

**Michiels et al (2008:) Red fluorescence in reef fish: a novel signalling mechanism?**

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**Abstract:** At depths below 10 m, reefs are dominated by blue-green light because seawater selectively absorbs the longer, 'red' wavelengths beyond 600 nm from the downwelling sunlight. Consequently, the visual pigments of many reef fish are matched to shorter wavelengths, which are transmitted better by water. Combining the typically poor long-wavelength sensitivity of fish eyes with the presumed lack of ambient red light, red light is currently considered irrelevant for reef fish. However, previous studies ignore the fact that several marine organisms, including deep sea fish, produce their own red luminescence and are capable of seeing it. We here report that at least 32 reef fishes from 16 genera and 5 families show pronounced red fluorescence under natural, daytime conditions at depths where downwelling red light is virtually absent. Fluorescence was confirmed by extensive spectrometry in the laboratory. In most cases peak emission was around 600 nm and fluorescence was associated with guanine crystals, which thus far were known for their light reflecting properties only. Our data indicate that red fluorescence may function in a context of intraspecific communication. Fluorescence patterns were typically associated with the eyes or the head, varying substantially even between species of the same genus. Moreover red fluorescence was particularly strong in fins that are involved in intraspecific signalling. Finally, microspectrometry in one fluorescent goby, *Eviota pellucida*, showed a long-wave sensitivity that overlapped with its own red fluorescence, indicating that this species is capable of seeing its own fluorescence. We show that red fluorescence is widespread among marine fishes. Many features indicate that it is used as a private communication mechanism in small, benthic, pair- or group-living fishes. Many of these species show quite cryptic colouration in other parts of the visible spectrum. High inter-specific variation in red fluorescence and its association with structures used in intra-specific signalling further corroborate this view. Our findings challenge the notion that red light is of no importance to marine fish, calling for a reassessment of its role in fish visual ecology in subsurface marine environments.

**Anker, A. & Dworschak, P.C. (2007b): Description of a new species of Richalpheus Anker and Jeng, 2006 (Crustacea: Decapoda: Alpheidae) from the Red Sea. Journal of Natural History 41(37-40): 2331-2340.**  
[http://www.informaworld.com/openurl?genre=article&issn=0022-2933&volume=41&issue=37&spage=2331&uno\\_jumptype=alert&uno\\_alerttype=new\\_issue\\_alert,email](http://www.informaworld.com/openurl?genre=article&issn=0022-2933&volume=41&issue=37&spage=2331&uno_jumptype=alert&uno_alerttype=new_issue_alert,email)

**Abstract:** *Richalpheus dahabensis* n. sp. is described from a single female specimen collected at a depth of 10-13 m from the mound of the callianassid mudshrimp, *Glypturus* sp., in the shallow lagoon near Dahab, Egyptian Red Sea. The new species differs from the type species, *R. palmeri* Anker and Jeng, 2006, by the absence of the fossa/tooth system on the pollex of the major chela. The diagnosis of *Richalpheus* is emended to accommodate the new species. The two possible pathways for the evolution of the fossa/tooth system within the leptalpheoid lineage are discussed.

**Herler, J. (2007): Microhabitats and ecomorphology of coral- and coral rock-associated gobiid fish (Teleostei: Gobiidae) in the northern Red Sea. Marine Ecology – and Evolutionary Perspective, 28(S1): 82-94.**

