Growing orchids in a small area or balcony

As the attraction of apartment living increases, downsizing a garden becomes a new challenge. Balcony gardens are fast becoming the new Aussie backyards; with green oases flourishing in places you would least expect. You can have an unseen lush garden inside your four walls, no matter how much living space you have.

"More Australians than ever are taking up apartment living, whether out of preference, convenience, or for other reasons. The 2016 Census of Population and Housing found that 10 percent (2,348,434) of all people in Australia spent Census night in an apartment. There is now around one occupied apartment for every five occupied in Australia, compared with one to every seven, back in 1991. The growth in apartment living is primarily an urban phenomenon, concentrated in Australian major capital cities. Over the past 25 years, the number of occupied apartments (including flats and units, excluding townhouses) in Australia has increased by 78 percent to 1,214,372 dwellings at the 2016 Census." (Australian Bureau of Statistics).

Introduction

It was the year 2000 when my health started to fail me. By the time the Sydney Olympics delivered 58 medals to Australia, both my husband and I at age

53 retired, to focus on my care. Yes, I lost my ability to travel around. I progressed from frequent traveller to frequent home isolation; which necessitated relinquishing my volunteering endeavours.

One door closes, and another door opens. I always admired my late mother's garden; especially her old bathtub full of orchids. Gardening in an apartment, without garden space was a challenge. My inquisitive mind was impressed with the notion of learning how to grow orchids on my small balcony, and/or in my living room. Consequently, a methodical plan was envisioned. Now, I'm working on my plan to promote a hobby growing orchids

Balcony Residential

indoors. Eventually, I'll specialise in Australian natives, particularly compact sarcochilus.

Residential upright buildings have individual

dwellings, referred to as a unit or apartment. A distinctive attribute to these units are the balconies, which vary in size and shape. Regular balconies will have doors that open up onto a small open balustrade platform on the outside of the building. Such balconies are usually above the ground floor, with sufficient space for outdoor enjoyment. Some balconies face the morning sun; some face the afternoon sun, or anywhere in-between. Some apartments may have more than one balcony.



Occupants express their personality with how they embellish their balcony. Many have their barbecue; while others exhibit an array of robust and heavy pot plants. Aesthetically speaking, the design and placement of pot plants are arranged to appease the spouse and/or the building's exterior governance.

While the balcony space is small, it does offer a place to socialise and connect with the outdoor climate while enjoying your garden oasis. However, balconies are prone to elevated wind speed. Wind in a linear flow across a flat and open area is very good for

consistent sailing. However, when the wind strength increases and hits upright buildings, the wind takes a path around and in-between them with increased velocity. This creates a damaging vortex that could damage unprotected plants, and even suck the plants and balcony furniture off the balcony! This is a very powerful show of force from Mother Nature. In extreme weather, it will blow the dog off its chain, orchids and my husband's bonsai over, again and again. That's a very efficient clearance sale! Balconies can be very susceptible to unpredictable storms. Orchids on open balconies during extreme weather events are too fragile to survive.

Protection is essential. Shield the plants from excessive sun, rain, wind and chemical cleaning liquids from balconies above. Consider a specially built clear polycarbonate cabinet on castors, to enable the cabinet to be moved for better shelter. The cabinet can be turned 90 or 180 degrees for equal environment exposure.

Since my husband implemented this prototype cabinet, all plants have survived healthily since the inception of this methodology. That's four years of extreme conditions: bush fire, drought, heatwave, and water restriction. Our split-system air conditioner was very useful for harvesting the water from the condensation drainage. During the last four years, on many occasions, I battened down the hatches, and secured the cabinet away from the balustrade, to protect the plants from predicted extreme weather. I now have three of these cabinets on my balcony, for further observation into the near and distant future.

The long term vision is to grow flowering orchids on a small balcony, and indoors. As the balcony project has met and exceeded my expectation; my main focus now is a better understanding on how to grow orchids that flower indoors.



Cabinet

2 = Lid,



Balcony cabinet

Polycarbonate Cabinet (to filter harmful ultraviolet light) <u>Components</u>

1 = Bottom,

3 = Sides, 4, 5, 6, & 7 = Sliding Doors, 8 = Sliding Shelf.

Indoors

It has now been some years since I stepped away from the balcony project. My living room project concentrates on growing orchids in a small space in the living room. This indoor

project offered a different and happier environment with no more chemicals, extreme weather, insects and pests. Many orchids are placed on the window sill or bay windows. Small apartments do not have this luxury. Placing a small stand near a window is an instinctive choice as a growing area. However, the sun and its ultraviolet radiation, without any airflow is harmful for most plants.

After years of accumulating results from my research and endeavours, I invited Mother Nature to reside with me indoors. When this invitation was declined, it became apparent that I would need to artificially provide the appropriate airflow, climate and light. Instruments need to play a vital role to show accurate information about my small indoor growing zone.

- Airflow. Continuous fresh and clean air is a must, to prevent orchid disease problems. Fresh moving air improves gas exchange through leaf pores, and around the roots. This process is required for the plant's metabolic processes to proceed. Proper air movement prevents fungal and bacterial problems on my orchids; and beats using chemicals.
- a) Air conditioner.

