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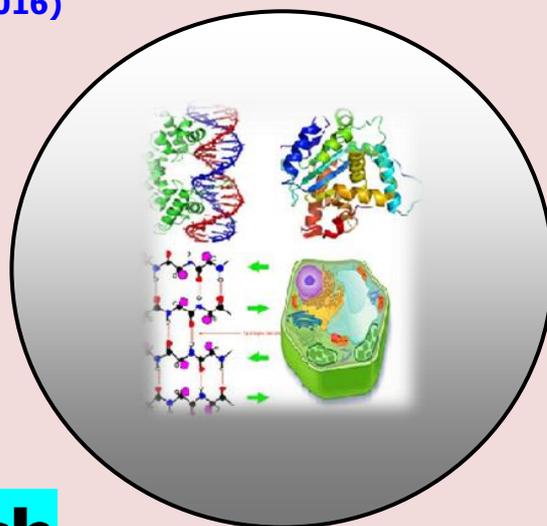
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RESEARCH PAPER

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Snake Plant (*Sansevieria trifasciata*): Imminent Classically Versatile House Indoor Detoxifier

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ABSTRACT

Sansevieria trifasciata does everything it can to sort out the humidity in your home, so that your skin, eyes and airways can also enjoy the plant. It converts poisonous substances into oxygen (O₂). And it's also incredibly strong and easy to care for. This desert plant has a readily adapted to life in the living room. The Snake Plant, or Mother-in-Law's Tongue, is one of the most recommended plants for improving air quality. The optimal place to keep this relatively inexpensive and low-maintenance plant is the bedroom, because it converts CO₂ into oxygen at night. Many proved that *Sansevieria* does not only absorb the indoor pollutants, it also can eliminate bad odor. So in case you buy new furniture still with strong adhesive smell, or you just painted the wall, or your room constantly smells bad, 2 pots of mature *Sansevieria* probably can free you from suffering undesired odor.

Keywords: Trichloroethylene, Formaldehyde, Benzene, Bad odor, MILT and CEM.

INTRODUCTION

In fact, according to the U.S. Environmental Protection Agency, the air inside the average home is up to 5x more polluted than the air outside. While moderately alarming on a certain level, it's really more of a catalyst for making positive changes in one's life that not only freshen up the air, but also allow us to more intimately connect with nature—not merely when we're outside, but in the comfort of our own living and working spaces. The remedy? Air purifying plants, of course. *Sansevieria trifasciata*, a member of the Lily Family, popularly goes by other common names. The very "politically correct" Mother-in-Law's (Mother-in-Law's Tongue or Snake Plant, 2010) tongue and Bowstring-hemp (*Sansevieria trifasciata*, 2012). The durability of *Sansevieria* makes it an excellent choice for apartment dwellers that often have limited success with houseplants due to lighting

issues. They should take a good look at the snake plant. *Sansevieria* tops the list as being the most tolerant of all decorative plants to survive the most unsuitable growing conditions, abuse and neglect a plant could receive. Basically, you have to work really hard to kill *sansevieria*. Snake plant is classic yet versatile houseplant with sword like foliage design. It is excellent for the forgetful gardener and its considered a top air purify plant for indoor environment (Harrison, Lorraine (2012). "The air inside the average home is up to five times more polluted than the air outside." (Figure 1).



Figure 1. Habit of Snake Plant and Indoor Plantation.

These are architectural plants with stiff, upright leaves up to 3 or 4 feet tall. The Snake Plant has green banded leaves, while the Mother-in-Law's Tongue features a yellow border. These plants are among the toughest of all houseplants—they can withstand virtually any conditions, from dark to bright. The only way to surely kill them is to overwater or never water at all. *Sansevierias* have a rich history of folklore and new science. These plants have a rich history of cultivation. In China, it was kept as a treasured houseplant because the Eight Gods bestowed their eight virtues on those who grew them. These virtues include long life, prosperity, intelligence, beauty, art, poetry, health and strength. The plants were kept near the entrances inside the home so that the eight virtues could pass through in a manner pre-Feng Shui. These plants also were placed in fine restaurants, herbalists, acupuncturists, doctor's offices, accountant's offices, banks, shrines, monasteries, and even in rice paddies. *Sansevierias* were grown and cherished well before the Chinese ti plant (*Dracaena* spp.) also known as the Good Luck Bamboo.

