

ANIMALS AND MONEY

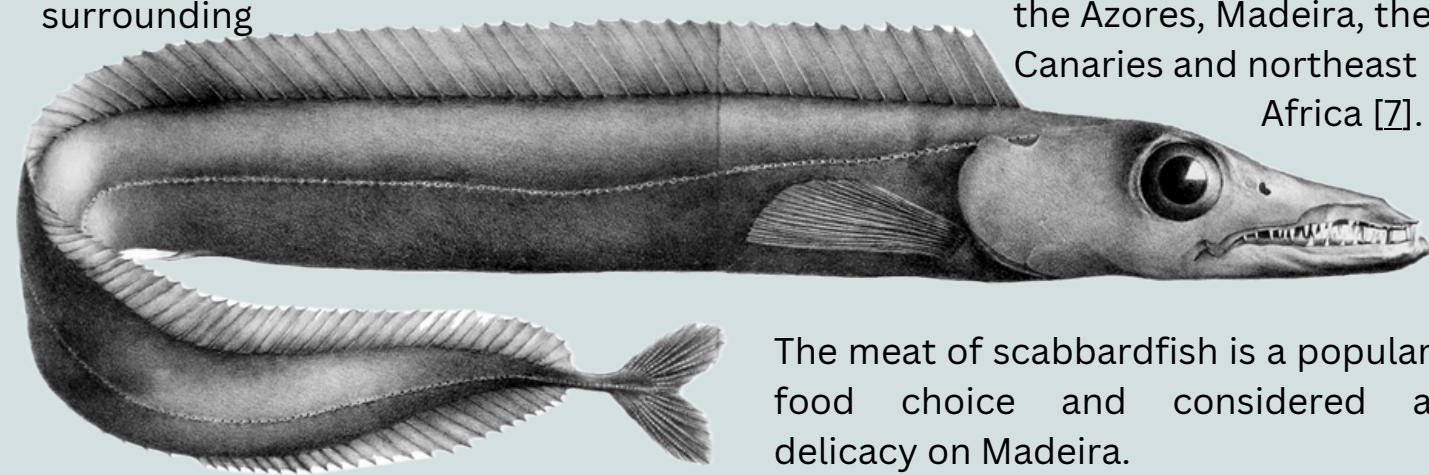
This part of BioS Reports unravels interesting relations between animals and the economy

Deep-sea Delicacy: The Value of Scabbardfish for Madeira

Rico Steinert

Fish is an important source of dietary protein, omega fatty acids and other nutrients. Portugal has the third highest per-capita fish consumption in Europe [1] and the Autonomous Region of Madeira has a particularly high consumption of fish-based meals [2].

Madeira is a large island off the coast of Africa. The waters surrounding the island have low levels of nutrients, and so, Madeiran fishery is dependent on a small number of species, including some deep-sea species [3]. Some of the most relevant deep-sea species are the black scabbardfish, *Aphanopus carbo*, and the intermediate scabbard fish *Aphanopus intermedius*. Black scabbardfish can be found in the northeast and central Atlantic from the British Isles to Madeira and the canary isles [4,5,6]. Intermediate scabbardfish live in the ocean surrounding the Azores, Madeira, the Canaries and northeast Africa [7].



The meat of scabbardfish is a popular food choice and considered a delicacy on Madeira.

Black scabbardfish have been caught on Madeira for more than 100 years [8]. Since the 1980s, fishery for black scabbard increased greatly, reaching a maximum of roughly 4500 tonnes in 1997 [3]. Catches have declined since, but scabbardfish still make up a large quantity of the annual yield, with more than one third of the total catch being scabbardfish in 2021 [9].

