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OBSERVATIONS OF AN UNIDENTIFIED BEAKED WHALE (*MESOPLODON* SP.) IN THE EASTERN TROPICAL PACIFIC

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ABSTRACT

Multiple sightings of a distinctive but unidentified species of beaked whale have been made in the eastern tropical Pacific. The unidentified whale has two color morphs: a conspicuously marked black and white form (judged to be larger), and a uniformly gray-brown form. Maximum length estimates have been 5–5.5 m. Other features include a relatively flat head, with a small, distinct melon; a moderately long beak; and a low, wide-based, triangular dorsal fin. On most animals the trailing edge of the dorsal fin is only slightly falcate and often appears straight. On the black and white morph, a broad white or cream-colored swathe originates immediately posterior to the dorsal surface of the head and runs posterio-ventrally on either side of the animal. The prevalence of scarring on the black and white animals suggests sexual dimorphism and that these larger, more conspicuously marked animals are adult males, while the smaller, browner, unscarred animals are females and young. Possibilities for identification include: 1) a well-marked race of a known *Mesoplodon* sp., 2) *Mesoplodon* (*Indopacetus*) *pacificus* or 3) an undescribed species.

Key words: *Mesoplodon*, unidentified beaked whale, eastern tropical Pacific.

In this paper we report on multiple sightings of a distinctive but as yet unidentified species of beaked whale from the eastern tropical Pacific (ETP). A morph of this whale that we assume is the adult male (*see* below) is conspicuously marked and eminently identifiable in the field. Despite this, it does not fit the description of any known species of ziphiid. We provide here a field description of the whale, identify its range and comment on its identity.

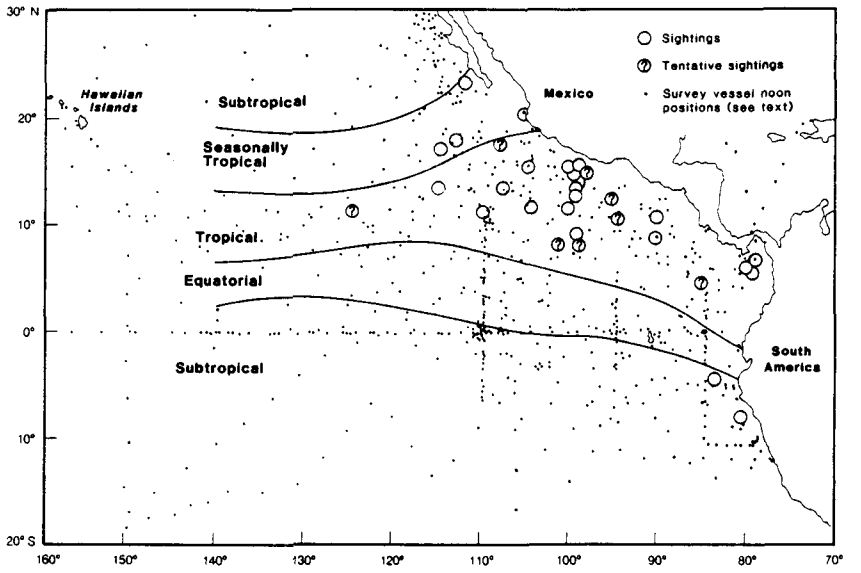

Figure 1. Sightings of the unidentified beaked whale in the eastern tropical Pacific relative to surface water types (after Wyrtki 1967).

Sightings

Figure 1 shows 24 positive and 8 tentative sightings of the unidentified whale. All except one were made by trained observers during marine mammal survey cruises for the Southwest Fisheries Center in the central and eastern tropical Pacific (*see* Perrin *et al.* 1983). Noon positions of survey vessels during these cruises are also plotted in Figure 1 and indicate the extent of survey coverage. The remaining sighting (Fig. 2) was photographed during a marine mammal identification course taught by two of us (AAL and JUR) at Facultad de Ciencias, Universidad Nacional Autonoma de Mexico (UNAM).

Description

The unidentified whale has two distinct color morphs: a conspicuously marked black and white form and a relatively nondescript morph that appears to be uniformly gray-brown (Figs. 2 and 3). When they have been seen together, the black and white animal has been judged by several observers to be the larger of the two. Estimates of maximum length have most often been between approximately 5–5.5 m, making it an average-to-slightly-large-sized *Mesoplodon* (*see* Mead 1984).

