170. http://dx.doi.org/10.5455/jcmr.2020.11.01.20
- Dadang RJ, Simborio LT, Casinillo NG, Amoroso VB (2020) The floriculture industry on the grassroots: the issues on ornamental plant growing, extraction and trading in Baganihan, Southern Philippines. *Adv Agric Bot Bioflux* 12(1):1–11
- Denk T, Güner HT, Grimm GW (2014) From mesic to arid: leaf epidermal features suggest preadaptation in Miocene

- dragon trees (*Dracaena*). *Rev Palaeobot Palynol* 200:211–228. https://doi.org/10.1016/j.revpalbo.2013.09.009
- Dewatisari WF, Nugroho LH, Retnaningrum E, Purwestri YA (2021) The potency of *Sansevieria trifasciata* and *S. cylindrica* leaf extracts as antibacterial against *Pseudomonas aeruginosa*. *Biodiversitas* 22(1):408–415. https://doi.org/10.13057/biodiv/d22015
- Dewatisari WF, To'bungan N (2024) Phytochemistry and ethnopharmacology of *Dracaena trifasciata*. *Nusantara Biosci*16(2):169–184. https://doi.org/10.13057/nusbiosci/n160203
- Dey B, Bhattacharjee R, Mitra A, Singla RK, et al. (2014) Mechanistic explorations of antidiabetic potentials of *Sansevieria trifasciata*. *Indo Global J Pharm Sci* 4(2):113–122. https://doi.org/10.35652/IGJPS.2014.115
- Doctor T, Manuel JJ (2014) Phytochemical screening of selected indigenous medicinal plants of Tublay, Benguet Province, Cordillera Administrative Region, Philippines. *Int J Sci Res Publ* 4(4):1–12.
- El Mokni R, Verloove F (2022) Further records of non-native succulents within Asparagaceae sensu lato as casual or naturalising aliens in Tunisia and North Africa. *Bradleya* 40(40):119–129. https://doi.org/10.25223/brad.n40.2022. a10
- Elshahawy IE, Darwesh OM (2023) Preventive and curative effect of difenoconazole+azoxystrobin and thiophanatemethyl against lucky bamboo anthracnose disease caused by *Colletotrichum dracaenophilum*. *Heliyon* 9(3):e14444. https://doi.org/10.1016/j.heliyon.2023.e14444
- Etesami H, Alikhani HA (2017) Evaluation of gram-positive rhizosphere and endophytic bacteria for biological control of fungal rice (*Oryza sativa* L.) pathogens. *Eur J Plant Pathol* 147(1):7–14. https://doi.org/10.1007/s10658-016-0981-z
- Fletcher J, Luster D, Bostock R, Burans J, et al. (2010) Emerging infectious plant diseases. In: Scheld WM, Grayson ML, Hughes JM (eds), Emerging Infections 9. ASM Press. https://doi.org/10.1128/9781555816803.ch18
- García-Hernández E, Loera-Quezada MM, Morán-Velázquez DC, Lopez MG, et al. (2022) Indirect organogenesis for high-frequency shoot regeneration of two cultivars of *Sansevieria trifasciata* Prain differing in fiber production. *Sci Rept* 12:8507. https://doi.org/10.1038/s41598-022-12640-4
- Ghaderi F (2023) New report of *Phytophthora occultans* associated with root and crown rot on *Sansevieria*. *Mycol Iran* 10(1):45–54. https://doi.org/10.22043/MI.2023.361284.1250
- Hematharshini A, Seran TH (2019) Effect of leaf segments and potting media on plant performance of *Sansevieria trifasciata* Hort. Ex Prain grown under ex vitro conditions. *Turk J Agric Food Sci Technol* 7(11):1743–1747. https://doi.org/10.24925/turjaf.v7i11.1743-1747.2394
- Hilal A, El-Argawy E, Korany A, Fekry T (2016) Chemical and biological control of *Dracaena marginata* leaf spots in Northern Egypt. *Int J Agric Biol* 18:1201–1212 https://doi.org/10.17957/IJAB/15.0229
- Ji Y, Landis J, Yang J, Wang S, et al. (2023) Phylogeny and evolution of Asparagaceae subfamily Nolinoideae: new insights from plastid phylogenomics. *Ann Bot* 131(2):301–312. https://doi.org/10.1093/aob/mcac144

