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Revision of the nomenclature status and taxonomic implications of two *Lepidion* species (Gadiformes: Moridae)

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Abstract

Lepidion lepidion and *Lepidion eques* are two nominal species of the genus *Lepidion* (Moridae) from the Mediterranean Sea and the North Atlantic Ocean, respectively. Following the publication of the latter species, several authors highlighted the morphological similarities between them, questioning their taxonomic relationship. Despite these reasonable doubts, the two species have long been considered as valid and separate species. Since the 2010s, a series of integrative studies, combining morphological and molecular analyses, have demonstrated that *L. eques* is a junior synonym of *L. lepidion*. However, the former has continued to be used inconsistently in biodiversity databases and ichthyological literature. Thus, while the "Catalog of fishes" immediately incorporated this new status, the databases "FishBase" and "WoRMS" did not, maintaining the validity of both species. Consequently, in the scientific literature, only a few authors adhere to the synonymy relationship, naming the Atlantic species as *L. lepidion*, while most maintain the older nomenclature of *L. eques*. These two nominal species represent an interesting case study on the application of taxonomic nomenclature and how the different criteria for incorporating new species affect the scientific community.

Key words: taxonomy, synonymy, nomenclature, biodiversity databases

Introduction

Taxonomy is the biological discipline that identifies, describes, classifies and names extant and extinct species and other taxa (Padial *et al*., 2010). Species names, as the only standardised measure of biodiversity, are essential for the communication of information about nature, although they may be subject to continuous changes and updates (Costello 2020). In some cases, several species can be recognized within one species (crypticism) and, on the other hand, the same name can be used to designate several species (synonymy). Users of taxonomic data find it challenging to keep track of such changes, especially when conflicting information is found in published literature and online, and it can be difficult to access some publications (Costello *et al*., 2018).

The term 'biodiversity' refers to the variability among living organisms from all sources, including variation in genetic, phenotypic, phylogenetic, and functional attributes, as well as changes in abundance and distribution over time and space within and among species, biological communities and ecosystems (Díaz & Malhi 2022). Biodiversity databases accessible online are playing an increasingly important role in biodiversity research and management. However, the quality of the data they contain is a key issue for global monitoring and assessment, and inaccurate and non-standard taxon names represent a severe problem.

The genus *Lepidion* is one of the oldest in the family Moridae, with fossil representatives recorded from the Middle Miocene. It is represented by nine species that live in deep waters of the continental slopes and seamounts around the world (Korostelev *et al*., 2023). Four species of *Lepidion* have been recorded in the North Atlantic-Mediterranean area: The Atlantic codling *Lepidion eques*, the Mediterranean codling *Lepidion lepidion*, *Lepidion guentheri* and the Schmidt's

