New Great Whale: Eden's Whale in Sri Lankan Waters?

To fully comprehend and confirm the identity of our new finding, a myriad of complex details need to be studied and absorbed. Whale identification is no simple task and to this end I aim below to meticulously describe the dissimilarities and specific details of this new whale as at first sight, in the water most whales appear similar.

The "Bryde's whale complex" comprise two forms of rorqual: Bryde's whale (*Balaenoptera brydei*, Olsen, 1913) or *B. e. brydei*, a "large form" that occurs in warm temperate and tropical waters of the Indian, Pacific and Atlantic oceans, and Eden's whale (*Balaenoptera edeni* (Anderson, 1878) or *B. e. edeni*, a "small form" that may be restricted to the Indo-Pacific (Perrin & Brownell 2007, Reilly *et al.* 2008, Martenstyn 2013, Kershaw *et al.* 2014). They are members of the rorqual family and considered as one of the great whales.

The identity and number of species in the "Bryde's Whale complex" is still unclear (Perrin & Brownell 2007, Reilly *et al.* 2014). Furthermore, the taxonomic status and relationships within these species remains complex and poorly understood. Thus, *Balaenoptera edeni* (Anderson, 1878) nomenclature is provisional for these two forms (*B. brydei* and *B. edeni*) until further genetic and morphological research may justify recognition of two species. Another candidate *Balaenoptera omurai* (Wada *et al.* 2003) or Omura's whale, was previously thought to be a pygmy form of Bryde's whale was recently classified as a separate species.

Omura's whale (length 11.5-12m) has only recently been described in 2003 and separated from the Bryde's whales. It is smaller than the Bryde's whale (length 13-16.5m) and has more morphological similarities to the fin whale than the Bryde's whale. Omura's whale resembles the fin whale in having an asymmetrical jaw colouring, a single median ridge on its head and a blaze.

B. edeni was originally described by Anderson (1879) from a specimen collected near the Sittang River, Myanmar, which is now held in Calcutta. It was small compared with "ordinary" Bryde's whales, being apparently nearly physically mature at only 11.3m in length (Rice 1998). Junge (1950) collected a further specimen (now held in Leiden) at Sugi Island (between Sumatra and Singapore), which he judged to be physically mature and "slightly over" 12m, and identified it with Anderson's *B. edeni* (Reilly *et al.* 2008).

Recent analysis of mtDNA control region sequences shows two discrete population units for *B. e. brydei* (larger, offshore form) and *B. e. edeni* (smaller, coastal form) in the northern Indian Ocean (Kershaw *et al.* 2014).

Here, I present new information, *to facilitate future whale identifications*, related to external morphological evidence, behaviour and distribution of a new form of whale in Sri Lankan waters that is thought to be the Eden's whale or small form Bryde's whale. In light of this recent finding, Sri Lankan and Indian minke whale and even fin whale historical and contemporary sighting records are brought into question. Further re-examination of these sighting distribution records will be required including Deraniyagala's minke whale *B. a. talmaha* (Deraniyagala 1963).

Bryde's whale (large form)

Eden's whale (small form)

At sea, the Eden's whale head is not readily seen and mostly resembles a large minke whale (particularly, *B. bonaerensis* found in tropical waters). Taxonomy is not fully elucidated for the minke whale in Sri Lankan waters (Martenstyn, 2013 a & b).

DESCRIPTION

The large form Bryde's whale (Bryde's whale) and small form Bryde's whale (Eden's whale) are believed to be two species within the Bryde's whale complex to be present in Sri Lankan waters. *This nomenclature is provisional pending further scientific studies and classification*.

Appearance

Members of the "Bryde's whale complex" are *moderately-sized rorquals, smaller than fin and sei whales but being larger than minke whales*.

The *Eden's whale head is smaller and more V-shaped* (more like a small fin whale or adult minke whale) compared to the Bryde's whale (which is more like a blue whale). Both heads are longitudinally ridged from the tip of the rostrum to the double blowholes. However, in Bryde's whale this central ridge is flanked by an auxiliary ridge, 1-2cm thick, on either side, whereas in *Eden's whale it is flanked by two auxiliary ridges on either side* (see photos below). The central ridge is most prominent; the other two or four may be indistinct.

