

Detailed table of coelacanths known to have been caught in Madagascar: 1987 to 2019

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Introduction: Thirty-four (34) specimens of the Western Indian Ocean coelacanth, *Latimeria chalumnae*, known to science have been collected in Madagascar in the period 1987 to 2019. The subheadings adopted in this Madagascar Coelacanth Inventory are the same as those used in the official Coelacanth Conservation Council/Conseil pour la Conservation du Coelacanth (CCC) Inventory (Bruton & Coutouvidis, 1991; Nulens *et al.*, 2011) except for the addition of '(16) Method of capture'. The coelacanth inventory has been updated annually by Nulens (2011, 2012, 2013, 2014 and 2015) and coelacanth discoveries in Madagascar have been discussed by Cooke *et al.* (2020).

CCC number: The assigned sequential number allocated by the CCC to all specimens that can be traced, over and above the accession number allocated to specimens by the museums and other institutions in which they are currently housed.

(1) *Date of capture:* Approximate dates, and times of capture, are given where known or estimated.

(2) *Site of capture:* The fishing village where the coelacanth was landed is given, or the island or mainland coast off which it was caught. In some cases only the country of capture is known.

(3) *Name of the fishers:* The name(s) of the fisher/s are given as well as his/their age.

(4) *Distance of capture from shore:* In kilometres, as estimated by the fishers.

(5) *Depth of capture:* In metres, as estimated by the fishers.

(6) *Bait used:* The species of fish or squid used as bait on hooks or nets.

- (7) *Weight*: Weight in kilograms estimated by the fisher or measured by a scientist.
- (8) *Length*: Total length in centimetres from the most anterior point of the snout to the most posterior part of the caudal fin, measured in a straight line. As these measurements have been made on fresh, frozen and formalin-preserved specimens, they are likely to be of variable accuracy. Most measurements were made in the final or near-final holding facility by scientists.
- (9) *Sex*: Male, female or immature. The sex could only be determined by dissection as coelacanths are not obviously sexually dimorphic except that males rarely exceed 140 cm in length [11].
- (10) *Condition on capture*: Whether or not the specimen was alive on capture and how long it stayed alive.
- (11) *Method of preservation*: The method of preservation of the specimen in its final holding facility.
- (12) *Condition of preservation*: Condition of the specimen after capture and preservation.
- (13) *First literature references*: The first references to the specimen in an authoritative list, scientific paper, personal communication or unpublished report.
- (14) *Current holding*: Current location of the specimen.
- (15) *Additional comments*: Any additional information of significance about the specimen, including any descriptive names.
- (16) *Method of capture*: By traditional or commercial fishers. No coelacanth has to date been caught deliberately by a scientist. ‘Jarifa’ are deep-set, large mesh gillnets set to catch sharks. The name is derived from ‘jarife’, a Swahili word that originally referred to seine nets but is now also applied to gillnets.

The specimens are catalogued in the order in which they came to the attention of scientists and not in the chronological order of capture. The information is incomplete for many specimens. Categories for which no information is available are omitted from a particular entry, as in the CCC Coelacanth Inventory.

Inventory of coelacanths caught in Madagascar (1987 to 2019)

CCC 300 (Fig. 1) (1) 1987 (2) St Augustin Bay, south of Toliara (7) 30-35 kg (8) 121 cm (9) Male (11) Dried and salted (12) The specimen was described as ‘badly preserved’ and ‘old poorly preserved dry skin’ [30] but it has now been expertly mounted as a naturalised display by Gianni Insacco, the scientific curator of the Museo Civico di Storia Naturale, and went on public display there on 13 December 2015 (Insacco *et al.*, 2016) (13) Insacco *et al.*, 2016 (14) Museo Civico di Storia Naturale in Comiso, Italy; museum accession number MSNC 4502 (15) This specimen is described in detail by Insacco *et al.* (2016). It precedes by eight years CCC 173 as the first specimen of *L. chalumnae* known to science from Madagascar (Heemstra *et al.*, 1996).

