

REEF HOBBYIST

M A G A Z I N E

SECOND QUARTER 2026 | VOLUME 19

SAVING FLORIDA'S REEFS



**AQUASCAPING PRINCIPLES
THAT MAKE A DIFFERENCE**



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SIGNS, DISEASE PREVENTION, AND
INTERVENTION**



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METEOR SHOWER CYPASTREA

A popular, fast-growing encrusting coral known for its bright orange-red polyps on a teal-blue base. It is considered a hardy aquacultured coral that thrives in low to moderate light and flow, making it ideal for lower reef tank positions. Lit with DALUA Illumagic X4 LED light fixtures.



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 - New Jersey- September 12-13, Edison, NJ
 - Chicago - September 26-27, Chicago, IL
- Reef-A-Palooza www.reefapaloozashow.net
 - New York - June 6-7, Secaucus, NJ
 - California- August 29-30, Anaheim, CA
- Reef Retreat www.reefretreat.org
 - June 5-7, Bristol, RI
- Southern Aquatic Experience www.southernaquaticexperience.com
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A LETTER FROM OUR EDITOR

As you bask in summer's warm rays and embark on those much-needed vacations, we hope you take a moment to reflect on your reefkeeping journey and engage with fellow reefers. Our reefing community is brimming with opportunity this season: hobbyist conventions span the nation; incredible content is surfacing online; and traditional hobbyist enrichment continues to bring joy through print publications like Reef Hobbyist Magazine.

Speaking of community- the RHM team would like to express our gratitude for the abundance of excitement and warmth extended to us during our relaunch. We could not have asked for a better reception. From our readers to our advertisers and distributors, we truly felt the love. We relished in your passion for our vibrant, educational content and our commitment to a free model that offers the best of both worlds: easy access to beautiful photography and expert information with no paywalls, supported by advertisers who value reciprocal community growth.

We hope RHM's Q2 edition provides you with the same magic we felt from all of you during our relaunch. Once again, we bring you hobbyist journeys from across the globe including Dutch hobbyist Danny's saltwater paludarium and California-based reefer Tyler Drehobl's carefully curated home aquarium. In addition to these great hobbyist stories, Q2 delves into the science of saving a coral on the brink of extinction, offers expertise on pest and disease control, and supplies a lesson in hardscaping from international award-winning aquascaper Luís Cardoso. What a lineup!

As you read up and dive into summer in search of the perfect products to make your reef tank dreams come true, we ask that you support your local fish stores and the advertisers who keep RHM's more than 160,000 printed copies FREE at over 1,300 local fish stores in the U.S., Canada and Australia each year.

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With your incredible support, we can proudly say that RHM is the magazine the entire hobby is reading!

Happy Reefkeeping,

Julie Shingadia

Editor-in-Chief, Reef Hobbyist Magazine



The Glass Jungle: A Dutch Hobbyist's Unconventional Saltwater Paludarium

STAFF WRITER

At just 23 years old, Danny has already spent nearly a decade documenting his journey through the aquarium hobby. Based in the Netherlands and known online as Danny's Aquariums, he has built a loyal following since 2015 by sharing the evolution of his setups, each one pushing a little further beyond the traditional boundaries of fishkeeping.

What began as simple freshwater tanks filled with guppies gradually evolved into nano reef systems, and ultimately into something far

more ambitious: a saltwater paludarium that blends the worlds of reef aquariums and terrestrial plant life into one cohesive ecosystem. It's a system that reflects not only his experience, but also his willingness to experiment.

Danny's current setup is as unconventional as it is striking. Built using a 100" x 22" x 12" glass aquarium, the system sits atop reinforced IKEA kitchen cabinets, modified with large wooden beams underneath for structural integrity, replacing the standard



cabinet feet. Lighting plays a crucial role in the success of the paludarium. The system is powered by five Illumagic X4 LED fixtures from DALIA International. One unit is dedicated to plant growth, featuring a freshwater spectrum with narrow lenses and mounted higher toward the ceiling. The remaining four are tuned to a reef spectrum, illuminating the underwater environment.

The lighting schedule is consistent across the system: sunrise begins at noon, sunset at 9 PM, and full darkness at 10 PM. The plant-focused light runs a balanced spectrum with red, green, and broad daylight channels, while the reef lights rely heavily on broad daylight output, deliberately avoiding heavy blue or UV emphasis.

Perhaps the most surprising aspect of Danny's system is what it doesn't include. There is no sump, no protein skimmer, and no reactors. Instead, the aquarium relies on three internal return pumps positioned between the rockwork, supported by three powerheads for circulation. A canister filter—running completely empty—serves a unique purpose: surface skimming, heating, and additional flow. Acting almost like an overflow, it helps prevent biofilm buildup without introducing filtration media.

Despite the absence of traditional reef equipment, the system remains stable. With a livestock composition focused primarily on macroalgae, mangroves, and soft corals, with only a handful of LPS corals, the demand for calcium, alkalinity, and magnesium is minimal. As a result, Danny does not dose these elements. Instead, stability is maintained through small, consistent weekly water changes.



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From the outside, many assume a system like this requires constant attention. In reality, Danny's maintenance routine is refreshingly simple. Each week, he performs a water change of approximately two jerrycans (around 13 gallons). Given that the aquarium is located in the attic, this routine doubles as a bit of a workout. The process itself takes between 30 minutes to an hour.

Maintenance begins with cleaning the glass using a Flipper magnet cleaner, done weekly to prevent algae from becoming difficult to remove. Excess macroalgae, particularly the fast-growing *Caulerpa* species, is manually removed without much precision. "It grows so fast," Danny notes, making frequent trimming more practical than careful pruning.

A turkey baster is then used to blow detritus off rocks and algae, allowing debris to be removed during the water change. Pumps remain running throughout the process, keeping everything simple and efficient.

On a monthly basis, Danny services his pumps, cleaning intakes with a toothbrush to ensure smooth operation. Daily care is minimal, taking no more than five minutes. It consists of misting the plants with RO water (occasionally supplemented with freshwater plant fertilizer, carefully applied to avoid contamination) and feeding the fish a mix of frozen, live, or dry foods.

The aquarium is home to a diverse and thoughtfully selected group of fish. Pairs of clownfish, filefish, Fridmani's dottybacks, Royal Grammas, Banggai cardinals, and pajama cardinals create a sense

of symmetry and balance. A Tomini tang and a multibar angelfish add movement and contrast, while a group of around 20 Trimma and Eviota gobies brings life to the finer details of the aquascape. Together, they inhabit a system that blurs the line between reef and jungle: corals and macroalgae below, mangroves and terrestrial plants above.

Despite its success, Danny already has plans for the future. He intends to rebuild the system, applying everything he has learned while incorporating features he originally envisioned but never implemented, such as tidal simulation and a rain system.

One of the main challenges he faces now is the rapid growth of mangroves. Their leaves are beginning to block significant amounts of light, and due to the sloped ceiling of the attic, adjusting the lighting only offers a temporary solution.

A redesigned layout could position the mangroves at the center of the system, where ceiling height is greatest. This would allow them to grow into fuller, more structured trees without interfering with light distribution.

Additionally, an automated misting or rain system would improve conditions for the terrestrial plants, particularly mosses that currently dry out quickly under the intense lighting.

For now, however, Danny's focus is shifting toward a new project: a dedicated saltwater fish room. As that develops, the current paludarium will gradually be dismantled, its livestock relocated, and its lessons carried forward into the next evolution of his work.

