

入圍 Shortlisted

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▶ 網路票選人氣獎第二名
2nd of internet vote

庫泥仿生珊瑚

Remakin The Green Coral

我們為了模擬珊瑚生長的過程與構造，以 Rhino-Grasshop-pe 軟體及 shortestwalk 指令，找出最短路徑讓空間中的點連接，再製成外型近大自然樣貌的珊瑚。為考量量產問題，我們參考了腦狀珊瑚以及深刻紋路珊瑚的構造，以圓潤且帶有珊瑚天然不規則的外表為發想，做出簡單的模具以利量產製作，構造完成後我們將其 3D 列印出來放入水中，觀察魚群是否會跟這樣的結構互動，放入前魚群的顏色較深（深色代表緊張與害怕），但放入珊瑚模擬結構後，魚群的顏色轉變為鮮豔，並且會自由的穿梭其中，有時倚靠或躲在裡面休息，本作品實驗證明魚群可以跟人造珊瑚共生，達到良性的互動。

Reservoir silt and coral bleaching and seawater acidification have always been an important issue in Asia. We use the high permeability water of the reservoir to simulate the function of corals. Its function can be used to filter water quality and filter impurities into small fish food. The bony reefs that look like nature can not only help the fish to achieve the function of asylum, the natural holes can also make the eggs safely hatch, increase the hatching rate of the fish, and add the oyster shell powder, its alkaline characteristics are used to improve Acid and alkali in water, reducing the degree of acidification of seawater, while raw materials are natural waste sludge to achieve the goal of sustainable environment The attached factory is a reservoir mud that we promote together with local ceramic factories.



ReMaking The Green Coral

重製綠色珊瑚礁



環保永續



水庫淤泥



牡蠣堆積



珊瑚危機

設計問題出發點

水庫淤泥問題一直是造成地方水庫壽命嚴重受損的主要原因之一,且為了清除這些淤泥所花費的財力食分可觀。

台灣西部沿海盛產牡蠣,時常可見廢牡蠣殼就堆置在路邊,不僅有礙市容,也衍生許多環境問題。

最嚴重的就是全球珊瑚危機,生為海洋中生態系的根基層,近年珊瑚的數量嚴重銳減,光靠人工的復育實在難以恢復原本樣貌...



除了投入大海用以復育海洋的綠色珊瑚,我們也將相同的材質投入到十分廣泛的水族造景,濾材中

市面上大多造景物 例如常見的: PVC人造珊瑚 / 聚脲類人造珊瑚

除了在外觀上的華麗,對於魚缸中的水質一點幫助也沒有,純粹只是一塊生產中破壞環境的塑料

且塑料的材質對於魚缸中的水質也有害,完全違背養魚守則的第一條

“養魚先養好水”



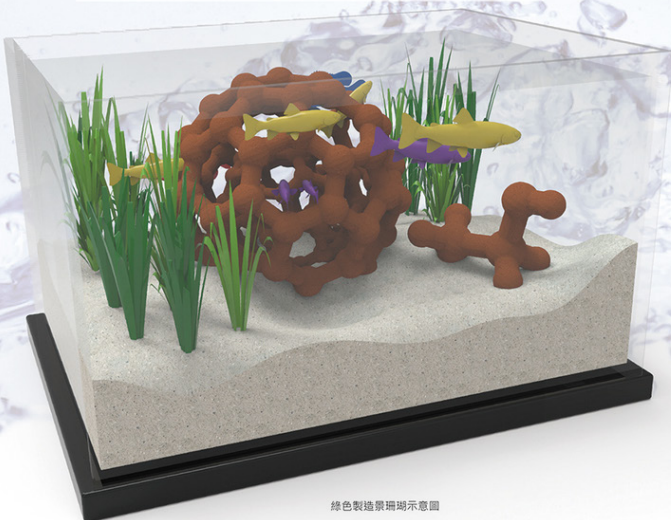
加入稻殼,稻殼是人類主食所剩下的副產物,但由於本身有著一定的體積,混入泥漿中攪拌均勻後,所混和的泥漿,在燒製時,窯爐內的溫度能將泥漿中的稻殼燃燬殆盡,而本身表面以及內部則產生這些稻殼的體積的空間,用於模仿珊瑚表面本身的細孔,這些細孔可以用來培養活化海水的消化菌