Bryde's whale (3 ridges on head)

Eden's whale (median & 2 aux. ridges)

Both forms of Bryde's whale are *completely grey under the lower jaws* (or mandible) unlike the fin whale's asymmetrical jaw colouring.

Bryde's whale dorsal fin is erect and curved whereas *Eden's whale dorsal fin is taller, more pointed at the tip and markedly curved (falcate)* particularly the rear edge, similar to the minke whale. The two photos below show the dorsal fins as they would appear from some distance. When seen at close range the Eden's whale dorsal fin is distinctly different.

Bryde's whale dorsal fin

Eden's whale dorsal fin

As can be seen they both have similar body colouration. Their *bodies are dark, smoky blue-grey body with cream or light blue-grey underside*. Lighter mottling and scars may be present. There is no blaze present on the body as is the case with Omura's whale or chevrons as in the fin whale.

Eden's whale (small form)

Their *flukes may be lighter on the ventral side*. *Flippers are dark on both sides* unlike some subspecies of minke whales that have white banding patterns above.

Behaviour

Bryde's whales cruise at between 1.9 and 6.5km/h (1-3.5kt), but can reach speeds of 18-24km/h (10-13kt). Eden's whale has been clocked at 3.9 to 5.2km/h (2.1-2.8kt) while cruising. While cruising its body is mostly horizontal and surfaces about every minute to take a breath. They are both, however, quicker and more erratic at the surface than other rorquals. These very active lunge feeders are often seen to change direction abruptly when going after mobile prey.

Eden's and minke whales are *inquisitive, and may suddenly appear beside boats*. In some instances whale-watching passengers may become alarmed. While travelling, Eden's whale is happy to swim alongside a vessel, turning sideways to have a better look. Bryde's whales rarely allow vessels to come close. They may approach a vessel with its engine off.

Bryde's whales are known to perform a partial, almost vertical breach. This behaviour is often repeated two or three times. They will breathe 4-7 times before diving. The usual dive duration is 2-5min, but some dives can take up to 20min. Both whales body and *tailstocks are sharply arched when diving, though the flukes are not displayed*.

A typical Eden's whale dive sequence commences with the rostrum breaking the surface at a slight angle, followed immediately by the blow. The head then drops to a shallower angle as most of the length of the back, including the dorsal fin, appears. In minke and sei whales, the blowholes and dorsal fin often appear simultaneously. Also, the blow from a minke usually commences before the body breaks the surface. In diving, the Eden's whale flukes are not shown; however there is a pronounced arching of the back.

Eden's whale *blow is a single 'cloud' 1-2m high*, often not seen at a distance.

Watch a 2 minute video of an Eden's whale cruising which ends with it sharply arching its body when making a dive.

http://youtu.be/ayb3JIkEhM4

Distribution

Sightings of Eden's whale have recently been confirmed in Kalpitiya and Trincomalee. In the past, this species has likely been recorded as a minke whale and even a fin whale. Based on anecdotal evidence from distribution data (Martenstyn 2013b) there is no reason why the Eden's whale should not be present all round Sri Lanka.

At present, the depth distribution has been recorded at 200-300m (near continental ledge) while cruising. There may to be a peak in sightings from March to April during the first intermonsoon. Further research is underway to better quantify its seasonality, geographic and depth distribution, and abundance in Sri Lankan waters.

Sighting distribution records will continue to be collated and analysed by the Centre for Research on Indian Ocean Marine Mammals (CRIOMM), and added to the Marine Mammal Distribution Database (MMDD) that presently contains over 4,000 marine records.

The Bryde's whale complex species detailed information is documented along with the rest of the rorquals on the CRIOMM website and will continue to be updated as and when further information becomes available.

http://iomarinemammals.wix.com/criomm#!brydes-whale/c1ahc

Key Identification Summary

Sei, fin, Bryde's, Eden's and minke whales all look very much alike at sea. However, the Bryde's whale with three ridges on its rostrum and the Eden's whale has five ridges are unique among rorquals. Sei, fin and minke whales, like other rorquals, have only a single median ridge. Bryde's and Eden's whales are smaller than sei and fin whales but larger than minke whales.

