

Knowledge of sea cucumbers by the Algerian community and an attempt to introduce them into the national gastronomy

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Abstract

In order to introduce sea cucumbers to the local Algerian market, a survey of 453 people was carried out in different region of the Algerian territory in order to analyse consumer interest in and their behaviour regarding sea cucumber food habits. Our results show that most people are able to spend between DZD 500 (USD 3.78) and DZD 2000 (USD 15.11) to buy seafood. Sea cucumbers are not well known by Algerians, but about 72% of the surveyed people would be able to afford them. These results provide basic data for the establishment of a marketing strategy for sea cucumbers in Algeria.

Key words: Sea cucumbers, seafood, Algeria

Introduction

Due to the high demand for sea cucumbers in recent decades (Conand 2018), new fisheries have rapidly developed since the 1990s in countries of the northeast Atlantic and the Mediterranean Sea, including Italy, Spain, Greece, Portugal and, particularly, Turkey, which monopolises the sea cucumbers export market (Conand 2006; Marquet et al. 2017). Sea cucumbers are rarely consumed in the Mediterranean region, and the entire sea cucumber catch is exported to Asian countries (Aydin 2018; Neghli and Mezali 2019). Since 2008, the collection of sea cucumbers in Algeria has been allowed but not for commercial purposes (Mezali and Slimane-Tamacha 2020). The exploitation of sea cucumbers is limited to their use as artisanal fishing bait. However, it is illegally traded to foreign countries (Neghli and Mezali 2019; Mezali and Slimane-Tamacha 2020). The fresh product – or its derivatives – have never existed on the local market and have never been introduced into the Algerian gastronomy. The present work aims to analyse the acceptance of sea cucumber by Algerian consumers and the possibility of integrating the sea cucumbers into their culinary habits as a way to establish consumption, fishing and production patterns in Algeria, taking into account the sociodemographic, economic and gustatory characteristics of Algerian consumers.

Methodology

The survey was carried out using an online questionnaire in two languages (French and Arabic) and shared on social network. The survey targeted a sample of 453 Algerian citizens from the 14 coastal wilayas (administrative divisions) of Taref, Annaba, Skikda, Jijel, B ejaja, Tizi-Ouzou, Boumerdes,

Alger, Tipasa, Ch elif, Mostaganem, Oran, Ain-T emouchent and Telemcen, and from different interior wilayas such as S etif, Blida, Gharda ia, Tiaret, Adrar and M'sila, during summer 2020 (Fig. 1).

The sample of the surveyed population is composed of twice as many women (66%) as men (34%). This high ratio of women to men is due to the fact that the majority of women are housewives and they are interested in gastronomy, and are the ones who are primarily responsible for preparing food. Interviewees from coastal wilayas represent 74% while those from inland wilayas represent 26% of the sample. The age of respondents was divided into four categories, with a predominance of respondents in the age group 18–25 (41%), followed by the age group 25–35 (39%). Those aged less than 18, and those over age 35 represented a relatively low rate (20%). Thus, the sample is mainly composed of young citizens between the ages of 18 and 35 who are mostly students (43%) and employees (40%). The dominance of young people in the sample is explained by the fact that they are more present on social networks than other age groups.

The survey covers three main parts:

- 1) The personal information of the interviewees: sex, age, wilaya of origin and socioprofessional situation.
- 2) Food habits of the consumers with regard to seafood products: involvement in food purchases (fully, partly or not at all); frequency of consumption of seafood (once a week, once a month, occasionally or never); species consumed (grouped into five categories: small pelagic fish, white fish, molluscs, crustaceans and sea urchins or mussels); budget devoted to the purchase of these products (< DZD 500 or USD 3.78,

