

## ***Corallium rubrum*: From Precious Coral to Ecosystem Engineer**

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*Corallium rubrum* is one of the most iconic and historically exploited benthic species of the Mediterranean Sea. Traditionally regarded as a precious coral of high economic and cultural value, it is increasingly recognized as a habitat-forming species playing a significant ecological role not only within coralligenous assemblages, but also in mesophotic and deep habitats.

This contribution explores the transition from the traditional perception of red coral as a commercial resource to its modern interpretation as a fine-scale ecosystem engineer. Unlike reef-building corals, *C. rubrum* enhances the structural complexity of already heterogeneous habitats. Dense facies of large colonies increase fine-scale rugosity, create persistent microhabitats and amplify spatial heterogeneity, potentially supporting cryptic biodiversity and benthic ecosystem functioning.

The presentation discusses how the long history of selective harvesting of large colonies has likely altered not only population abundance, but also habitat architecture and ecological functionality. In this context, conservation becomes particularly challenging, as *C. rubrum* is simultaneously a vulnerable species and a socio-economic resource deeply embedded in Mediterranean cultural traditions.

Special attention is devoted to the main knowledge gaps that still limit effective ecosystem-based conservation. These include connectivity between deep and shallow populations, quantitative larval production, adaptive genetic potential, trophic eco-physiology, historical demographic baselines and, above all, the quantitative assessment of the ecosystem role played by red coral populations. The need for standardized mapping approaches is also highlighted, in order to improve our understanding of the actual contribution of this species to the functioning of Mediterranean ecosystems.

Understanding not only where red coral occurs, but also how much ecological complexity this “slow” species generates, represents one of the major future challenges for marine conservation in a rapidly changing Mediterranean Sea.