What makes Danny's approach stand out is not just the uniqueness of his setup, but the philosophy behind it. By stripping away complexity and focusing on balance, observation, and consistency, he demonstrates that even the most ambitious systems can remain approachable.

In a hobby often defined by equipment and precision, Danny's saltwater paludarium is a reminder that creativity and a willingness to experiment can be just as powerful.

List of equipment:

5x Illumagic X4 LED lights from DALUA International:

- 1 of which is a freshwater spectrum with narrow lenses situated higher up on the ceiling to light the plants.
- 4 reefer spectrum

2x Oase OptiMax 800 (full power)

1x Oase OptiMax 300 (full power)

3x AI Nero 3 (at ~50%)

1x Oase Biomaster Thermo 850 Canister Filter. 

 Follow Danny on Instagram @dannyaquariums





TRACHYPHYLLIA – SEVERE TISSUE RECESSION

Macro of advanced tissue recession on a fleshy LPS with significant exposed skeleton

TISSUE RECESSION

- Extensive tissue pulling back
- Large areas of bare skeleton
- Tissue thinning and loss of attachment

EXPOSED SKELETON

- White/gray skeleton fully exposed
- No tissue coverage
- Highly vulnerable to further damage and infection

DEAD TISSUE / JELLY

- Patches of dead tissue and brown jelly
- May indicate RTN/STN progression
- Risk of spreading to remaining tissue

COMMON CAUSES

- Poor water quality
- Aggressive chemicals
- Physical damage
- Lighting stress
- Infection or pests

WHAT TO DO

- ① Improve water quality immediately
- ① Stabilize parameters (alk, Ca, Mg, NO₂, PO₄)
- ① Reduce stress (light, flow, handling)
- ① Dose iodine and coral supplements
- ① Monitor daily and act fast
- ① Consider fragging healthy tissue if possible

LPS CORAL DECLINE: WARNING SIGNS, DISEASE PREVENTION, AND INTERVENTION

SCOTT SHILES

Imagine a torch coral at dusk in a mature reef tank. Its long, elegant polyps sway like sea anemones in a gentle current, glowing electric green and purple under moonlight LEDs. The colony looks alive—almost breathing, a living sculpture that turns any aquarium into a miniature ocean masterpiece.

Then, days later, something shifts. The polyps tighten. The once-luxuriant tissue thins. A faint brown slime appears at the base of a head. Within hours, what was thriving begins to melt into a viscous jelly. The reefer watches helplessly as a prized specimen, sometimes worth hundreds of dollars, slips away.

This is the quiet tragedy of Large Polyp Stony (LPS) coral decline. Torch corals, hammer corals, frogspawn, octospawn, Trachyphyllia, Wellsophyllia, Lobophyllia, Acanthophyllia, Cynarina, and Goniopora

rank among the most coveted animals in the hobby for their movement, texture, and sheer presence. Yet they are also among the most frustrating. Their decline is rarely sudden. It unfolds in stages, often masked as “normal adjustment” until the damage is irreversible.

After more than four decades keeping reefs, from my first tanks in 1984 through thousands of specimens selected and observed in both retail and online settings, one pattern stands clear: most LPS losses are not mysterious. They are preventable.

Disease or pest damage is seldom the primary culprit; it is the final act in a drama that begins with stress, injury, or overlooked husbandry. Learning to read these corals like a naturalist reads wildlife— noting the slightest change in posture, inflation, or color— turns frustration into success.

WHY LPS CORALS ARE ESPECIALLY VULNERABLE

LPS corals span a diverse group: branching Euphyllia with their long, flowing tentacles; solitary fleshy corals like Trachyphyllia and Cynarina that balloon like living balloons; brain-like Lobophyllia; and the polyp-heavy Goniopora. What unites them is an abundance of exposed living tissue—far more than the small polyps of SPS corals. This tissue is a marvel: it hosts symbiotic zooxanthellae for energy, secretes a protective mucus layer, and expands dramatically to feed and photosynthesize.

But that same exposed tissue is fragile. Direct flow abrades it. Sharp rock tears it. A neighbor's sting or a sudden lighting spike can cause it to retract, weakening the animal. Shipping stress, nutrient swings, or parameter instability further compromise the mucus barrier, opening the door for opportunistic bacteria (such as Vibrio species) or protozoan ciliates. The result is a common sequence: stress first, visible disease or pest damage second.

THE FIRST SIGNS OF TROUBLE MOST HOBBYISTS MISS

The earliest warnings are subtle—the coral equivalent of a wild animal's change in behavior.

In branching Euphyllia (torches, hammers, frogspawn, octospawn), polyps may shorten, lose their relaxed sway, or appear clenched. A colony that once danced in moderate flow now looks tense. Color may dull slightly before any recession appears.

Fleshy corals such as Trachyphyllia, Wellsophyllia, Cynarina, Acanthophyllia, and Lobophyllia, signal through inflation. Healthy specimens look plump and turgid. Early decline shows up as pinching, wrinkling, or thinning over the skeleton. Feeding response weakens and the coral no longer expands consistently from one day to the next.

Goniopora often provides the longest early warning: patchy or reduced extension, uncoordinated polyp movement, or a gradual loss of fullness.

Catching these cues gives the reefer precious time. Waiting for obvious tissue loss usually means the battle is already uphill.



What Really Bugs you ?

Whatever it is, a good bath will take care of it. **ReVive Coral Cleaner™** is a new type of coral dip solution developed by Julian Sprung. Its formula is based on powerful plant extracts, but it isn't harsh on coral tissues the way iodine-based dips are. For coral dipping prior to acclimation to aquariums, for rinsing prior to shipping, and for dipping newly fragmented corals, such as at coral farming facilities.



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THE MOST COMMON REASONS LPS CORALS DECLINE

Husbandry lies at the root of most problems. Excessive direct flow creates mechanical stress on delicate tissue. Overly intense lighting, especially post-shipment, can photo-inhibit the zooxanthellae and weaken the coral. Poor placement, such as tissue rubbing rock or neighboring colonies, causes chronic abrasion. Parameter instability (alkalinity swings, salinity fluctuations, and temperature spikes) adds cumulative stress. Even acclimation after shipping can create invisible wounds that surface later.

These stressors erode the coral's natural defenses, allowing secondary issues to take hold.

BROWN JELLY DISEASE: THE AGGRESSIVE MELTDOWN

Brown jelly disease (often called BJD) is the nightmare most LPS keepers fear. It strikes Euphyllia hardest but can affect other fleshy corals. The signature symptom is a brown, slimy, jelly-like mucus enveloping dying tissue. This is the result of rapid necrosis driven by opportunistic bacteria (commonly Vibrio) or ciliates that proliferate once the coral is stressed.

Immediate action is critical.

Remove the coral from the display tank to prevent spread.

In a separate container, gently siphon or blow off loose necrotic material with a turkey baster.

Surgically excise dead or infected tissue using a fresh razor or scalpel sterilized in 3–6% hydrogen peroxide.

Dip the coral in an iodine-based solution (Lugol's or diluted povidone-iodine/Betadine at light-tea color strength) for 15–60 minutes, monitoring closely for stress. Many successful recoveries also incorporate a short hydrogen-peroxide bath (3–6% for 5–15 minutes) or commercial coral-safe dips.

For severe cases, a brief quarantine treatment with ciprofloxacin (approximately 0.125 mg/L, prepared from a veterinary or aquarium-grade source and dosed over 3–6 days in an isolation tank) has shown dramatic results in hobbyist reports when combined with the above steps.