- Katakam M, Panja B, Saha J (2023) Disease spectrum of cornstalk plant [*Dracaena* sp.] and its distribution: a review. *Pharma Innov* 122(9):3080–3085
- Kee YJ, Latiffah Z, Masratul Hawa M (2018) First report of *Stemphylium lycopersici* causing leaf spot on *Sansevieria trifasciata* in Malaysia. *Plant Dis* 102(2):445–446. 10https://doi.org/10.1094/PDIS-07-17-1049-PDN
- Kee YJ, Zakaria L, Mohd MH (2020) Morphology, phylogeny and pathogenicity of *Fusarium* species from *Sansevieria trifasciata* in Malaysia. *Plant Pathol* 69(3):442–454. https://doi.org/10.1111/ppa.13138
- Kim SW, Jeong Y, Yang KY, Jeong RD (2022) First report of natural infection of *Dracaena braunii* by pepper mild mottle virus in Korea. *J Plant Pathol* 104(4):1579–1579. https://doi.org/10.1007/s42161-022-01205-z
- Lestari M, Mugi S, Sulhadi S, Sutikno S (2023) The effect of ornamental plants on reducing the intensity of electromagnetic wave radiation. *Phys Commun* 7:35–42. https://doi.org/10.15294/physcomm.v7i1.41534
- Lontoc SMH, Soriano CF, Comia SAMM, Hernandez AFR, et al. (2020) In vitro antioxidant activity and total phenolic content of *Sansevieria trifasciata* (snake plant) crude ethanolic and aqueous leaf extracts. *Asia Pac J Allied Health Sci* 1:35–58
- Li X, Yang Y (2020) Preliminary study on Cd accumulation characteristics in *Sansevieria trifasciata* Prain. *Plant Divers* 42(5):351–355. https://doi.org/10.1016/j.pld.2020.05.001
- Madjos G, Ramos K (2021) Ethnobotany, systematic review and field mapping on folkloric medicinal plants in the Zamboanga Peninsula, Mindanao, Philippines. *J Complement Med Res* 12, 21. https://doi.org/10.5455/jcmr.2021.12.01.05
- Manwar AV, Khandelwal SR, Chaudhari BL, Meyer JM, et al. (2004) Siderophore production by a marine *Pseudomonas aeruginosa* and its antagonistic actionagainst phytopathogenic fungi. *Appl Biochem Biotechnol* 118(1):243–251. https://doi.org/10.1385/ABAB:118:1-3:243
- Monteles RP, Sousa ES, da Silva Matos K, et al. (2020) Neoscytalidium dimidiatumcauses leaf blight on Sansevieria trifasciata in Brazil. Australas Plant Dis Notes 15(1):19. https://doi.org/10.1007/s13314-020-00389-6
- Morsy AA, Elshahawy IE (2016) Anthracnose of lucky bamboo *Dracaena sanderiana* caused by the fungus *Colletotrichum dracaenophilum* in Egypt. *J Adv Res* 7(3):327–335. https://doi.org/10.1016/j.jare.2016.01.002
- Mudgal G (2021) An efficient and quick protocol for in vitro multiplication of snake plant, *Sansevieria trifasciata* var. Laurentii [Prain]. *Plant Cell Tissue Organ Cult* 147:405–411. https://doi.org/10.1007/s11240-021-02132-0
- Nayak AK, Mallick SN (2021) First report of *Aspergillus* terreus causing sunken leaf spot on *Dracaena aletriformis* in India. *Australas Plant Pathol* 50(1):7–9. https://doi.org/10.1007/s13313-019-00653-z
- Pamonpol K, Areerob T, Prueksakorn K (2020) Indoor air quality improvement by simple ventilated practice and *Sansevieria trifasciata*. *Atmosphere* 11(3):271. https://doi.org/10.3390/atmos11030271
- Pandiyarajan S, Manickaraj SSM, Liao AH et al (2024) Supercritical CO₂ mediated construction of aluminium