CCC 173 (1) 3 August 1995 according to Nardo Vicente (1997) who was at the IHSM in Madagascar at the time and was involved in the preservation of this specimen) but 5 August 1995 according to Insacco *et al.* (2016) and Ravoloharinjara (2019) (2) In the Onilahy Canyon off Anakao, opposite the mouth of the Onilahy River, 30 km south of Toliara (3) José Mampionona (22 years), Sébastien Seban (21) and Rakoto from Soalara (4) 4 km (5) 190 metres (6) Small fish bait in *jarifa* net (7) 34.9 kg (8) 134 cm (9) Male (11) Frozen, then placed in 10% formalin (12) Excellent, abdominal cavity opened by incision along ventral midline to allow preservative to enter (13) Nulens *et al.* (2011); Heemstra *et al.* (1996) (14) IHSM at the University of Toliara (15) Caught over a sandy substrate about 15 km from the continental slope. Dominique Coutin bought the specimen from the fishermen for 25 000 Malagasy francs (US \$6) and took it by boat to Tolair, where it was placed in a freezer. Descriptive name: 'Mad 1 Anak'. CCC 173 was regarded as the first *L. chalumnae* specimen known from Madagascar until the recent discovery of CCC 300 in the collection of the Natural History Museum in Comiso, Italy (Insacco *et al.*, 2011) (16) *Jarifa* gillnet.

CCC 176 (1) 6 December 1997 (2) Anakao, opposite the mouth of the Onilahy River, 30 km south of Soalara, near the capture location of CCC 173 (3) José Mampionona (22 years), Sébastien Seban (21 years) and Rakoto (4) 2 to 3 km (5) 60 metres (7) 90 kg (8) 190 cm (9) Female containing 13 unhatched eggs (13) Nulens *et al.* (2011); Ravoloharinjara (2019) (14) On display at the Fort Dauphin (Tolagnaro) Town Hall as a gift from the ISHM (15) Descriptive name: MAD 2 (16) *Jarifa* gillnet.

CCC 177 (1) 3 March 2001 (2) Fiherenamasay, north of Manombo South, north west of the False Pass of Tsiloapky from where the continental slope descends steeply (3) Fisher named Galy working for Dr Toany of IHSM at Fiherenamasay, north of Toliara (4) 3 to 4 km (5) 100 metres (7) 75 kg (8) 160 cm (9) Female containing nine unhatched eggs (11) Frozen after dissection on 03.03.01 (12) Excellent (13) Nulens *et al.* (2011); Ravoloharinjara (2019) (14) The specimen was dissected by Dr Toany of IHSM on the night of 3 March 2001 (when found to contain 9 egg sacs). Several days later the specimen was taken to the Copefrito company at the port of Toliara for freezing. In 2004 the specimen was loaned to the South African Institute for Aquatic Biodiversity (SAIAB) in Makhanda, South Africa, at the time that SAIAB was undertaking a research cruise for potential coelacanth sites in the Mozambique Channel. The specimen was subsequently returned to Toliara (15) Tissue samples were taken by SAIAB staff (Heemstra *et al.*, 1996; Nulens *et al.* (2011). Descriptive name: MAD 3 Fih (16) *Jarifa* gillnet.

CCC 179 (1) 21 July 2001 (2) Tsiandamba, 80 km north of Toliara (3) Fishers from Tsiandamba (4) 5 to 6 km (5) >100 metres (7) 73 kg (8) 160 cm (9) Female with four unhatched eggs and two unborn fetuses (13) Nulens *et al.* (2011); Ravoloharinjara (2019) (14) IHSM at the University of Toliara (15) The fish was photographed. Descriptive name: MAD 4 Tsi (16) Large mesh *jarifa* gillnet.

CCC 205 (Fig. 2)(1) 18 May 2006 (2) Nosy Lava, Barren Islands archipelago, off Maintirano (Nosy Lava is the south-westernmost island with the closest access to deep water) (5) 140 metres (8) 171 cm (10) Alive at capture, died by the time it reached the shore (11) Head and some fins frozen, rest of body dried and sold (12) Body cut up and sold in fish market (13)

Niaina (2006); WWF (2007) (15) This specimen was caught much further up the west coast of Madagascar than the other specimens. Identified by Géraud Leroux, a marine biologist working for WWF.