Return the coral to a low-flow, stable quarantine or recovery tank with gentle indirect lighting and regular small feedings once stable. The key: address the underlying stressor (flow, placement, parameters) or recurrence is likely.

TISSUE NECROSIS (RTN AND STN): THE CREEPING OR SUDDEN COLLAPSE

Rapid Tissue Necrosis (RTN) can strip tissue in hours; Slow Tissue Necrosis (STN) advances over days or weeks. Both appear as

retreating margins or white skeleton exposure, often starting at the base. While more common in SPS, they occur in stressed LPS when protozoans (such as *Philaster* species) or secondary bacterial infections exploit weakened tissue. Early RTN and STN detection and removal of affected areas improve survival dramatically.

Treatment protocol:

- Isolate the coral.
- Perform the same cleaning and iodine/hydrogen-peroxide dip as for brown jelly.
- In stubborn cases, a short antibiotic dip (amoxicillin or similar in a controlled quarantine bath) combined with excellent water quality and targeted feeding can support regrowth.
- Address root causes: stabilize alkalinity and calcium, reduce detritus at the base, and ensure moderate flow without direct blasting.

OTHER BACTERIAL AND PROTOZOAN INFECTIONS

General bacterial necrosis or ciliate infestations may not produce obvious “jelly” but show as patchy recession, foul odors, or rapid color loss. Protocols mirror those above: isolation, mechanical cleaning, iodine dips, and—when indicated—short antibiotic courses

INDOPHYLLIA CORAL RECOVERY JOURNEY

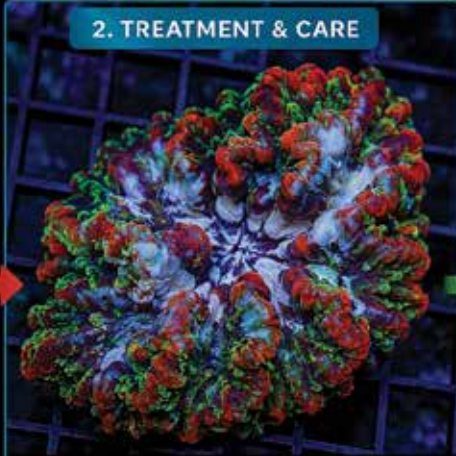
DAMAGED → **TREATMENT & CARE** → **FULL RECOVERY**

1. DAMAGED



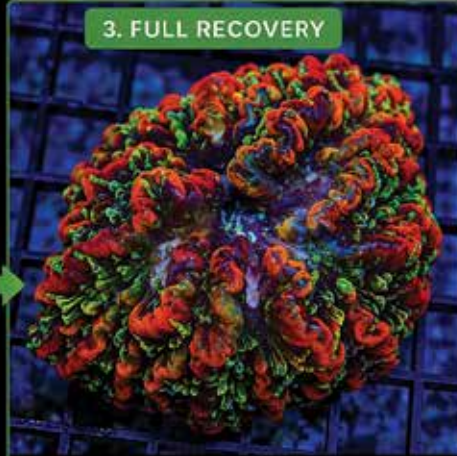
- ❗ Tissue recession and loss
- ❗ Dull, faded coloration
- ❗ Exposed skeleton in areas
- ❗ Irritation / inflammation
- ❗ Stress from poor water quality or instability
- ❗ Vulnerable to further damage and infection

2. TREATMENT & CARE



- ✅ Improved water quality
- ✅ Stable parameters
- ✅ Target feeding & flow adjustment
- ✅ Regular monitoring
- ✅ Patience and consistent care

3. FULL RECOVERY



- ✅ Full, thick, and inflated tissue
- ✅ Vibrant, intense coloration
- ✅ Strong attachment and growth
- ✅ Thriving and healthy colony
- ✅ Resilient and dominant in the reef

“ With early detection, proper intervention, and stable husbandry, even challenged LPS corals can return to full glory. ”

BRIGHT ORANGE TORCH CORAL

SUFFERING RTN FROM BROWN JELLY

CLOSE-UP SEQUENCE

1. BROWN JELLY BEFORE TREATMENT



- ❗ Brown jelly covering tissue
- ❗ Tissue recession at the base
- ❗ Tentacles deflated and discolored
- ❗ Active RTN progression

2. AFTER TISSUE REMOVAL



- ✓ Brown jelly and dead tissue removed
- ✓ Exposed skeleton cleaned
- ✓ Healthy tissue line remains
- ✓ Ready for healing

3. EARLY RECOVERY



- ✓ Tissue regrowth around the base
- ✓ Tentacles fuller and extending
- ✓ Color improving
- ✓ Healing well - continue stable care

💡 TIP: Act fast with brown jelly. Remove it completely, support water quality, and maintain stable conditions for the best recovery.

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BRIGHT RED GONIOPORA

HEALTHY vs. STRESSED COMPARISON

✓ HEALTHY



- ✓ Polyps fully extended day and night
- ✓ Vibrant, uniform red coloration
- ✓ Firm, turgid tissue
- ✓ Strong attachment to rock
- ✓ Good water flow and stable parameters

⚠ STRESSED



- ⚠ Polyps retracted, especially during daytime
- ⚠ Dull or patchy coloration
- ⚠ Tissue appears loose or thinning
- ⚠ Base may show recession or detachment
- ⚠ Often caused by poor water quality, inconsistency, low flow, or chemical irritation



TIP: Keep stable parameters, moderate flow, and target feed to promote extension and color.

in quarantine. Prevention, like stable husbandry and prophylactic dipping, is far more effective than cure.

PESTS: HIDDEN THREATS TO LPS CORALS

LPS corals attract fewer specialized predators than SPS, but several pests still cause chronic stress.

Euphyllia-eating polyclad flatworms (small, camouflaged worms) can riddle torches and hammers. Vermetid snails secrete irritating tubes. Hydroids and small predatory worms colonize bases. Nuisance flatworms or pyramid snails may opportunistically feed on weakened tissue.

Management:

Inspect and dip every new coral thoroughly (iodine-based dips excel here).

For flatworms, manual removal plus repeated dips (or targeted flatworm treatments in quarantine) breaks the life cycle.

Vermetids are best removed mechanically or covered; hydroids often retreat with improved flow and nutrient control.

Quarantine remains the gold standard.

GONIOPORA: A SPECIAL CASE WORTH EXTRA ATTENTION

Goniopora's reputation for mysterious decline persists even in modern aquaculture. These corals often suffer when nutrients drop too low, feeding is inconsistent, or flow is mismatched.

Early signs appear as uneven extension rather than outright necrosis. Consistent moderate feeding (phytoplankton, zooplankton, or reef foods several times weekly) and rock-steady parameters usually reverse the trend.

PREVENTION: THE TRUE ART OF LONG-TERM SUCCESS

Prevention begins the moment a coral enters your care. Dip every arrival. Acclimate slowly to light and flow. Place thoughtfully, allowing full expansion without abrasion or crowding. Maintain rock-steady chemistry rather than chasing "perfect" numbers. Feed regularly, but avoid overfeeding. Monitor nightly for aggression between corals.

Healthy LPS thrive in settled systems where the reefer has learned to observe rather than constantly intervene.

