Sea Glow

Fluorescent Coral Colors

By Nina Roepke

Background

There are multiple factors that affect a coral's color including light intensity, light spectrum, nutrient levels, trace elements, zooxanthellae, fluorescent pigments, and non-fluorescent pigments. Fluorescence describes the behavior of an object that absorbs the light of one wavelength and then emits the light at a different wavelength.

While the intensity of the light is important, the concentration or color of certain wavelengths of light is also crucial. The color change to a coral that one sees is the coral's natural response to that light source. Zooxanthellae, symbiotic cells which contain chlorophyll, provide the coral with nutrients as well as protection.

Aquarium light bulbs are classified by color temperature measured in degrees of Kelvin (K), which indicates the hue of the particular light source. The higher the value of the K, the greater the light will penetrate through deeper water and even more in saltwater. The higher the K value, the more blue the light will become and create a brighter and crisper light. A lower K value will produce a warm yellow light.

Coral has a symbiotic relationship with zooxanthellae, marine algae, to receive some nutrients. Coral can also capture planktonic organisms, food particles, and absorb dissolved organic matter. It is the corals adjusting the zooxanthellae that affects the color of the coral. Many corals also develop a protective pigment, usually pink, purple, or blue in color.The corals that have that have those certain pigments usually come from shallow waters, where they need to be protected from the light intensity of the ultraviolet rays.

Lobed Brain Coral
Lobophyllia

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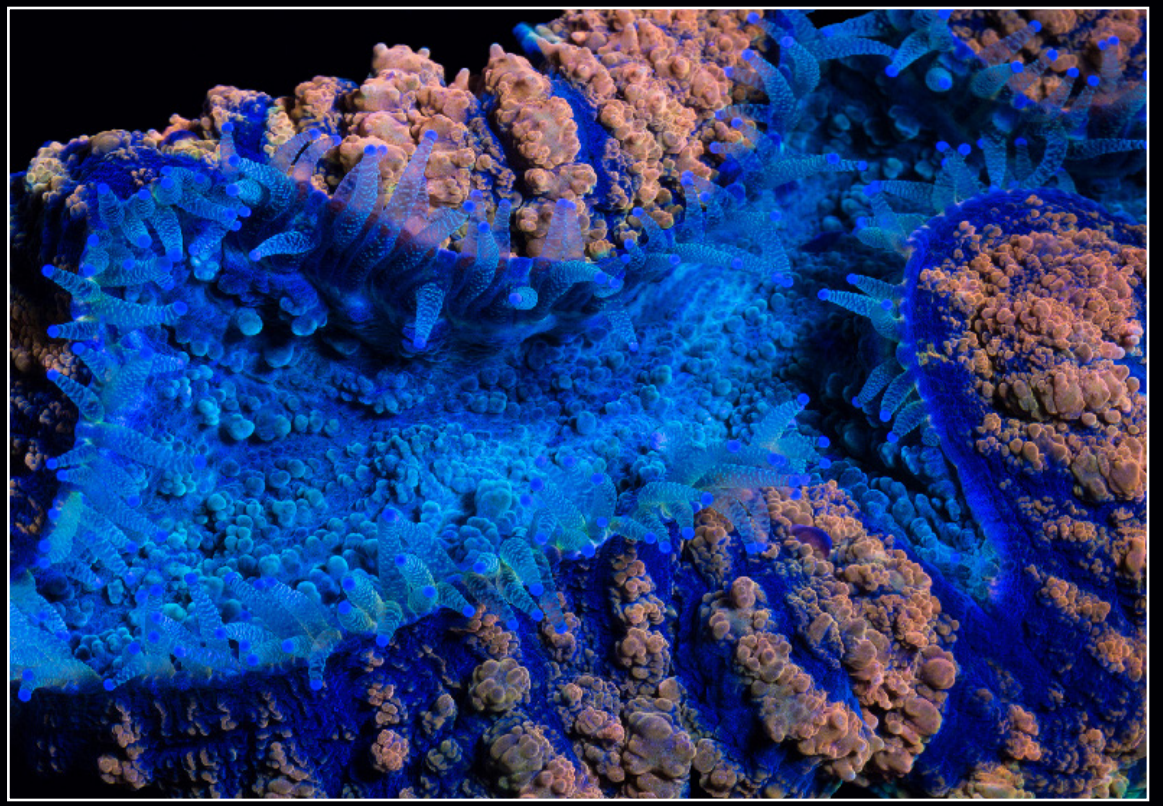


