

'Cymbidium Chatter'

Edition 14 - July 20 2020



Cymbidium Mesmerise 'Looby Loo'
Photograph: 3 Amigos

Welcome to this edition of Cymbidium Chatter. Unfortunately the news regarding the COVID-19 situation is not getting any better and I doubt that any Orchid Societies will be conducting Spring Shows. My own judging schedule has been wiped out, so I guess I'll just have to enjoy my own flowers this season.

I'm sure that many growers will miss the trading tables and vendors at Spring shows, there are always plenty of Cymbidiums to purchase. So what do growers who are looking to increase the number of plants they have, do during these unprecedented times. Fortunately we have a number of nurseries throughout Australia who have an online presence and who regularly post plants through Australia Post or couriers. Choose wisely and I'm sure you will not be disappointed with any purchases you make. I have made a few purchases in recent times and I can only express my complete satisfaction with the quality of the plants received and the service provided. My most recent addition to my collection was from a private grower in Queensland, a very large, healthy Cymbidium *dayanum* alba. Communication with the seller was first class, the packaging of this large plant could not have been better, the health of the plant was exceptional and for once Australia Post delivered, getting the plant from Gympie to Melbourne in near record time. My other main purchase (not Cymbidiums) this year was from Barrita Orchids, New South Wales. Once again, I could not have been happier with all aspects of this transaction. Healthy plants, outstanding service, great packaging and another tick for Australia Post. These are just two experiences I have had recently but in the past I have bought plants from Ezi-Gro Orchids, Springfield Orchids, Bryants Orchids (flasks of Greg Bryant's Cymbidium seedlings from Pauline's Laboratories, South Australia) and they have all delivered quality plants and service. So if you are feeling a bit down, brighten your day and buy some plants from one of the many reputable nurseries throughout Australia - I know you will not be disappointed!

Please remember to send me any photographs of plants as they begin to flower. I would be very interested in receiving photographs of new seedlings, who knows we may even be able to set-up a competition for the Best Seedling 2020.

In this edition Joshua White continues with his excellent articles about viruses in Cymbidiums, the fourth and last instalment will be included in next week's CC.

As I complete this week's edition, a bit late this week, there is a promising report from Oxford, UK, regarding a vaccine for COVID-19. Let's hope the early indications of it eliciting an immune response, are indeed correct, as this would certainly allow us to return to some sense of normality in the future! Stay safe and well - happy growing!

— Orchid Viruses —

By Joshua White

Part 3: CymMV and ORSV

In the first two parts of this series, I covered some steps every orchid grower can take to reduce the risk of introducing and spreading viruses in their collections, as well as information on getting plants tested. It is worth knowing a bit more about how these viruses work and the threat they pose, though, so in this part we will take a closer look at two of the viruses that the Cymbidium grower is likely to encounter, especially in older collections.

Cymbidium Mosaic Virus (CymMV)

CymMV is one of the two viruses that are likely to be found in old *Cymbidium* collections. However, it can infect a wide range of genera (*Cattleya* Alliance, *Dendrobium*, *Phalaenopsis*, *Vanilla*, etc.) and symptoms differ depending on the genus.

The virus is a member of the *Potexvirus* genus and there are at least two known strains (Moles et al 2007); Agdia's test strips were updated in 2011 to detect both strains. It is the quickest of the three viruses to become systemic (i.e. present throughout the infected plant), taking only a matter of weeks to do so (Hu 1994). This means that it can spread throughout a collection quite quickly if good plant hygiene is not observed. It can transmit via the pollen of an infected host plant (Koh et al. 2014) and there is also a confirmed insect vector (Allen 2010, 2012) – *Periplaneta australasiae*, or the Australian cockroach! It has been established that it does not transfer via seed for *Dendrobiums* (Porter, et al. 1996), so it may be possible to sterilise dry seed from an infected mother plant and get virus-free seedlings (I would still be very cautious with this approach, however).

I have only encountered this virus once (in a plant grown from a backbulb) and it was asymptomatic, so I have no photos of confirmed symptoms to provide as a reference. However, I did note that the infected plant had not grown as vigorously as the other backbulbs from the same collection (which all tested negative). One point of interest is that all the plants in this group had been kept together for almost two years before I got around to testing them; this suggests that as long as pests are controlled and hygiene measures maintained (refer to Part 1), the risk of the virus transferring between adjacent plants is very low (the neighbouring plants were retested about two months after the removal of the virused plant to confirm that they had not been infected). This is only a single case, though, so it shouldn't be taken as proof that CymMV cannot transfer between adjacent plants by direct contact.

Odontoglossum Ringspot Virus (ORSV)

ORSV is the Orchid virus I have encountered most and my guess is that it is the most prevalent virus in older collections in Australia. In my opinion, it is the worst of the three and I'll explain why.