WHEN TO INTERVENE

The art lies in timing. Minor adjustments to flow, light, or placement often suffice for early stress. Visible tissue loss, brown jelly, or

HAMMER CORAL

SIDE-BY-SIDE COMPARISON



HEALTHY – GOOD POLYP EXTENSION

- ✓ Tentacles long, inflated, and fully extended
- ✓ Tips open and relaxed
- ✓ Swaying/gentle movement in the flow
- ✓ Strong color and turgor



EARLY DECLINE – TIGHTENED, SHORTENED TENTACLES

- ⚠ Tentacles tight, shortened, and less inflated
- ⚠ Tips closed or less open
- ⚠ Reduced movement or retraction in flow
- ⚠ May indicate stress from water quality, lighting, or other environmental factors

progressive recession demand immediate isolation, cleaning, and treatment. Repeated handling of a merely adjusting coral can do more harm than good.

DIFFERENT LPS CORALS, DIFFERENT FAILURE PATTERNS

Branching Euphyllia often show reduced extension first, then recession from the base. Fleshy solitary corals (Trachyphyllia, Cynarina) wrinkle and thin before edges recede while Lobophyllia may develop irritated patches. Goniopora gives the longest behavioral warning.

Mastering these patterns separates casual keepers from those who maintain prize colonies for years.

FINAL THOUGHTS

LPS coral decline is rarely random. Behind every case of brown jelly, tissue necrosis, or pest damage lies a preventable chain of stress, injury, or oversight. The good news is that these corals are remarkably resilient when their needs are understood. They reward patience, observation, and thoughtful husbandry with years of breathtaking displays.

Torch corals, hammer corals, frogspawn, octospawn, Trachyphyllia, Wellsophyllia, Lobophyllia, Acanthophyllia, Cynarina, and Goniopora are not mere ornaments. They are living animals with clear signals, biological limits, and an extraordinary capacity to thrive when we learn to read them as fellow inhabitants of the reef. *R*

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Visual Architecture: Bringing Aquascaping Principles to the Marine Reef

LUÍS CARDOSO

STRUCTURAL AQUASCAPING: HOW FUNCTIONAL ELEMENTS BECOME VISUAL ARCHITECTURE

For many years, hardscape in the saltwater aquarium was thought of almost exclusively in biological terms. The rock served to provide surface for bacteria, attachment points for corals, shelter zones for fish, and some compartmentalisation of flow. All of this is still essential. But in practice, this approach has ended up conditioning how many marine layouts are conceived: dense, static structures, sometimes hard to read, often built as a simple utilitarian base that forgets the aesthetic side.

The problem is that this view relegates the hardscape to a secondary role. And a good reef tank deserves more than just a functional base. It deserves composition, impact and direction. It deserves a visual architecture capable of supporting not only life, but also emotion, identity and memory.

This is precisely where aquascaping principles can transform the way we think about saltwater layouts.

In aquascaping, structure is never merely support, it is composition from the very first moment. It forms the narrative backbone of the aquarium. Before the plants take root, before the mosses soften the transitions, and before biological maturation stabilises the landscape, the structure already exists. It embodies a clear visual intention: a dominant line and focal point, a main mass, a sense of depth, and a

proportion between full and empty. The structure does not wait for the plants to give it value, it already speaks for itself.

Bringing this logic into the marine aquarium does not mean copying aquascaping. It means applying the same idea of composition to the reef. It means looking at the rock not just as support for corals, but as a structural point of interest. It means building reefs with visual language, rather than simply stacking rocky volumes out of technical concern.

The compositions that accompany this article stem precisely from this conviction. In all of them, the structure seeks to have a presence of its own. There are masses that dominate how the aquarium is read, bridges that create tension, corridors that open depth and oblique lines that suggest movement. The relationship between stone, wood and empty space gives the layout an energy that precedes the actual planting. It is this energy that distinguishes a functional hardscape from a memorable hardscape.

MORE THAN PILED ROCK

One of the most common mistakes in marine aquariums is to confuse complexity with quality. More rock is added, more tiers, more support points, more surfaces, in the belief that this will enrich the layout. In reality, the opposite often happens: the composition loses clarity, the visual hierarchy is diluted and the structure turns into a heavy,

indistinct mass with no direction. A strong layout is not necessarily a full layout. It is a layout that speaks for itself.

In aquascaping, this idea is fundamental. We do not just pile up rocks or wood; we have to bear in mind that not every stone deserves the limelight, not every line should compete with the others. The composition works because there is a decision. There is a main mass, a secondary one, transitional elements and areas of visual rest. The observer's gaze is guided; it is not left adrift.

In marine tanks, this principle is just as valid. When the hardscape is designed with intention, it ceases to be just an accumulation of biological material and becomes a constructed landscape. And that landscape can have a monumental, delicate, aggressive, fluid, austere or organic character. The important thing is that it has an identity.



IMPACT: THE FIRST IMPRESSION MATTERS

Every layout needs a dominant feature. Something that makes it recognisable and immediately captures the observer's attention. This feature can take many forms: a large inclined mass, a central arch, a lateral cliff, a pronounced valley... The name matters little. What is essential is that there is a strong visual idea.

In a reef tank, impact should not depend solely on the corals that will come later. The hardscape itself should be able to make its presence felt from day one. When that happens, the aquarium gains aesthetic maturity even before biological maturity.

Many reef layouts fail precisely because they do not focus on this main point. They try to distribute the rock in a "balanced" way, but end up producing a neutral composition, without tension, without asymmetry, without surprise. Everything seems to be in the right place, but nothing truly happens.

Impact arises when we take risks and step out of our comfort zone. When we accept that a structure needs strength, scale and direction. It is not about exaggerating; it is about committing to an idea.

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FLOW: LETTING THE EYE TRAVEL THROUGH THE STRUCTURE

After impact comes the reading. And here one of the most important concepts in aquascaping comes into play: flow. A good hardscape does not just impress at first glance, it guides the eye. It makes the composition unfold naturally, almost effortlessly. The masses relate to each other, the lines point out paths, the textures repeat rhythms, the empty spaces create pauses. There is visual continuity.

In saltwater, flow is particularly important because the reef is, by nature, an environment full of information. As the corals grow, new forms, new colours, new volumes, new contrasts appear. If the underlying structure is already disorganised, maturation will only amplify the disorder. Conversely, when the hardscape is clear and fluid, biological growth adds richness without destroying legibility.

Flow can be built through the orientation of the rocks, the repetition of angles, the way one mass leads into the next, or the creation of visual corridors between different volumes. In many cases, it is not even necessary for the structure to be entirely physically connected. It only needs to be visually connected. That distinction is crucial.

MOVEMENT: BRINGING STONE TO LIFE

If there is one concept that is under-explored in traditional marine hardscape, it is movement. Not the real movement of water, although that is biologically critical, but the movement suggested by the composition.

Most structures look static, heavy and final. Others, by contrast, seem to have been pushed by the current, shaped by time, tensed by natural forces. This difference comes from the way the lines are built. Diagonals play a decisive role here. A slightly inclined mass creates more energy than a completely horizontal block. A bridge between two formations generates tension. A section over empty space creates expectation. A layout that is more closed on one side and more open on the other suggests direction. All of this brings the structure to life.

Aquascaping works with this idea in an exemplary way. Nature rarely presents itself in rigid, frontal geometries. It appears in controlled imbalances, in erosion, in broken rhythms, in overlaps and organic tensions. Marine hardscape benefits enormously when it absorbs this way of reading. The rock then ceases to look merely placed and starts to look formed.