**Abstract:** Twenty-one coral- and coral-rock associated gobiid fish species were examined in the Gulf of Aqaba, northern Red Sea in autumn 2003 and spring 2004. They represent the seven genera *Bryaninops*, *Eviota*, *Gobiodon*, *Paragobiodon*, *Pleurosicya*, *Priolepis* and *Trimma*. Clear spatial niche segregation was found in all species. Branching corals of the genus *Acropora* were obligatorily inhabited by *Gobiodon* spp., while *Paragobiodon echinocephalus* was restricted to *Stylophora pistillata*. Three *Bryaninops* species showed species-specific associations with *Acropora* spp., *Millepora dichotoma* and *Cirripathes* sp.. Most of the five *Eviota* species had weak associations with live corals but frequented coral rock. Among the genus *Pleurosicya*, two species were encountered. *Pleurosicya micheli* frequented massive scleractinian corals, while *P. prognatha* occupied various species of *Acropora*. *Priolepis semidoliata* was only occasionally observed and found on coral rock. Weak associations with scleractinians corals were documented in *Trimma avidori*, and *T. mendelssohni*, both of which inhabit coral rock. Principal component and cluster analyses showed several morphological features to be important ecomorphological traits. Gobiid species inhabiting encrusting or massive corals have a more depressed body than species in branching corals. Eye size was well correlated with preferred water depth, especially in the coral-associated species. A typical gobiid feature – the pelvic disc – was found in very different character states and corresponded with preferred microhabitats. A well-developed suctorial pelvic disc was typical for obligate coral-dwellers.

**Dirnwöber, M. & Herler, J. (2007): Microhabitat specialization and ecological consequences for coral gobies of the genus *Gobiodon* in the Gulf of Aqaba, northern Red Sea. *Marine Ecology Progress Series*, 342: 265-275.**

**Abstract:** The microhabitat selection and distribution of six coral-associated species of *Gobiodon* was examined in the Gulf of Aqaba, northern Red Sea, including three recently discovered species. A total of 1626 fishes were counted visually using 10 x 1 m belt transects in 1731 colonies of 13 species of *Acropora*. Niche segregation was observed at the level of coral species. *Gobiodon* sp. 2 was the most specialized, occupying only *A. hyacinthus*; *G.* sp. 1 was most generalized (three species of *Acropora*). *G. reticulatus* was a zone specialist that preferred deeper water regions. Less specialized species were able to use substitute host corals, which enabled them to maintain extraordinarily high abundance. *G. histrio*, for example, preferred the rare *A. digitifera* but was common in the very abundant *A. acuminata*, although proportionally fewer breeding pairs were established in the latter. When compared to the western Pacific, *G. histrio* showed a more generalized behaviour in the northern Red Sea, and different coral species served as host corals; the latter also holds true for the even more generalized *G. rivulatus*. Hence, species of *Gobiodon* appear to alter host-use and degree of specialization on a global scale.

**Herler J. & Hilgers H. (2005): A synopsis of coral and coral-rock associated gobies (Pisces: Gobiidae) from the Gulf of Aqaba, northern Red Sea. *aqua, Journal of Ichthyology and Aquatic Biology*, 10 (3): 103-132.**

**Abstract:** Field investigations in the Gulf of Aqaba , northern Red Sea (Dahab, Sinai , Egypt ) revealed 21 species in seven genera of gobiid fish associated with corals and/or coral rock. Three as yet undetermined species of *Gobiodon* (*G.* sp.1, 2 and 3) were found to be new for the Red Sea . Like the congeneric *G. citrinus*, *G. histrio*, *G. reticulatus* and *G. rivulatus*, they are obligate dwellers of *Acropora* corals. Among the other genera, *Bryaninops yongei* significantly differs from its congener *B. ridens* in live coloration as well as by its preference for *Cirripathes* sp., while the latter obligatorily inhabits *Millepora dichotoma*. A third species, *B. natans*, exhibits hyperbenthic behaviour, violet eyes and a yellow belly on the otherwise transparent body and is commonly associated with *Acropora loripes* and *A. squarrosa*. The five *Eviota* species examined were less specialized and associated with live corals of various growth forms and/or with coral rock. *Paragobiodon echinocephalus* showed very low occupation rates of the highly abundant *Stylophora pistillata* and was mostly found in small breeding pairs. Within the genus *Pleurosicya*, *P. micheli* is more slender than *P. prognatha* and shows a distinct longitudinal red internal stripe, while the latter is transparent with a few brown speckles in life. *Pleurosicya micheli* inhabits massive scleractinians, whereas *P. prognatha* is found in *Acropora*. *Priolepis*

semidoliata was rare and associated with coral rock. Weak associations with scleractinians were also found in *Trimma avidori*, which was common but prefers steep or overhanging substrates mostly consisting of coral rock. *Trimma mendelsohni* prefers coral rock caves.