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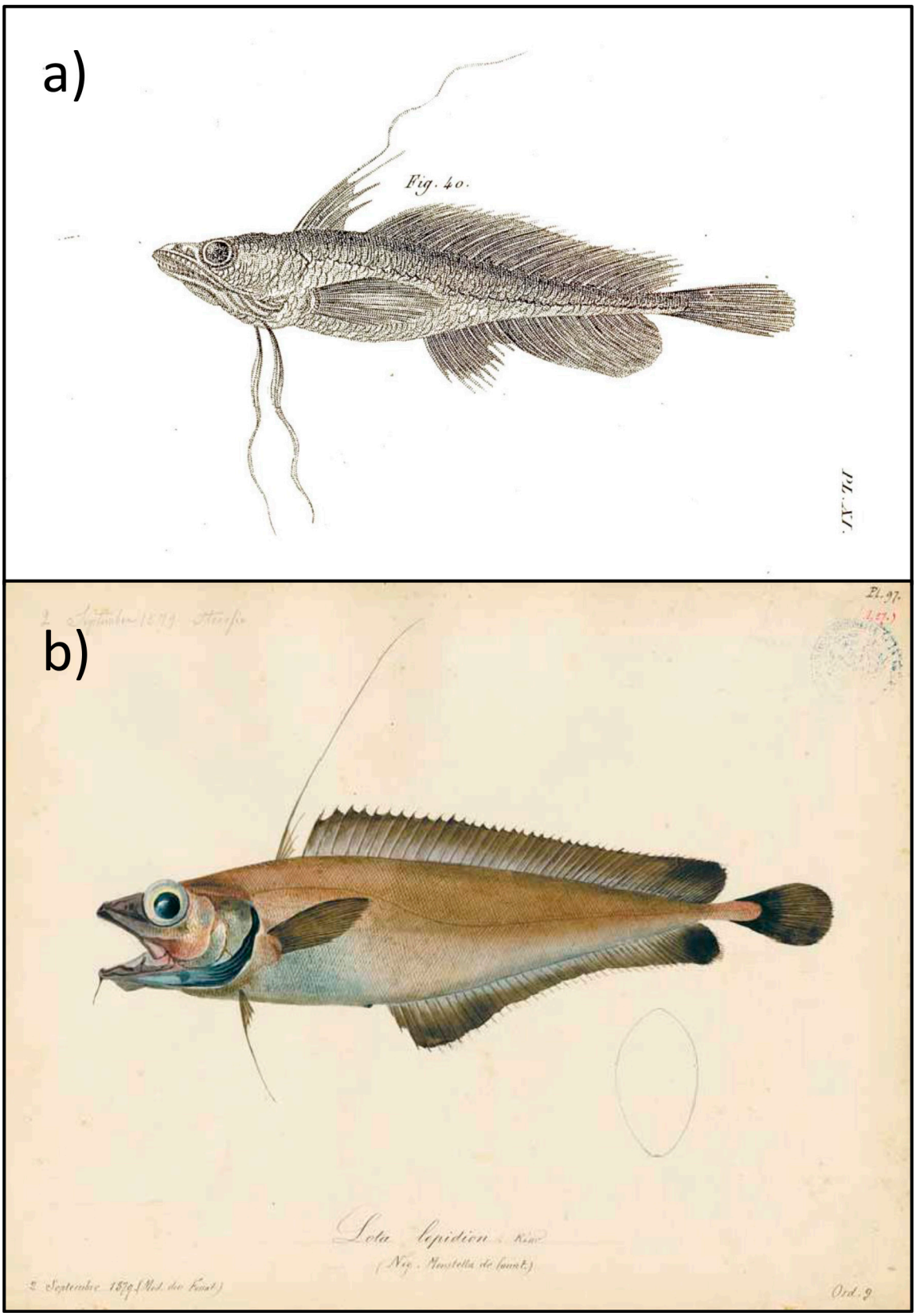

FIGURE 1. *Lepidion lepidion* according to a) Original description of Risso (1810); b) V. Fossat, 1879, Muséumd'Histoire naturelle de Nice.

cod *Lepidions chmidti*. However, while *L. guentheri* and *L. schmidit* have been recognised as two valid species, the taxonomic status of *L. eques* and *L. lepidion* is controversial and subject to scientific debate as valid or synonymous species (Collet 1905; Bañón *et al*., 2013).

The aim of this manuscript is to critically analyse the historical evolution of the taxonomic status of two similar species like *L. lepidon* and *L. eques* through an examination of the ichthyological literature and their incorporation into public online databases. This analysis is a clear case-example of the study of changes in taxonomic nomenclature, the criteria for the incorporation of these changes and how they affect the scientific community.

Nomenclatural status of *Lepidion eques* and *Lepidion lepidion*

No new *Lepidion* specimens were examined. A bibliographic search of historical records of the *L. lepidion* and *L. eques* species was carried out. A specific search was also conducted to analyse the incorporation of synonymy status in the scientific literature from 2014 to 2024 (not shown), following the first manuscript using an integrative taxonomy approach (Bañón *et al*., 2013). Exceptions were made when one of the authors of the above-mentioned manuscript had participated or when references previous to that year were included. The sources of information used were the databases Web of Science database, Scopus, and Google Scholar. The search employed the following keywords: "*Lepidion eques*" or "North Atlantic codling" and "*Lepidion lepidion*" or "Mediterranean codling".

