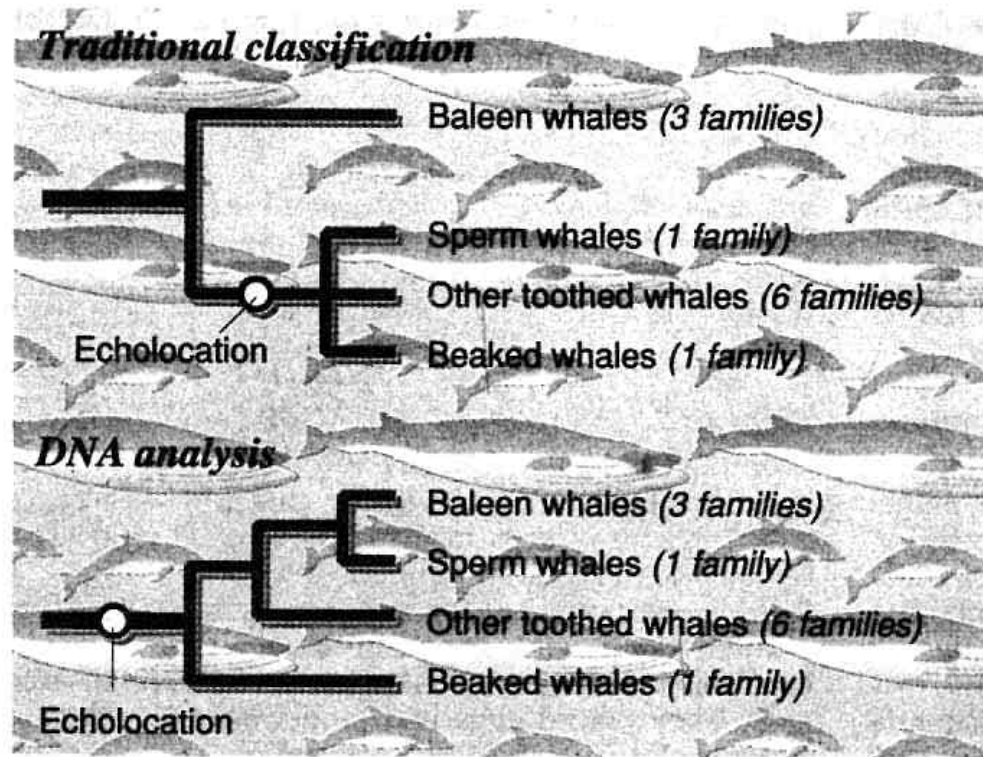


Baleen whale's genes capture echoes of past

THE classification of whales and dolphins (order Cetacea) should be completely revised, say researchers from the US and Belgium who have analysed the DNA of these animals. According to the new analysis, the sperm whale and the pygmy sperm whale, both of which have teeth, are more closely related to baleen whales than other toothed whales.

Ideally, the classification of a group of animals should reflect how the animals evolved. Fossils can give an indication of this but usually the classification is based on the identification of common characteristics. Whales and dolphins were divided into two suborders. The toothed whales (Odontoceti) have teeth and use echolocation, whereas baleen whales (Mysticeti) have baleens—plates in the mouth—which filter food from the water. Sperm whales were grouped with the Odontoceti because they have teeth in their bottom jaw.

Now Michel Milinkovitch of the Free University of Brussels and his colleagues at the State University of New York have found that this classification is not com-



patible with their DNA analysis of several whales and dolphins.

The researchers studied 16 cetacean species. They determined the DNA sequences of the genes that coded for the mitochondrial 12S and 16S ribosomal RNA, and compared them with the aid of a computer. They found that the DNA sequence of the sperm whale and pygmy sperm whale were more closely related to the baleen whales than to other toothed whales and

dolphins. The study also showed that the beaked whale (which has only a few teeth) is only distantly related to any other whale or dolphin (*Nature*, vol 361, p 346).

To check their results, the researchers obtained from a database the DNA sequences of the myoglobin of 10 whales and dolphins. Myoglobin is the protein that helps muscles to take up and store oxygen. Again, the researchers found that the two sperm whales were more closely related to the baleen whales, and that the beaked whales were distantly related.

The findings have important implications for the evolution of echolocation.

According to traditional classification, the ancestor of the toothed whale developed echolocation, while the baleen whales never had the ability (see Figure). But the revised classification implies that the ancestor of all whales used echolocation, and that the baleen whales subsequently lost the ability. The alternative explanation, that both the sperm whales and other toothed whales developed echolocation independently, is unlikely.

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