Background

Known for forming colonies, lobed brain coral is often found in multiple individual groups of the same species. Each of these groups will have a very distinct color and texture. A tapestry of color and design is how colonies of this coral are often described. Long sweeper tentacles can sting and damage other sessile animals. *Lobophyllia genus* extends feeder tentacles at night.

Description

Lobophyllia colonies are either flat or domed. Colors can range between dark red, green, olive, brown and gray, can be a combination or monochromatic. Their large, thick, and fleshy polyps have either a smooth or rough surface. Noted are contrasting oral disc tissue in blue, white, gray, orange, red and green.

Habitat

The *Lobophyllia* genus are found in the Indo-Pacific and western Central Pacific; in the Philippines and Indonesia, from Japan to Australia, and Mozambique to the Mariana Trench. Colonies are located in protected areas, which can be either shaded or brightly lit waters.

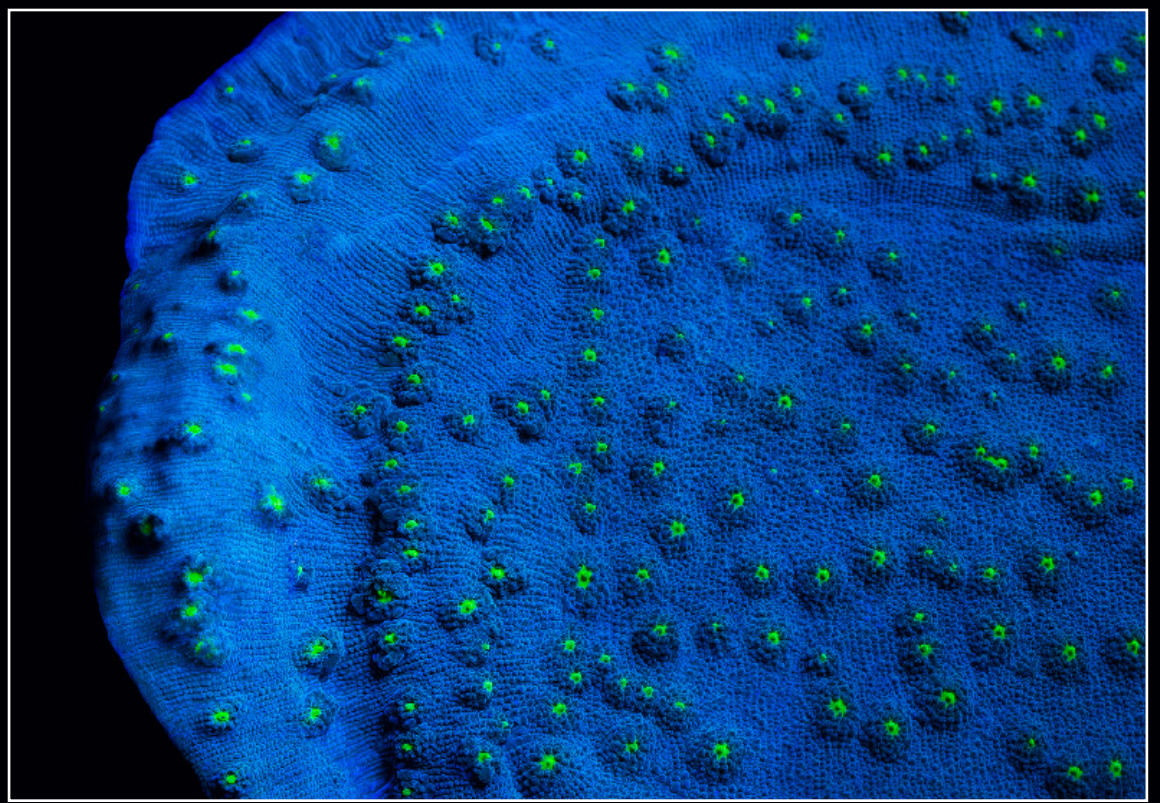
Hedgehog Coral
