

The dark side of sacoglossan slugs: Why the “crawling leaves” are no phototrophs



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**Room: Institute of Parasitology,
Boardroom**

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Sacoglossan sea slugs fascinate, as they are able survive prolonged starvation periods through plastids they sequester from their algal prey. Research on the slugs and their lasting kleptoplasts stretches back many decades and the issues of how slugs survive starvation and what mediates kleptoplast longevity have sometimes been conflated. It was once thought that horizontal gene transfer from the alga to the slug could explain kleptoplast longevity, but most recent data – including slug genome sequencing – refutes this hypothesis. In addition, in regard to explaining prolonged starvation periods even the role of photosynthesis itself is in question. These results have forced us to become more critical about the topic and not only reconsider the prime role of kleptoplasts in green sacoglossan slugs, but in particular to find an alternative explanation for kleptoplast longevity. From the literature, and results we will present, we know that the kleptoplasts’ genomes remain expressed in the slugs. Could the plastids sequestered by the different LtR species – albeit originating from the most distant corners of algal evolution – have something in common that has been so far overlooked because the focus was on the slug’s nuclear genome? The topic will be discussed in the context of our most recent findings that offer an entire new avenue of pursuit to investigate the nature of plastid longevity, not only in kleptoplasts of sacoglossan slugs.

You’re welcome!