

4.5 The Prehistoric Coelacanth

The coelacanth is a so-called “Lazarus” species; an organism known from the fossil record long before a living species was discovered.

The history of the Coelacanth

The first fossilized coelacanth was described by Louis Agassiz more than 170 years ago.¹ Since then, more than 120 fossil species have been recorded, from at least 47 genera. Coelacanths then seemed to disappear from the fossil record until the discovery of a living coelacanth in South African waters.

The first living coelacanth was caught in 1938 at a depth of about 70 m near East London. Museum curator Marjorie Courtney-Latimer identified the unique fish and corresponded with Dr JLB Smith, a senior lecturer at Rhodes University (in Grahamstown). He identified it as a coelacanth, and announced the discovery of a living coelacanth in March 1939,² naming the species *Latimeria chalumnae*, in honour of Ms Courtney-Latimer and the locality in which the fish was caught. In December 1952 a second coelacanth was caught off

the Comoros. It appeared to be morphologically different from the first,³ however the missing anterior dorsal fin and tail fin fringe turned out to be merely mutilations of the *Latimeria chalumnae*.⁴

It was thought that the fish caught near East London was a stray, and its home environment was in fact the Comoros. By 1990 more than 160 coelacanths had been caught in the Comoros, but there was speculation that they might occur more widely in the West Indian Ocean region, with reports of coelacanth sightings along the east coast of Africa, as well as the west coast of Madagascar. In 1991 a large female was caught about 24 km offshore of Pebane, Mozambique, she was pregnant with 26 almost-term pups; and in 1995, a coelacanth became entangled in a deep-set (190 m depth) gill net, about 4 km off southwestern Madagascar.⁵

In 2000, almost 62 years after the first coelacanth was caught, a second fish was observed in South African waters. It was found by accident, by three divers at the Jesser Canyon, about 4 km off Sodwana Bay. They noticed a large fish concealed in an overhang of the canyon, and on closer inspection discovered two more coelacanths in the vicinity.

They returned a month later to get photographic evidence, filming three coelacanths in a small cave at a depth of 108 m. In 2001, they documented further coelacanth activity in the cave, with one being over 2 m. In total, they observed eight coelacanths in the Jesser canyon, on three separate expeditions.⁶ Subsequent expeditions have found many more.

What we now know about coelacanths

The slow growth of the coelacanth has been partly attributed to the relatively small surface area of its gills.⁷ A limited ability to take up

The prehistoric Coelocanth, off Sodwana.



Photo: Peter Timm

oxygen would also explain their lethargic behaviour and apparent restriction to cooler, oxygen-rich deep water. During the day they rest in protected recesses such as caves, crevices or overhangs, usually at a depth of 100-300 m, and a temperature of 16-22°C.⁸ They range between a number of these preferred refuges, sometimes occurring singularly, and sometimes in groups,⁷ but do not seem to interact whilst in them, either sexually or agonistically.

However, they can strike at speeds of up to 25 m.s⁻¹ and can swim at a velocity of greater than 3 m.s⁻¹ when necessary.⁹ Nevertheless, this type of swimming is not sustainable due to the fishes' need to conserve energy. The lobed pectoral fins appear to be the primary means of momentum, assisted by the rest of the lobed fins, which provide both locomotory and stabilising support.¹⁰

Observation data from the Comoros shows that they move out of sheltered areas at dusk, drifting down the slope to feed. They descend to depths of 200-280 m for about 8-10 hours per night, occasionally foraging down to 400-600 m.⁹ Their feeding strategy appears to involve drifting with the current just above the substrate, opportunistically striking prey, perhaps detecting the presence of organisms by electroreception, using a highly enervated rostral organ (a large gel-filled cavity in the snout).¹¹ Unique amongst modern fishes, their skulls have an intracranial hinge, allowing the large mouth to open very wide. The coelacanth's stomach has a spiral valve, which allows for slow, efficient digestion.¹² This coupled with a very slow metabolism, means that they can go for long periods between meals.

South African coelacanth protection

At the time of its discovery off Sodwana Bay, the then Department of Environmental Affairs and Tourism understood the importance of the discovery and promulgated legislation and regulations to protect South African coelacanths. With the support of Ezemvelo KZN Wildlife they drew up a management and conservation strategy. Part of the strategy was to engage in a research programme to better understand the coelacanth, its environment and conservation status.

A multidisciplinary programme called the South African Coelacanth Conservation and Genome Resource Project was launched in April 2002, by the then Department of Arts, Culture, Science and Technology. The project developed into

a multi-national initiative, and was later renamed the African Coelacanth Ecosystem Programme (ACEP).¹³

By the culmination of ACEP in 2006, ten ship-based research expeditions had been undertaken along the east coast of southern Africa and the south-western Indian Ocean, including three dedicated *Jago* manned submersible cruises. A total of 26 individual coelacanths were documented as resident in the iSimangaliso Wetland Park, mostly within the Jesser, Wright and Chaka Canyons, over a range of about 50 km.

A total of 294 *Latimeria chalumnae* catches have been documented since 1938, and after 21 years of monitoring the coelacanths of the Comoros the population appears to be stable at around 300-400 adults.¹⁴

Although it was originally argued that all coelacanths caught outside of the Comoros Islands were strays, mounting evidence points to the existence of a number of viable populations in the South West Indian Ocean region, including Jesser Canyon. This means that KZN is home to a unique, viable population of prehistoric coelacanths. They are fortunately well protected in their iSimangaliso Wetland Park refuge. ■

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