In 2021, 5,200 tonnes of fish were caught in Madeiran waters, generating 14.1 million € [9]. Of this amount, scabbardfish contributed 1,900 tonnes which resulted in a first sale value of 5.8 million € [9]. In the same year, the GDP of the Autonomous Region of Madeira was 5.026 billion € [10]. Scabbardfish, according to their first sale value, therefore contributed 0,115% of the Madeiran GDP in 2021. The value of a single scabbardfish depends on its weight. A kilogram of scabbardfish has a rough first sale value of 3,05 €, but scabbardfish are usually heavier than that. Using specific weight-length formulas, the weight of a single fish can be determined [11]. On average, black scabbardfish are 118 cm long, while the slightly larger intermediate scabbardfish is measured at around 128 cm [11]. These lengths equal mean weights of 1675 g for black scabbardfish and 2731 g for intermediate scabbardfish. Therefore, a single black scabbardfish has a first sale value of 5,11€, while that number increases to 8,33€ for intermediate scabbardfish. There are however a few factors to consider regarding these price estimates. The prices are first sale value, and the product likely goes through multiple levels of distribution before reaching the customer, who will probably pay substantially more when purchasing the fish. Therefore, the first sale values lead to an underestimate of the importance of scabbardfish economically. Also, intermediate scabbardfish were only recently discovered near Madeira and are difficult to externally differentiate from Black Scabbardfish [7]. It is possible that some of the data may have been based on the assumption that there was only black scabbardfish present. That would mean that black scabbardfish may be overvalued in economic calculations as some of the earnings are made with intermediate scabbards.

While scabbardfish continue to be a popular delicacy in Madeira, it is difficult to assess the state of the scabbardfish population and its future fate. By 2014, stocks of most other Madeiran fish were either collapsed or overexploited [12]. This could increase the pressure on scabbard populations. After 1997, there was a reduction in scabbardfish fishing vessels. However, the number of hooks per vessel and the number of days at sea have increased instead [12,13]. This goes along with an increase in travel distance per vessel to get to better fishing grounds which may point towards scabbardfish being overfished in some areas [3]. A prevalent theory suggests that the entire European black scabbard population is one large stock whose individuals migrate south depending on age or maturity [4]. If this is correct, then reductions in black scabbardfish should be examined as the collective result of all European countries and regions currently active in scabbardfish fishing. Therefore, to protect the population, cooperative measures for more sustainable fishing of scabbardfish would be required.

EXCURSIONS AND OTHER NEWS

Small insights in student's or professor's points of view, field trips, and other stuff we do.

Lab Rotation: From Roadkill to Exhibition Piece

Asude Demir



Imagine you are sitting in the car and driving when you suddenly notice a carcass on the side of the road. Everybody must have experienced this once in their lifetime. But have you ever wondered why the carcass curiously disappeared the next day or what happened to it? For natural history museums, like the Elementarium in Kamenz, those carcasses (mostly found by individuals who bring them to the museum) are very precious. They are used for data acquisition and archiving to get information about the local vertebrate populations and the reasons for their death. I recently completed a 4-week internship at the Elementarium as a chance to widen my horizons as a biologist and share my knowledge with visitors of all ages. There is, after all, a lot more to biology than lab work, and I was glad to get the chance to work and learn in a new environment. This internship gave behind the scenes insight into what happens once a carcass is brought to the museum. Firstly, background data must be noted, including the location where the carcass was found, who found it, when it was found and, if known, the reason for the animal's death. After that, the carcasses are usually put in the freezer to store it for future processing. What follows is called taxidermy. There are several forms of performing taxidermy on dead animals. If an animal is going to be shown in the museum, the skin is removed, cleaned and put over an artificial body, which is made of different materials, depending on the size of the animal. This should imitate the real body shape. The cleaned skin of vertebrates is usually used to make bellows, which can be stored and saved in the collection. The skeleton is also cleaned, cooked and bleached before storage. In cases where birds are found, a different method of taxidermy is carried out, called plucking. This involves plucking the feathers and placing them on a scheme, which is a board that organizes the feathers of a specific species based on where they are found on the body. This type of taxidermy was a big part of my internship. Working at the museum was rewarding and taught me many lessons, the most important being that I will never pass a carcass on the road without picking it up in a bag and bringing it straight to the museum.

EXCURSIONS AND OTHER NEWS

Science Slam - And the Winner is...

Helen Rothfuß

Star Trek, Frozen, Poor Things and the Last of Us. These popular films and shows attract cinephiles and scientists alike, although maybe for slightly different reasons. On the 21st of March, more than 100 people interested both in fiction and science, gathered in the Irish Fiddler for the Science (Fiction) Slam 3.0.



The event, organised by Lipotype, Science goes to School and BioS Reports, involved slammers explaining in simple terms the science behind their favourite movie, series or videogame in just 5 minutes. To have a shot at a cash prize, participants needed to convince the jury, which consisted of four scientists from industry and research here in Dresden. The results of the evening were 10 interesting and funny talks, with topics ranging from brain transplantation to memory erasure and a fungus creating real-life zombies. The winning topic of the evening was tardigrades and their love life, based on "Ripper" from Star Trek.