CCC 231 (1) 18 February 2009 (2) Seawards of the barrier reef towards the mouth of the Fiherenana River, Fiherenamasay (3) Fisher from Ifaty (5) 200 metres (13) Nulens *et al.* (2011) (14) IHSM at the University of Toliara, Toliara (15) The fisher brought the fish to Atimoo Plongée who sent it to Reef Doctors, a British NGO who brought it to the IHSM.

CCC 232 (1) July 2002 (2) Toliara, precise location unknown (3) *Vezo* migrant fisherman (7) 35 kg (8) 150 cm (12) About 200 scales removed, rest of the body cut up for bait and destroyed (13) Nulens *et al.* (2011) (15) Information obtained from Y le Bars (16) Almost certainly *jarifa* gillnet.

CCC 244 (1) About 20 September 2008 (2) 80 km south-west of Cap Ste Marie (3) Fishermen from the vessel, *El Amine* (7) 40 kg (8) 150 cm (10) Dead (11) Frozen (12) Eviscerated onboard (13) *l'Express de Madagascar*, 2008. (14) Fishing company, Copefrito, in Toliara (15) When the Centre de Surveillance des Pêches checked the cargo of the factory ship, *El Amine*, on 20 September 2008, following a tip-off from the Coast Guard, this undeclared coelacanth was found hidden on board, and several other infringements of the fishing laws were revealed. The ship was escorted to Toliara where the eviscerated coelacanth was handed over to the authorities and stored in the cold room of Copefrito, where it is still housed. On 21 October 2008 the newspaper *Les Nouvelles* headlined an article on the incident, 'Pêche illicite - Où sont les coelacanthes pris par *El-Amine*', mentioned that over 300 kg of coelacanth had been captured with *El Amine's jarifa* shark nets, and stated that they suspected that coelacanth trafficking had been taking place. After paying a fine the *El Amine* was allowed to leave Toliara on 30 October 2008 (16) *Jarifa* shark net.

CCC 245 (1) April 2008 (2) Maintirano (11) Freezing (12) Frozen (13) Nulens *et al.* (2011) (15) Information provided by Géraud Leroux.

CCC 251 (Fig. 3) (1) Between 22 and 29 March 2001 (2) Fiherenemasay, then transported by commercial fishing vessel to Toliara (5) 120 metres (7) 80 kg (8) 180 cm (9) Female with two unhatched eggs (10) Alive on arrival at Toliara but died shortly afterwards (D Stanwell-Smith, pers. comm., May 2020) (11) After it died, freezing on a commercial fishing vessel (12) Frozen (13) Nulens *et al.* (2011) (14) IHSM Museum, Toliara (15) Identified by Man Wai Rabenevanana of the IHSM Museum, Toliara (16) *Jarifa* gillnet.

CCC 252 (1) 12 July 2005 (2) Fiherenemasay (7) 60.3 kg (8) 155 cm (9) Female with two eggs (11) Frozen (12) Good, dissected to allow freezing (13) Anon (2005).

CCC 284 (1) 21/22 September 2010 (2) West of Nosy Ve, a small island about 3 km from Anakao (3) Razafimanovo Tinard (4) >2 km from Nosy Ve (5) >150 metres (6) Pelagic fish (7) 85 kg (8) 187 cm (9) Female with no eggs or fetuses (10) Dead in *jarifa* shark net (11) Dried and stuffed (12) Good, dissected (13) Nulens *et al.* (2011); Ravoloharinjara (2019) (14) IHSM Museum, Toliara (15) Information provided by John Bemiasa to Clemence Ravelo (16) *Jarifa* gillnet.

CCC 285 (1) 27 November 2010 (2) West of Nosy Ve near Anakao (3) Tine Hoe Julien, fisher from Lovokampy (4) 1 to 2 km west of Nosy Ve (5) 250 metres (6) Pelagic fish (7) 41 kg (8) 134 cm (9) Male (10) Dead in *jarifa* shark gillnet (11) Dried and stuffed (12) Good, dissected (13) Nulens *et al.* (2011); Ravololoharinjara (2019) (14) IHSM Museum, Toliara (15) Information provided by John Bemiasa to Clemence Ravelo (16) *Jarifa* gillnet.

