Bill Russell vs. Wilt Chamberlain: The Algae Biofuels Angle

By JIM LANE, Editor, *Biofuels Digest*

Congratulations, you're in the algae business. You've found your magic strain, built your lab, some mini-ponds and tiny paddle-wheels.

The sun is shining, the CO2 is pumping, your pond is turning a darker and darker shade of green. You've found the golden path — you're making fat algae, fit for purpose and fast enough for profit!

Then some two-celled varmint comes along. Wham! He gobbles your golden algae goose in one big phagocytosic bite.

[Phagocytosis!? And you thought the only five-syllable word you needed to know was Philadelphia. Welcome to biofuels.]

Worse, you find that no matter where you situate your algae in the pond — eventually, some buffed-out, six-pack abs, ripped MicrobeZenegger comes along — competitor, predator, pest, parasite or pathogen. Kicking sand in your algae's face like the beach bully from the old Charles Atlas fitness ads.

Robbing him of his food sources, possibly his dignity, probably his life and certainly your profits.

It may sound like small potatoes now. After all, today we depend on petroleum — also known as ancient algae cemeteries, liquefied by geologic time and pressure.

Eventually, we'll have to figure out how to do something more interesting and sustainable than algae grave-robbing — also known as "drilling and exploration" — and in farming algae, we will move from the hunter-gatherer stage to the agricultural stage — microbially-speaking.

To do so, we better learn to strengthen, defend and treat them.

After all, let's consider the problem here. Nature hasn't (so far) selected algae for long life. Generally, the little one-celled growth factories survive by blooming slightly faster than they get eaten. Making a world that's safe for algae is like breeding ice cream at a children's party and hoping no one stops by for a nosh.

Tracking parasites

That's why it was so interesting when Sapphire Energy announced the completion of a collaborative study, which identified the morphology, ultrastructure, and life history of A. protococcarum, one of the most difficult to manage algae parasites.

Their findings are detailed in "Characterization of Amoeboaphelidium Protococcarum [1]: An Algal Parasite New to the Cryptomycota Isolated from an Outdoor Algal Pond Used for the Production of Biofuel," published today in the online scientific journal PLOS ONE — you can read it here.

The article provides a comprehensive study of the parasite challenge facing crop protection for scaled algae cultivation in open-pond systems. These results will provide a broader understanding and promote the development of sustainable management strategies for biofuel production.

For now, a shout out to the team — Robert McBride, Salvador Lopez, Craig Behnke, and Philip Lee, of Sapphire Energy; Peter Letcher and Martha J. Powell at the University of Alabama; and Robert Schmieder, at San Diego State University.

"Identifying and overcoming crop protection challenges, from pest control to environmental factors, is critical to ensuring successful, scalable algae farming, and has long been a part of the research and development objective of Sapphire Energy," said Alex Aravanis, MD, Ph.D., chief science officer at Sapphire Energy.

What can we draw from the news from Sapphire and friends?

Good news — that attention is engaged in the community on defending their 'lil algae, not just birthing and fattening them.

Bad news — it definitely looks like there is a gap as wide as the Grand Canyon in terms of the effort that will be needed to catalogue all known parasites and design defenses (not to mention competitors, predators and the like).

Meaning that there's still a lot of faith in the algae business, tangled with the science — the faith, that is, that overcoming the challenges is feasible both in economics and in time.

For the skeptics will continue to shout, “where are the gallons?” and the answer cannot be that some lowbrow algae predator ate them all up, or that they were slayed by a virus.

In basketball, the debate raged for a decade — would you rather have Wilt Chamberlain, the greatest scorer of all time, or Bill Russell, the greatest defender of all time, on your roster. Chamberlain, for sure, set more records for the books. Excepting one — consecutive NBA championships. Russell has that one.

Chalk up one for the defenders.

What’s your take? Please feel free to comment below! For more information, please visit www.biofuelsdigest.com *[2].*

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[1] http://dx.plos.org/10.1371/journal.pone.0056232
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