THE VALUE OF NEGATIVE SPACE

Another point where aquascaping offers a decisive lesson to reefkeeping is the importance of negative space. Many reef tanks are still set up with a fear of emptiness. Too much is filled, too much is occupied, too much is closed. The logic seems simple: more rock means more useful surface, more places for corals, more of a feeling of a “complete reef”. However, in composition, emptiness is not absence, it is a tool. Negative space is what allows breathing room, what enhances a main structure, what creates contrast, scale, depth and tension. An arch is impressive because there is emptiness beneath it. An overhanging platform gains lightness because there is space in front of it. A channel suggests a path because there is distance between its banks. Emptiness does not weaken the composition; it structures it.

In a marine aquarium, negative space has an additional advantage: it improves circulation, makes maintenance easier, allows better light distribution and offers more natural swimming areas for fish. In other words, this is not just about aesthetics. As often happens in good design, the most elegant visual solution is also the most functional.

DEPTH: TURNING GLASS INTO LANDSCAPE

An aquarium is always limited in volume. Creating the illusion of depth is therefore one of the most sophisticated tasks in any hardscape. And this is precisely where aquascaping experience becomes extremely useful.

Depth is not achieved simply by placing material at the back. It is achieved through overlap, stepping, compression and opening of planes. It is achieved with lines that lead into the layout, with valleys that direct the gaze, with larger rocks in the foreground and progressive fragmentation towards the back. It is also achieved through the substrate, which can be used as a corridor, a bank, a riverbed or an area of visual rest.

In a marine context, this understanding is invaluable. A well-constructed reef does not just occupy space; it organises it. It creates foreground, midground and background. It builds layers of shade. It suggests distance even inside a relatively short box. When this is done well, the aquarium grows visually. It looks bigger, deeper, more immersive.

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FOCAL POINT AND HIERARCHY

No strong composition exists without hierarchy. The observer needs to understand what is primary, what is secondary and what serves as transition. This idea, central to aquascaping, can also be applied to the marine aquarium.

The focal point does not have to be an isolated object; it can be a large rocky mass, an arch, a ridge, a central bridge or even a void strategically framed between two volumes. The important thing is that there is an area of greater visual intensity that organises the rest of the composition. Without hierarchy, the layout becomes noisy. Everything competes. Everything demands attention at the same time. And when everything wants to be the protagonist, nothing is truly remembered.

In marine tanks, this is even more important because corals will add new focal points over time: colour, texture, movement, vertical growth. If the underlying hardscape does not already have a clear hierarchy, the final result risks becoming visually chaotic. A good layout anticipates this evolution and prepares for it.

AESTHETICS AND FUNCTION SHOULD WORK IN HARMONY

There is a recurring idea, especially in systems geared more towards coral growth, that hardscape aesthetics are a secondary luxury compared with the technical demands of the aquarium. In practice, this opposition is false. A well-designed hardscape can, and should, bring both dimensions together. It can be expressive and stable. It can have movement and safety. It can create zones, passages and height differences without compromising structural integrity. It can offer high-exposure areas for SPS, more sheltered areas for LPS, shaded points, flow channels and platforms for coral placement, all within a coherent composition.

This naturally requires planning. It requires a solid understanding of how the materials behave, the centre of mass, support points, fixing techniques

and the way flow will interact with the structure. But this requirement should not be seen as a limitation; it should be seen as the creative challenge that will make all the difference in the final layout.

DESIGNING FOR THE FUTURE

Perhaps one of the biggest differences between an ordinary layout and a truly good one lies in the ability to anticipate maturation. In the marine aquarium, the hardscape cannot be designed just for the photo on the day of the set-up. It has to be designed for what will happen six months, one year and two years later.

The corals will grow, thicken and occupy volumes. They will cast shadows and change the way the reef is read. If the initial structure is too compact, too uniform or too poor in planes, this evolution will eventually smother the composition. Conversely, when the hardscape is built with space, hierarchy and depth, biological growth reinforces the design instead of destroying it.

This is where the influence of aquascaping proves especially mature. An aquascaper does not create a layout only for day one; they consider what it will look like once the flora has reached full development. The same should happen in marine tanks. The reef of the future starts with today's structure.



An example of these aquascaping principles by Keith Berkelhamer



FROM SUPPORT TO LANDSCAPE

Ultimately, what is at stake is a change of mindset. Instead of asking only where there will be space to place corals, perhaps we should ask what landscape we want to build. A suspended reef? An eroded rocky slope? A system of islands connected by visual tension? A dense, dramatic structure or a light, airy composition?

These questions change the process. They force us to stop thinking only in terms of function and to start thinking in terms of visual narrative as well.

The marine aquarium has everything to gain from this evolution. Not because it needs to imitate freshwater, but because it can benefit from the discipline in composition that aquascaping has developed in an extraordinary way over recent decades. When the concepts of impact, fluidity, movement, negative space, depth and hierarchy genuinely enter into reef construction, the rock stops being just infrastructure. It becomes language.

And perhaps that is the next step in the aesthetic maturity of marine fishkeeping: recognising that a great reef does not start with the corals. It starts much earlier. It starts with the act of building a foundation with intention, presence and vision.

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THE “FLONDURAN” HOPE:

CAN CROSS-BORDER CORALS SAVE FLORIDA’S REEFS?

MARIJKE PUTS

In June 2024, early beachgoers lounging on the bright sands of Tela, Honduras, may have noticed an unusual sight: people wading from the shallows carrying insulated containers, working quickly in the rising heat. Within hours, those containers would be en route to Miami, Florida. But the cargo in question was not treasure, or even fine Honduran seafood; it was thirteen fragments of critically endangered elkhorn coral.

Elkhorn corals do not like to travel, nor are they easy to obtain. Their collection was the culmination of exhaustive sampling and legal wrangling across the Caribbean, and their shipment had to be painstakingly coordinated to prevent the cargo from dying in transit. A mere sixteen hours after being lifted from the Honduran reef, the fragments were carefully divided between researchers at the Florida Aquarium and the University of Miami. All the corals survived their journey. But why move them in the first place?

Researchers have been closely monitoring elkhorn coral numbers for over two decades. Scientifically known as *Acropora palmata*, elkhorns are a “keystone” species: their branching structure offers

hundreds of other reef inhabitants a safe place to live and helps protect coastlines from erosion by absorbing wave energy. This crucial importance to reefs across the Caribbean has not afforded them much protection, however. Colony numbers in Florida had already declined drastically as a result of disease outbreaks and human activity when a 2023 heatwave triggered a massive bleaching event that decimated most of the remainder. They are now functionally extinct in the Sunshine State, with adult colonies so few and far between that they are no longer able to reproduce.

Floridian elkhorn corals, sitting at the northern end of the species’ natural range and thus receiving less predictable weather than their Caribbean siblings, were likely always vulnerable. Now, climate change appears to have tipped the balance from “just survivable” to “unsustainable.” The corals themselves have some heat resistance, but their symbiotic algae—the photosynthetic dinoflagellates they host in their tissues, known as zooxanthellae—generally don’t. Once a threshold is reached, the symbiosis collapses: heat-damaged zooxanthellae begin to emit toxic by-products, compelling the coral to expel them in what is known as a bleaching event. Unable



Andrew carries cooler to the boat

to obtain enough energy without its algae, the coral will starve or succumb to disease if conditions don't improve quickly.

Likely as a result of drastic environmental changes, elkhorn coral spawning on degraded reefs can become asynchronized or even stop. Indeed, reproductive success in the Florida population has plummeted: there are simply no baby elkhorns to be found. At this stage, even if the scattered colonies were to spawn and their gametes were to succeed in finding each other, the resulting offspring would likely suffer from significantly reduced genetic diversity and increased susceptibility to disease.