CCC 310 (1) April 2011 (2) In the Onilahy Canyon near Soalara, St Augustin Bay (5) >300m (13) Nulens *et al.* (2011); Ravololoharinjara (2019) (15) The specimen was photographed by a member of a team from the NGO, DERAD.

CCC 288 (1) 5 May 2010 (2) Off Anakao, 1 km to the west of Nosy Ve (3) Tine Hoe Julien (4) >1 km west of Nosy Ve (5) 150 metres (6) No bait used (9) Female (13) Nulens *et al.* (2019); Ravololoharinjara (2019) (15) Information provided by John Bemiasa to Clemence Ravelo (16) *Jarifa* gillnet.

CCC 289 (1) 10 February 2011 at 19h00 but John Bemiasa gives 11h00 (*pers. comm.* to Rik Nulens, 7.11.2011) (2) Anakao, 20 km west of Nosy Ve (3) Olivier, fisher from Lovokampy (4) 20 km (5) 200 metres (6) Baited with fish (7) 80 kg (8) 175 cm (9) Female with empty egg cases (13) Nulens *et al.* (2011); Ravololoharinjara (2019) (14) On display at the IHSM Museum, Toliara (15) Stomach full of 'medium-sized fish' [21] (16) *Jarifa* gillnet.

CCC 290 (1) 11 February 2011 at 09h00 (2) Anakao, 2 km to the west of Nosy Ve (3) Tine Hoe Julien, fisher from Lovokampy (4) 2 km (5) 200-300 metres (6) No bait used (7) 60 kg (8) 149 cm (9) Female (11) Frozen (13) Nulens *et al.* (2011); Ravololoharinjara (2019) (14) IHSM Museum, Toliara (16) *Jarifa* gillnet.

CCC 291 (1) 13 February 2011 at 11h00 (2) North-west of Sarodrano (3) Tine Hoe Julien (4) About 7 km (5) 200-300 metres (6) Baited with fish (7) 75 kg (8) 170 cm (9) Female [5,18] (11) Frozen (13) Nulens *et al.* (2011); Ravololoharinjara (2019) (14) Cold room of the fishing company, Copefrito, in Toliara (16) *Jarifa* gillnet.

CCC 292 (1) 12 March 2011 overnight (2) North-west of Sarodrano (3) Tine Hoe Julien (4) 3 km (5) 200-300 metres (6) Baited with fish (7) 75.2 kg (8) 182 cm (9) Female (11) Frozen (13) Nulens *et al.* (2011); Ravololoharinjara (2019) (14) Cold room of the fishing company, Copefrito, in Toliara (16) *Jarifa* gillnet.

CCC 293 (1) 21 May 2011 at 14h00 (2) Anakao, 2 km to the west of Nosy Ve (3) Celyn, fisher from Lovokampy (4) 2 km (5) 150-200 metres (6) Baited with fish (7) 29.45 kg (8) 130 cm (9) Male (11) Frozen (13) Nulens *et al.* (2011); Ravololoharinjara (2019) (14) Cold room of the fishing company, Copefrito, in Toliara (16) *Jarifa* gillnet.

CCC 294 (Fig. 4) (1) 2 July 2011 at 10h00 (2) Andanora, 2-3 km from Soalara (3) Tine Hoe Julien (4) 7 km from St Augustin (5) 150-200 metres (6) Baited with fish (7) 84.64 kg (8) 170 cm (9) Female, 'pregnant' [21] (13) Nulens *et al.* (2011); Ravololoharinjara (2019) (14) Cold room of the fishing company, Copefrito, in Toliara (16) *Jarifa* gillnet, 24 cm stretched mesh.

CCC 295 (1) 3 August 2011 at 15h00 (2) Anakao, about 10 km west of Nosy Ve (3) Antoine, fisher from Lovokampy (4) About 10 km (5) 150-200 metres (6) Baited with fish (7) 32 kg (8)

140 cm (9) Female (11) Frozen (12) Frozen (13) Nulens (2012); Ravololoharinjara (2019) (14) Cold room of the fishing company, Murex, in Toliara (15) When M Ravololoharinjara visited Murex during the November 2019 survey she was told that they no longer had the specimen as it had been 'shared with company personnel during the passage of Cyclone HARUNA in 2013' (16) *Jarifa* gillnet, 24 cm stretched mesh.