- waste recovered γ-Al₂O₃ impregnated *Dracaena trifasciata* biomass-derived carbon composite: a robust electrocatalyst for mutagenic pollutant detection. *J Colloid Interface Sci* 659:71–81. https://doi.org/10.1016/j.jcis.2023.12.117
- Praptosuwiryo TN (2003) *Sansevieria* Thunb. Plant Resources of South-East Asia No 17: Fibre plants. https://prosea.prota4u.org/view.aspx?id=6555 (04.08.2025)
- Raslan M, Abdel-Rahman R, Fayed H, Ogaly H et al. (2021) Metabolomic profiling of *Sansevieria trifasciata* Hort ex. Prain leaves and roots by HPLC-PAD-ESI/MS and its hepatoprotective effect via activation of the NRF2/ARE signaling pathway in an experimentally induced liver fibrosis rat model. *Egypt J Chem* 64(11):6647–6671. https://doi.org/10.21608/ejchem.2021.78970.3877
- Saraf S (2023) Dragon's blood tree (*Dracaena cinnabari*): a Cenozoic relict. In: Shah MM (ed) Endangered species present status. IntechOpen. https://doi.org/10.5772/intechopen.112282
- Sharma A, Parashar K, Kumari A, Srivastava D, et al. (2023) Fluorescent carbon dots from snake plant for applications as probe for optical and electrochemical sensing of Hg²⁺ and Fe³⁺ and bio-imaging agent. *ChemSelect* 8(42):e202301249. https://doi.org/10.1002/slct.202301249
- Stamenković S, Beškoski V, Karabegović I, Lazić M, et al. (2018) Microbial fertilizers: a comprehensive review of current findings and future perspectives. *Span J Agric Res* 16(1):e09R01. https://doi.org/10.5424/sjar/2018161-12117.
- Tallei TE, Riano E, Rembet JJ, Pelealu BJ, et al. (2016) Sequence variation and phylogenetic analysis of *Sansevieria trifasciata* (Asparagaceae). *Biosci Res* 13(1):1–7.
- Teixeira SL, Campanati M, Teixeira MT, Almeida RF (2005) Esterilização de meios nutritivos para cultura de tecidos vegetais, pela combinação de esterilizantes químicos e forno de microondas. *Rev Ceres* 52:343–349
- Uchida JY, Kadooka CY, Aragaki M (2003) Dracaena decline and root rot. College of Tropical Agriculture and Human Resources, University of Hawaii at Manoa. https://www.ctahr.hawaii.edu/oc/freepubs/pdf/HB-103.pdf
- Umoh O, Edet V, Uyoh V (2020) Comparative analysis of the phytochemical contents of dry and fresh leaves of Sansevieria trifasciata Prain. Asian J Res Bot 3(1):41–47
- Vidaver AK, Tolin SA, Lambrecht P (2006) Laboratory, growth chamber, and greenhouse microbial safety: plant pathogens and plant-associated microorganisms of significance to human health. In: Fleming DO, Hunt DL (eds) Biological Safety: Principles and Practices. Fourth Edition. ASM Press. 35–52. https://doi.org/10.1128/9781555815899.ch3
- Wantahe E, Bigambo P (2023) Review of *Sansevieria ehrenbergii* (SE) leaf fibers and their potential applications. *Cellulose* 30:9241–9259. https://doi.org/10.1007/s10570-023-05481-5
- Yuniarsih N, Hidayah H, Gunarti NS et al (2023) Evaluation of wound-healing activity of hydrogel extract of *Sansevieria trifasciata* leaves (Asparagaceae). *Adv Pharmacol Pharm Sci* 2023(1):7680518. https://doi.org/10.1155/2023/7680518
- Zhang S, Xu ZY, Le R, Hu HQ (2020) First report of leaf blight wilt on *Dracaena sanderiana* by *Pantoea stewartii* subsp. *indologenes* in China. *Plant Dis* 104(6):1854–1854. https://doi.org/10.1094/PDIS-06-19-1143-PDN

Вестник защиты растений, 2025, 108(2), с. 90-97

OECD+WoS: 4.01+AM (Agronomy); 1.06+QU (Microbiology)

https://doi.org/10.31993/2308-6459-2025-108-2-17081

Мини-обзор

ОБЗОР БОЛЕЗНЕЙ DRACAENA TRIFASCIATA (ASPARAGALES: ASPARAGACEAE)

М.М.Р. Альберка†, Т.М. Куэнка†, Г.О. Морта†, И.Ф. Оканья†, Ю.Л.Д. Пенейра†, М.А. Балендрес* *Научный колледж, Университет Де Ла Саль, Манила, Филиппины*

*ответственный за переписку, e-mail: mark.angelo.balendres@dlsu.edu.ph

†Авторы с равным вкладом

Декоративные растения играют важную роль в повседневной жизни, доставляю положительные эмоции людям из всех слоёв общества. Декоративные растения стали привычным зрелищем, добавляя комфорт даже в самые маленькие пространства. Среди них драцена трёхполосная Dracaena trifasciata, которая пользуется большой популярностью в домашнем хозяйстве. Несмотря на свою репутацию выносливого растения, драцена всё же подвержена заболеваниям листьев и корней, что негативно сказывается на её общем состоянии и эстетической ценности. В тропических регионах, где частые осадки и высокая влажность создают идеальные условия для размножения бактериальных, грибных и вирусных патогенов, болезни растений могут стать серьёзной проблемой, способной повлиять на их внешний вид и здоровье. В данной статье рассматриваются болезни D. trifasciata и других видов драцены, современные методы борьбы, а также перспективы использования известных дезинфицирующих средств для применения в помещениях. Пятнистость и ожог листьев, антракноз, вирусные и бактериальные заболевания – распространённые заболевания, связанные с D. trifasciata. Помимо обрезки, борьба с болезнями драцены включает стерилизацию инструментов и оборудования для предотвращения перекрёстного заражения. Наконец, в данной статье обсуждается важность накопления знаний о болезнях D. trifasciata и связанных с ними патогенах, что полезно для соответствующих заинтересованных сторон. Эти знания могут помочь потребителям разобраться в распространённых болезнях листьев драцены, что позволит им принимать более обоснованные решения при покупке этих растений. Исследования в области здоровья растений способствуют улучшению ухода за растениями в домашних хозяйствах, что благоприятствует созданию цветущих садов по всей стране.

Ключевые слова: антракноз, ожог листьев, листовая пятнистость, декоративное растение, Sansevieria

Поступила в редакцию: 05.06.2025 Принята к печати: 30.07.2025

_

[©] Альберка М.М.Р., Куэнка Т.М., Морта Г.О., Оканья И.Ф., Пенейра Ю.Л.Д., Балендрес М.А. Статья открытого доступа, публикуемая Всероссийским институтом защиты растений (Санкт-Петербург) и распространяемая на условиях Creative Commons Attribution License 4.0 (http://creativecommons.org/licenses/by/4.0/).