Back to Internet Library

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14 and 18 March 2025 (Note please that virtually **all highlighting/emphasis in the typeface of the quotes** by W.-E. L. except italics for genera and species names)

# Whiskers in Whales – What do They Prove?

The answer usually given in evolutionary texts is this[1]: "Whiskers in whales are just totally functionless rudimentary structures inherited from a land mammal, thus proving whale evolution and descendance from a terrestrial ancestor."

However, Jennifer Kennedy, Marine Science expert, Executive Director & Co-Founder of jen@blueoceansociety.org – although she seems to think that "we don't know why whales have hair" – she nevertheless points out that there are some theories on possible functions, as for example:

> "Each hair follicle is **surrounded by nerves**, which likely perform a **sensory function**. Perhaps they are used to sense prey in the water or **assess prey densities to tell the whale when there is enough fish in a school that it's worth feeding.** They may also be used in **social situations** (such as if a calf needs to tell its mom that it needs to nurse), or maybe they are used to detect changes in water currents."[2]

Kennedy added this photograph of a humpback whale[3] and text ("*believe it or not, whales do have hair, although it's only visible in some species*") for an illustration:

My hypothesis is: Whales do not have "whiskers" (vibrissae) because evolution forgot to mutate them away, i.e. failed to delete them. They probably have a whole range of important functions – even those that develop only vibrissal follicles:

**Mynett et al.** (2021) have this to say on vibrissal hairs and follicles:

> "Indeed, both beluga whales (*Delphinapterus leucas*) and narwhals (*Monodon monoceros*) do not develop vibrissal hairs at all (Yablokov, Bel'kovich, & Borisov, 1972). Subsequently, cetacean vibrissae—especially those of odontocetes — were often thought to be vestigial (Yablokov & Klevezal, 1969).
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> ...However, there is an ***emerging realization that cetacean vibrissal follicles are likely to be functional in many species*** (Berta et al., 2015; Czech-Damal et al., 2012; Drake et al., 2015; Gerussi et al., 2020)."[4]

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[1] For a series of scientific comments doubting the generally asserted story on whale evolution see https://evolutionnews.org/tag/whale-evolution/ See also Richard Sternberg https://www.youtube.com/watch?v=glgXFGW_K6g 67.219 Aufrufe 14.12.2021
Evolutionary biologist Richard Sternberg challenges what he calls the "National Geographic" or "textbook" view of the fossil record as a support for modern Darwinian theory. In this bonus interview released as part of the Science Uprising series, Sternberg unpacks what the fossil record really shows, what we learn from population genetics about Darwinian theory, and how the Darwinian mechanism can't account for the evolution of whales. He also examines competing scientific explanations for the abrupt appearance of new body plans in the history of life.

[2] https://www.blueoceansociety.org/blog/do-whales-have-hair/

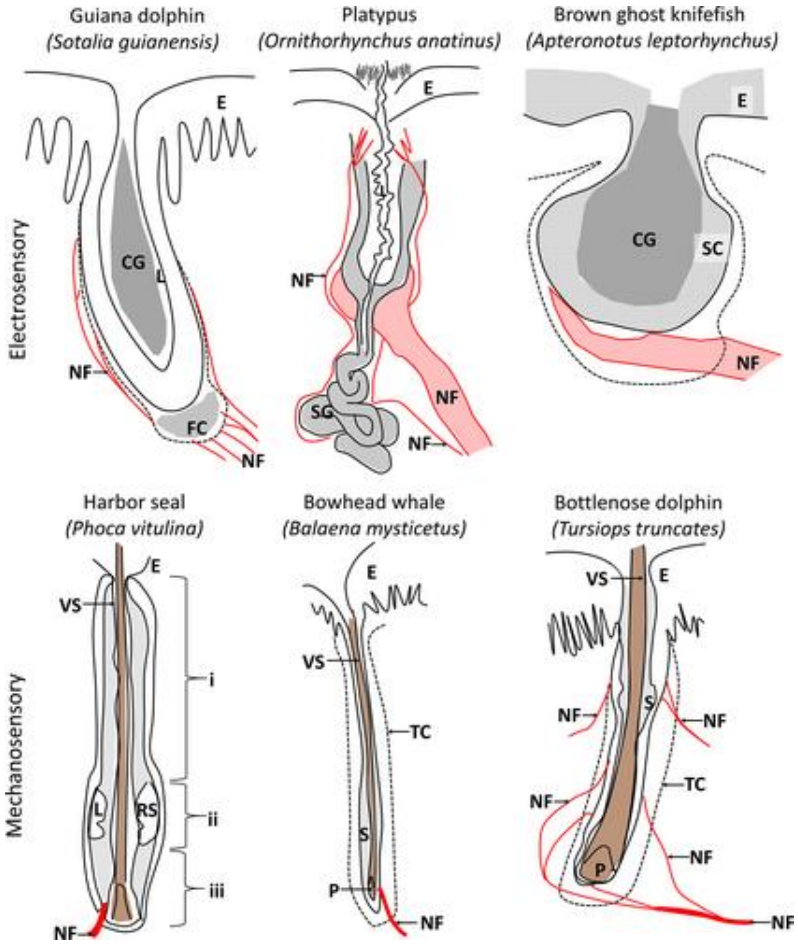
[3] Geringfügig bearbeitet.

