

RCVS Fellowship Day 2017

Fellows in Focus: The health of corals, and their importance for society

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Although Aristotle had originally classified corals as plants, it was now universally accepted that they were animals, explained Robert Gilbert, Professor and Head of the Department of Clinical Sciences at Ross University veterinary school in St Kitts. Therefore, they were a legitimate target for veterinary attention.

There was growing awareness of the erosion of the health and presence of corals, he said. Initially, he had regarded this in the same way as he regarded the endangerment or extinction of terrestrial mammal species – as the tragic loss of something of great beauty that was irreplaceable.

However, he now believed that, in many ways, the loss of corals was more significant.

Comprising individual polyps inside calcium carbonate exoskeletons, coral reefs were vast colonies of animals that were not only beautiful, but also of immense value to mankind, he said. While corals occupied less than 1% of the ocean floor, they supported more than 4,000 ocean species. It had been estimated that some 40% of all ocean life depended on corals to some extent. Coral reefs sheltered the young of commercially important fish species, they provided physical protection against erosion for coastal communities, and they helped preserve mangrove and sea grass ecosystems.

Corals also directly supported approximately half a billion people who fished on reefs and indirectly supported some two billion people through income generated by tourism, recreation, education and research.

He explained that corals had two ways of obtaining nutrition: each polyp had a mouth surrounded by tentacles armed with nematocysts, which could catch prey. But corals also contained single-celled, photosynthetic algae called zooxanthellae, which lived within the flesh of the polyps and helped them survive in nutrient-poor waters. The zooxanthellae also gave corals their colour.

Adverse environmental effects, particularly rising ocean temperatures, were causing corals to become bleached. The increased temperatures resulted in the zooxanthellae either dying or being expelled from the corals, resulting in bleaching. The corals themselves did not die immediately, and could replenish the zooxanthellae if environmental conditions improved. However, prolonged bleaching led to coral death.

Bleaching had affected two-thirds of the Great Barrier Reef in the past two years, he said.

Infectious diseases also affected corals. Listing five diseases that had fulfilled Koch's postulates – white plague, white band, white patch disease, aspergillosis and bacterial bleaching – Professor Gilbert felt the situation with coral disease was similar to that of domestic animal diseases 200 years ago, namely, very little was known about them and because the knowledge base was limited, so was the ability to do anything to prevent, treat or cure them.

Most studies of corals were observational studies, he said, and fewer than 10% of publications on coral disease included any histopathological detail or record of damage at a cellular level. He believed that the veterinary profession had a legitimate contribution to make in this area. Coral was in many ways comparable to an epithelial surface and the disease processes were not unlike those occurring at the surfaces of the skin or gut – something that veterinary pathologists would be familiar with.

Therefore, histopathology would allow a better understanding of the interactions between corals and pathogens and this deeper understanding would be vital to the survival of corals, he said.

However, he suggested that vets could have another role in helping conserve corals. Explaining that corals could reproduce both sexually and asexually, Professor Gilbert said that the sexual reproductive component meant that it was possible to exercise some element of selective breeding. For example, some strains of coral that had survived bleaching had been cultivated in laboratories with the aim of returning them to the wild. Also, corals that had survived bleaching in the northern part of the Great Barrier Reef, where ocean temperatures had increased, had been translocated to the currently cooler southern areas of the reef in the hope that they would crossbreed with native corals, giving them some tolerance if the water temperature warmed.

These approaches had shown some promise, he said, but the veterinary profession was well aware that, as soon as the production of any species was intensified – such as through cultivation in a laboratory – the potential for disease also increased.

It was therefore very important that vets got involved with corals. No matter how far someone lived from the ocean, their health and wellbeing were directly or indirectly affected by the health and continued wellbeing of the corals of the world. As a profession, vets had a role to play in the continued health and wellbeing of these incredibly important and beautiful custodians of biodiversity of the oceans.