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**Microbiological and Parasitological Survey
on Mediterranean Loggerhead Sea Turtles**



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During the last decades, marine ecosystems have been over-exploited, and exposed to multiple stressors, resulting in the deterioration of their health status. Increasing pollution, harmful algal blooms, habitat degradation, emerging and re-emerging diseases in marine species, and many other concerning symptoms have given rise to the urgent need to monitor the fragile status of marine ecosystems. One method to address this complex issue is to identify and monitor sentinel species. Health assessment, exposure to environmental contaminants, mortality documentation and infectious disease surveillance are all complementary aspects of sentinel species monitoring, and could be investigated by wildlife rescue centres.

Sea turtles have already been used as bio-indicator of environmental pollution, due to their characteristics of longevity, trophic level, and habitat use. Nevertheless, sea turtle diseases have not been fully investigated, especially in the wild, and an exhaustive health assessment of sea turtle populations is still not possible.

This study consisted in a microbiological and parasitological survey on Mediterranean loggerhead sea turtles, with the main objective to assess the health status of both the individuals and the population, concurrently addressing the role of sea turtles as carriers of potential zoonotic agents and as sentinels for their ecosystems. Specifically, it focused mainly on loggerhead sea turtles in the Tyrrhenian Sea, examining both diseased and healthy animals, admitted and rehabilitated in a rescue centre, as well as unhatched eggs from loggerhead hatched nests.

The survey outlined the bacterial and parasitic communities of wild sea turtles in the Mediterranean, providing additional information to assess the health of individual sea turtles, based on which it is possible to recognize deviations and signals of emerging threats to individuals, populations and ecosystems alike. The vast majority of the detected microorganisms are regarded as opportunistic pathogens, yet they should be taken into account when planning sea turtle conservation efforts. Moreover, some of the microorganisms detected in sea turtles are potential zoonotic agents, raising health concerns for other marine animals, as well as for humans that, for occupational or recreational activities, would come into contact with sea turtles. The various microorganisms appeared to be interconnected with each other in determining the health status of sea turtles, as well as with the ecosystem, being influenced by environmental factors. In conclusion, this study strengthened the link between turtle health and ecosystem health and consequently the role of sea turtles as

sentinels of the ecosystem, integrating within the wider concept of One Health.