**Poster presentation**

**Submission theme:** Marine Biodiversity, Food Safety and Security

**Title:** Overview and progress of consortium research related to the biology, ecology and aquaculture of rabbitfish

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Coastal habitats support global fisheries by ensuring the survival of juvenile fishes. These habitats constitute one of the fishing areas targeted by small-scale fishermen in the least developed countries, including Madagascar. The accessibility of these habitats at low tides makes it an ideal fishing area for mosquito seine nets as observed for instance in SW Madagascar and beach seining in Kenya. However, this practice negatively impacts fisheries production due to catches of high numbers of juveniles, in Madagascar and Kenya mostly composed of shoemaker spinefoot rabbitfish (*Siganus sutor*). Despite Malagasy laws that forbid the deployment of mosquito seine nets, fishermen continue with their use. In Kenya, the beach seines have been outlawed but enforcement remains a challenge. This context highlights the need for management measures and alternative sources of income for a sustainable use of marine resources and for improving the fishermen livelihood. The ongoing consortium research entitled “Fish juvenile recruitment in coastal habitats of western Indian Ocean” was funded by MASMA program administered by WIOMSA. It is an interdisciplinary research program intending to understand recruitment patterns of shoemaker spinefoot rabbitfish (*Siganus sutor*) in coastal habitats of Kenya and Madagascar. It explores evidence-based solutions for improving the welfare of coastal communities and sustainable use of marine resources.

Research activities were divided into four work packages. In WP1, *Siganus sutor* recruitment patterns in coastal habitats were targeted to identify the nursery ground and recruitment periods. It is based on juvenile fish sampling at four coastal habitats (mangroves, seagrass meadows, intermediate areas and seagrass associated with the coral reef) in Madagascar during twelve months. In WP2, sampling for the analysis of the population connectivity of *S. sutor* for detecting the sources of juveniles in the coastal habitats at five sites along the western coast of Madagascar was completed. In WP3, ecological models for predicting the arrival of newly settled *S. sutor* will be based on historical and newly collected data (WP1) using the random forests algorithm. Predictors are composed of remotely sensed oceanic conditions and a post-larval supply index calculated from post-larval sampling in the coastal habitats using light-traps. Like juvenile sampling, post-larval sampling was performed three nights per month which will cover all the juvenile sampling periods. In WP4, fish feeding behavior is studied and experiments on capture-based juvenile fish grow-out are ongoing at the Belaza aquaculture facilities (Toliara, Madagascar). Eight fish grow-out treatments focusing on three stocking densities, three fish diets, and pond dimensions are being tested.

In WP1, about 5,720 juvenile individuals were obtained from 120 juvenile fish samples. The standard length of each of these individuals were measured for analyzing the spatial distribution of *S. sutor*. The nursery ground and recruitment seasons for *S. sutor* emerged from our research. The findings will be presented orally by PhD student Helga Berjulie Ravelohasina during the symposium. In addition, about 360 epifaunal community samples were obtained between July 2021 and April 2022. The spatial distribution of abundance, diversity and richness of epifauna associated with seagrass will be presented in a poster by MSc student Mory Justino. In WP2, at each location, 45 individuals were sampled, for a total of 225 adults for Madagascar and 180 from Kenya. Genotyping is in progress. In WP3, monitoring of the newly settled fish, in parallel with post-larval sampling, is in progress and should be completed by June 2022. In meantime, the extraction of remotely sensed oceanic conditions covering the sampling periods is being processed with R programming for the period. In WP4, preliminary results on fish grow-out identified the best fish diet and the most optimal stocking density at the smallest size (about 2 cm of standard length). More details related to these findings will be presented in a poster by master student Nandrianina Maminantenaina. In addition, the gut content and stage isotopes of three ontogenetic stages (i.e. post-larvae, juvenile, and adult) of S. sutor were analysed the natural trophodynamics. The findings are based on 1160 gut contents and muscle tissue samples collected during the warm (October 2021 to February 2022) and cool season (May to August 2022).

The potential nursery areas and the main recruitment seasons of *Siganus sutor* were identified. The oral presentation entitled “The potential nursery areas and recruitment season of *S. sutor* in Madagascar” by Helga Berjulie Ravelohasina will provide further details of our findings. The variability of food availability related to epifauna concentration will be known in the poster on Mory Justino. The most optimal fish diet as well as the optimal stocking density will be presented in a separate poster entitled “Density and fish diet effect on rabbitfish growth in controlled systems” presented by Nandrianina Maminantenaina.

**Key words:** *Siganus sutor*, Nursery areas, Selection factors, Recruitment season, Fish grow-out, Experiments, Fish diets, stocking density.