The head is relatively flat, as in most mesoplodonts, with a small but distinct melon. The beak is moderately long, appearing similar in size to that of *M. densirostris*. On one occasion an observer reported that the mandible was paler than the upper part of the beak on one of the black and white animals.

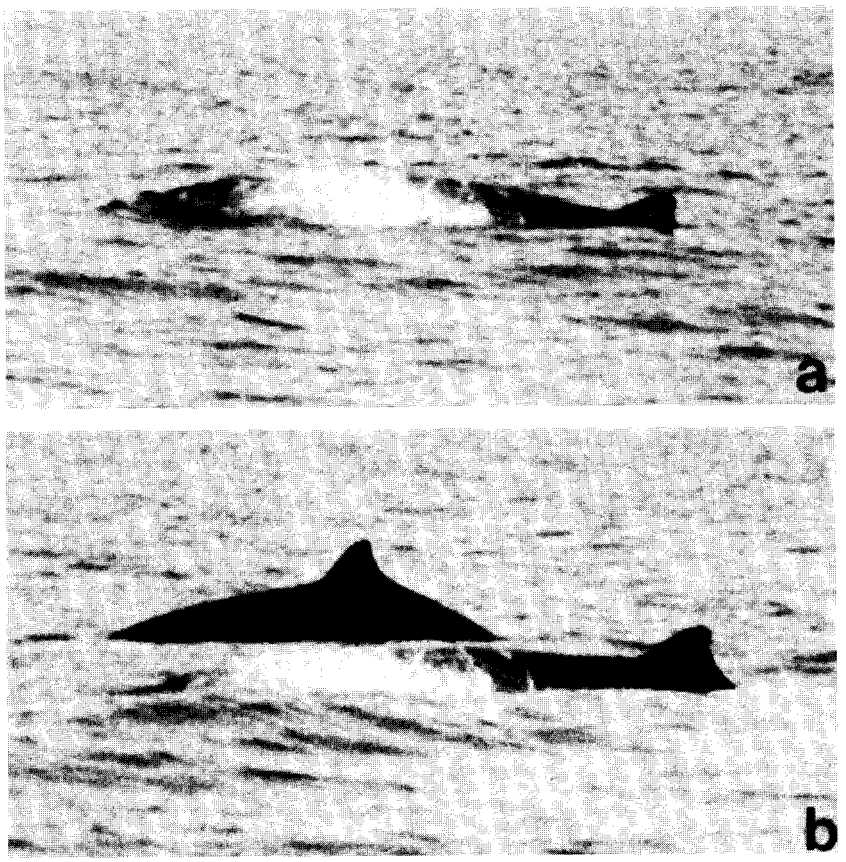

Figure 2. Photographs of the unidentified beaked whale from Bahia de Banderas, Jalisco, Mexico. The animal shown in 2a and 2b, foreground, is presumably an adult male; notice the scratches behind the white area. Photos by P. Hernández and J. L. López.

The distinctive dorsal fin is low, wide-based and triangular. On most animals the trailing edge of the fin is only slightly falcate and often appears straight.

Most of the dorsal surface of the black and white form, including the dorsal fin, is dark and has been variously described as blackish, black/brown, chocolate brown or dark olive brown. This is similar to the range in color variation noted for short-finned pilot whales (*Globicephala macrorhynchus*) in the eastern Pacific. Pilot whales in the field are generally described as jet black, but in the ETP they often appear greenish brown. Whether these perceived differences are the result of lighting effects, as seems likely, or some actual physical differences, is not known. For the time being, the unidentified whale is best described as black and white.

On the black and white morph, a broad white or cream-colored swathe originates immediately posterior to the dorsal surface of the head and runs posterio-ventrally on either side of the animal. Anteriorly, the swathe is rather broad, maybe 60–90 cm, but appears to taper out toward the trailing end. This swathe has been seen to form a very large and contrasting chevron when the animal is viewed head on (and probably from above also). When seen at a distance, the posterior edge of this chevron forms a fairly distinct, contrasting border against the dark color of the rest of the posterio-dorsal surface of the whale. On closer inspection however, this border is seen to be broken up by what appears to be white dappling on a dark background. A possible clue concerning the ontogeny of the chevron pattern came from a sighting of an animal, apparently a young adult, that had the contrasting white chevron pattern described above, but it was formed entirely of individual white spots. The white spotting may become confluent as the animal matures, eventually forming the characteristic chevron pattern. The head and beak area of the black and white animal is darker than the chevron but lighter than the back and usually appears reddish brown or tan (Fig. 2).