Echinopora lamellosa

Background

The Clown Goby species swim around the hedgehog coral's surface, excreting a toxic body slime so other fish don't bother with them. Hedgehog corals have more varied growth forms than any other genus. Their colonies can be either arborescent, forming elongated tree-like branches, or foliaceous, thin leaf-like sheets, sometimes a mixture of both.

Habitat

The *Echinopora* genus are found in the Indo-Pacific, from Singapore to the Philippines, the Red Sea to New Caledonia, Fiji, and the Marshall Islands, Samoa and Australia.



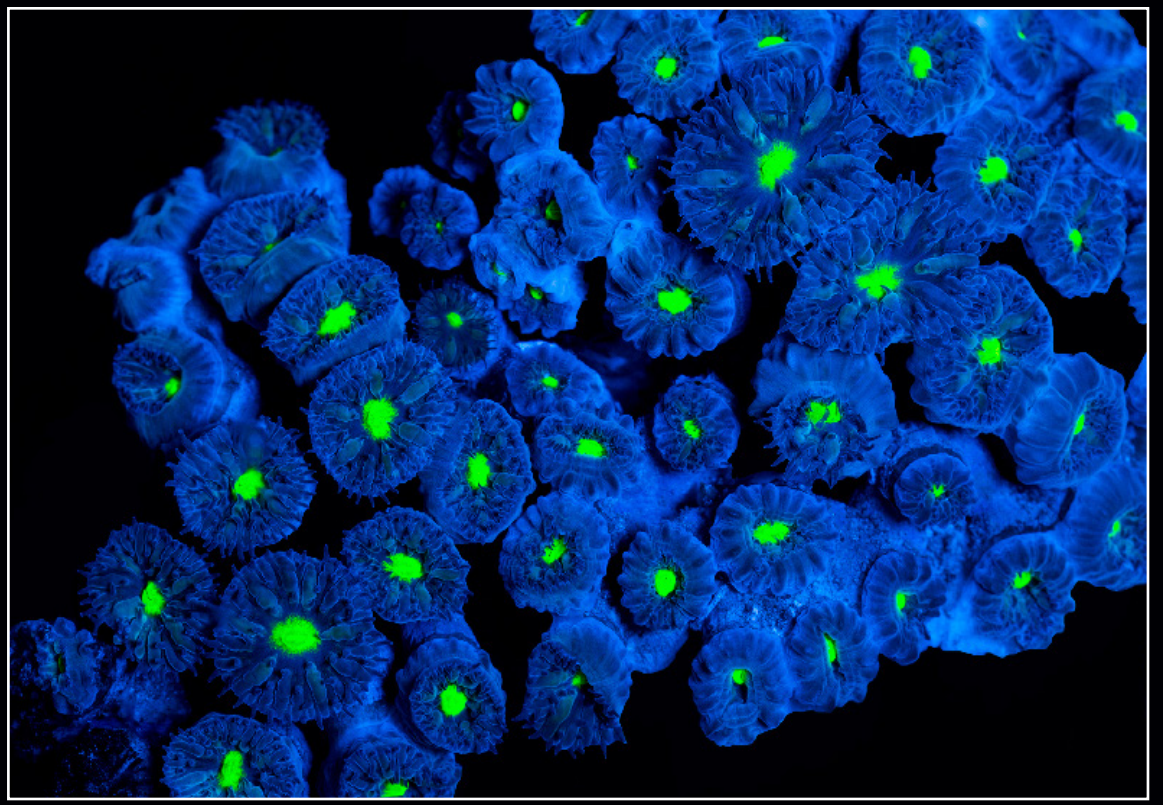
Description

Hedgehog coral colonies have thin bones and form whorls, and tiers, with an occasional tubular shape. The corallites are thin-walled and the calices measure from 2.5 to 4 mm in diameter. Green, cream, brown and yellow are the dominant colors for wild caught specimens of hedgehog coral. More colorful animals including intense variations of these colors as well as sky blue that have been developed in aquacultured specimens.

