

## **Genetic and morphological assessment of *Alloteuthis* species in the North East Atlantic**

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Cephalopods are an increasingly valuable global resource, offering an alternative to finfish fisheries. However, many cephalopods are data-deficient species which lack fundamental ecological knowledge required to maintain a sustainable fishery. *Alloteuthis*, a genus of longfin squid, is an important fishery in Iberia, the Mediterranean, and NW Africa and comprises a significant proportion of landings in the North East Atlantic. Genetic data support the existence of three species, however, all species exhibit high morphological plasticity throughout their range, hindering accurate identification to species level. Therefore, species identification is based on assumptions made from the species distribution ranges, as described in past studies. This study employed DNA barcoding to confirm the presence of *Alloteuthis media* off North Ireland and the North coast of Scotland for the first time, increasing the geographic range of this species. Furthermore, we illustrate a high rate of misidentified *Alloteuthis* throughout its range in the Atlantic. This study combines DNA barcoding (mitochondrial COI gene) and morphological measurements from *Alloteuthis* individuals from specific areas with the aim of deriving reliable morphological characters to successfully distinguish the three species in the field throughout their distribution.

Ultimately, our research highlights the need for a comprehensive review of the genus *Alloteuthis* throughout its entire distributional range. Misidentification has contributed to uninformative landings data, inconsistencies in the literature and genetic databases, resulting in poorly-monitored and therefore potentially unsustainable fisheries. Reliable taxonomic identification are essential to describe species distribution, ecological impacts and to understand the life cycle, which is vital for accurate stock assessment and for ensuring sustainable fisheries.