

Microalgae Produced in Recirculation Aquaculture Systems

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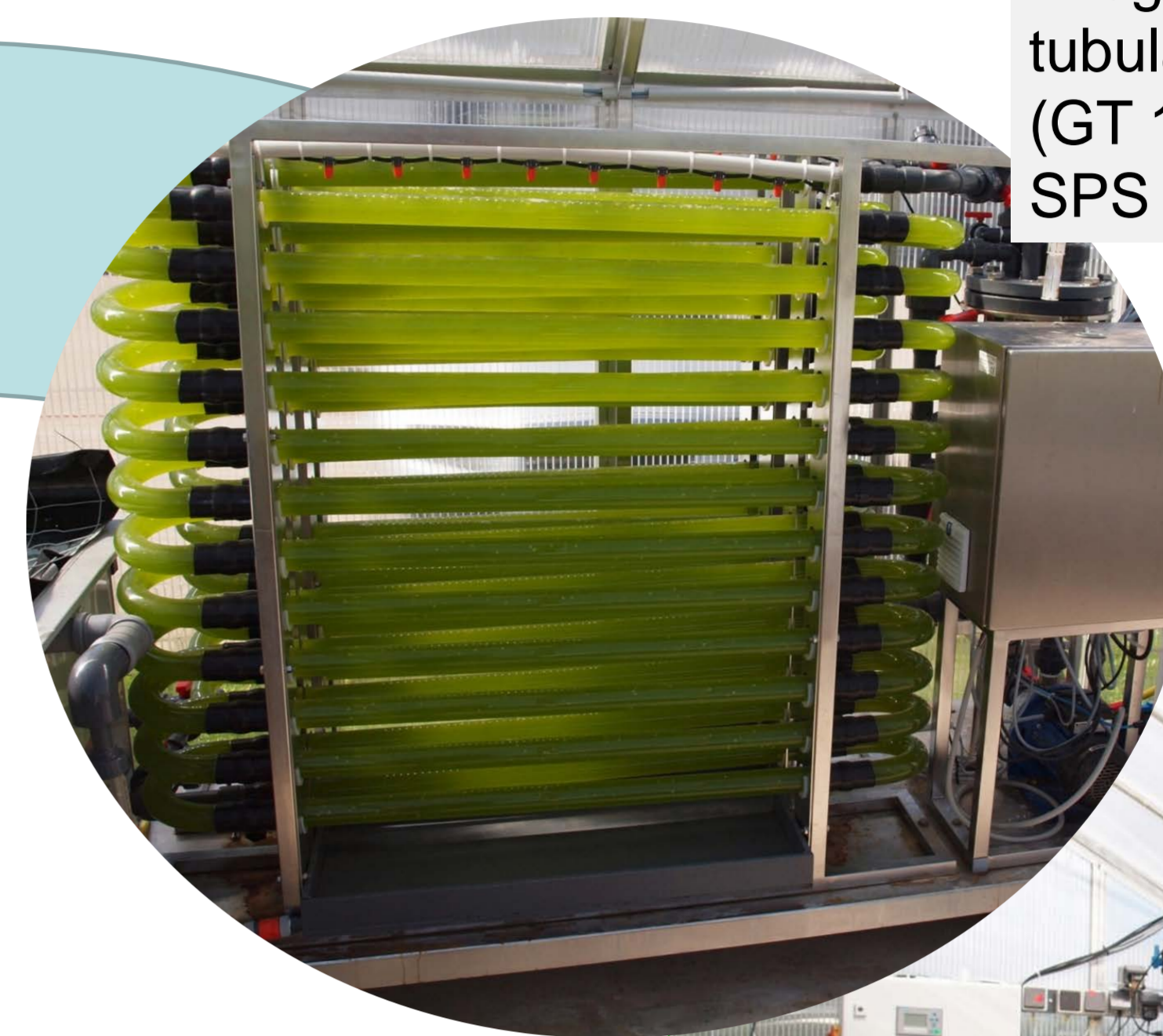
Recirculation aquaculture systems (RAS) produce large amounts of dissolved and particulate Reststoffe. The landbased systems allow recycling of ... in coupled processes. In the context of the INTERREG project Energetic Algae a process was developed to use dissolved .. as nutrients for microalga in a zero-exchange RAS for marine fish.



RAS: The process water from the production tank (7 m³) passes a drum filter and the biofilter (nitrifikation) at arate of 17000 L/Std. A ozone-enhanced protein skimmer, a small biofilter (denitrifikation) und the PBR are integrated in independent side streams.

Systeme characteristics:

- clear process water,
- Low nutrient concentrations,
- No exchange of process water, less than 1% waste water for flushing out particulate waste!



Integrated tubular photobioreactor (GT 100, IGV GmbH); SPS (Siemens)



Flat panel airlift PBR (Subitec GmbH); 3 x 25L
Background: PLC, compressor



Harvest of algae with ozone-enhanced flotation;
The flotote has a biomass concentration of > 60 g/l. The clarified culture medium is send back to the RAS.

The successfull integration of light-dependent production of microalgae for bioremediation of process water in a zero-discharge requires:

- ✓ Clear process water in RAS.
- ✓ Optimized productivity of PBR by model-based regulation of process water (nutrient) supply.
- ✓ Automated, semi-continuous process water supply to PBR
- ✓ Automated back-flushing of membrane that retains algae in PBR.
- ✓ Process-integrated harvesting process, amenable to automation.
- ✓ Complete recycling of culture medium after harvesting of algae.