[4]: See full reference footnote next page.

Mynett et al. (2021) report on possible functions of vibrissal follicles:

> "Gerussi et al. (2020) found hair shafts still present within the follicles of adult *Tursiops truncatus*, although they were not protruding external to the skin. They also found the follicles to be well-innervated (Figure 1, bottom) and concluded that the vibrissal follicles were ***still functional, despite not having external hair shafts***, and could play a **proprioceptive role**. Yablokov et al. (1972) also suggested that ***short vibrissal hair shafts could move within the follicle to provide information about water movement and the speed of angular head movements***. If so, a distributed network of nerve fibers along the follicle length could help detect these vibrissal shaft movements, as well as potentially providing a ***thermoregulatory capacity*** (Gerussi et al., 2020). Indeed, branching nerve fibers along the vibrissal shaft have been observed in the delphinid species *Sotalia guianensis* and *Tursiops truncatus* (CzechDamal et al., 2012; Gerussi et al., 2020)."

Figure 1 by Mynett et al. showing the "Anatomy of electrosensory and mechanosensory structures. A summary of common anatomical structures":




"**Top row** shows electrosensory structures, including vibrissal crypt in Guiana dolphin (*Sotalia guianensis*) adapted from figure 2 in Czech-Damal, Dehnhardt, Manger, and Hanke (2013); mucous glands in Platyus (*Ornithorhynchus anatinus*) adapted from figure 1 in Czech-Damal et al. (2013); and tuberous sensory organ in Brown ghost knifefish (*Apteronotus leptorhynchus*) adapted from figure 2a in Zakon et al. (1998).

**Bottom row** shows mechanosensory vibrissal follicles in Harbor seal (*Phoca vitulina*) adapted from figure 1 in Dehnhardt, Mauck, and Hyvärinen (1998); bowhead whale (*Balaena mysticetus*) adapted from figure 3a, b in Drake et al. (2015); and bottlenose dolphin (*Tursiops truncatus*) adapted from Gerussi et al. (2020).

E: Epidermis; L: Lumen; S: Sinus; RS: Ring Epidermis; CG: Conductive gel; FC: Fat cells; SC: Secreting cells; SG: Secreting gland; NF: Nerve fibers; VS: Vibrissal shaft; TC: Tissue complex; P: Dermal papilla; *Phoca vitulina* has three sections to the follicle (i, ii, iii), whereas all the other species have one section to the follicle. *Tursiops truncatus* represent juvenile specimens; adult specimens are represented in all other species."[5]

[5] Figure 1 by Natasha Mynett, Hannah L., Mossman, Tim Huettner, Robyn A. Grant (2021): Diversity of vibrissal follicle anatomy in cetaceans. https://anatomypubs.onlinelibrary.wiley.com/doi/10.1002/ar.24714 Not uninteresting in this context: "Skin deep: Aquatic skin adaptations of whales and hippos evolved independently": https://www.sciencedaily.com/releases/2021/04/210401112857.htm ""When you look at the molecular signatures, there is a striking and clear answer," said study co-corresponding author and evolutionary genomicist Michael Hiller, from the Max Planck Institute of Molecular Cell Biology and Genetics and the LOEWE-Centre for