Asexual propagation and outplanting—the act of taking coral cuttings (frags) and replanting them on the reef—had been the go-to elkhorn conservation method up until the 2023 "Coralpocalypse." It is easy to obtain a large amount of material to plant back on the reef; these cuttings, however, are no more equipped to deal with the rapidly changing environment than their parent corals were, and they bleach all the same when the next heatwave hits. Additionally, asexual propagation does very little to combat genetic poverty, as the resulting corals are genetically identical. As was painfully demonstrated in 2023, when years of hard elkhorn recovery work went up in smoke in the span of a few weeks, this genetic poverty can make populations highly vulnerable. A new approach is desperately needed, which is why researchers working with the University of Miami and the Florida Aquarium found themselves harvesting elkhorn fragments in Honduras.

To prevent elkhorn corals from disappearing entirely, scientists are turning to an approach rarely seen in coral conservation: assisted gene flow (AGF), the human-assisted movement of individuals and genes between populations within a species' range. Could introducing fresh genes rescue the population's genetic diversity and possibly even increase its tolerance to heat?

The earliest assisted gene flow experiments paired cryopreserved elkhorn coral sperm from Florida and Puerto Rico with coral eggs from Curaçao. Hundreds of healthy juveniles were produced, but they never made it onto Florida's reefs. Keri O'Neil, director of the Florida Aquarium's Coral Conservation Program, explains that caution is warranted when mixing different coral populations: "From a genetics perspective, the safest approach is to mix populations that would have natural genetic mixing anyway." Elkhorns from the western population—which includes Florida's reef—likely rarely mix naturally with their eastern counterparts, like those from Curaçao.

Attention turned west. After years of searching for a suitable western Caribbean population and navigating permitting barriers across multiple countries, researchers finally secured approval to work off the Honduran coast near Tela. Although travel guides tout the town's beaches as a "natural paradise," water samples revealed a somewhat different story: the shallow coastal bay is warm, turbid, and heavily polluted by runoff. And yet the elkhorn corals thrive, raising hopes that these colonies may be the key to helping Florida's reefs survive a warming ocean, too.

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Diver, Cailyn Joseph, sorting corals.

Once permission was obtained, researchers moved fast to test this possibility. Andrew Baker of the University of Miami, whose lab studies coral resilience and helped identify and evaluate candidate populations, worked with collaborators across the region to source the material. The team selected thirteen fragments of Tela's healthy elkhorn colonies to ship to Miami, working quickly and diligently to avoid damage and delays that might upset the fragile corals. A cargo airline partner helped rush the precious cargo through customs. Upon arrival, the fragments were divided between the University of Miami and the Florida Aquarium in order to, as Baker puts it, "avoid putting all our eggs in one basket."

Not that the researchers had any eggs at their disposal at this point. The corals first had to be crossed in order to obtain potentially more genetically diverse "Flonduran" elkhorn juveniles that could safely be planted on wild reefs. Aquarists will be aware that getting corals to "dance the horizontal tango" in captive conditions can be highly challenging. As a testament to the team's expertise, however, several colonies spawned at the Florida Aquarium only months later, allowing the Floridians and Hondurans to mingle. The resulting offspring were quickly shared between the two institutions. Between them, they now have a carefully reared cohort of around 250 elkhorn juveniles at their disposal.

Despite the scope of the project so far, both O'Neil and Baker emphasize that there are, as of yet, no guarantees that these Florida $\times$ Honduras crosses might provide the "Hail Mary" Florida's elkhorn population so desperately needs. "We don't know yet whether

that resilience comes from the coral itself, its symbionts, nutrient conditions, or a combination of factors; this is really a first step in finding out," says O'Neil.

Coral symbionts in particular complicate the matter because photosynthesizing corals like elkhorns don't face heat stress alone. They rely on their microscopic partners, the zooxanthellae, for most of their energy. Not all potential symbionts are created equal, however. The elkhorns found in Tela host a particularly heat-tolerant variety called *Durusdinium*, but when researchers attempt to pair these sturdy algae with other elkhorn corals, the partnerships don't always last after outplanting. Corals that host *Durusdinium* are more resistant to bleaching but appear to have slower growth rates, explaining why they may "feel inclined" to switch partners—much to the frustration of researchers who, unlike the corals, know the next heatwave could be right around the corner.

Teasing out the delicate relationship between genetics, symbionts, and reef conditions—and their effect on coral survival—involves outplanting juveniles, carefully monitoring them, and comparing their performance to Florida $\times$ Florida crosses. Fifty juvenile "Flondurans" already grace Miami's reefs, a first in AGF for corals. Baker is cautiously encouraged by early results: "We outplanted them July 1st [2025] expecting a warm summer, and there was a natural bleaching event. They didn't bleach—however, neither did the Florida-by-Florida corals. We had provisioned both with heat-tolerant zooxanthellae." On this occasion, the elkhorns appeared to have kept their *Durusdinium* symbionts.



Fabrizio Conejo surveys corals

While the data trickles in, the University of Miami lab has already begun to test assisted gene flow techniques with other coral types, like brain corals. Baker notes that exporting material becomes significantly less complicated when the local government is on board with the project from the get-go: "The Cayman Islands, who we have a great relationship with, were seeing this bleaching event that was happening in 2024... So having spent years getting permits from all of these different countries to export [brain coral] broodstock, I got permits from the Cayman Islands in three days to go down there. Because the people who wanted me to do it were the government themselves, who issue the permits." He jokingly dubs the resulting crosses "Flayman" corals.

Other additional measures, like coral probiotics and thermal conditioning (getting the juveniles used to higher temperatures before outplanting), are also being studied as part of a \$16 million NOAA grant awarded to the University of Miami in 2023. This grant aims to support emerging science and technology in coral breeding and restoration and is itself tied to a much larger effort through NOAA's Mission: Iconic Reefs project. More than anything else, Baker hopes for improved policy around coral export for research purposes, which is governed by CITES. In a 2025 paper for Science, he and other scientists explore whether coral fragments could be regulated more like plant cuttings than wildlife, potentially streamlining international exchange. Baker says, "That would allow registered nurseries to exchange coral fragments among themselves. It would greatly increase our ability to share and propagate corals and really try to work faster." When asked what else can be done, he mentions he thinks reef aquarists could one day contribute, too: "These are people who dedicate their lives

to reef keeping. They are passionate, knowledgeable, and already deeply engaged with the science."

Whatever shape future policy and techniques take, it's clear the field of coral science and conservation is in rapid motion. Whether aquarists will obtain heat-proof corals that can survive summer chiller outages thanks to assisted gene flow remains doubtful, particularly given that it's still unclear how much of a coral's thermal tolerance depends on its genetics versus its symbionts. But might we have a future as citizen scientists in coral conservation?

For centuries, ocean currents carried coral larvae across the Caribbean, linking reefs hundreds of miles apart. Today, with warming seas and population collapse having severed those connections, their genetically depleted offspring seem poised for extinction. If humans caused the genetic flow between Floridian and other elkhorn corals to stop, could it also be their responsibility to restart it? A growing group of scientists says yes, and efforts like the "Flonduran" crosses represent this new, more active phase in coral conservation.