Original descriptions (s. **XIX**) *Lepidion lepidion* (Fig. 1) was initially described as *Gadus lepidion* based on a specimen from Nice, France, in the northwestern Mediterranean (Risso 1810). Risso had already described some diagnostic characteristics of the genus, such as an elongated filamentous second ray of the first dorsal fin and a single anal fin deeply indented at mid-length. However, he had erroneously considered the first ray to be the elongated one and had identified two anal fins instead of a deeply serrated one. Additionally, the description of the specimen includes counts of four rays in the first dorsal fin, 54 rays in the second dorsal, six rays in the pelvic fins, 20 rays in the pectoral fins, 48 rays (24+24) in the anal fin, 22 rays in the caudal fin and seven branchiostegal rays.

*Lepidion eque*s was described as *Haloporphyrus eques* in the northeastern Atlantic, following the examination of specimens captured in the Faroe Channel, situated between the two island groups of Shetland and the Faroe Islands (Günther 1887). The description includes counts of four rays in the first dorsal, 56–62 rays in the second dorsal, 49–54 rays in the anal, seven pelvic fin rays and branchiostegal rays, 180 scales in the lateral line and 10–11 pyloric caeca.

Taxonomic revisions (s. **XX**) During the 20th century, several authors pointed out the taxonomic similarity between *L. lepidion* and *L. eques*. Collet (1905) was the first to identify similarities between these two species, suggesting that "*L. eques* is so close to the typical species of this genus, *L. lepidion* described in 1810 by Risso from the Mediterranean (*Gadus lepidion*), and that it is likely that both species are identical". The author compares a specimen of *L. lepidion* from Nice preserved in the Christiania Museum with an equally large specimen of *L. eques* from the Faroe Channel and concludes that the eye of the *L. lepidion* specimen is insignificantly smaller than that of *L. eques*, and that all other characters seem to coincide in the two species.