CCC 296 (1) 25 August 2011 at 15h00 (2) Anakao, about 2 km west of Nosy Ve (3) Fisher from Lovokampy (4) About 2 km west from Nosy Ve island (5) 150-200 metres (6) Baited with fish (7) 62 kg (8) 170 cm (9) Female (13) Nulens (2012); Ravololoharinjara (2019) (14) The specimen was not kept to discourage fishermen from hunting for coelacanths (16) *Jarifa* gillnet, 24 cm stretched mesh.

CCC 297 (1) January 2012 (2) Toliara, precise location unknown (11) Frozen (13) Ravololoharinjara (2019) (14) Cold room of the fishing company, Murex, in Toliara (15) MNHN in Paris, France (16) Almost certainly *jarifa* gillnet.

CCC 311 (1) 31 May 2012 (2) Fiherenamasay (5) 100-200 metres (7) 36 kg (13) Nulens (2012); Ravololoharinjara (2019) (16) *Jarifa* gillnet.

CCC 298 (1) July 2012 (2) Toliara, St Augustin, precise location unknown (7-8) 'very large coelacanth' (R Nulens, *pers. comm.*, 10 March 2020) but actual weight and length not available (9) Female (13) Nulens (2012); Ravololoharinjara (2019) (14) Cut into pieces and sold at a market (15) The president of the Association des Pêcheurs de St Augustin confirmed the catch to John Bemiasa at the IHSM (16) Almost certainly *jarifa* gillnet.

CCC 312 (Fig. 3) (1) ca 2012 (2) Maintirano (5) 100-200 metres (7) 36 kg (12) Only the head and three fins were preserved (13) Ravololoharinjara (2019) (14) IHSM Museum, Toliara (15) Brought to the IHSM Museum by Berthin Rakotonirina for display.

CCC 301 (Fig. 4) (1) February 2013 at about 02h00 (2) Ambanilia, near Sarodrano (3) Fisher from St Augustin (4) About 6 km (5) About 500 metres (7) 35 kg (8) 130 cm (9) Male (10) Good (11) Formalin (12) Whole specimen (13) Ravololoharinjara (2019) (14) On display at the Résidence Eden Ecolodge, Sarodrano, south of Toliara (15) Information provided to Rik Nulens by John Bemiasa at the IHSM [*pers. comm.*, 14 November 2016]. Photograph of specimen available at https://madatrek.com/wp-content/uploads/IMG_1369-1024x768.jpg (16) *Jarifa* gillnet.

CCC 313 (1) February 2013, two days after the capture of CCC 301, but given as May 2014 by Ravololoharinjara (2019) (2) Near St Augustin, precise location unknown (3) Fisher from St Augustin (7) 35-50 kg (8) 150 cm (10) Alive on capture (11) Alive (12) Live specimen that was brought to the Résidence Eden Ecolodge in Sarodrano by fishermen but immediately released back into the sea by the staff of the lodge 'but only a few hours later, the fishermen of Sarodrano fished and consumed him' [32] (13) Ravololoharinjara (2019) (14) Eaten by fishermen (15) Information provided by the lodge staff.

CCC 314 (Fig. 5) (1) About 2015 (2) Near Anakao, precise location unknown (3) Artisanal fisher (12) Damaged tail fin (13) Ravololoharinjara (2019) (14) Jardin de la Mer, an exhibition centre on the plants and animals of Madagascar that opened in Toliara in 2017 (15)

Information provided by staff at the Jardin de la Mer [14]. See <https://business.facebook.com/zahatanymada/videos/268928107103096/>.

CCC 315 (Fig. 6) (1) 11 June 2011 (2) St Augustin, Toliara (12) The specimen was originally in good condition but was allowed to deteriorate and only the dried head and two fins are now preserved (13) Houssen (2012); Ravololoharinjara (2019) (14) Courtyard of the Regional Fisheries Directorate in Toliara (15) The specimen was photographed at the Collège Etienne de Flacourt, Toliara, in the presence of then director of the Regional Fisheries Directorate, Gilbert François, who provided the catch information.