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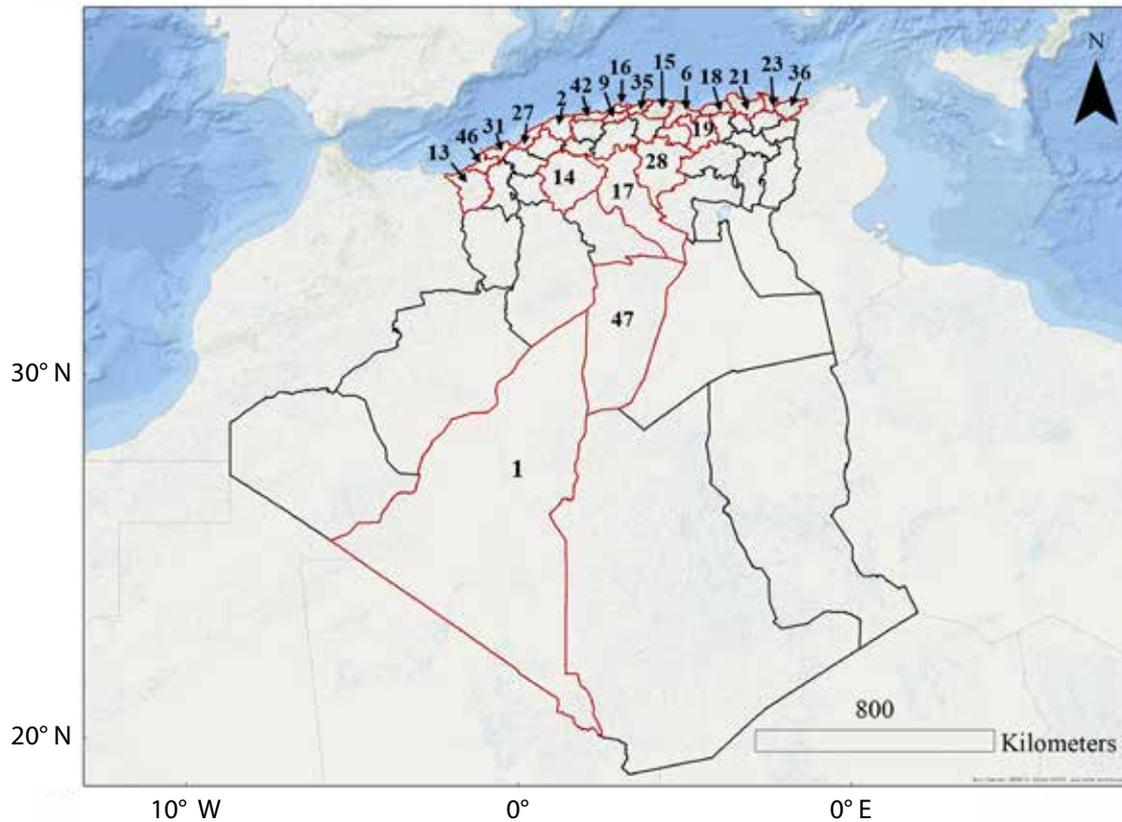


Figure 1. Residential location of Algerian citizens who participated in the questionnaire survey. Numbers indicate the numerical code of each wilaya. 1: Adrar; 2: Chelif; 6: Béjaia; 9: Blida; 13: Tlemcen; 14: Tiaret; 15: Tizi-Ouzou; 16: Algiers; 17: Djelfa; 18: Jijel; 19: Setif; 21: Skikda; 23: Annaba; 27: Mostaganem; 28: M'sila; 31: Oran; 35: Boumerdes; 36: El Taref; 42: Tipasa; 46: Aïn-Témouchent; 47: Ghardaïa.

DZD 500–1000 or USD 3.78–7.56, DZD 1000–2000 or USD 7.65–15.11 and > DZD 2000 or USD 15.11) and the purpose of their consumption (just for taste or for their nutritional or health benefits).

3) State of knowledge of sea cucumbers by Algerian consumers (through its field of study, work, documentaries or through an intermediary): their ability to introduce it into their foods habits knowing its nutritional benefits; types of dish they will be tempted by (longitudinal muscles of *Parastichopus regalis*, raw sea cucumber cut into slices, cooked cut into small pieces and cooked entirely) and finally the type of product they would like to find on the market (fresh to prepare at home or already prepared).

Results and discussion

Differences between women and men in food purchases

Our results show that 48% of people are partially involved in food purchases, 22% are fully involved and 30% are not involved at all. It turns out that men are the most involved in purchasing food (Fig. 2A) and a large number of women are not. Generally, in Algerian society, men have more contact with the outside world and take care of outside household tasks, including food purchases, while women take care of inside household tasks such as food preparation.