Flonduran elkhorn corals may save Florida's reefs, encouraging scientists to explore a range of other crosses between isolated coral populations. They may "kick the bucket" and bleach just as quickly as the rest during the next big heatwave. But most likely, as Baker notes, success will look like a middle ground: "This isn't like a miracle cure; it's about buying time. If these corals survive the next marine heat wave, I'll feel we've made progress." Given this coral's keystone status, that's more important than it might sound. [R](#)



Andrew packs elkhorn in cooler



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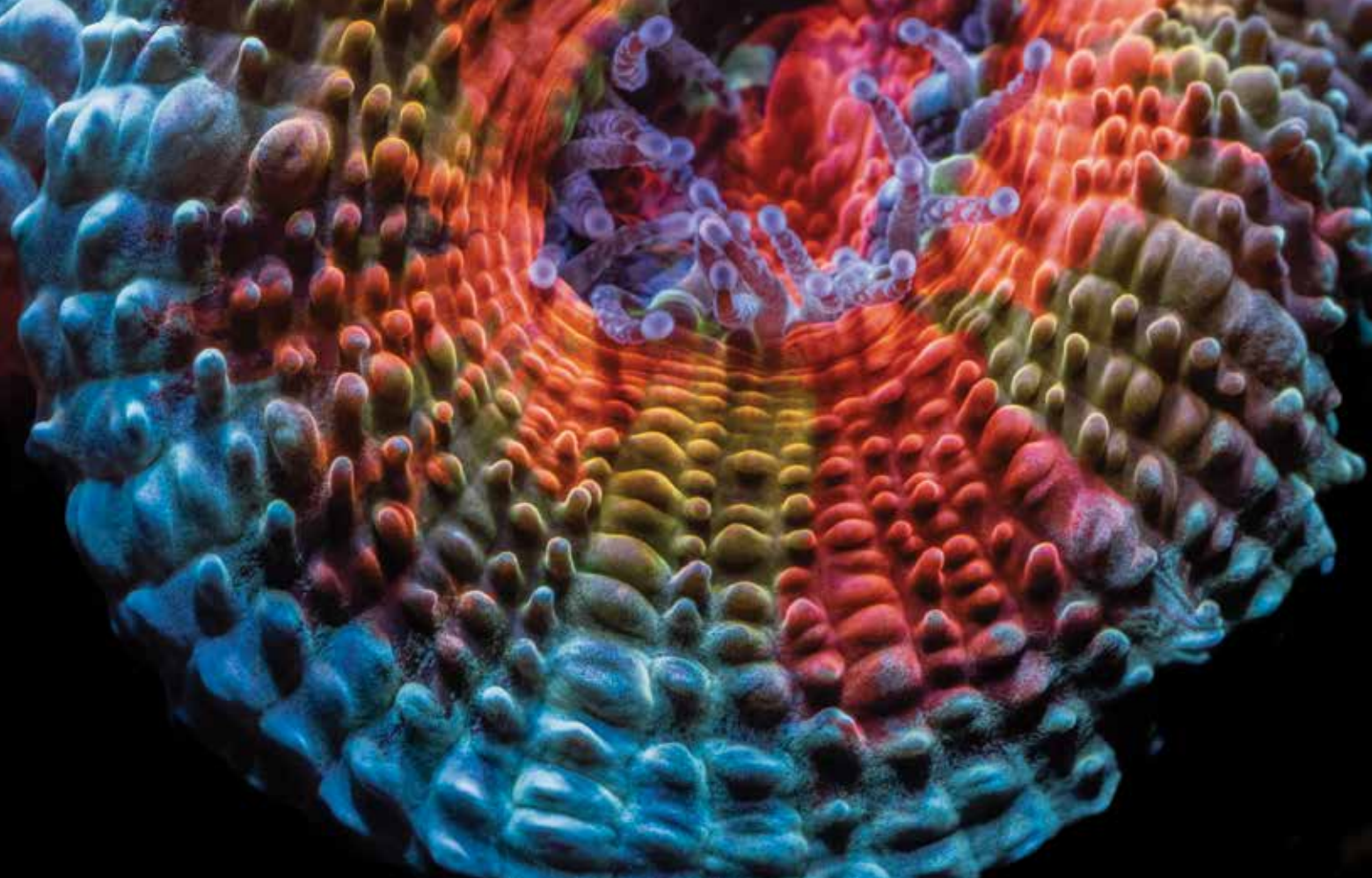


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Q&A WITH TYLER DREHOBL

Patience, Preservation and the Perfect Micromussa

The Backstory

What does your reef hobbyist origin story look like?

I have been in the hobby for around 13 years, starting back in 2012 when I set up my first saltwater tank. Prior to that, I kept a variety of cichlid tanks until I decided I wanted to give saltwater a try. Like many first-time reefers, I began by overstocking my tank and purchasing corals I wasn't yet experienced enough to keep healthy. Eventually, I learned the value of patience. I ultimately became a reefer with a strong ability to keep livestock healthy, colorful, and growing quickly.

The Coral Feature

Tell us more about your tank's featured coral, the ReefTRD Random Color Generator "Acan Lord"?

The coral I have chosen to feature is my personal strain of *Micromussa lordhowensis* known as the ReefTRD Random Color Generator Acan Lord. (Yes, I know they aren't classified as *Acanthastrea* anymore, but they were for the longest time, and as the saying goes, "old habits die hard!")

Micromussa lordhowensis is my favorite type of coral to collect. What makes this specific variety special is that no two polyps have the same color or combination of colors. As new polyps develop, they always display a unique pattern and hues that may not appear anywhere else on the colony, hence the name "Random Color Generator." While all polyps start with a base color of orange and

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a teal rim, individual polyps will throw out various hues of green, yellow, red, pink, blue, and purple. This coral is the true definition of a "rainbow" and is a piece I will always keep in my systems.

The System & Maintenance

Let's talk shop. How do you keep the system running smoothly, and what does your maintenance look like?

My system is a 50-gallon "Low Boy" frag tank. It is a relatively low-PAR system, with the brightest portions maxing out around 200 PAR. My filtration is simple, relying on filter pads and a small refugium running on a reverse light cycle.

For chemistry, I aim for stability: Alkalinity at ~8.5, Calcium at ~425, Magnesium at ~1450, Nitrates at ~10–20, and Phosphates at ~0.05–0.1. I test the "Big Five" weekly and perform a monthly ICP test to audit my kits and check trace elements.

When it comes to feeding, my fish get a variety of frozen foods, pellets, and nori. I target-feed my corals Reef Roids once a week, siphoning out any excess during my subsequent water change. For dosing, I rely on Brightwell products for maintaining parameters and adding amino acids, and I also add several types of live phytoplankton.

What makes your tank unique?

I run a very simple system with very low light. I find that low PAR is great for my large collection of Micromussa because they tend to hold their multi-color rainbows rather than morphing into solid reds or oranges. Many people struggle to maintain rainbow coloration, but I've found my system not only maintains it, but often enhances it.