Roule (1919) recognises a single species *L. lepidion*,

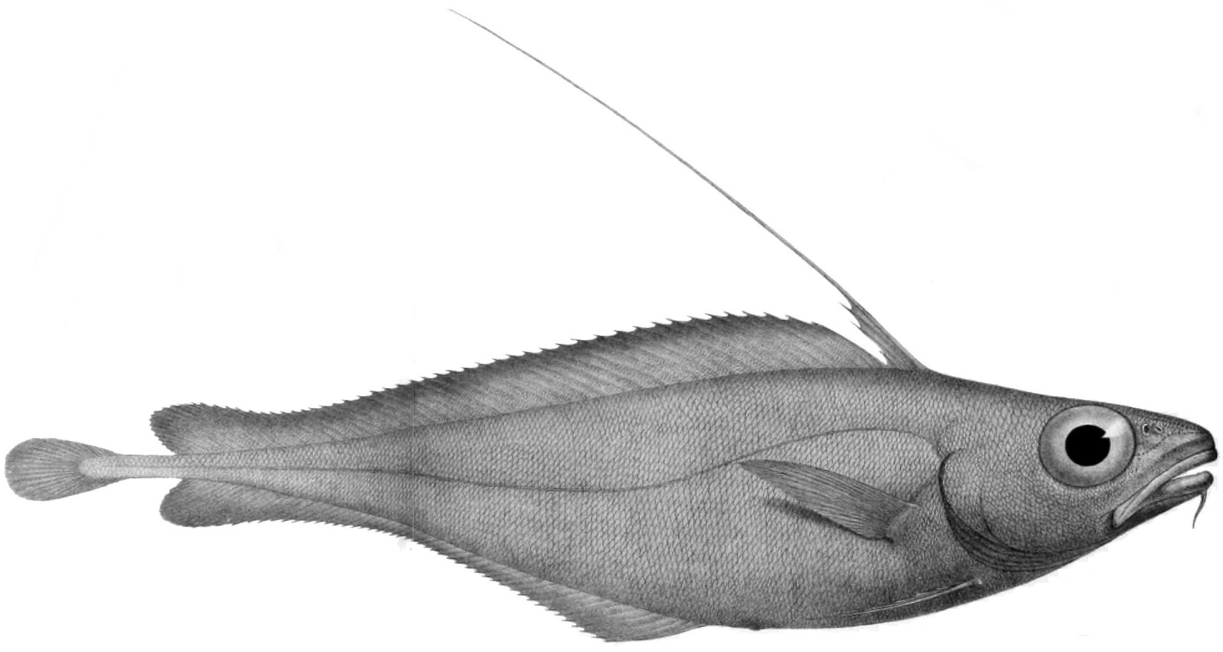

FIGURE 2. Illustration of *Lepidion eques* from Report on the deep-sea fishes collected by H.M.S. Challenger during the years 1873–1876 (Günther 1887).

of which *L. eques* is a variety. He reports two specimens, one from the Mediterranean, off the coast of Monaco and one other from the Atlantic, in the Bay of Biscay, both *as Haloporphyrus lepidion*, var. eques, Günther. He states that "this form should be regarded as an abyssal variety of *Haloporphyrus lepidion* Risso; it differs from the type only in that its trunk is lower and its eyes slightly larger".

Norman (1935) noted that *L. eques* is "very closely related to, or perhaps identical with *L. lepidion*". Svetovidov (1948) mentions three species for the North Atlantic Ocean and adjacent seas, but only two, *L. lepidion* and *L. schmidti*, were listed. Grey (1956) also considers *L. lepidion* to be the only valid species of the two, which would be widely distributed in the North Atlantic and western Mediterranean, and notes that "there may be two species included under the name *Lepidion lepidion*. If distinct, the two forms are closely related and the various records cannot be correctly applied to one or the other from a study of the literature alone".

Raimbault (1963) considered the validity of these two species and noted that "The main characters given as differential (total length/height of body; head/orbit; interorbital/orbit) the reports provided by the various authors do not agree and are often imprecise. On the basis of these data, several of the specimens examined would belong to the species *lepidion* for certain characters and to the species *eques* for others. In our opinion, this distinction should be completely rejected". Maurin (1968), corroborated the synonymy between *L. lepidion*, and *L. eques*, as proposed by Raimbault (1963) and this conclusion is also reported in Bini (1970).

Templeman (1970) observed that, given the great resemblances and the overlapping of meristic and mostly of the morphometric character values, both species could be considered to have a subspecific rather than a specific relationship. However, he finally concluded that it would be unwise to propose that *L. eques* should be considered a synonym of *L. lepidion*.

In two extensive taxonomic revisions (Cohen 1986; Cohen *et al*., 1990), the authors proposed that *L. lepidion* from the Mediterranean Sea and *L. eques* from the North Atlantic Ocean should be considered as two distinct and valid species. The two species can be distinguished from each other on two diagnostic characters: the size of the eye (the diameter of the eye is contained 3.1–3.6 times in the head length in *L. lepidion* versus 2.6–3.1 times in *L. eques*) and by the number of the anal fin rays (48–51 in *L. lepidion* versus 50–54 in *L. eques*).