Blasto Coral
Blastomussa

Background

The skeletal structure of the *Blastomussa* corals make them ideal for various mollusks, sponges and some sessile invertebrates to hide; gaining protection from predators. Coexistence with many organisms is a trait of the Blasto coral. Each coral polyp can be its own animal.



Description

Blastomussa corals form large fleshy polyps. Each corallite in a colony extends out from a common center, that creates a branching structure that extends upward in a dome shape. Dark red and green color morphs occur in nature. Through aquaculture, colors can include green, purple, yellow, pink, red, and sometimes blue.

Habitat

The *Blastomussa* is located around Australia, on the Great Barrier Reef, and south to the Houtman Islands. They are also found from Madagascar to New Caledonia.

Bubble Mushroom
Discosoma sanctithomae

Background

The shape of its tentacles, provides this coral with its name. The bubble mushroom coral has unusual characteristics of sometimes closing part way, into a purse-string style, it quickly captures an unaware fish seeking to hide in the enclosure. Their tissue is very thin however, and can tear easy. The bubble mushroom is a carnivore and semi-aggressive. Their tentacles contain toxins.

Description

Tentacles of bubble mushroom coral can form rounded vesicles or may elongate creating a fuzzy appearance. This is a coral without a skeleton, but internal structures are the same as stony corals. The upper surface of the coral is called the oral disc. The small stalk area, is called the column and it is located just above the pedal disc, where they attach to surfaces. The bubble mushroom coral can be translucent green, blue, yellowish green, purple-mauve, green, brown and orange. The tentacles may contrast in color and be iridescent.

Habitat

Discosoma is located in the Western Atlantic Ocean; Florida, Bermuda, Caribbean, and the Bahamas. They like to grow on dead corals, rubble, and between coral heads, preferring indirect intense lighting.

