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The hideous price of beauty

An investigation into the market of deep-sea shark liver oil

Introduction

When it comes to sharks, little goes to waste. The flesh is eaten, the fins are cooked in soup, the cartilage is made into dietary supplements, the teeth into jewelry and the skin into bags, wallets or shoes. The livers of certain deep-sea species (inhabiting depths of 200-4000 meters are rich in oil and are the primary material for the squalene industry, which is a key provider for the cosmetics and nutraceutical sectors. With fins, oil is the highest priced shark product on international markets.

No existing study specifically focuses on shark liver oil and its by-products. Where the substance is produced is unclear, its uses are not well defined and the market volumes are unknown. In the absence of statistics on the product (shark liver oil and squalene are not declared at national or international levels), we investigated the shark liver oil market by interviewing fishermen and oil & squalene producers.

Given its value, it appears that shark liver oil is not merely a product of bycatch, but the main product of targeted fisheries. We estimate that over three million deep-sea sharks, all of which are extremely vulnerable species, are caught each year to sustain this market, essentially to supply the cosmetics sector.

Key Findings

• The 2012 global demand for shark liver oil is estimated at 2000-2200 tons (a more than 20% decrease compared to 2010). Around 90% of this total is used in the production of squalane for the cosmetics industry, around 9% by the nutraceutical industry and 1% by other sectors.

• Over three million deep-sea sharks are needed each year to meet the needs of the shark liver oil market. Deep-sea sharks are inherently vulnerable to fishing, even if caught in low numbers. Species such as the Gulper shark *(Centrophorus granulosus)*, the leafscale gulper shark *(Centrophorus squamosus)* and the Portugese dogfish *(Centroscymnus coelolepis)* are already in danger of extinction in the Northeast Atlantic.

• These sharks are mostly the product of targeted fisheries and not simply bycatch. This even seems to be a prerequisite for the production of high-quality oil. In all areas concerned, this is an industry of specialized fishermen, producers and traders, which has its own, specific production cycle.

• Given the high market value of shark liver oil (12 to 15 dollars per kilo), it appears that a distinct phenomenon of 'livering' exists, in which the liver is removed and the carcass thrown back overboard, by analogy with 'finning' (removal of shark fins, before the injured animals are thrown back, usually still alive).

• On a global scale, the squalane used in cosmetics still largely comes from sharks.

• Only in Europe does the market seem to have moved predominantly towards plant-based squalane (olives and other). Today the majority of the global squalane production seems to be derived from plants while it only represented 30-40% of the global production by the end of 2010.

• In Japan, the world's leading market for squalane (40% of global demand), plant squalane is almost non-existent.

• The main reason for the ongoing use of animal squalane is financial: plant squalane is 30% more expensive than shark squalane.


• Specialized producers often sell shark squalane as plant squalane. Suppliers have thus misled large multinationals in the cosmetics sector as to the nature of the squalane sold.

• Since 2011, determining the origin of the squalane used in cosmetics is simple and inexpensive.

• End consumers have no way of knowing whether the product they are buying contains shark squalane. Current labeling regulations do not demand that the origins of the squalane be indicated (Council Directive 76/768/EEC).

• Spain plays a central role in the shark liver oil trade. The Spanish corporation, Squalop Oil, has the capacity to place 80 tonnes of oil per month on the market, and alone can supply a quarter of the entire global shark liver oil market.

• The French company Sophim, which boasts being the world leader in squalene and squalane production, was the main buyer of shark liver oil in the 1990s and 2000s, along with the Japanese company Kishimoto Special Liver Oils. Sophim has now diversified and also makes plant squalane, with shark squalane supposedly representing only a very small proportion of its production. Despite these claims, the English version of the company's website declares that Sophim 'buys'[1] and 'needs'[2] shark liver oil. The shark species referred to on the site are endangered,[3] and include the gulper shark *(Centrophorus granulosus)*, which is in critical danger of extinction in the North-East Atlantic. Its liver oil is portrayed as the 'Rolls Royce' of oils.

• The price per tonne for shark liver oil is generally 12 000 to 15 000 dollars, and depends on its squalene content. Squalene is generally sold at 15 000 to 25 000 dollars per tonne, and squalane at 20 000 to 35 000 dollars per tonne, depending on its origin.

Production and trade

• From the 1960s, Japan played a pioneering role in the industrial production of shark squalene and its use in cosmetics. The Japanese company Kishimoto Special Liver Oils thus became world leader in the production of shark squalene and squalane, and the world's greatest buyer of crude shark liver oil.

• Until the mid 1990s, the Spanish and Portuguese fleets working in the Atlantic provided for nearly two thirds of the global shark liver oil demand.

• In the 2000s, the fishing effort moved southward, due to a decline in deep-sea shark populations in the North-East Atlantic and the introduction of quotas for these species in Europe (2005), as in Australia and New Zealand. The 2006 ban on using gillnets in certain ICES zones at depths of over 600 meters also contributed to this shift. Today, this southward transition of the fishing effort seems to be over.

• In tropical and semi-tropical waters, the absence of management measures makes it easier to access fish resources, and production costs are lower. Moreover, and for reasons still unknown to us, in these areas some of the commonly found deep-sea shark species have a higher oil concentration in their livers than in European waters.

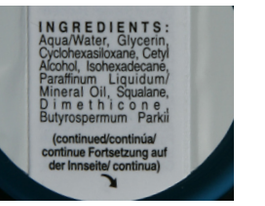
• The southward displacement of the fishing effort seems to have yielded oil supplies that are richer in squalene and may explain, along with the increasing use of plant squalane in cosmetics, the decreasing overall quantities of oil available on the market.

• Today, the majority of shark liver oil is produced in the Indian Ocean, the South-East Atlantic and the West Pacific. The main oil-producing countries are the Philippines, Indonesia, India, Australia, New Zealand and (indirectly) Spain.

• Today, Spanish oil traders work directly off the coasts of several African countries, as well as in the Pacific, via partnerships or joint ventures.

(1) http://www.sophim.com/html/webuy.html
(2) http://www.shark-liver-oil.net/sharkliveroil.html
(3) http://www.shark-liver-oil.net/squalene.html





• It is not currently possible to analyze the global shark liver oil market. Other than in South Korea, there is no standard code specifically designating the product. Consequently, countries do not declare these exchanges to the FAO. The same problem applies for international squalene and squalane trade.

The nutraceutical sector

• Shark liver oil is the primary material for many nutraceutical products, because it is credited (without scientific proof) with extraordinary benefits.

• However, heavy metals and persistent organic pollutants, which accumulate in the fat of large marine predators, have been found in squalene and shark liver oil capsules in Japan.

• Around 9% of shark liver oil production is used by the nutraceutical sector.

• This sector, unlike the cosmetics sector, does not seem to envisage replacing shark squalene with plant squalene.

The pharmaceutical sector

In the pharmaceutical sector, shark squalene is mainly used as an ingredient in adjuvants for vaccines. Laboratories prefer shark squalene over less pure plant squalene alternatives. The volumes used are relatively small.

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