Bryde's whale (large form)	Eden's whale (small form)
• Three ridges on head • Head is more U-shaped • Prominent, erect and moderate curved dorsal fin • Skin may be mottled • Uniform bluish-grey upper body colour • Thin, hazy blow 3-4m high • May arch tailstock but no fluke-up on dives • Flukes rarely seen above surface • Avoids approaching vessels • Flippers are dark on both sides	• Five ridges on head • Head is more V-shaped • Relatively high, falcate dorsal fin with pointed tip • Skin may be mottled • Uniform bluish-grey upper body colour • Indistinct hazy blow 1-2m high • May arch tailstock but no fluke-up on dives • Flukes rarely seen above surface • May approach or suddenly appear near vessels • Flippers are dark on both sides

The Eden's whale ridges are not readily seen at sea otherwise by now we would have learned a lot more about this whale. However, the shape of the head and dorsal fin along with body colour, surface and dive behaviour will aid in distinguishing the Eden's whale from other similar rorquals. Identifying a whale often comes down to a process of elimination and this whale is no exception.

REFERENCES

Deraniyagala, P.E.P. 1963. 'Mass mortality of the new subspecies of little piked whale *Balaenoptera acutorostrata thalmaha* and a new beaked whale *Mesoplodon hotaula* from Ceylon.' *Spolia Zeylanica,* 30(1): 79-84.

Junge, G. C. A., 1950. 'On a specimen of the rare fin whale, *Balaenoptera edeni* Anderson, stranded on Pulu Sugi near Singapore'. *Zoologische Verhandelingen*, 9: 3–26, 9 pls.

Kershaw, F., Leslie, M.S., Collins, T., Mansur, R.M., Smith, B.D., Minton, G., Baldwin, R., LeDuc, R.G., Anderson, R.C., Brownell, R.L. Jr. and Rosenbaum, H.C. 2013. 'Population Differentiation of 2 Forms of Bryde's Whales in the Indian and Pacific Oceans.' *J. Heredity* pp. 1-10. doi:10.1093/jhered/est057.

Martenstyn, H. 2013a. *Out of the Blue: A guide to Marine Mammals of Sri Lanka, Southern India and the Maldives*. Colombo. Sri Lanka.

Martenstyn, H. 2013b. *Sri Lanka Marine Mammal Records 2013.* First Ed., CRIOMM.

Martenstyn, H. 2014. 'Marine Mammal Sightings Log.' Colombo, Sri Lanka. (Unpublished).

Perrin, W.F. & Brownell Jr., R.L., 2007. 'Proposed Updates to the List of Recognised Species of Cetaceans.' *Rep Int Whal Comm.* SC/59/O15:1–4.

Reilly, S.B., Bannister, J.L., Best, P.B., Brown, M., Brownell Jr., R.L., Butterworth, D.S., Clapham, P.J., Cooke, J., Donovan, G.P., Urbán, J. & Zerbini, A.N. 2008. *Balaenoptera edeni*. The IUCN Red List of Threatened Species. Version 2014.2. <www.iucnredlist.org>. Downloaded on 27 August 2014.

Rice, D.W. 1998. *Marine mammals of the world. Systematics and distribution*. Special publication number 4. Society for Marine Mammalogy, Allen Press Inc., Lawrence, Kansas. v-ix+231pp.

Wada, S., Oishi, M. & Yamada, T.K. 2003. 'A newly discovered species of living baleen whale'. *Nature* 426: 278-281.

Yapa, A. and Ratnavira, G. 2013. *The Mammals of Sri Lanka*. Field Ornithology Group of Sri Lanka.

Prepared by:

Howard Martenstyn
Director Research
Centre for Research on Indian Ocean Marine Mammals
Email: hmartenstyn@gmail.com
Website: www.slam.lk

28th September 2014
Colombo, Sri Lanka

News release published on SLAM website blog: http://www.slam.lk/#!blog/cki9