

# Investigation of sensory profiles and hedonic drivers of emerging aquaculture fish species

Niki Alexi,<sup>a,b\*</sup> Derek V Byrne,<sup>a</sup> Evangelia Nanou<sup>b</sup> and Kriton Grigorakis<sup>b</sup>

## Abstract

**BACKGROUND:** The aquaculture sector needs to increase the diversity fish species and their processed products to cover rising consumer demands. Candidates for this diversification have been identified to be meagre, greater amberjack, pikeperch and wreckfish. Yet scientific knowledge on their sensory profiles and consumer hedonic responses is scarce. The aim of the current study was to investigate these aspects, since they are essential for product development and market targeting.

**RESULTS:** Species exhibited different sensory profiles with the exception of the odor/flavor profiles of meagre and greater amberjack, which were similar. Texture was more important than odor/flavor in explaining interspecies differences. Yet the hedonic responses were equally related to texture and odor/flavor. None of the species received negative hedonic scores. Both positive and negative hedonic drivers were identified within the odor/flavor and texture modalities.

**CONCLUSION:** The distinct profiles of meagre, greater amberjack, pikeperch and wreckfish make these fish species valuable first materials for new product development and for covering markets with different sensory preferences. Differences in fish texture are more easily perceivable, yet small variations in fish odor/flavor can have a great impact on consumers' hedonic responses.

© 2017 Society of Chemical Industry

**Keywords:** CATA; *Argyrosomus regius*; *Seriola dumerili*; *Sander lucioperca*; *Polyprion americanus*

## INTRODUCTION

The global demand for fish and processed fish products is rising.<sup>1</sup> Due to the continuous decline in marine captured fisheries observed during the last decades, the estimated demand can be covered solely through aquaculture.<sup>2</sup> Indeed, the growth in fish production mainly originates from this sector, which accounts currently for approximately 50% of the fish consumed globally.<sup>1,2</sup> Yet a mere increase in production quantity will be unable to satisfy long-term consumer demands, since a great variability in consumer preferences for fish and processed fish products exists.<sup>3</sup> In particular, the limited diversity of locally produced aquaculture products has been identified as one of the main reasons of the current EU's dependency on fish imports.<sup>4</sup> Moreover, it has been found that when consumer is presented with a high number of product alternatives, there is greater chance of substituting a preferred product with a similar one.<sup>5,6</sup> Therefore diversification, in terms of implemented species and processed products, is crucial for the aquaculture sector to cover the rising demands and remain sustainable in the future.

New/emerging finfish species in aquaculture production include meagre (*Argyrosomus regius* Asso), greater amberjack (*Seriola dumerili* Risso), pikeperch (*Sanders lucioperca* L.) and wreckfish (*Polyprion americanus* Bloch & Schneider). These species have been identified as ideal candidates for diversification owing to their existing markets worldwide, their rapid growth rates and their large final commercial sizes.<sup>7–11</sup> These characteristics are important since they can allow processing to a wide range of value-added products. Yet, since most of the candidate species are fairly new in aquaculture, no or limited knowledge is recorded regarding their sensory characteristics and consumer hedonic

responses. The only documented sensory profiles among these species correspond to meagre and pikeperch, whereas consumer hedonic responses have been explored only for meagre.<sup>12–15</sup> Exploring the sensory characteristics of emerging fish species is crucial, however, since sensory perception is among the capital factors that influence consumers' acceptance and final food choice.<sup>3,16</sup> Moreover, these characteristics are essential for future development of processed products.

Consumer research is of great importance for the research and development of a new food product.<sup>17</sup> Affective methods, such as hedonic tests, have been widely used with consumers to determine and quantify the degree of consumer preference towards a given product.<sup>18</sup> Yet the importance of using consumers to extract analytical sensory information of products has also been underlined. The main argument for implementation of consumers is that they differ fundamentally in their perception of a product, and therefore information extracted from them is more actionable than the data obtained from trained panels.<sup>19–21</sup> This has led to the development of several methodologies appropriate for eliciting sensory information directly from

\* Correspondence to: N Alexi, Food Quality Perception and Society, Department of Food Science, Aarhus University, Kirstinebjergvej 10, DK-5792 Aarslev, Denmark. E-mail: niki.alex@food.au.dk

<sup>a</sup> Food Quality Perception and Society, Department of Food Science, Aarhus University, DK-5792 Aarslev, Denmark

<sup>b</sup> Institute of Marine Biology, Biotechnology and Aquaculture, Hellenic Centre for Marine Research, 16777 Athens, Greece