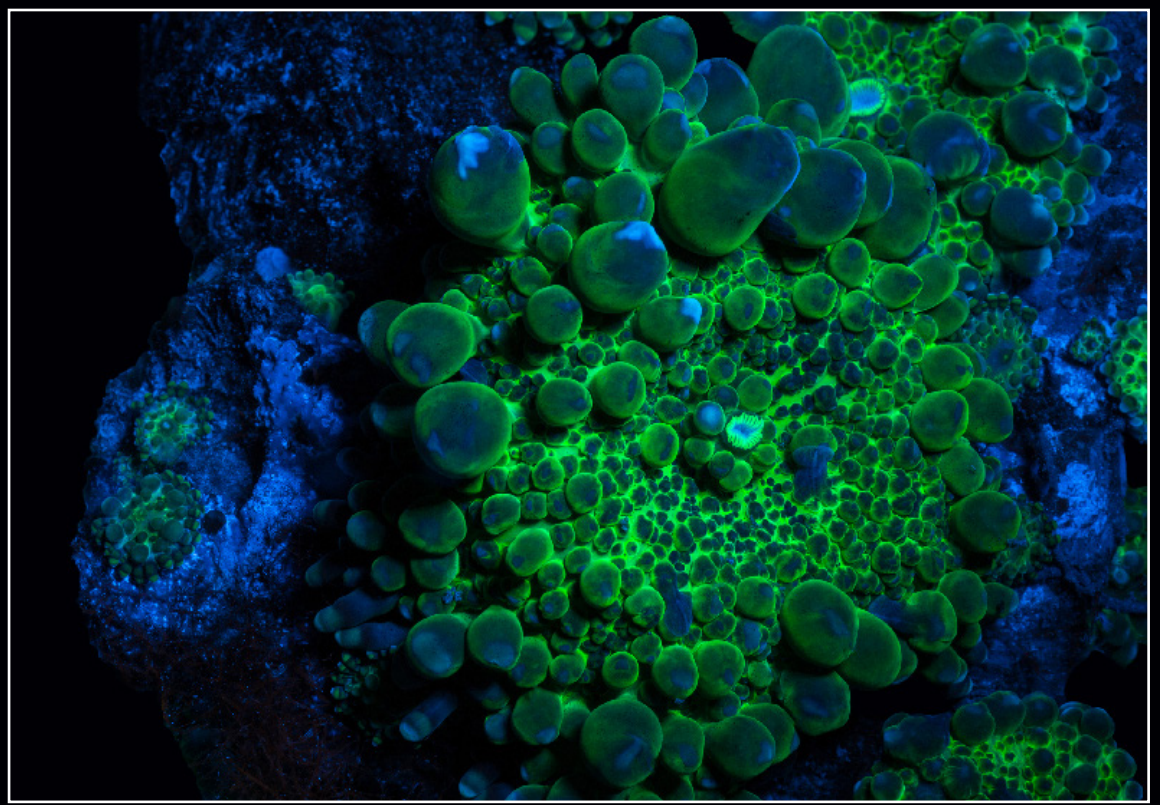
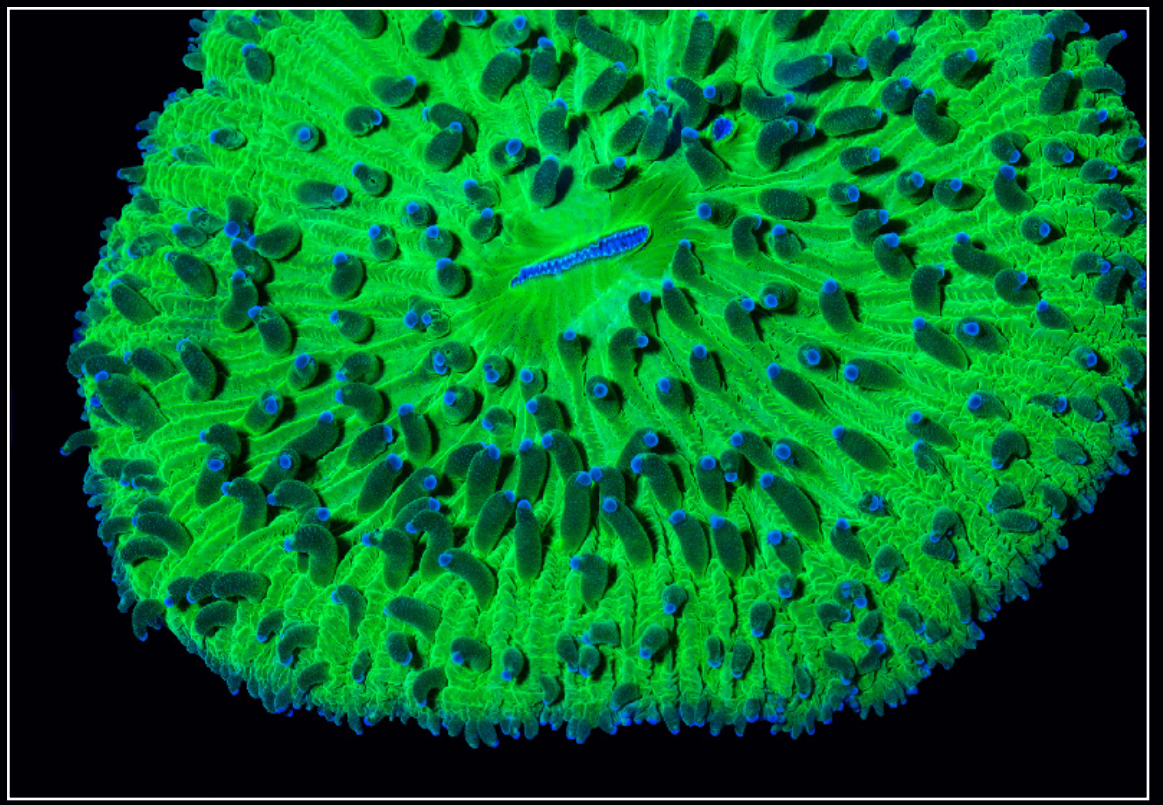


Plate Coral

Fungi



Background

Plate coral are free-living, solitary corals. They are known to travel by inflating their tissue and using current to move, up to twelve inches per day. This coral is known to climb slight slopes up to a 30 degree angle, and to right themselves if they get flipped over. It excretes a heavy mucus coat which contains strong toxins that can severely damage other corals, not in its same family.