Whenever the black and white animal has been seen at relatively close range, scratches and scarring have been noted, particularly along the trailing edge of the chevron (*see* Fig. 2). No scars have been seen on the lighter brown animals. In most species of *Mesoplodon*, only adult males have teeth that erupt from the surface of the gum (usually one on either side of the lower jaw). These teeth generally protrude as tusks and, because of intraspecific fighting, males scar each other up considerably at times. Consequently, adult males are often discernable from females and young by the presence of extensive scarring (Heyning 1984). The prevalence of scarring on the black and white animals suggests that the unidentified beaked whale is sexually dimorphic and that the larger, more conspicuously marked black and white animals are adult males, while the smaller, browner, unscarred animals are females and young.

The second, ostensibly female, color form appears uniform gray/brown or bronze-colored. No conspicuous color pattern, markings or scarring have been noticed on this form. The dorsal fin of the brown animal is also low, wide-based and triangular, although it tends to be slightly more falcate than in the males. The brown animals are relatively nondescript and separating them from other mesoplodonts in the field may not be possible. In fact, all of the positive sightings shown in Figure 1 were based on the presence of at least one readily identifiable adult male of the species.

Mead *et al.* (1982) described a similar sexual dimorphism with respect to external color patterns in *M. carlhubbsi*. In that species, the adult male has a "brilliant white" rostrum and a "distinctive white patch . . . centered on the dorsal prominence of the melon," while the remainder of the body is dark gray or black. Female and subadult *M. carlhubbsi* show an incipient version of this pattern but are more uniformly gray-brown.

Figure 3 is an artist's rendition of both morphs of the unidentified whale based on photographs (Fig. 2), and descriptions and sketches made during field observations. The ventral color patterns shown are inferential, as that part of

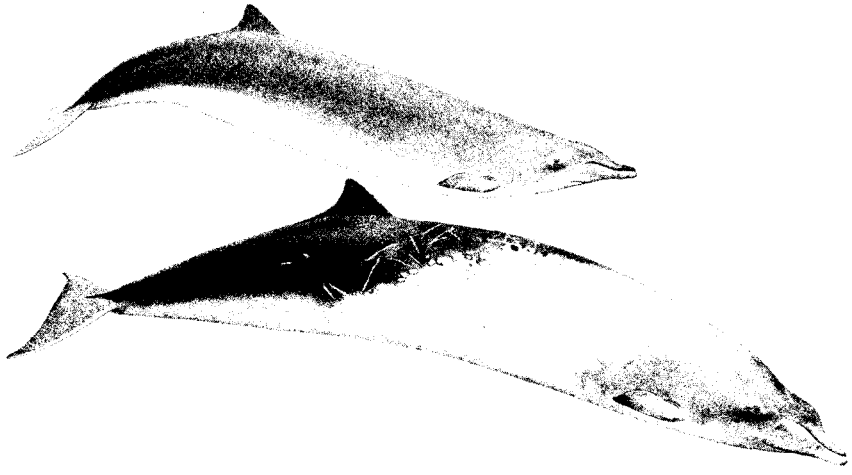

Figure 3. An artist's depiction of the unidentified beaked whale drawn from Figure 2 and illustrations and descriptions made in the field. The larger animal is a presumed male, while the smaller animal (not to scale) shows the pattern of presumed female/juveniles (*see* text). We have seen little more of this animal than is visible in Figure 2 and the ventral patterns shown here are inferred. Illustration by Lou Silva.

the animal has never been seen. Likewise, the shape of the beak and gape line has not been adequately examined; the illustration shows a generalized mesoplodont head and rostrum of about the right proportions for the unidentified species.

No erupted teeth have been seen on this species either, though we have specifically looked for them. We suspect if they exist, and they almost certainly do, they are probably not as large or conspicuous as in *M. layardii* or even *M. carlhubbsi*.

