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## The effects of pollution on elasmobranch health and specific disease development in wild populations

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Up to date, there is almost no data on the mechanisms of disease development in elasmobranch species, further associated with specific anthropogenic pressures on the environment. Through our pioneer research durin Rufford projects and later National Geographic Society, we have adopted the multidisciplinary approach which relies on pathology (histopathology and immunoghistochemistry), ecology, radiology and molecular biology – together with the analysis of available data. Through so far studies, we have analyzed over 30 elasmobranch species from the various habitats in the Mediterranean sea, primarily Adriatic sea. Though it is believed to have a highly developed immune system, elasmobranchs nevertheless suffer from various pathological changes: primary inflammatory/infectious, traumatic, cardiovascular and toxin-associated diseases and tumors. A bacterial infection often includes sepsis, dermatitis and enteritis; fungal infection include dermatitis, hepatitis and branchitis; while the suspected viral infections include papilomatosis, herpesvirus and adenovirus. Parasitic infection are not rare in elasmobranchs and include nematodiasis, myxozoanosis, amoebiasis, coccidiosis, ciliate infections and other. Different toxicoses include toxic gill disease fenbendazole, ammonia, chlorine, chloramine and gas bubble disease. Understanding the models of disease development is a basis for the establishment of long-term in-situ conservation of threatened species.

Key words: shark, skate, ray, elasmobranch, disease, pollution, pathology