This plant [The leaf's sharp spike represents the sharp tongue of women in general, and mothers-in-law in particular (*Sansevieria trifasciata*, 2015)].

If you've just wrapped one up for your partner's lovely mum, make sure to mention that you're not trying to say anything bad.] does everything it can to sort out the humidity in your home, so that your skin, eyes and airways can also enjoy the plant. It converts poisonous substances into oxygen (O₂). And it's also incredibly strong and easy to care for. This desert plant has a readily adapted to life in the living room. [Keep a Snake Plant in Your Bedroom to Improve the Air Quality While You Sleep]. The Snake Plant, or Mother-in-Law's Tongue, is one of the most recommended plants for improving air quality. The optimal place to keep this relatively inexpensive and low-maintenance plant is the bedroom, because it converts CO₂ into oxygen at night.

In its roundup of the best cheap plants for improving indoor air quality, Wisebread notes that Mother-in-Law's Tongue is recommended by a NASA study (which lists at least a dozen air-improving plants) and researcher Kamal Meattle, who has shown us that just three common houseplants can improve indoor air. Meattle says Mother-in-Law's Tongue is known as "the bedroom plant." While most plants take away oxygen at night, this one gives off oxygen at night. The plant also filters formaldehyde, trichloroethylene, xylene, toluene, and benzene from the air. Meattle recommends 6-8 waist-high plants per person for optimal output from this oxygen factory.

An interesting research program has been done by NASA using a few selected plants (one is *Sansevieria*) for air purification and to curb "Sick Building Syndrome."

The *Sansevieria* is an ideal plant for indoor spaces because it is a superb air purifier. Studies, including those performed by NASA, have consistently shown the plant to remove toxins such as formaldehyde, xylene, toluene, and nitrogen oxides (NO_x)—which means that industries and workspaces such as automotive plants and shops, aircraft plants, plywood, carpeting, paint makers and sellers, printing, and offices, where these chemicals abound in the products produced and used, would greatly benefit by keeping several *Sansevieria* around. NASA, whose study purposed to determine how to clean the air in space stations, recommends at least 15 to 18 medium-to-large size plants for a 1,800 square-foot home. Snake Plant a.k.a. Mother-In-Law's Tongue (MILT): Of all the different oxygen producing plants, this one is unique since it converts a lot of CO₂ (carbon dioxide) to O₂ (oxygen) at night, making it ideal to have several in your bedroom. 6-8 plants are needed per person to survive if there is no air flow (meaning you could in a completely air sealed room if you had these plants). The snake plant also removes formaldehyde from the air. Most plants largely uptake Carbon dioxide (CO₂) and release oxygen during the day (photosynthesis) and uptake oxygen and release CO₂ during the night (respiration).

Helps fight Allergies and Sick Building Syndrome

Snake plant absorbs toxins and releases oxygen. The plant may releases moisture in the air and lessens airborne allergens. The *Sansevieria* meets these conditions perfectly.

Persons with allergies, therefore, should find a friend in such plants because they are a natural and cheap way to stay healthy. Further, public spaces and workplaces, especially, should be aware of the value of air-purifying plants for these reasons. Sick building syndrome (SBS) describes the way the health of certain individuals of a certain residence or building acquires moderate to acute symptoms that are linked to the building while no specific illness can be identified.

Most of the symptoms involved with SBS appear to be related to poor indoor air quality. They include ear, nose, and throat irritation; coughing; itching; dizziness and nausea; lack of concentration; fatigue; even chest tightness and muscle aches. But the symptoms leave not long after individuals have departed the building.

