

Created: 14 September 2020 15:11:19 CEST  
Updated: 15 October 2020 22:54:11 CEST  
Status: Submitted  
Type: Poster

Abstract language: English  
Presentation language: English

A/V equipment: Laptop, Video projector, Microphone  
Resubmission: Please enter your original Abstract Number: ICRS2020-1876  
Have you updated the content of the abstract? no

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Session: Unexplored and unexpected reefs->6C - Mesophotic Coral Ecosystems: Lifeboats in the Challenging Future of Coral Reefs?

### Content English

Title: Mesophotic coral assemblages on offshore oil platforms: unexplored hotspots for coral conservation in the Arabian Gulf?

Abstract: Offshore oil and gas platforms can provide adequate substratum for the settlement and recruitment of sessile marine invertebrates, as well as increase of habitat and food availability for fishes. Nevertheless, despite the fact that there are currently over 800 offshore oil and gas platforms in the Arabian Gulf, scarce information is available regarding the biological assemblages associated with these structures. We herein studied the previously unexplored biological assemblages that grow attached to the oil platforms in the Al Shaheen Oil field, in the north of the EEZ of Qatar. Results from the analysis of ROV surveillance videos showed that age and depth are the main factors determining the distribution of sessile assemblages on these platforms. In contrast, no differences in community structure were found among the 9 platform locations studied, indicating a high level of connectivity within the oil field. At 30-60 m depth range, soft corals (Alcyonacea) and azooxanthellate scleractinian corals (e.g., *Cladopsammia* sp.) dominated the communities. The abundance of both groups increased with depth and the hard corals also tended to be more abundant on older platforms (>10 years). Coral reefs constitute the most diverse, complex and productive marine ecosystems in the Arabian Gulf, but widespread mass coral die-off has been reported during the last three decades. Corals are declining at such an alarming rate, particularly in shallow coastal habitats, that several species are now threatened with regional extinction. Further losses of coral communities seem unavoidable in this region, due to climatic changes and coastal development, both of which are unlikely to decrease in the near future. Our research has shown that offshore oil platforms can be considered as regional hotspots or refuges for coral conservation in the Arabian Gulf. The fact that azooxanthellate reef building corals are recruiting and growing on these oil platforms is highly significant, given that this type of corals had not previously been reported in Qatari waters. It further raises the question of whether their regional distribution extends beyond artificial substrates. Furthermore, it clearly illustrates the potential of this type of offshore infrastructure to support the establishment of functional reef ecosystems, suggesting that the conversion of decommissioned oil platforms into artificial reefs (i.e., Rigs to Reefs), may be a valid alternative in this region.

Keywords: Persian Gulf, Porifera, Hydrozoa, Octocorallia, Bryozoa, Actiniaria, Cirripedia, Bivalvia