

Sibling Bald Sea Urchin Disease affecting the edible *Paracentrotus lividus* (Echinodermata: Echinidea) in Sardinia (Italy)

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Different species of echinoids and bivalves are suffering infectious diseases as the effect of ocean warming. In Sardinia (Western Mediterranean Sea) the keystone sea urchin species *Paracentrotus lividus* (Lamarck 1816) is widely appreciated as edible resource. Recently, a number of individuals were found to be infected by a no specified bacterial morphologically matching to a “bald sea urchin disease” (Fig. 1). In February 2019, a sampling campaign took place in two locations in the West and East Coast, inside and in proximity of local Marine Protected Areas. Field samplings were approved by the Regione Autonoma Sardegna (Fishing License for scientific purposes n.310/AP SCIE/N.1 10/01/2019). Samplings were carried out at the end of February 2019, when water temperature was 13°C. For each sampled site we performed two replicates of fast 50 m belt transects to estimate the infection rate as the total individuals infected on the total counted.

The estimated infection rate was around 5% in both of sampled locations. A higher level of preyed sea urchins was observed, compared to natural predatory level previously observed in all the surveyed sites. Moreover, an unusual amount of dead sea urchins has been observed stranded on the storm berm, neighbouring one of the sampled sites.

Microbiological analysis puts in evidence bacterial infection as the potential causal agent that could be temperature-related. Previous mass mortalities of sea urchins due to this infection were reported in the northwestern Mediterranean Sea in the past, where populations of shallow waters sharply declined until 75% during the summer period.

A number of papers argued global warming might be linked to the occurrence of catastrophic events in the Mediterranean Sea, which could alter the host/pathogen range and modify pathogen transmission rates. Thus, the spread of the infection could cause important consequences at genetic, population, community and ecosystem level. In the study area, it seems already evident how predatory pressure on populations sampled was increased probably due to the lowering of the natural defences of the sea urchin preys as consequence of the infection.

Accordingly, the outbreak of this infection probably related with environmental changes could determine important effects on trophic interactions and generating unpredictable cascading effects.

In this area, an increasing of the sea urchin disease and related mortality is expected in the next months with the temperature increasing. A long-term monitoring across the summer season will be crucial to understand the extent and magnitude of the phenomenon as its implications.

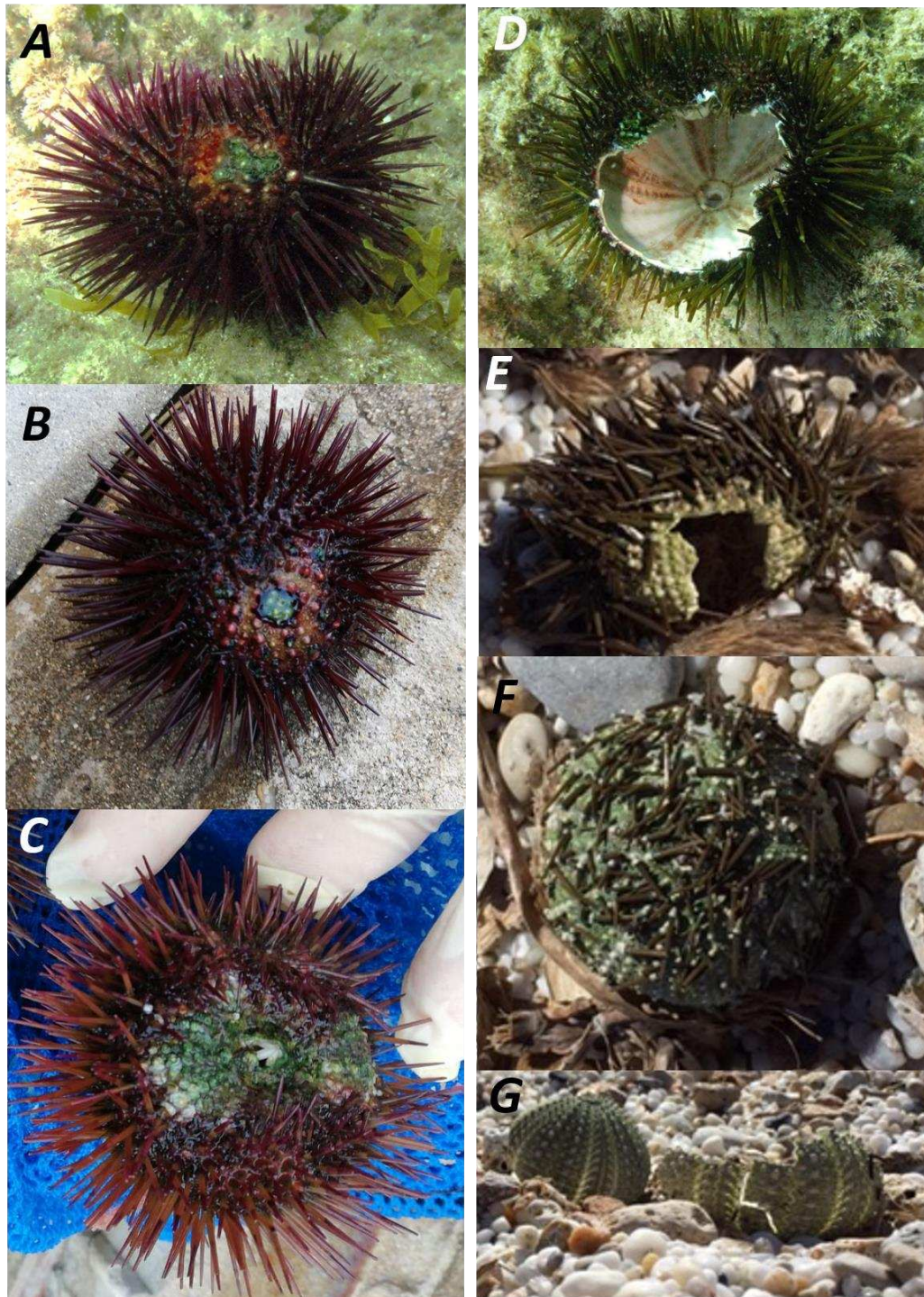


Fig. 1 Specimens infected by a bacterial morphologically matching to a “bald sea urchin disease” occurred in Sardinia in February, 2019. Diseased specimens: in situ (A), sampled (B, C), preyed (D) and stranded (E, F, G).