Description

Saucer-like shapes to dome shapes best describe the plate coral. Short tapering tentacles, retract during the day, coming out only at night. These tentacles are hidden between the blade-like septal teeth that radiate out from the center. Wide slit-like mouths have long septa radiating from the center to the coral edge. There is a wide array of colors for plate coral.

Habitat

Fungia genus are found in the Western Central Pacific, in the Philippines, Papua New Guinea, the Indo-West Pacific, the Western Indian Ocean from Gulf of Alden to Seychelles, and in the Northwest Pacific in Taiwan. Plate corals inhabit reef slopes on the flat areas between the lagoons and the reef. They are found in areas that are protected from strong water movement.

Button Polyp
Zoanthus

Background

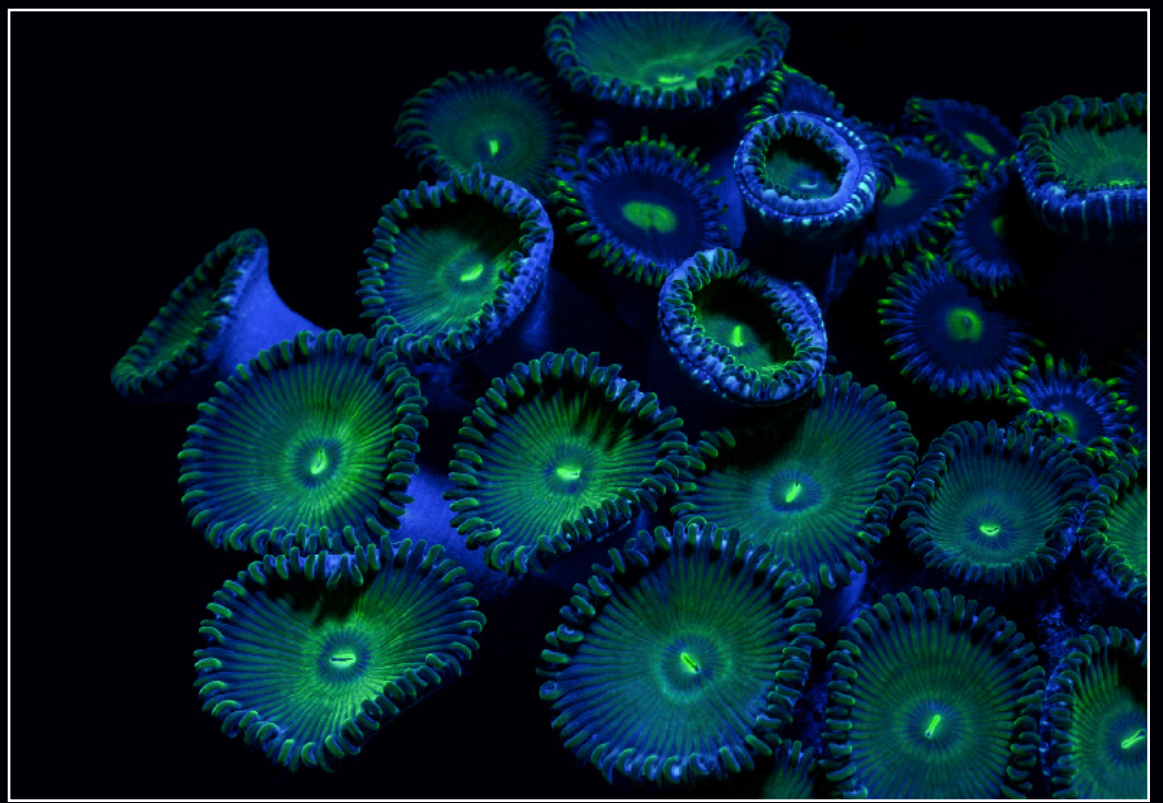
The button polyp coral is a member of the *Zoanthidae* family, known for having varying degrees of poison called palytoxin. The toxin, must either be ingested or enter the bloodstream to affect a person. Ultraviolet lighting makes the button polyps appear to be glowing in the dark.

