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Live and dead foraminiferal faunas from Saint-Tropez Canyon (Bay of Fréjus): "In situ" and "culture" observations

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Living (rose Bengal stained) and dead foraminiferal faunas have been studied at a 373 m deep station (CAMT-5 station) in Saint-Tropez Canyon (Bay of Fréjus, France). Biocoenoses and thanatocoenoses were investigated in the >150 μm fraction of two 10 cm long cores collected with a classical Barnett multi-corer. A first ("in situ") core was directly fixed with ethanol and rose Bengal at the time of the sampling, whereas a second ("culture") core was incubated in the laboratory for 2.5 years before the faunistic inventory took place.

Both cores present similar thanatocenoses that are only partially contaminated by neritic foraminifera transported from adjacent continental shelf areas. Moreover, thanatocenoses are almost invariable throughout the 10 cm long cores. The sedimentological analysis (X-Ray, colorimetry, granulometry) of a third core reveals neither graded sediments nor erosional surfaces. Abundant organic remains (algal fragments) are detectable along the cores in the muddy sediment. These observations are indicative of a continuous input of fine-grained sediment as well as resuspended organic matter (algal remains) originating from shallower areas, and preclude scenarii of catastrophic turbiditic events which could eventually have influenced the dynamics of the living faunas and altered the fossilized foraminiferal signal. .

The living “in situ” fauna is characterized by an elevated diversity and moderate equitability. The high abundance of intermediate and deep infaunal taxa (*Uvigerina elongatastriata, Bolivina alata, Melonis barleeanus, Globobulimina* spp. and *Chilostomella oolina*) suggests that the living foraminiferal fauna has adapted to the sedimentary focusing of important amounts of organic matter, in our canyon environment. Algal remains, originating from continental shelf areas form an important part of this low quality organic input. Some living specimens as the shallow epiphytic taxon *Rosalina bradyi* (Cushman, 1915) were found attached to these algal debris.

During the two and a half years of incubation, the “culture” core suffered high salinity and oxygen changes; salinity ranged from 35 to 62 psu whereas oxygen concentration at the sediment-water interface was almost zero when the “culture” core was sampled. It was no surprise, that all dominant taxa found in the “in situ” core had disappeared in the “culture” core. Surprisingly, a single taxon, *Rosalina bradyi* (Cushman, 1915), survived these extreme adverse experimental conditions. It was mainly found close to the strongly hypoxic sediment-water interface, but some individuals were found until 10 cm deep within the anoxic sediment. Its density (516 ind/100cm^2) is was about two orders of magnitude higher than in the “in situ” core (3 ind/100cm^2). *R. bradyi* was obviously the last species able to reproduce and grow in our culture conditions. Our results could suggest therefore that this normally neritic taxon is able to tolerate major changes of salinity and bottom water oxygen concentration, and to survive prolonged periods of strongly adverse conditions that proved to be lethal for all taxa of the natural fauna of this canyon site.