After telling the usual evolutionary story on whales that "these marine mammals have evolved from terrestrial ancestors over millions of years, ***slowly transitioning*** from a life on land to one in the ocean", Anaïs Remili from the *Whale Scientists*[6] notes (2023) the "large diversity of whiskers between species" as follows:

> "While most newborn toothed whales, (i.e.: dolphins, and porpoises), show a row of vibrissae on their rostrum (their snout), some species of baleen whales can show curious structures on their heads. Humpback whales can bear up to 50 of these structures called tubercles. Each tubercle has a hair in the middle and **is connected to nerves** – around 400 of them. ***Some of these nerves might sense changes in pressure or water movements***."
>
> "Bowhead whale newborns also show patches of vibrissae on their chin, rostrum, and close to their blowholes. Since ***baleen whales do not use echolocation, these small vibrissae or tubercles might help them navigate their first weeks in the water***."

Concerning the question "Are whiskers useful to cetaceans?" Remili continues:

> "In their early stages of life, whales and dolphins can use their vibrissae ***for crucial functions such as staying close to their mothers, recognizing individuals, and locating the mom's nipple for feeding***. Dolphin calves only start to use echolocation after a couple of weeks. To do so, they emit high-frequency clicks into the water and interpret the returning echoes to navigate, locate prey, and communicate. But ***before using this impressive skill, they might have to rely on their vibrissae to navigate their new environment***.
>
> However, as they grow up, cetaceans' whiskers disappear. After shedding their whiskers, individuals retain a continuous line of minuscule cavities called 'vibrissal crypts' throughout their entire lifespan. These may play a different role, ***possibly helping the adults sense the movement of water and the position of their heads***.
>
> Some scientists even suggested that these structures ***might be used for electroreception*** in some species of dolphins, which involves the detection of electrical signals in the environment. For dolphins foraging in muddy environments like the ***Guiana dolphins, electroreception could help them detect fish movements in the sediment***."[7]

Almost all of the whale species (about 94[8]) display whiskers except two, namely *Delphinapterus leucas* and *Monodon monoceros*. As already mentioned above, Mynett et al. write (2021) – to repeat this key point:

> "Indeed, **both beluga whales** (*Delphinapterus leucas*) and narwhals (*Monodon monoceros*) **do not develop vibrissal hairs at all** (Yablokov, Bel'kovich, & Borisov, 1972). Subsequently, cetacean vibrissae – especially those of odontocetes – were often thought to be vestigial (Yablokov & Klevezal, 1969).
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> ...However, there is an ***emerging realization that cetacean vibrissal follicles are likely to be functional in many species*** (Berta et al., 2015; Czech-Damal et al., 2012; Drake et al., 2015; Gerussi et al., 2020)."[9]

But why do the (two) species of the family Monodontidae not develop vibrissal hairs at all? So why these exceptions?

Let's take the marsupials for an illustration. What is the function of the pouch? Answer (among many further points): The "bag is used to hold and protect their offspring"[10]. However, one may raise the question: If these pouches have such

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Translational Biodiversity Genomics in Germany. "Our results strongly support the idea that 'aquatic' skin traits found in both hippos and cetaceans evolved independently. And not only that, we can see that the gene losses in the hippo lineage happened much later than in the cetacean lineage."

[6] Anaïs Remili (2023): Why are baby whales and dolphins born with whiskers? By Anaïs Remili / December 7, 2023 / Whale Science / Baleen whales, Toothed whales, Whale Biology https://whalescientists.com/dolphin-whiskers/
Concerning vestigial whale hips, see please https://evolutionnews.org/2014/09/whales_hips_ano/
as well as https://www.cell.com/action/showPdf?pii=S0960-9822%2821%2900301-8

[7] See also Summer E. Drake et al. (2015): Sensory Hairs in the Bowhead Whale, *Balaena mysticetus* (Cetacea, Mammalia) https://anatomypubs.onlinelibrary.wiley.com/doi/10.1002/ar.23163

[8] https://en.wikipedia.org/wiki/List_of_cetaceans (retrieved 12 March 2025)

[9] See again: https://anatomypubs.onlinelibrary.wiley.com/doi/10.1002/ar.24714

[10] https://www.studysmarter.de/schule/biologie/zoologie/beuteltier/ German sentence:"Dieser Beutel dient zur Aufnahme und zum Schutz ihrer Nachkommen"

important functions, why are there extensive groups of animals without pouches such as the placentals?