Habitat

The *Zoanthus* genus are commonly located in both the Atlantic and Pacific Oceans. The habitat includes shallow tidal areas, lagoons, and back reefs.

Description

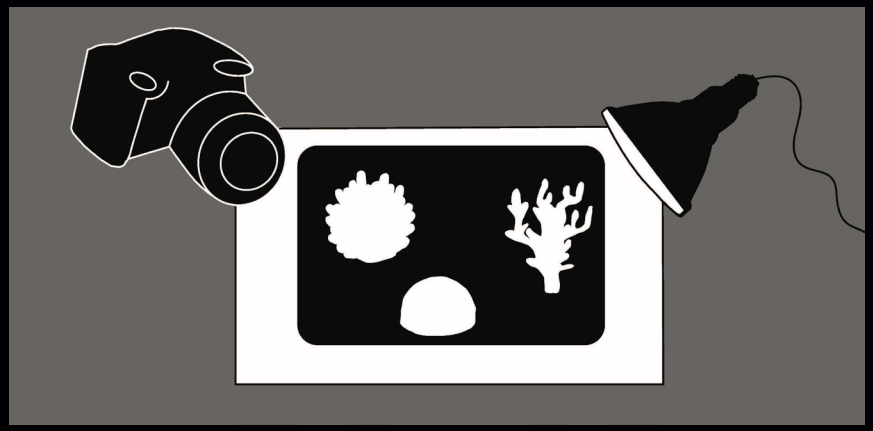
This coral has a fairly short stalk topped with a flat oral disc. The tentacles are delicate and radiate from the outside of the disc. The polyps can be connected to each other, but they primarily form mats. The oral disk has a mouth, or siphonoglyph, in the center leading into their stomach cavity that has vibrating cilia. They can be very colorful, with numerous colors ranging from a brown, to bright green, turquoise, yellow, orange, and red.

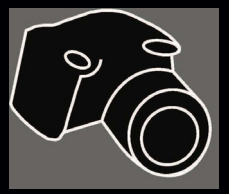


Lighting and Setup

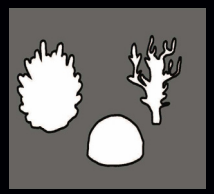
The coral was photographed using a Canon 6D camera with a Canon 100mm macro lens. To achieve a black background, three or four different coral specimens were placed in a shallow black tub filled with salt water. The black tub was then placed onto a table to be photographed. To achieve a parallel view, the camera was placed on a tripod and tilted over the black tub. A 460nm ultraviolet light was used to allow the corals to fluoresce. In order for the camera to recognize the bright colors, the white balance on the camera was set to 10,000 Kelvin. The coral specimens were photographed at ABC Aquarium in Penfield, New York.