ORSV is a member of the *Tobamovirus* genus, along with other plant viruses such as Tobacco Mosaic (TMV) and the various Cucumber Mosaic/Mottle viruses. Many of these viruses are incredibly stable and can remain viable outside a host for years (Inouye 1966; Coutts et al. 2013). The longest study specific to ORSV that I am aware of demonstrated that it remains viable (and hence capable of infecting plants) for **at least two years on surfaces**, but other studies indicate *Tobamoviruses* can last more than a decade under the right conditions.

It is thought to be quite resistant to UV-C radiation, which is the germicidal ultraviolet wavelengths that generally do not reach the earth's surface. The related TMV requires an exceptionally high level of UV-C to destroy it (American Air and Water n.d.) – 440000 μ Ws/cm², which is ~10x greater than anthrax and ~66x greater than influenza! ORSV also has a high thermal inactivation point (around 95°C), significantly above the temperature of residential hot water. This extreme stability outside a host means that thorough and consistent hygiene measures are essential to prevent the spread of ORSV. The most common way plants are infected is through tools or pots, but pests are also thought to transfer the virus.

ORSV is the most infectious of the three viruses, infecting up to 80% of the plants exposed to it. It is capable of infecting the pollen of host plants as well and is known to transfer to other plants this way (Hamilton & Valentine 1984; Koh et al. 2014), so any ORSV-infected plant should never be used in breeding. It takes up to seven months to become systemic (Hu 1994), which is both good and bad – it is slower to travel through a collection, but it also means you need to wait seven months after a plant has potentially been exposed before you can test it without the risk of a false negative result.

To make matters worse, the symptoms are highly variable and plants can even be asymptomatic (Pearson & Cole 1986) or only show symptoms on one or two leaves on the entire plant (a common occurrence in my experience). Often the nature of the symptoms means that they can be obscured by environmental or fungal damage as well. Infected plants will not grow as well and may not even bloom.

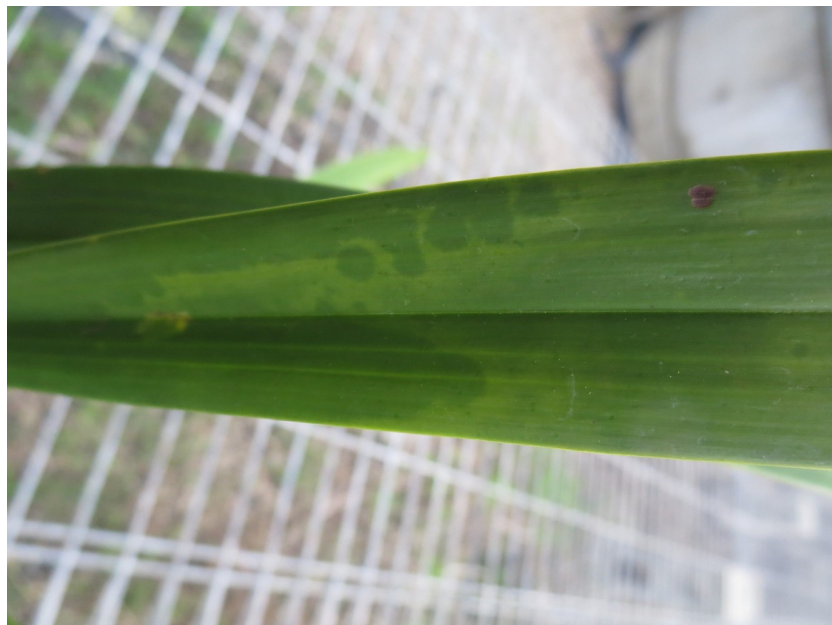


I have never seen rings or circular necrotic patterns in Cymbidiums that were confirmed to result from ORSV, so do not expect them just because of the name of the virus. Most of the confirmed infections I have seen show a mix of chlorotic markings (lighter green-yellow patches on the leaves, sometimes in the shape of a “V”) and necrotic lines (dead, black or brown tissue). Intriguingly, the placement of the necrotic lines has been quite consistent and I suspect may be a good visual indicator of ORSV – necrosis occurs as patches or solid bands down the middle of one or both halves of the leaf (not down the middle fold of the leaf, nor on the edges of the leaf, as shown in the previous photos).



I have only seen the aforementioned “V” chlorotic mark once. It is shown above (left); above right shows the single symptomatic leaf on a different plant that tested positive for ORSV.

Nado Lenkic (of Springfield Orchids, Western Australia) kindly provided this photo of ORSV symptoms showing more circular chlorotic markings. In my experience, this is not common, but can occur.



In the Next Part...

The final part of this series will cover Orchid Fleck Virus, a more recent introduction into Australia.

References

Allen, C., 2010. *Virus Transmission in Orchids through the feeding damage of the Australian cockroach, Periplaneta Australasiae*. Acta Horticulturae, (878), pp.375–379. Available at: <http://dx.doi.org/10.17660/actahortic.2010.878.47>.