One of the great biologists, Karl von Goebel[11], once formulated a basic principle of biological forms and functions as follows: '*It works this way, but it could also work differently*.' In such cases, we regularly find 'substitute structures and functions'.

In the exceptional Monodontidae whale family with its two species beluga and narwhal, functions such as the following could be more pronounced:

> "...narwhals use sound to navigate and hunt for food. ***They primarily vocalise through clicks, whistles and knocks, created by air movement between chambers near the blowhole***. ... ***Whistles and throbs are most commonly used to communicate with other pod members***. ... Narwhals sometimes adjust the duration and pitch of their pulsed calls to maximise sound propagation in varying acoustic environments. Other ***sounds produced by narwhals include trumpeting and "squeaking-door sounds". The narwhal vocal repertoire is similar to that of the beluga whale***. However, the frequency ranges, durations, and repetition rates of narwhal clicks differ from those of belugas.

In addition, as compared to the other cetaceans, these two species exhibit a whole series/range of special anatomical and physiological characteristics, which unfortunately have only been researched in part or not at all so far.

These are likely to include features that completely replace and take over some functions that have been identified for other cetaceans or that still require further research, such as:

> "...**sensory function**. Perhaps they are used to sense prey in the water or ***assess prey densities to tell the whale when there is enough fish in a school that it's worth feeding*****.** They may also be used in **social situations**..."

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**Addendum**: In the context of the topic of vestigial structures I have repeatedly[12] emphasized that there is ***A Massive Contradiction Within the Theory of Evolution Itself*** – varying that theme now for the whales as follows:

In utter contrast to all the assertions on rudimentary structures in whales – now according to the evolutionist's own presuppositions on the limitless powers of natural selection, the present organ systems in whales should **all be functional and already display the best solutions possible**, i.e. they cannot be designed more elegantly, more efficiently and perfectly, so that any redesign would be entirely superfluous. Why?

Darwin himself asserted: "…natural selection is daily and hourly scrutinizing, throughout the world, every variation, even the slightest; rejecting that which is bad, preserving and adding up all that is good; silently and insensibly working, whenever and wherever opportunity offers, at the improvement of each organic being in relation to its organic and in organic conditions of life" … "I can see no limit to this power" … "natural selection … always intently watching each slight alteration in the transparent layers [of the eye]; and carefully preserving each which … in any way or in any degree, tends to produce a distincter image".

Modern neo-Darwinians enthusiastically agree: Prof. John Avise: "***Natural selection comes close to omnipotence***". Prof. Christopher Exley is, indeed, convinced that "***both the beauty and the brilliance of natural selection are reflected in its omnipotence to explain the myriad observations of life***" (virtually/vitally in agreement with Dawkins, Coyne, Futuyma, Todd, Ayala, Mayr and many other renowned evolutionary authors). Or take Nobel laureate Francois Jacob: "The genetic message, the program of the present-day organism...resembles a text without an author, that a proof-reader has been correcting for more than two billion years, continually improving, refining and completing it, ***gradually eliminating all imperfections***." And as result of this limitless, omniscient and omnipotent natural selection "gradually eliminating all imperfections" now the assertion that whales are full of needless, superfluous, dispensible, leftover, residuary, unrequired, totally useless but ***energy consuming*** rudimentary organs? – Pointless energy consuming processes during their formation in ontogeny and later partial or full maintenance, preservation, continuation and conservation over thousands of generations over millions of years? No, there are good reasons to assume that whiskers in whales are functional and that their ingenious blueprints are best explained by intelligent design.

Back to Internet Library

[11] https://de.wikipedia.org/wiki/Karl_von_Goebel (retrieved 12 March 2025)

[12] Literature references *cf.* https://www.weloennig.de/Kidney1x.pdf, https://www.weloennig.de/OmnipotentImpotentNaturalSelection.pdf, https://www.weloennig.de/PANDA.Part1.pdf https://www.weloennig.de/PANDA.Part1.pdf, https://www.weloennig.de/HumanEvolution.pdf pp. 6 and 7 and 41 – 44, also some additional articles here: https://evolutionnews.org/tag/vestigial-organs/ As for the theme of the eyes *cf.* https://evolutionnews.org/tag/eyes/