Recent discoveries of coelacanths in Sodwana Bay, South Africa, suggest that a significant coelacanth population exists along the southeastern African coast outside the volcanic islands of the Comoros.1–4 The large area of possible distribution makes the search for further coelacanths a daunting task. The recognition of coelacanth traces in empty caves attests to their presence, providing an additional means to map coelacanth distribution; similar structures may prove useful in the identification of coelacanthish fish traces in the fossil record.

Coelacanths, *Latimeria chalumnae* Smith, 1939, are nocturnal drift hunters that retreat to caves, an important habitat requirement, during the daytime.1 Known coelacanth caves are, however, not always occupied when investigated by either submersible or Trimix diving, suggesting that different cave sites are used by coelacanths within their range. This paper reports the existence and observations, from photographs and film footage taken from the *Jago* submersible during the April 2004 expedition, of coelacanth traces in a sandy substrate cave in Chaka Canyon, St Lucia, South Africa (Fig. 1).

Submarine caves of the Comoros are formed in volcanic structures preserved in steep-sided walls1 in a sediment-starved environment. The Sodwana coelacanths, however, inhabit the edge of a sandy continental shelf, making use of caves developed on steep slopes in submarine canyons (Fig. 1). Caves were created by karstic erosion of Cainozoic carbonates along palaeo-shorelines, during Late Pleistocene sea-level lowstands.5 Shifting shelf sediments cascade into the canyons and settle in the quiet protected water within caves and overhangs, which are typically concentrated at depths of between 100 and 120 m and occasionally at 150 m. Cave morphology is diverse with some large caves up to 5 m deep and between 3–5 m wide and 2–3 m high.5 Observations in the Diepgat Canyon (Fig. 1) show that, although many of the caves have a rocky floor, some fine-grained sediment is usually present. Of the 42 documented caves in the White Sands, Jesser and Wright canyons in the Sodwana Bay area, only six caves were occupied by coelacanths. Given the low occupancy rate of caves and the difficulty of access, the recognition of coelacanth trackways in empty caves becomes vital in maximizing the limited habitat, distribution and population observations that can be made during deep-water dives.

Coelacanth fin morphology and motions are fundamentally different from those of other fishes,6,7 producing a unique trace in the sediment and fossil record. For example, the ichnogenus *Parundichna schoelli*, discovered in the Middle Triassic, Lower Keuper, of southwest Germany, was interpreted as that of a coelacanthish fish, produced by the pendulum motion of paired pectoral and pelvic fins, which acted in alternation as in tetrapods.8

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Traces reported in South African waters indicate resting, resulting from the fish adopting a hovering position in a cave. The dominant motion observed in this case is by the lobed anal fin and the paired pelvic fins, sculling with a period of 1 to 6 seconds between sweeps,\(^6\,^7\) the large caudal fin generally remaining motionless. The pectorals move only occasionally, such as when the fish reverses, resulting in a more energetic swipe from the right pelvic fin.\(^7\) The resultant observed sediment patterns comprise a hummocky floor with rounded to occasionally pointed pinacles of sediment up to a height of approximately 10 cm (Fig. 2).

The extent of coelacanth distribution in the Western Indian Ocean covers a considerable area, making the search for further elusive coelacanth populations particularly challenging. The recognition of coelacanth traces provides a novel way to assess the presence of these fish in current-free, sediment-floored caves and may thus provide useful additional data on coelacanth movements in the Sodwana and St Lucia canyons. Further detailed work and observations of modern coelacanths and their traces may prove valuable in the recognition of similar tracks in the fossil record.

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