

RHEINISCHE FRIEDRICH-WILHELMS-UNIVERSITÄT BONN
Fachgruppe Biologie

Zoologisches Forschungsmuseum Alexander Koenig

Biologisches Kolloquium

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im Hörsaal Zoologie, Poppelsdorfer Schloss

Dr. Gregor Christa

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“Evolution and physiology of functional kleptoplasty in Sacoglossa“

Einladung: Prof. Dr. H. Wägele (ZFMK)

Abstract: Some species of the marine gastropod taxa Sacoglossa are able to retain the chloroplasts of their algae food source and keep them functional active in their own cytosol, even when the slugs starve for weeks to months to come. This – in the animal kingdom – unique system to acquire photosynthesis is referred to as functional kleptoplasty. It is still unknown what factors are necessary to establish and maintain functional kleptoplasty. Theory has it that the slugs need to have certain physiological and genome adaptations to recognize and integrate the chloroplasts (then called kleptoplasts). This also implies that they are then prevented from being digested. The chloroplast itself needs to bring along the ability to withstand of being isolated from their natural cellular milieu, especially in the absence of any algae nuclear encoded proteins important for plastid functionality. Here, plastid encoded mechanisms to protect against excessive light intensities and to repair the photosystem are hypothesized to be crucial for kleptoplast longevity. Independently of the underlying mechanisms, it is often hypothesized that the slugs survive starvation periods because of continuous support of photosynthates provided by the kleptoplasts. Yet, recent analyzes showed that photosynthates first accumulate during a couple of weeks before they become accessible for the slugs. However, the potential nutritional support of the kleptoplasts for the slugs is still controversy discussed.