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AQUAPONIC FARMING- A CONTINUOUS SUPPLY OF FOOD FOR SPACE COLONIES

Abstract

Previously, hydroponic farming, where plants are cultivated in water had been suggested for habitat in space. But in this paper, we have proposed the use of aquaponic farming, which combines aquaculture — cultivating fish and other aquatic animals in tanks — with hydroponics. The water from the fish tank is pumped onto the plant-growing beds. The clean water is re-circulated back to the fish tank while the fish excretions offer nutrients for the plants. A cross-breed fish was obtained in which no gravity-dependence occurs if treated with altered light directions. This fish as well as its embryo can successfully survive in microgravity. So carrying only embryo will be enough to set the aquaponics project there. Also, this farming requires only 1/10th the amount of water used in conventional agriculture. On the top of it, the fish is capable of breeding in the microgravity as well, so the project can be continued for long terms. Vegetables like kale, spinach, tomato, arugula and lettuce can be cultivated without any need of fertilizer, pesticide or fertilizers. Also, it gives multifold growth of 6-8 times more than open field. This kind of set up can be of great help for future space settlement and can provide human race with the required produce all year long without any restriction of environmental conditions as the conditions in this project can be controlled.