University of the Ryukyus
International Graduate Program for Asia-Pacific Region

REPORT

i) Researcher information
Fabienne Künzli, first-year PhD Student
Laboratory of assoc. prof. Tachihara Katsunori
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ii) Acceptance information
Assoc. prof. Jamie Seymour - venom specialist
School of Marine & Tropical Biology
James Cook University, Cairns, North Queensland, Australia

iii) Research term
July 6, 2012 – August 3, 2012

iv) Research information
- Participation in the 12th International Coral Reef Symposium, Cairns 2012
- Comparative study of life history characteristics in Triggerfishes (Balistidae)

Symposium
The symposium highlighted the contemporary progress and development in coral reef science. About 2'500 people from 80 countries were participating and showed their results within the framework of 22 Symposia themes. I and Keita Koeda from Tachihara sensei’s laboratory were holding our oral presentation in the “fish & fisheries” theme on the second day of the symposium. On the remaining days, I attended the oral presentations focusing on life history, reproduction and larval ecology, recruitment and connectivity of coral reef fishes and sharks.

Triggerfish research - outline
The triggerfish family (Balistidae) is a highly modified and advanced group of fish and they are easily recognized by their characteristic deep-bodied and laterally compressed body form. Though the members of this family are mostly distributed in tropical seas in great variety and are considered to be an important component of the coral reef fish community, very little is known about their life history characteristics and habitat use. Acquiring biological information of fish species is necessary in order to describe their life cycle and species-specific strategies and to understand the role and importance in their habitat. Besides, several triggerfish species represent an important fisheries resource and are especially appreciated by aquariophilists due to their colorful appearance and aggressiveness.
One part of the research abroad contained the sampling of the target species named Picasso triggerfish to get spine, vertebrae and gonad samples in order to obtain information about age and growth and reproductive biology. Those samples are not only very valuable for a comparison with my current data from Okinawa Island but since there are no published information available about basic life history aspects of balistids from Australia, the obtained data will contribute to a better understanding of the specific life cycle in geographically different locations.

Another part comprised the direct underwater observation of adults and juvenile Picasso triggerfishes. I was especially interested in the habitat occupied by small recruits. Based on my current results for the spawning season of the Picasso Triggerfish from Okinawa (May-September), I expected that the spawning season in the Great Barrier Reef had already taken place during the summer season in the southern hemisphere, thus around the beginning of the year.

The Great Barrier Reef in Australia is hosting a great variety of coral and fish species. Specific species are collected by “cairns marine”, a licensed marine life provider for retail outlets, wholesalers and public aquaria around the world. I could directly purchase triggerfish specimens from this provider (http://www.cairnsmarine.com/).

Totally 9 Picasso triggerfish (left) and one closely related species from the same genus (right) could be purchased. The distribution range of the Halfmoon triggerfish is restricted to Australia and Micronesia. It is a very rare species and literally nothing is known about its biology.
Specimens were measured, weighted and dissected (left) at the laboratory of James Cook University in Cairns, to extract gonads. Samples were afterwards immersed in boiling water to get spines and vertebrae (right).

The pictures show thin sections of vertebra (left) and the corresponding dorsal spine (right) of a female Picasso Triggerfish with totally 3 translucent year rings (146 mm in Standard length). The estimated age ranged between 3-8 years and totally seven individuals had a translucent band on the margin of sectioned spines and vertebrae. This is indicating that the fishes are laying down a year ring probably in the colder winter season, similarly to the triggerfishes from Okinawa.

This picture shows a histological section of a female ovary. No female and male showed higher developed oocytes and testis stages, respectively. According to that, those fishes were not reproducing at the time of catchment in July.
In the shallow coral reef area of Green Island I could find three different species of triggerfishes during skin-diving: the Picasso triggerfish (Rhinecanthus aculeatus), the Blueline Triggerfish (Pseudobalistes fuscus) and the Titan Triggerfish (Balistes viridescens). The latter two species were still juveniles and probably using this habitat as a feeding ground since the bigger-sized adult species are usually found in deeper water. Interestingly, several juvenile Picasso triggerfishes (recruits of ca. 40-50 mm Total lengths) were spotted in the very shallow reef area. This is strongly indicating that the spawning season in this species took place about half year ago in the summer season.

i) Achievements

The research trip including the participation in the symposium was a great experience with lots of impressions and new inputs, ideas and motivation gained for my research. Even though sample size of the purchased specimens was low due to the high prices achieved for ornamental triggerfishes, the so far obtained results are quite promising and are simply emphasizing the need for more specimens from different geographical parts of the world.

Even though the commercial sampling of live-stock from the Great Barrier Reef is strictly controlled, information about age, growth and reproductive biology is essential to establish and maintain a sustainable trading with coral fishes and especially to protect vulnerable and potentially vulnerable species from an over-collection.