Preferences with regard to seafood

The results show that 50% of interviewees consume fish occasionally, 26% consume fish once a week and 23% once a month. In addition, 40% choose fish for its good protein intake, 40% opt for seafood for its good taste while 20% consume it for both reasons. The most consumed seafood products in Algeria (Fig. 2B) are sardines, round sardinellas allache and anchovies (40.3%) because of their accessibility and their affordable price (between DZD 500 or USD 3.78, and DZD 800 or USD 6.04) by most interviewees, followed by white and redfish (red sea bream, sea bream, tuna and swordfish), with a percentage at 21.9%. The prices of these fish are within the margins of the average budget spent on fish which varies between DZD 500 (USD 3.78) and DZD 2000 (USD 15.11) (73%) (Fig. 2B). The more the budget for purchasing seafood increases, the more these products are of high commercial value, such as shrimps, lobsters and mussels. Indeed, the more the price of these products increases, the more their demand by consumers decreases and this is explained by the low purchasing power of the Algerian citizen.

The budget devoted to the purchase of seafood is closely related to the frequency of their consumption. Frequency increases when the consumer's budget is relatively high (Fig. 2C). The consumption of seafood is therefore conditioned by the purchasing power of consumers; people with high monthly income can afford to consume seafood regularly and spend more money for its purchase, unlike middle- and low-income families.

