

Discovery of an Unusual Use of leatherback fat as an insect deterrent in Mauritania

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Traditional uses of sea turtle fat: For centuries, indigenous people from tropical regions have used sea turtle fat for many purposes, including cosmetics especially for beautifying the skin. When Europeans settled in these regions and discovered turtle oil, they first used it for cooking and then as a lubricant or lamp oil (Simmonds 1879). The derived cosmetic products were first manufactured in Germany and France in the 1930s. The commercial value of these products then increased as turtle fat was recognized as a powerful rejuvenating cream (De Navarre and Ruszkowski 1933). The fat was therefore added to a wide range of cosmetics such as perfumes, soaps, facial creams and mascara. The sea turtle fat use stopped at the beginning of the Second World War but remained on the market until the 1970s. Recently, Chacón (2002) indicated the use of hawksbill, *Eretmochelys imbricata*, green turtle, *Chelonia mydas*, and olive ridley, *Lepidochelys olivacea*, fat in Belize, Guatemala, Honduras, Nicaragua, Costa Rica and Panama. Additionally, he reported the trafficking of dermatological creams containing sea turtle fat between Guatemala and Belize.

In India, in the Lakshadweep Islands and the mainland coast, green turtle fat was used as boat coating ("odhum"). A single turtle can provide the right quantity of oil (i.e. between 10 and 20 liters of oil) for coating an entire pirogue (Tripathy and Choudhury 2007). Sea turtle fat was further used as treatment for asthma, convulsions and different kinds of body pain (Murthy 1981).

In Africa, the natives of the Bijagos archipelago called sea turtle fat *grassura*. The fat is mainly used as cooking oil to improve the taste of meat (e.g. of turtle meat and fish) and also as a medicine, massage oil and for reducing sprains (Bernatets 2009; Regalla 2012). On Roume Island (Loos Islands, Guinea), the fat is also used as food (e.g. in combination with rice) and as an ointment to apply in the case of sprains and fractures (Fretey *et al.* 2006). The Imraguen fishermen in Mauritania, extract the fat from the killed sea turtle, melt it and then mix it with the meat being cooked. The melted fat can also be stored in plastic bottle as oil for future use. The Imragen women use this oil to treat diseases such as diabetes, headaches, lumbago, rheumatism and constipation. Mixed with corn or rice porridge, the oil is used to treat digestive diseases. Among the seasonal Senegalese migrants in southern Mauritania, the oil is preserved to "liberate the organisms" or, as described by the fishermen, "to eliminate stomach parasites" (Fretey and Mint Hama 2012).

Traditional use of leatherback fat: The leatherback sea turtle, *Dermochelys coriacea*, has a ~40 mm thick pseudo-shell formed by a mosaic of small dermal bone and fat-saturated connective tissues containing trans-6-hexadecenoic acid. All the phospholipids derived from the fatty deposits are enriched in arachidonic acid (Ackman *et al.* 1972), which was used in cosmetology, in dermal creams and lotions to treat skin rash.

In West and Central Africa, traditional practitioners commonly use the leatherback sea turtle fat because it is believed to contain

bioactive molecules with health benefits. In Côte d'Ivoire, ethnic groups use the fat in traditional pharmacopoeia to treat mouth ulcers, oral sores and rheumatism as well as for joint massage. In Togo and Benin, the freshly killed leatherback turtle is hung vertically and left in the sun to allow the oil to drain from the carcass into a bowl placed underneath (Dossou-Bodjrenou *et al.* 1999; Fretey *et al.* 1999); about 40 liters of oil can be collected from a single carcass. When mixed with honey, this oil is used to cure fevers, fainting, chickenpox, convulsions, tetanus seizures, malaria as well as hepatic disease. In Togo, farmers mainly used the leatherback fat as food, massage oil and treatment for fractures. Additionally, they make the *suh*, an agricultural tool used in rice fields, from this fat (Sabinot 2003). In Cameroon, the lyassa villagers used the leatherback turtle fat as cooking oil; north, in the Batoke village near Limbé, marabouts (a sorcerer or magician in West Africa) use the fat to prepare remedies for their secret pharmacopeia (Fretey 1999). On the nearby island of Bioko, the species is exclusively captured for its fat (Butynski 1996); to date, no records or interviews are available for identifying the use of the leatherback sea turtle fat in that region. Nevertheless, it is most likely that the local people use it for purposes described above.

Outside Africa, in the Persian Gulf and Indian Ocean Islands, for example, the leatherback fat was used as a sealing material for caulking the inside of boat hulls (Kinunen and Walczak 1971; Tripathy and Choudhury 2007); in Papua New Guinea, as lamp oil (Spring 1982); in the Caribbean (i.e. US Virgin Islands, British Virgin Islands, Grenadines, Panama (U.S. Fish and Wildlife Service 1981)), as medical remedy. In Panama, the leatherback is called *baúla* and its oil was reported to have extraordinary curative powers, particularly against chills and infantile asthma (Hastings 2003).

An unknown use of leatherback fat in Mauritania: The present study was conducted at the end of October 2014, in

Mauritania, north and south of Nouakchott. Fishermen from the Lévrier Bay were interviewed to identify the frequency at which sea turtles were encountered at sea. A fisherman indicated that one leatherback sea turtle stranded in February 2014 on a nearby beach. This observation was interesting since leatherback sea turtle strandings are uncommon in Mauritania (Maigret 1983; Fretey and Mint Hama 2014).

The fisherman told us that he collected the stranded turtle, extracted the oil by melting the fat tissue and then put the oil into bottles. He showed us fragments of the leatherback shell that were still present on the beach and took us into his cabin and showed us some of the bottles containing the leatherback oil.



Figure 1. The Mauritanian fisherman interviewed shows us his bottle containing 1 liter of leatherback oil (© J. Fretey).

He explained that the oil was used to coat the sides of fresh fish fillets to avoid attracting insects (e.g. ants and flies) when fish are dried in the sun on the metal roof of his cabin.



Figure 2. Leatherback oil is applied with a brush on the fish (© J. Fretey).



Figure 3. The fish is now protected against insects will be placed in the sun on the roof of the house (© J. Fretey).

To our knowledge, this is the first record of the use of leatherback fat as an insect deterrent. It is likely that such practice is widespread across Africa. It would be worthwhile to identify historical events that led to such a use by the Mauritanian fishermen. Additionally, it would be interesting to study the effectiveness of leatherback fat as an insect deterrent.

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