Now there are a few things that plausibly explain this, like ventilation that doesn't properly distribute air; chemicals from carpets, upholstery, copy machines, pesticides, and cleaning agents; outside pollutions being pumped in; bacteria, molds, and viruses. Do you see the alarming link between these explanations and formaldehyde, xylene, toluene, and nitrogen oxides? The *Sansevieria* is a ready remedy for SBS.

Feng Shui and Placement

The Snake plant purifies air by absorbing toxins through the leaves and producing pure oxygen. In fact, the *Sansevieria* is an ideal bedroom plant. Whereas most other plants release carbon dioxide at night (in the absence of photosynthesis), the *Sansevieria* continues to produce oxygen.

Also known as mother-in-law's tongue, this plant is one of the best for filtering out formaldehyde, which is common in cleaning products, toilet paper, tissues and personal care products. Put one in your bathroom — it'll thrive with low light and steamy humid conditions while helping filter out air pollutants. Sometimes the Mother-in-Law's Tongue plant, also called the Snake Plant (*Sansevieria trifasciata*) is considered a bad Feng Shui plant. However, this is not true, because the Snake Plant can bring very helpful feng shui energy when needed in specific areas of a home or office; this plant has strong protective energies. Spiky plants like snake plants are excellent for shielding you against negative Chi, but their aggressive energy means you need to place them where they're not in highly-trafficked areas of your home. The snake plant is a perfect expression of upward, growing ch'i. The strong wood energy cuts through negative or stagnant energy. The best position to place the plants in your office or home is a place that is enriched by the plant's Wood element. Southeastern, Southern, and Eastern corners are the best fengshui spots to place your plants. The Chinese used to grow this plant in their houses, as a valuable house plant, since the Eight Gods conferred their eight virtues as gifts, to all those who possessed this plant (Figure 2).



Figure 2. Snake Plant growing in room.

The eight virtues are prosperity, beauty, long life, intelligence, health, art, strength and poetry. They placed the plants close to the entrance within their home for the purpose of enabling the eight virtues to enter according to pre-Feng-Shui.

The *Sansevieria trifasciata* 'Laurentii' (aka 'mother-in-law's tongue' or 'snake plant') has been proven by Wolverton Environmental Services to be one of the most effective toxin removing plants on the planet, ridding the air of:

- Trichloroethylene – Symptoms associated with short term exposure include excitement, dizziness, headache, nausea and vomiting followed by drowsiness and coma in serious cases.
- Formaldehyde – Symptoms associated with short term exposure include irritation to nose, mouth and throat, and in severe cases, swelling of the larynx and lungs.
- Benzene – Symptoms associated with short term exposure include irritation to eyes, drowsiness, increase in heart rate, headaches, confusion and in some cases can result in unconsciousness.

- Xylene – Symptoms associated with short term exposure include irritation to mouth and throat, dizziness, headache, confusion, heart problems, liver and
- Many proved that *Sansevieria* does not only absorb the indoor pollutants, it also can eliminate bad odor. So in case you buy new furniture still with strong adhesive smell, or you just painted the wall, or your room constantly smells bad, 2 pots of mature *Sansevieria* probably can free you from suffering undesired odor (Wolverton et al., 1999).

CONCLUSION

There are about 15 plants that NASA recommends as pollutant absorber plants, but *Sansevieria* is apparently to be the most ideal, as this plant is easy to grow, very hardy, has a long life time with excellent capacity to absorb many household toxic airborne pollutants and convert them to harmless substances. A study found out that *Sansevieria* can absorb up to 80% air pollutant. Putting 2 potted mature *Sansevieria* can clean the air pollution of a 100 sqft room. Another virtue of *Sansevieria* is it also has CAM (Crasulacean Acid Metabolism); release oxygen to the air at night, despite of consuming it like other plants commonly do. This makes *Sansevieria* ideal to be used as indoor plant, as a natural way to fight the Sick Building Syndrome. Many proved that *Sansevieria* does not only absorb the indoor pollutants, it also can eliminate bad odor. So in case you buy new furniture still with strong adhesive smell, or you just painted the wall, or your room constantly smells bad, 2 pots of mature *Sansevieria* probably can free you from suffering undesired odor

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