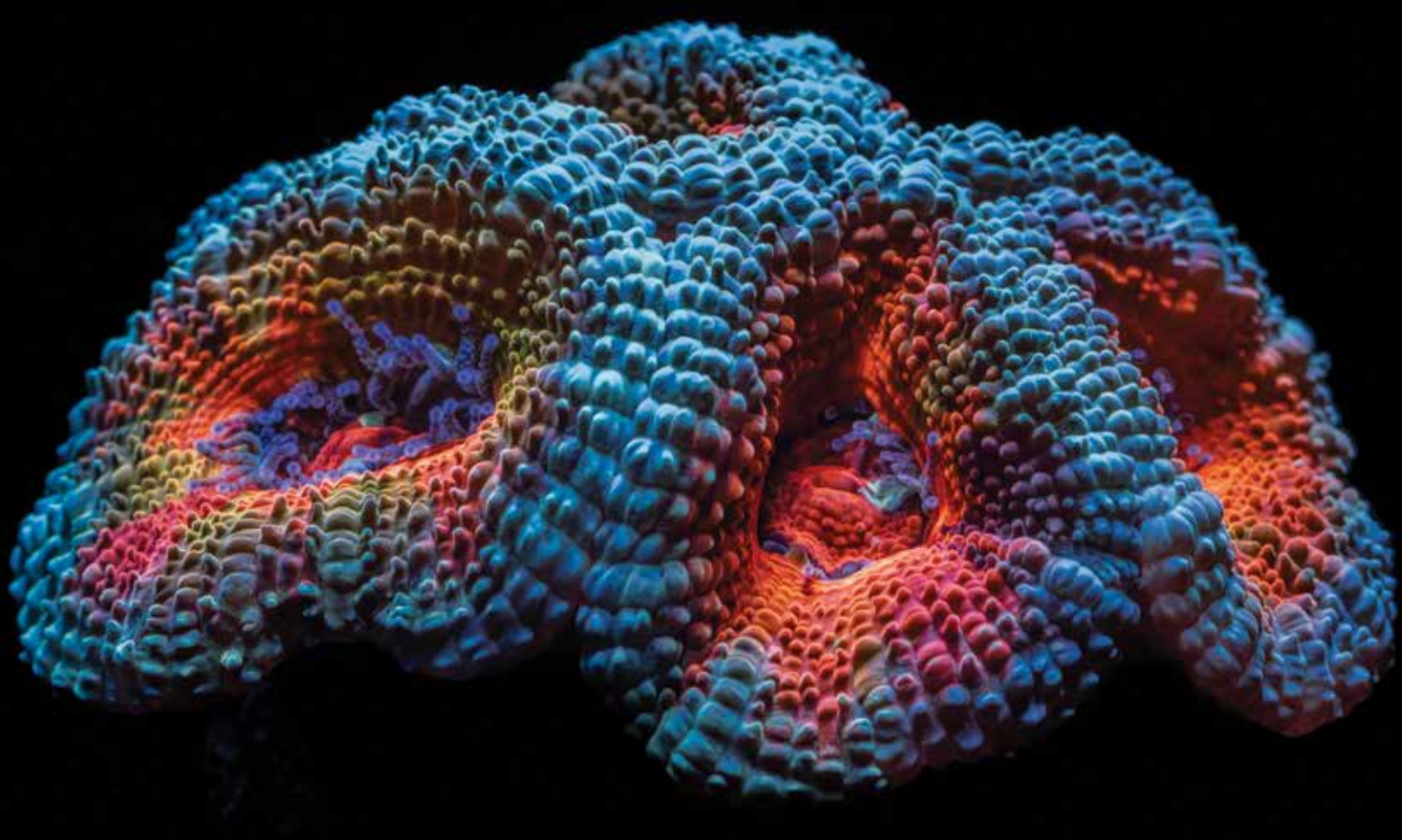
Inspiration & Accomplishments

Where do you look when you want fresh inspiration for your system?

To be honest, most of my inspiration comes from fellow reefers on Instagram. There are so many people with great tanks and even better coral collections on social media these days. While social media can occasionally be misleading compared to reality, I always enjoy seeing the successes of others within the hobby.

Reflecting on your journey, what are you most proud of accomplishing with your tank?

I am most proud of the fact that it is extremely rare for anything to perish in my tank. When I bring in a healthy specimen, I can rest assured it will thrive and grow. I am also proud of my success in "rescuing" corals; with a bit of TLC, I've found that corals struggling in other systems often make a great recovery in mine.



Obstacles & Advice

What obstacles did you encounter during setup, and how did you overcome them?

One obstacle I really struggled with early on was "letting things be." I always felt the need to tinker with everything the moment I saw an issue. This often exacerbated problems instead of fixing them. I still struggle with the inclination to tinker, but I have developed the discipline to make changes one at a time, slowly, with periods of observation in between.

What is the best advice you can give to other hobbyists pursuing their own tank and reefing passion project?

Stability is much more important than any specific number. As long as your system is within the acceptable range, focus on keeping it stable rather than "chasing" a magic number.

If you could go back to 2012 and give yourself one piece of advice before starting your project, what would it be?

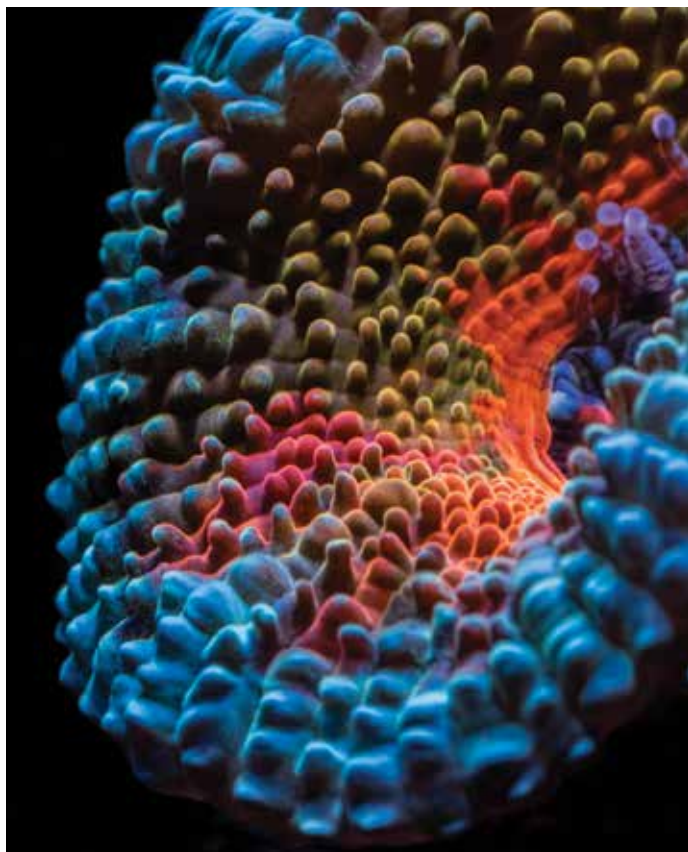
If you notice a problem, don't throw the "kitchen sink" at it. Take a beat and think about the potential factors causing the issue. Address them one at a time and observe the system for a few days to a week before making another move. This prevents you from making too many changes at once and having to guess which change made things better (or more commonly, worse).

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Final Thoughts

What are your favorite inhabitants?

Definitely the *Micromussa lordhowensis*. They have some of the best color combinations in the hobby and are non-aggressive with each other, making them perfect for species-specific gardens. It is extremely rewarding to watch a small frag grow into a large colony. I currently have around 50 varieties of rainbows and high-end lineages, and they are always the first thing people notice when they see the tank.

Finally, how has your reef tank enriched your life?

The biggest impact is the therapeutic value. As an avid scuba diver, I would love to spend every day traveling the globe and diving the world's reefs, but that isn't an option. The next best thing is coming home to my little slice of the ocean inside a glass box in my home office. Whenever I am stressed out or having a rough day, I can always find a moment of peace with my reef tank, clearing my mind of the hustle and bustle of the world outside my tank.

Tank Specifications

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