A reverse cycle split-system air conditioner that provides premium air quality with humidifying/dehumidifying the air; ventilation and air purification with a Hepa filter is very beneficial for plant life and asthmatics.

b) Anemometer.

An anemometer is an instrument that measures wind speed. Use telltales to see that the air is flowing.

c) Case fan.

12 volt directional slow speed quiet fans in the growing chambers are a must.

d) Ceiling fan.

A ceiling fan is very effective for when the air conditioner is not required.

d) Tell-tales.

A piece of yarn, fabric or lightweight material attached to a surface to provide a visual airflow movement: dearly loved by most sailors.



Case Fan

Tell-tales

2) **Climate.** The climate of my geographical area of Lake Macquarie is humid subtropical. The seasons shift from mild and cool in winter, to warm and hot in the summer. There are no extreme seasonal differences, as the weather is moderated by proximity to the ocean.

An indoor climate is more than just indoor air. The indoor climate is comprised of, for example, the temperature, air humidity, and carbon dioxide level.



Good quality of the indoor climate is of great significance for both the occupants and plant life. A good indoor climate is not too dry, nor too humid. It is free of unpleasant smells, stuffy air, and extremely high carbon dioxide content. The indoor temperature is not excessively

hot or cold. This is regardless of the external conditions. The quality of the indoor climate is maintained with ventilation.

It is well understood from prior teachings that increased concentrations of carbon dioxide increases photosynthesis; stimulating plant growth. Raised carbon dioxide concentrations in the air can be beneficial for plants.

A carbon dioxide (CO2) handheld portable gas detector showed that the carbon dioxide level indoors was higher near my indoor orchids than on my balcony. This instrument also displays the humidity and temperature reading.

3) **Light.** All living plants need a light source for energy. This energy is usually provided by daylight or sunlight and enables photosynthesis to occur. A light meter shows the variation between sunlight, shade, overcast and indoors. The visible light spectrum of violet, blue, green, yellow, orange

and red; plus unseen ultraviolet and infrared radiation produces white light. Some of the light spectrum can be seen in a rainbow. Indoor LED grow lights use a combination of these colours; predominantly red and blue at a ratio of 5:1 to 9:1.

There is a lot of written material in the public domain that cites the use of grow lights; including the duration, the colour and the intensity. I use 12 volt LED grow lights in a circuit that does not require a cooling fan. I'm also trialling professional grow lights from the commercial sector; even though they have cooling fans which are very quiet. At this stage, I am leaning towards the commercial units as they have a better light intensity. The plants like the correct light. They will tell you so, by standing up to be counted.



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All living plants need a light source of energy to enable photosynthesis
Approximate Visible Spectrum Wavelength in nanometers



The aesthetically pleasing, unique, small mobile stands have been assembled from aluminium tubes with lights over the orchids. The orchid pots are held by the holder

above a wet drip tray. This facilitates airflow, moisture and humidity under the orchid. These LEDs also provide enough room light at night. The stand assembly is only tethered by an electrical cord when light is required. The castors allow easy movement of the stand around the house.



White light stand

Grow light stand

This methodology has produced repeat-flowering orchids. As I write this essay, I have encyclia, sarcochilus and phalaenopsis in flower. There are several other sarcochilus spiking, even though this is not the natural time. This confirms that the "chamber theory" is successful.

As growing space is at a premium, compact native sarcochilus plants are preferred. However sarcochilus require an overnight temperature drop that is beyond my natural indoor climate. After months of research, I purchased a commercially available cooling unit. The footprint of the cooling unit is about one third the size of a standard dining table, which I have christened GLIC. It has been retro-fitted with a LED grow light, two small case fans, and an outlet on each side to remove stale air, as fresh air is taken in from the



A white Perspex sheet covers the front, back and sides and reflects grow light. Airflow onto the plants, raises the CO2 level and humidity. The chamber also keeps out any pesky insects; a great bonus. As a rule, we rarely get insects indoors, and no nasty cockroaches. There is a drip and humidity tray made of clear Perspex to complement the transparent cabinet; and pot holders incorporated to maximise the number of orchids (now an obsession). The GLIC is on a stand and can be moved around if required.

For sarcochilus, I use the cooling cycle on GLIC to reduce the overnight temperature during winter to help initiate flowering. This would apply to any type of orchid you choose to grow in the chamber. One of my friends said she loves visiting the "house of intrigue"

and then started wheeling my chamber to the door.



While this presentation is not fully exhausted, it does offer an insight into my small growing spaces. These are the balcony cabinet, the indoor stand and GLIC (growing chamber). The GLIC incorporates airflow,

climate, light, and cooling; all in one integrated standalone, transparent mobile cabinet. Itisa small indoor growing space that is separated from the outside weather. During recent times, extreme heatwaves have damaged orchids outside; while mine continued to thrive indoors.

The GLIC provides a small indoor living garden, in plain sight all year-round. It embellishes the room's décor, and is of great intrigue to visitors. Most importantly, caring for this small indoor garden is a great interest and hobby. It has proven to be most helpful during the coronavirus self-isolation.

Should you require further information, please do not to hesitate contact me through my website: <u>www.lnDoorOrchids.com.au</u>

Orchids Enthusiast, Kate Collins of Belmont NSW