Integrative taxonomy (s. **XXI**) A total of three manuscripts combining morphology and/or molecular tools of *L. lepidion-L.eques* were published in the early 21st century. Bañón *et al*. (2013) examined 10 specimens of *L. lepidion* from the Spanish Mediterranean and 16 of *L. eques* from the Spanish Atlantic.Their results indicated that there were no morphological or DNA barcoding differences between sampling sites, suggesting that all specimens were conspecific. Barros-García *et al*. (2016) increase the number of specimens and sampling sites for DNA barcoding analysis of *L. lepidion-L. eques*, obtaining similar results, the absence of biogeographic barriers and, thus, the presence of a single species. Finally, Barros-García *et al*. (2020) analysed 17

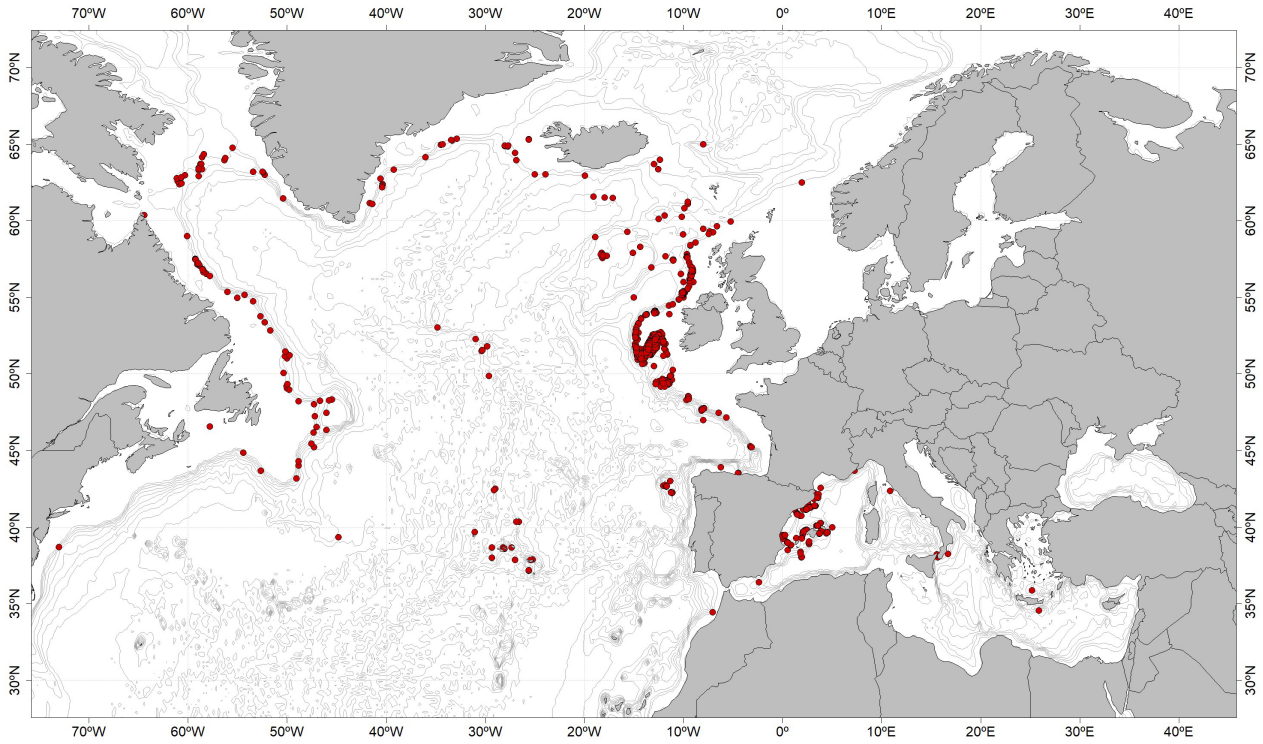

FIGURE 3. Distribution of *Lepidion lepidion* based on geolocation data reported as *Lepidion eques* and *Lepidion lepidion*, downloaded from the Global Biodiversity Information Facility (GBIF.org 2024) and the Ocean Biogeographic Information System (OBIS 2024) (date of access: 15/10/2024).

different morphological measures, three mitochondrial and two nuclear markers of *L. lepidion*-*L. eques*, with the same result as the previous studies. This led to the conclusion that *L. eques* should be considered a junior synonym of *L. lepidion*.