Distribution

The normal range of the unidentified whale appears to be restricted to the eastern tropical Pacific (Fig. 1). Nearly all of our sightings were within an area Wyrtki (1967) characterized as tropical surface water. This is an area of very warm water and recorded sea surface temperatures for 20 of our sightings were ≥27°C (80°F). The two sightings in Figure 1 that appear south of this range were associated with southerly intrusions of warm water. The southernmost sighting was made in February 1983 when a major El Niño event was shifting anomalously warm water and associated organisms south along the coast of Peru (Barber and Chavez 1983, Velez *et al.* 1984).

Biological Observations

Herd size for the 24 positive sightings ranged from 1 to 8, with groups of 2 or 3 being the most common. As noted above however, these results pertain

only to sightings with adult males present. For 16 sightings where color morph information was obtained for all of the animals present, 5 were lone males, 6 were male/female (or possibly male/juvenile) pairs, and 5 involved single males with 2 or more female/juveniles, including one sighting with an estimated 8 animals.

At sea, this whale behaves similarly to other *Mesoplodon* species. It is usually seen rolling over slowly at the surface or traveling at a moderate pace and in fairly tight groups when more than one animal is present. It generally does not engage in any sort of "playful" activity, *e.g.*, breaching, tail-slapping, or spy-hopping, though on one occasion a lone male was seen to breach clear of the water three times in a row. Like other members of the genus, its behavior repertoire, at least when it is at the surface, appears to be very limited and stereotyped. Under normal circumstances there is no visible blow.

Identity of the Whale

In considering the possibilities for identification, two genera of beaked whales, *Berardius* and *Hyperoodon,* can be eliminated because of excessive size (approximately 12 and 7 m, respectively). *Ziphius cavirostris* is tan or whitish with a stubby beak and is a species we commonly identify in the eastern tropical Pacific (Pitman, unpublished observations). *Tasmacetus shepherdi* is probably too large also (maximum length at least 7 m, Mead 1984) and its distribution appears to be circumpolar in southern oceans (Gaskin 1982). The relatively small size (5–5.5 m), distinct beak, and small but discernable melon lead us to identify the whale with the genus *Mesoplodon.*

Currently there are 12 recognized living species of *Mesoplodon.* From descriptions and photographs of stranded animals, the external pigmentation patterns of most of these have gradually become known (*e.g.*, Baker 1983, Leatherwood *et al.* 1983), and none matches the description of the unidentified whale. (A possible exception to this, *M.* (*Indopacetus*) *pacificus,* is discussed below.)

Nearly all of the information on *Mesoplodon* distribution has come from stranded specimens. Gaskin (1982) stated that the genus "seems to be in a process of prolific speciation, possibly as a result of population isolation events which began in the Pliocene and were completed in the Pleistocene." Given the large number of species in this open ocean group, it is not surprising that the distributions of individual species appear to be limited to distinct water masses (Mead 1981, Mead *et al.* 1982). Of the species known to inhabit tropical or warm temperate waters, *M. europaeus* is known only from the Atlantic, *M. gingkodens* inhabits the western Pacific (though apparently strays to the eastern Pacific), and *M. densirostris* is pantropical. One of us (RLP) has identified *M. densirostris* several times in the eastern tropical Pacific but only west of the area where the unidentified whale occurs. To date, there has not been any *Mesoplodon* specimen material collected from within the area that appears to be the normal range of the unidentified whale (J. Mead, personal communication).

Tropical surface water and the apparent range of the unidentified whale (Fig. 1) both correspond to a distinct and highly productive oceanographic area that

forms a unique biotic province in the eastern Pacific (Reid 1962, Wyrtki 1967, McGowan 1972, Au and Perryman 1985). The range of the unidentified whale is also nearly identical to the range of the eastern spinner dolphin (*Stenella longirostris*), a pantropical species with a well-marked form endemic to the eastern tropical Pacific (Perrin *et al.* 1985). From the evidence above, it seems likely that a distinct, possibly endemic, species of *Mesoplodon* also occurs in the eastern tropical Pacific.

Possibilities for identification of the unidentified whale include the following:

1) It may be a well-marked race of a known species of *Mesoplodon.*
2) *Mesoplodon* (*Indopacetus*) *pacificus* is currently the rarest extant species of whale known and has never been identified in the flesh. It is known from only two skulls: one from Queensland, Australia, and one from Somalia, northeast Africa. It is possible, however, that these records represent extralimital strays from a localized population inhabiting a little-explored area, such as the eastern tropical Pacific.
3) It may be an undescribed species.

The identity of the whale will remain unknown until a stranded specimen is collected.

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