Allen, C.D., 2012. *Transmission of Cymbidium Mosaic Virus in Oncidium Orchids by Periplaneta australasiae*. Masters in Science. Faculty of the Graduate School of the University of Maryland, College Park. Available at: https://drum.lib.umd.edu/bitstream/handle/1903/13664/Allen_umd_0117N_13659.pdf.

American Air and Water, UV Irradiation Dosage Table. American Air and Water. Available at: <https://www.americanairandwater.com/uv-facts/uv-dosage.htm> [Accessed April 20, 2019].

Coutts, B.A., Kehoe, M.A. & Jones, R.A.C., 2013. *Zucchini yellow mosaic virus: Contact Transmission, Stability on Surfaces, and Inactivation with Disinfectants*. Plant disease, 97(6), pp.765–771.

Hamilton, R.I. & Valentine, B., 1984. *Infection of orchid pollen by odontoglossum ringspot and cymbidium mosaic viruses*. Canadian journal of plant pathology. Revue Canadienne de phytopathologie, 6(3), pp.185–190.

Hu, I.S., 1994. *Transmission, Movement, and Inactivation of Cymbidium Mosaic and Odontoglossum Ringspot Viruses*. Plant Disease, 78(6), p.633. Available at: <http://dx.doi.org/10.1094/pd-78-0633>.

Inouye, N., 1966. *A Virus Disease of Cymbidium Caused by Odontoglossum Ringspot Virus*. Reports from the Ōhara Institute of Agricultural Biology, Okayama University, 13(3). Available at: http://ousar.lib.okayama-u.ac.jp/files/public/4/49987/2016052809564197652/boi_013_003_149_159.pdf.

Koh, K.W., Lu, H.-C. & Chan, M.-T., 2014. *Virus resistance in orchids*. Plant science: an international journal of experimental plant biology, 228, pp.26–38.

Moles, M. et al., 2007. *Evidence that Cymbidium mosaic virus (CymMV) isolates divide into two subgroups based on nucleotide diversity of coat protein and replicase genes*. Archives of virology, 152(4), pp.705–715

Pearson, M.N. & Cole, J.S., 1986. *The Effects of Cymbidium Mosaic Virus and Odontoglossum Ringspot Virus on the Growth of Cymbidium Orchids*. Journal of Phytopathology, 117(3), pp.193–197. Available at: <http://dx.doi.org/10.1111/j.1439-0434.1986.tb00934.x>.

Porter, K.G., Kuehnle, A.R. & Hu, J.S., 1996. *Lack of seed transmission of cymbidium mosaic virus in Dendrobium*. Lindleyana: the scientific journal of the American Orchid Society, 11(4), pp.211–213.



One of our favourites, Mesmerise 'Looby Loo', gets better with age, first of 4 spikes to open up.

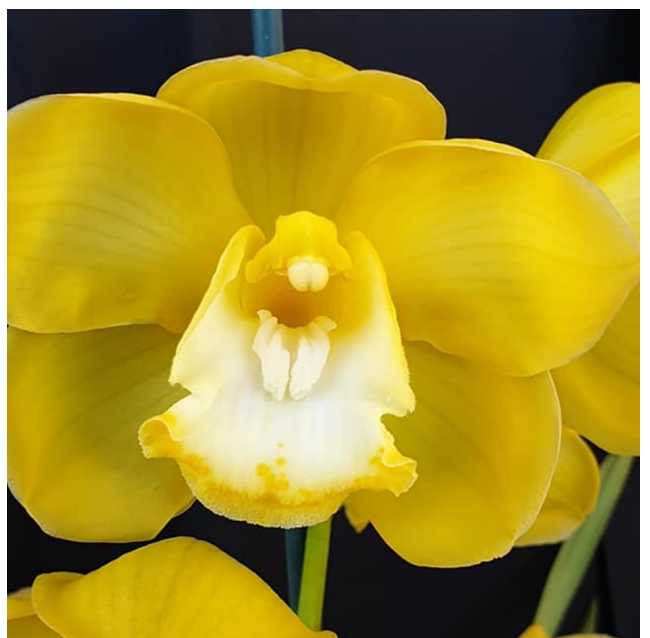
The 3 Amigos

Chee, John and Shane, the 3 Amigos, continue to post some great photographs on their Facebook page. South Australia is fortunate in that orchid clubs/societies are able to conduct Winter shows and plan for their Spring shows.

The 3 Amigos always have a strong presence in the main shows and here we have two excellent flowers. The pure color on the right is extremely vibrant and for a first flowering seedling it has huge potential.

Photographs: 3 Amigos

All contributions, articles and photographs to Geoff Bailey at grb17@bigpond.com



First flowering seedling (Albryant x Mem. Patsy Bauman) x Purely Dreaming