

Jeremy Gay and Nathan Hill investigate some new LED lights, T5 light, bacterial balls and a filter on their way to the UK shops

Evolution Aqua Pure Aquarium

Bacterial products scare me. I've a history of being skeptical of their effectiveness, traditionally trying to persuade people to adopt methods I trust more.

So, when the clear, gelatinous balls of Pure Aquarium — a derivation of Pond Pure — appeared I decided it was time to have it out with the creators.

At Evolution Aqua's UK headquarters, I sat down with Jasper Kuijper, the man behind the product. After some conversation — and there was occasional friction — I felt satisfied that this product can back up its claims.

Understandably, Evolution Aqua wants to keep some product technicalities close to its chest, so I had a few gaps to fill with speculative research.

My best theory is that the process is similar to the immobilisation techniques using polyethylene glycol (or PEG) prepolymers, as used in water sewage treatments. If I'm right then the research behind this method is watertight and the results — at least where treatment of waste water is involved — are well documented and very impressive with captured bacteria that get to work quickly.

The balls are, in effect, grown in an activated sludge. Formed from a hygroscopic polymer, each ball absorbs a mixture of fluid and bacteria, layering up until it has a complement of heterotrophic and autotrophic bacteria. It's a well-understood process and allows for nitrifiers and heterotrophs to co-exist.

Pure Aquarium requires oxygen to function, with no claims of nitrate reduction being attached. This is good, as it would require anoxic conditions that the balls don't provide. Indeed, this is something backed up by waste water research.

Dosage is open to debate and

one to two balls per 25 l/ 5.5 gal for routine maintenance is usually recommended. It's hardly a precision measurement, accounting for any variances between balls.

These balls are added either directly to the bottom of the tank or to the filter to eventually biodegrade. Re-dosing is weekly and, in the event of fish consuming them, there are no detrimental effects. Indeed, for reasons unexplained, I had the best part of an entire packet in my mouth for a few minutes and suffered no ill effects.

Multi-tasker

The winning factor is the omission of any claim that this will start an aquarium cycle. The product is intended as a standalone to existing biological activity, and although it claims to — and by all accounts should — help establish tanks, it's not intended as a sole developer of filter bacteria.

The combination of different bacteria, rather than focusing on one or two species, means a wide range of microbial life is incorporated, including species devoted to the consumption of cloudiness-causing organic wastes. This product can multi task, being especially helpful in biologically struggling tanks.

Although not realistically possible, overdosing the product could overwhelm existing filters and replace existing biological activity. However, this would require huge amounts!

Does it work? Our experiences so far say yes. Clouded staff tanks have been remedied remarkably quickly and our filters have avoided any crashes or fluctuations.

It's harder for us to comment on ammonia or nitrate reduction,



lacking the time and space for a huge multiple tank trial with controls, and not having readings in our own systems.

I'm very impressed. I never thought I'd be saying that about a bacterial product, but the science is sound, the product makes realistic claims, and in the flesh it has positive effects. Good effort, Evolution Aqua!

The product is widely available in a 250g/50 ball size, but at time of writing, Evolution Aqua are offering a smaller, free sample for those happy to pay P&P.

► **Price:** £9.95 for 50 balls.

► **More info:** www.evolutionaqua.com

Nathan Hill

What are heterotrophic and autotrophic bacteria?

When most fishkeepers start to think of 'filter bacteria' they are actually referring to autotrophic bacteria. These can convert chemicals that do not contain carbon, such as ammonia (NH₃) and nitrite (NO₂), but not something like proteins (CHON) that contain carbon.

Heterotrophic bacteria prefer organic wastes — those containing carbon. Under lab conditions some species will also consume ammonia and this has caused them to be marketed as filter starting products.

Although incredibly hard to bottle the autotrophs essential for filters, it's very easy to preserve heterotrophs.

In new tanks heterotrophs will outcompete autotrophs for vital resources. While a typical filter autotroph divides around every 15-20 hours, heterotrophs can do so every 20 minutes. In the time it takes for one autotroph division you could have more than 30 trillion heterotrophs in the tank — taking up valuable space, oxygen and food.

However, in a healthy tank with plenty of autotrophs, a controlled addition of heterotrophs can be beneficial, especially where organic wastes need to be consumed. Add too many, though, and you'll witness spikes of ammonia and nitrite as beneficial bacteria are outcompeted for food.