CCC 316 (1) 23 March 2019 (2) Barnhill Point (3) Tinard family fisher (4) 0.8-1 km (5) 200 metres (7) 79 kg (8) 150 cm (9) Female (13) Ravololoharinjara (2019) (14) Courtyard of the Regional Fisheries Directorate in Toliara (15) The specimen was purchased for consumption (16) *Jarifa* gillnet.

CCC 317 (Fig. 7) (1) 13 May 2010 (2) Nosy Ve, near Anakao (3) Tine Hoe Julien (10) Good (11) Fresh (13) www.inaturalist.org/photos/35765909 [accessed 29.4.2020] (14) Almost certainly sold for food in the Toliara market (15) The specimen was photographed on a *pousse-pousse* (rickshaw) by Thierry Cordenos, a teacher at the Collège Etienne de Flacourt, Toliara, Madagascar. It was brought to the IHSM Museum where it was identified by staff but it was not measured, weighed or preserved (16) Almost certainly *jarifa* gillnet.

References

- Anon. 2005. Le coelacanth, icône de la Journée mondiale du Tourisme. *Les Nouvelles*, 5 October 2005.
- Bruton, M. N. & Coutouvidis, S. E. 1991. An inventory of all known specimens of the coelacanth, *Latimeria chalumnae*, with comments on trends in the catches. *Env. Biol. Fish.* 1991; 32: 371-390.
- Cooke, A.J., M.N. Bruton & M. Ravololoharinjara. 2020. Coelacanth discoveries in Madagascar, with recommendations on research and conservation. *South African Journal of Science* (in press).
- Heemstra, P.H., A.L.J. Freeman, H. Yan Wong, D.A. Hensley & H.D. Rabesandratana. 1996. First authentic capture of a coelacanth, *Latimeria chalumnae* (Pisces: Latimeriidae), off Madagascar. *South African Journal of Science* 92: 150-151.
- Houssen, S. 2012. *Le coelacanth*. Flaque et Cours d'Eau, janvier 2012. Le Journal du Collège Etienne de Flacourt, Tuléar, Madagascar, no. 11(1): 1, 10.
http://www.collegetulear.fr/fichiers_utiles/college_francais_journal_N11.pdf
- Insacco, G., R. Nulens & B. Zava. 2016. The coelacanth, *Latimeria chalumnae* Smith, 1939 at the Natural History Museum of Comiso, taxidermic preservation and notes on the other world specimens. *Natura Rerum* 4(1): 25-38.
- Niaina, N. 2006. A peine capturé un coelacanth rejoint la marmite – capture d'un spécimen de coelacanth au large de Maintirano. *Les Nouvelles*, 1st July 2006; 1: 1-2.
- Nulens, R. 2011. Additions to the coelacanth inventory. *Smithiana Special Publication* 3, 12 September 2011. Update 1, 21 November 2011.

Nulens, R., 2012. Additions to the coelacanth inventory. *Smithiana Special Publication 3*, 12 September 2011. Update 2, 21 December 2012.

Nulens, R., 2013. Additions to the coelacanth inventory. *Smithiana Special Publication 3*, 12 September 2011. Update 3, 27 December 2013.

Nulens, R., 2014. Additions to the coelacanth inventory. *Smithiana Special Publication 3*, 12 September 2011. Update 4, 28 December 2014.

Nulens, R., 2015. Additions to the coelacanth inventory, *Smithiana Special Publication 3*, 12 September 2011. Update 5, 29 December 2015.

Nulens, R., L. Scott & M. Herbin. 2011. An updated inventory of all known specimens of the coelacanth, *Latimeria* spp. *Smithiana Special Publication 3*: 1-52.

Ravololoharinjara, M. 2019. Rapport de Mission à Toliara pour l'inventaire des captures et spécimens de coelacanth. *Resolve sarl internal report*, November 2019: 1-12.

Vicente, N. 1997. Un coelacanth à Madagascar. *Océanorama 27*: 11-15.

WWF. 2007. Bulletin de la Tortue Marine. *Les Dernières Nouvelles du Programme du WWF sur la conservation des tortues marines en Afrique et Madagascar*, Numéro 3, février 2007: 1-14.

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