Top-down View

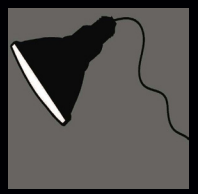




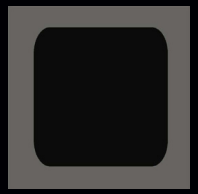
Camera



Coral

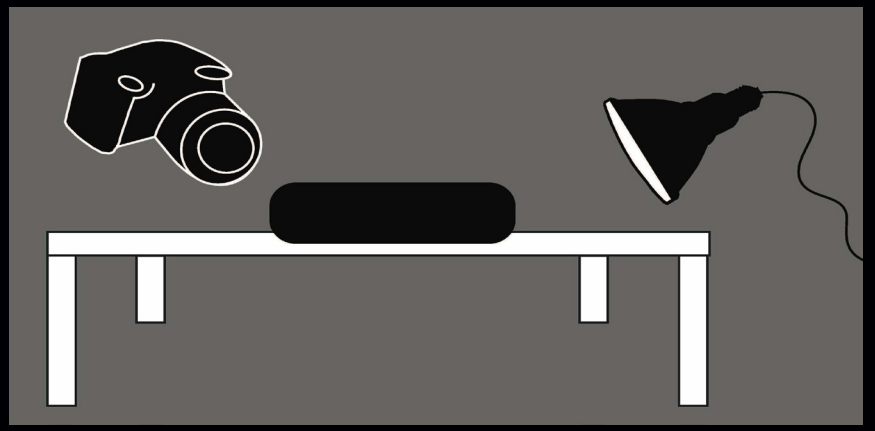


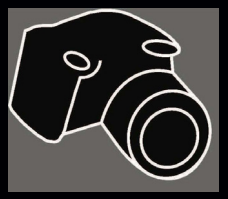
UV Light



Shallow Tub

Side View





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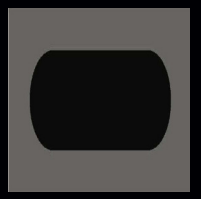
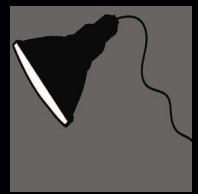


Shallow Tub



UV Light

Biography

Nina Roepke is a third year photography student who is pursuing a degree in Biomedical Photographic Communications at Rochester Institute of Technology. The experiences at RIT has provided her with the opportunity to learn and use a variety of photographic equipment. This has allowed her to further her skills in photography. Nina enjoys photographing nature, specifically in the macro setting, as well as creating photomicrographs using a microscope.
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http://www.sciencephotography.com

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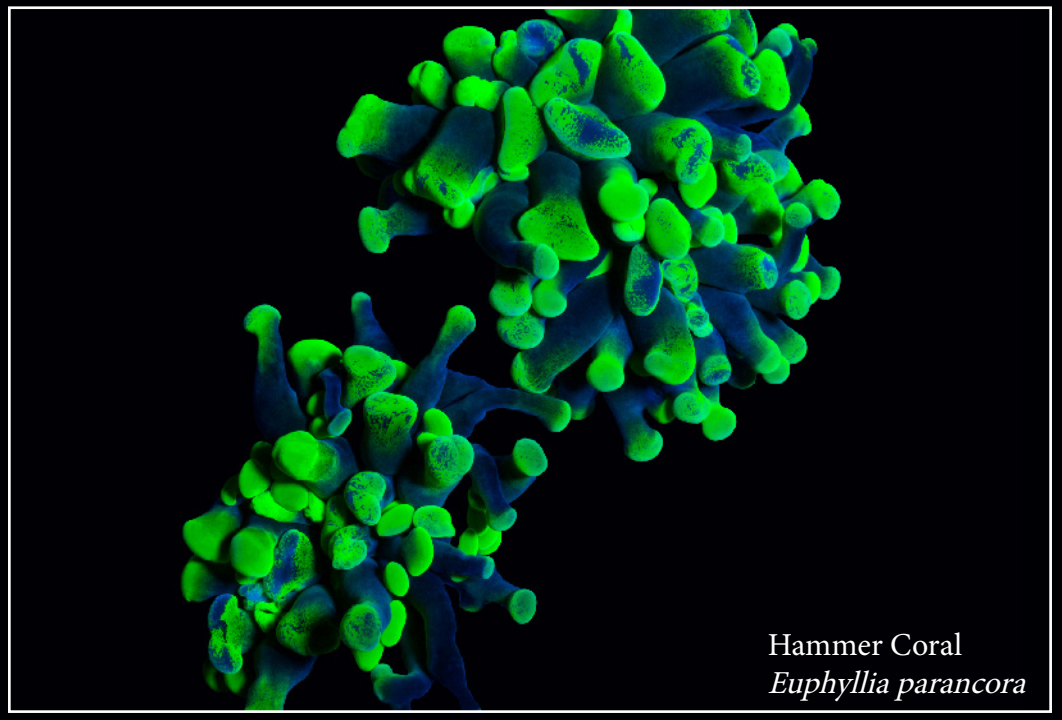

Hammer Coral
Euphyllia parancora