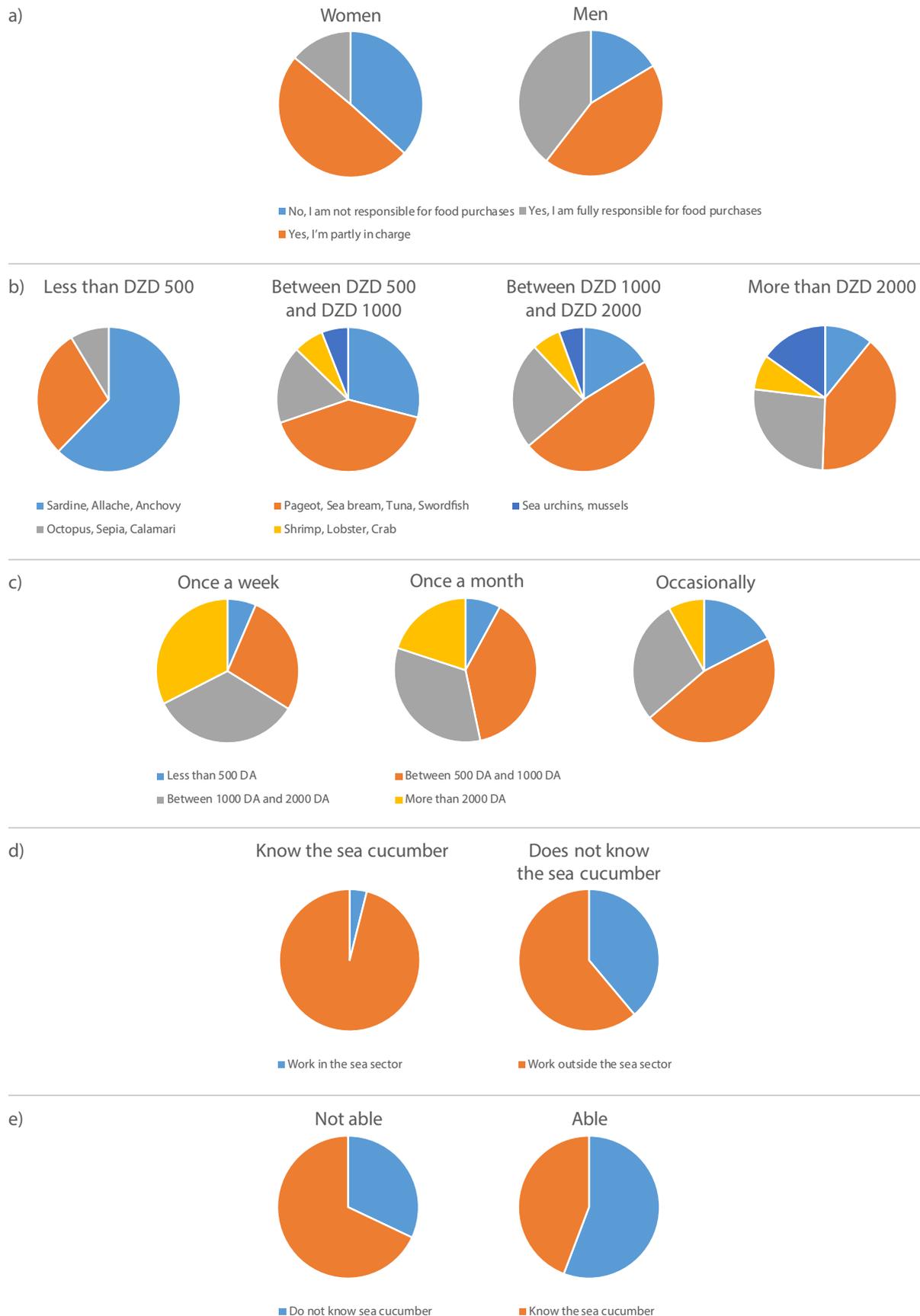


Figure 2. a) Responsibility for food purchases by gender; b) Type of seafood purchased according to the budget spent; c) Purchase frequency of seafood products according to the budget spent; d) Knowledge of sea cucumber by interviewees according to their work (in or out the sea sector); e) Ability of the respondents to introduce sea cucumbers into their food habits according to their knowledge of this product.

Sea cucumbers and the Algerian consumer

More than half of the interviewees (51%) do not know what sea cucumbers are, and 96% work outside the sea sector. However, of the 49% who are not familiar with sea cucumbers, more than half do not work in the sea sector (Fig. 2D). The means that allowed them to know about sea cucumbers are different, but is mostly by their field of study and from other people (59%). Others know about sea cucumbers through science documentaries and through their profession (divers or fisherman). By bringing to the attention of interviewees the benefits of sea cucumbers, 78% are ready to introduce these animals into their diet and 63% are tempted by the dishes proposed. According to our results, those who did not know about sea cucumbers are more able to introduce them into their food habit than those who do (Fig. 2E).

Among the four dishes proposed in the survey, 48.5% of interviewees chose the one made from small pieces of sea cucumbers (probably because it looks similar to chicken or some other meat), 27.4% chose the dish presented by the longitudinal muscles of the royal sea cucumber *Parastichopus regalis* (Cuvier, 1817), while dishes made of raw sea cucumbers – sliced or cooked – are not attractive to many people (12.5% and 11.6% of those surveyed, respectively).

If sea cucumbers were available in Algerian markets, 48.3% of those surveyed reported that they would tend to buy the fresh product and prepare it at home, while 24.3% reported that they would buy it already prepared in restaurants, and 27.4% would not buy it at all. The reasons given by those who refuse to include sea cucumbers in their diet fall into four categories: 1) those who feel sea cucumbers are “disgusting”, “strange” or “frightening” in appearance, and find their texture and shape disagreeable; 2) those who fear they are toxic and might cause allergies; 3) those who believe they are important for their and its ecological role; and 4) those who are undecided because they are not part of Algeria’s traditional cuisine and prefer to taste it first and then possibly learn how to cook it so as to introduce it into their culinary habits.

Conclusion

The sample of the Algerian population on which this work is carried out is composed mainly of young people coming mostly from coastal wilayas. The consumption of seafood by Algerians is occasional and not very diversified. The majority of Algerians prefer small pelagic fish species (e.g. sardines, round sardillas and anchovies) and devote a budget of DZD 500 (USD 3.78) to DZD 1000 (USD 7.56) on these. Sea cucumbers are not well known to Algerian consumers, but the majority of respondents affirms their ability to introduce this seafood into their dishes. Hence, the importance of organising tasting sessions to present this seafood product to the Algerian community (in dry or raw form), organise workshops to show how it is cooked and especially to make people aware of its culinary importance as a source of omega-3, omega-6 and other fatty acids and proteins that can decrease

the risk of certain diseases (Mecheta et al. 2020), its role in the marine environment and the need to exploit in a rational way these marine species while avoiding the collapse of their natural stocks.

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