Assessment of deep-water (30 - 60 meters) benthic communities by SCUBA diving techniques

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In Brazil, benthic marine algae is one of the most well studied group of organism due to the continue effort by researchers during the last 40 years. 811 species of macroalgae are cited to the Brazil marine ecosystems. However, the knowledge of the Brazilian Marine Flora is restricted to the intertidal or shallow deep water zones, and studies that focus their goals in benthic communities from deep-water zones are lacking. Between 20° and 22° lat. S the Brazilian continental shelf presents an extension up to 60 nautical miles. At this area, the water is clear (visibility of 20 to 30 m depth) and the sea bottom is hard, covered by crustose coralline algae balls named "rhodoliths". Associated to these aspects, upwelling waters reach this area, allowing singular oceanographic characteristics. A poorly known very special benthic assemblage associated to a rich macrofauna is found between 40 to 100 m depth in which the main element is one species of kelp, *Laminaria abyssalis*. This species reaches 5 m long and it is endemic for this area. It is very interesting that kelps distribution is restricted to temperate regions, not being found in tropical waters. Until now, sampling in this area was done only by few "environmentally unfriendly" dredging activities. In November, 2004, our group was the first to dive and film this community at 50 m depth where a very rich community of sponges, corals, mollusks, crustaceous and fish were seen. Recently, the Brazilian Oil Company, Petrobras, found fine oil deposits in the referred continental shelf area, that will be exploited in the next 10 years. Therefore, the aim of this project is to characterize the diversity and abundance of marine benthic community of the southeastern Brazilian continental shelf between 30 and 60 m depth by using SCUBA diving techniques. Our specific goals are: 1. produce a list of species present in the area that includes the groups of algae; 2. support with biological relevant information the inclusion of this geographical area in a new environmental Brazilian marine protected area; 3. determine the degree of endemism of the study area; 4. determine the dominant groups of organisms in the area; 5. characterize population dynamic of *Laminaria abyssalis*. The specific environment benefit of this project is to provide basic information about a marine ecosystem with special biological characteristics, that is poorly known and that can be in degradation risk within a few years. The significance of our project is to make public by scientific and educational ways an important marine ecosystem that, according to our state of information, presents a high degree of endemism and that supports a great marine biological diversity. The field work will include at least six field trips in 8 study sites distributed along 20 and 22° lat. S and between 30 and 60 m depth during two years. The sites distance of the mainland varied from 25 to 50 nautical miles. Sites will be selected based on depth and accessibility. For specimens voucher collection and community composition assessment SCUBA diving techniques will be used. All diver equipment and dive planning procedures will be obtained and developed by the cooperation with Diver's Quest S#3057. Time and logistics in depths higher than 30 m prohibited random sample allocation. Community composition will be assessed in 4 depths, 30, 40, 50 and 60 m in four seasons (summer, fall, winter and spring) by using the rhodoliths as unit sample. At least 50 rhodoliths (that present a mean diameter of 15 cm) are collected and all organisms are transferred to appropriate collection bags and thereafter lifted to the boat. Samples will be separated and fixed with formalin (4 % for algae and 10 % for animals) or alcohol (70 %). Digital video will be recorded in each site, where a series of images are obtained at a constant distance of the bottom (for example, at the depth of 50 m, the images are obtained at 30 m depth) and thereafter used determine the density of *L. abyssalis* populations. At least 30 *L. abyssalis* individuals are collected for population parameters (blade length and width, fresh biomass and phenological state). At each collection site and season, temperature, salinity and underwater irradiance (LI-193SA, LI-COR, USA) will be measured. At the presentation, the obtained partial results will be use as examples to determined the efficiency of the applied methods to characterized the population and community structure of deep water benthic communities.