## Conferences

Herler J.: Ecology and morphology of coral-associated gobies (Gobiidae) in the Red Sea. Oral presentation at the 6th conference of the German Ichthyological Society, Munich (Germany), March 2008.

Herler J.: Shaping up - Eco-morphology and growth patterns in coral-associated fishes: Poster presentation at ECI (European Congress of Ichthyology) XII Dubrovnik (Croatia), Sept. 2007.

Riedlecker E., Herler J. & Hilgers H.: JAWS: Trophic morphology of coral-associated fishes from the Red Sea. Poster presentation at ECI (European Congress of Ichthyology) XII Dubrovnik (Croatia), Sept. 2007.

Wall M., Herler J. & Ott J.: Post-settlement migration in coral-associated fishes: an experimental approach. Poster presentation at ECI (European Congress of Ichthyology) XII Dubrovnik (Croatia), Sept. 2007.

Herler, J: Morphological adaptations to microhabitats in coral-associated fishes: Oral presentation at ISRS (International Society for Reef Studies), Bremen (Germany), Sept. 2006.

Niedermüller S., Schiemer L. & Herler, J: Interactions between coral-feeding and coralinhabiting reef fishes in the northern Red Sea: Poster presentation at ISRS (International Society for Reef Studies), Bremen (Germany), Sept. 2006.

Schiemer L., Niedermüller S. & Herler, J: Does live coral cover and coral health influence the community of highly specialized reef fishes?: Poster presentation at ISRS (International Society for Reef Studies), Bremen (Germany), Sept. 2006.

Herler J. (2005): Inaccessible shallow-water habitats: a realm for marine gobiid dwarfs. Oral presentation at EMBS (European Marine Biological Symposium) 40, Vienna, August 2005.

Dirnwöber M. & Herler J. (2005): Microhabitat choice of selected Gobiodon species (Pisces: Gobiidae) in the Gulf of Aqaba, northern Red Sea. Poster presentation at EMBS (European Marine Biological Symposium) 40, Vienna (Austria), August 2005.

## Theses

Wagler, Marit (University of Leipzig, 2007-2008; supervisors: Prof Dr. Willie Xylander, Prof Dr. Franz Brümmer)

Hannak Judith (University of Vienna, ongoing; supervisor: Prof. Dr. Jörg Ott): "Reef management concept for a frequently visited coral reef (Dahab, Sinai, Egypt)."

Kompatscher Sarah (University of Vienna, ongoing; supervisor: Prof. Dr. Jörg Ott): "Evaluation of the current reef condition north of the Napoleon-Reef (Dahab, Sinai)."

Wall Marlene (University of Vienna, 2007-2008; official supervisor: Prof. Dr. Jörg Ott): "Postsettlement migration of coral-associated fishes: an experimental approach."

Riedlecker Eva (University of Vienna, 2007-2008; official supervisor: Prof. Dr. Helge Hilgers): "Trophic ecomorphology of coral-associated fishes (Gobiidae) from the Red Sea."

Schöpf Verena (University of Vienna, 2007-2008; supervisor: Prof. Dr. Martin Zuschin): "Prey selection and life habit of the corallivorous gastropod *Drupella cornus* in the northern Red Sea."

Lucie Schiemer (University of Vienna, 2006-2007; official supervisor: Prof. Dr. Jörg Ott): "Influence of live coral cover on the assemblage and abundance of coral-associated gobiid fishes in the northern Red Sea."

Simone Niedermüller (University of Vienna, 2006-2007; official supervisor: Prof. Dr. Jörg Ott): "Interactions between coral-feeding and coral-inhabiting reef fishes – an etho-ecological study of chaetodontid feeding behaviour and gobiid microhabitat selection."

Markus Dirnwöber (University of Vienna, 2004-2006, official supervisor: Prof. Dr. Jörg Ott): "Microhabitat choice of selected Gobiodon species (Teleostei: Gobiidae) in the Gulf of Aqaba, northern Red Sea."