水庫淤泥為主要材質,其功能為燒製後表面所產生的細孔能達到過濾水中物質,使的水中以浮游生物,微生物為主食的生物能夠直接在其表面上攝食,達到改善水質的效用,並且外觀也仿生大自然的珊瑚,居食功能皆能在此珊瑚上呈現出來



加入牡蠣殼(粉)一來是能夠透過牡蠣殼本身的所含的碳酸鈣(CaCO₃)來解決海洋中大量二氧化碳(CO₂)所造成的海洋酸化問題(自然中珊瑚礁也因為此原因而大量消失)二來能解決台灣西海岸部十分常見的牡蠣殼山,大量的牡蠣殼無從解決的方法在這邊能有有效的應用在人造珊瑚中,且不會造成二度環境汙染



綠色製造珊瑚示意圖



使用相同材料所製成的濾材,該濾材經過實際投入魚缸中,與一般市售濾材相比,有著更好的淨化水質與和水中酸鹼濃度的功能,不僅能有效控制水中的含氮量,且經由稻殼燃燬後的孔洞比起市售濾材大,能培養更多有助改善水質的硝化菌



應用在魚缸中的珊瑚,我們跳脫以往大自然中腦狀,樹枝狀,菌狀外型的珊瑚,我們希望人們在幫自己魚缸中的魚造景時,能思考如何讓魚,人,以及這個珊瑚做互動,所以我們將珊瑚以結構式的形式呈現,顧客可以依照魚缸的大小組裝成適合尺寸的珊瑚,也能透過這些組裝起來的空間,讓魚兒能在這些空間得到互動,庇護,居食的功能

ReMaking The Green Coral

重製綠色珊瑚礁



Environmental sustainability



reservoir sedimentation



Oystershell accumulation



crisis of coral reefs

Problems:

The sedimentation cause damage of reservoirs and reduces its using period. What's worse, it cost a lot of money to get rid of the sedimentation.

The west area of Taiwan abounds in oysters, and its common to see thrown-away oyster shells on the street. These shells caused dirtiness and environmental problems in the city. Out of those mentioned above, the most serious issue is the dramatically decrease of coral all around the world.



except of placing the green reefs for restoration in the ocean, we also use them in the gardening of aquarium and the making of filter elements.

Most aquarium gardening elements like PVC and PET artificial reefs are just a piece of plastic material that's placed in the water. Moreover, since plastic pollutes the water, it breaks the rule of "using cleanwater" while fishkeeping.



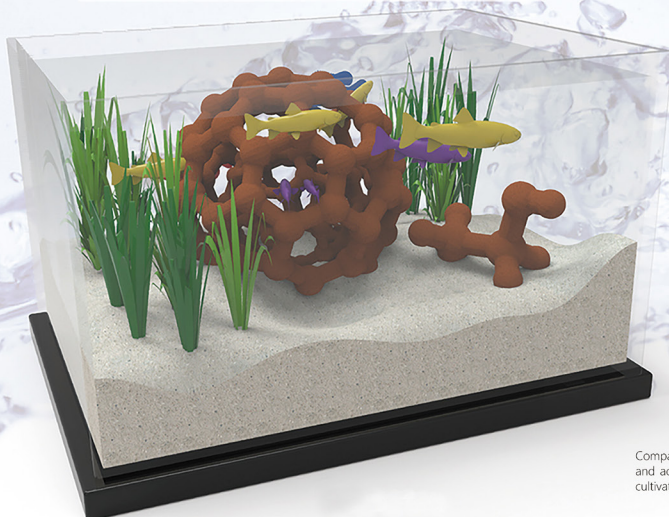
These holes on our green reefs can be used to cultivate nitrifying bacteria for activating ocean water. Also, it'll become the habitation of algae and helps to purify the water.



Adding paddies: We use paddies, the by-product of rice, and silt as the main ingredient of our green reef. When we place the mixture of them in the kiln, only the paddies will be burned out. By this way, we can create a material which have a lot of little holes on it, which is similar with the surface of corals.



The oyster shell powder contains $CaCO_3$. After adding the powder in the green reef and place it in the sea, we can improve the problem of ocean oxidation (the main reason that causes the number decrease of corals). At the same time, we can reuse the shells and solve the problem of abandoned shells.



Compared to most of the filter elements in the market, our green reef has better efficiency in water filtering and acid-base neutralization. Besides, it has better control of nitrogen content in the water and helps cultivate more nitrifying bacteria for water purification.