Ichthyological databases and recent literature Biodiversity databases are repositories of taxonomic information that provides information on the biodiversity of a specific area or group of living organisms. In the case of fishes, there are three main online databases: one generalist, the World Register of Marine Species (WoRMS) (WoRMS Editorial Board 2024; https://www.marinespecies.org), and two fish-specific databases, FishBase (FB) (Froese & Pauly 2024; https://www.fishbase.se) and Eschmeyer's Catalog of Fishes (ECoF) (Fricke *et al*., 2024; https://www.calacademy.org).

A search on 10 Juny 2024 on the status of *L. lep*idion and *L. eques* returns different results. In ECoF, *L. eques* is listed as "Synonym of *Lepidion lepidion* (Risso 1810) - (Bañón *et al*., 2013:1 [ref. 32386], Barros-García *et al*., 2016:9 [ref. 34527]). Current status: Synonym of *Lepidion lepidion* (Risso 1810). Moridae. Habitat: marine".

However, in WoRMS and FB, both *L. lepidion* and *L. eques* are considered as valid species, although in FB with the following annotationon *L. eques*: "This species is a synonym of *Lepidion lepidion* according to Bañón *et al*., 2013 (Ref. 93087) and Barros-García *et al.*, 2016 (Ref. 109127)".

A review of the ichthyological literature to study the application of the nomenclatural change after 2013 revealed notable differences. While the invalid name *L. eques* is mentioned in 24 manuscripts, only seven manuscripts refer to the valid name *L. lepidion*.

Updated distribution. The distribution map of *L. lepidion* has been updated according to the ichthyological literature and biogeographic records in the OBIS and GBIF databases, searching both the valid name *L. lepidion* and its synonym *L. eques* (Fig. 3). *Lepidion lepidion* is a widely distributed species in the North Atlantic Ocean and Mediterranean Sea. In the western Atlantic it is found from Greenland and Canada to the northern United States, around 40ºN. In the central Atlantic, in Iceland and along the northern Mid-Atlantic Ridge, between 50ºN and the Azores. In the eastern Atlantic, from Norway and the northern British Isles to Morocco. In the Mediterranean Sea it is more common in the western area.

Discussion

The taxonomic status of *L. eques* has been controversial and the subject of scientific debate since its publication in 1887. However, considered as a whole (Bañón *et al*., 2013; Barros-García *et al*., 2016, 2020), these three manuscripts proved beyond any doubt that *L. eques* is a synonym of *L. lepidion* and, so far, these result has not been refuted. Therefore, while Mediterranean specimens remain named *L. lepidion*, Atlantic specimens should be renamed from *L. eque*s to *L. lepidion*. Unfortunately, this fact has hardly been reflected in biodiversity databases, having little echo in the scientific community.

Nowadays, only the ECoF database reflects the synonymy between both species, whereas FB and WoRMS do not. FB is the authoritative fish species database for WoRMS, hosted and managed externally (WoRMS Editorial Board 2024) and, therefore, shares the same criteria. Cohen's papers (Cohen 1986; Cohen *et al*., 1990) have long been the authoritative taxonomic reference for gadiforms, and Cohen *et al*. (1990) is the main reference for considering *L. eques* as a valid species in the FB database.

Both the ECoF and FB databases cite Bañón *et al*. (2013) and Barros-García *et al*. (2016), omitting the third and most comprehensive study of Barros-García *et al*. (2020). It should be noted that, although FB considers *L. eques* a valid species, a note on its species´ web page cites the synonymy criteria following Bañón *et al.* (2013) and Barros-García *et al*. (2016). This seems inconsistent, as the synonymy criterion is mentioned in a valid species, which causes confusion and raises doubts as to which criterion should be taken into account.

As far as the scientific community is concerned, the synonymy of *L. eques* is poorly accepted in the ichthyological literature. A review of the literature reveals that only 22.6% of the publications consider *L. eques* to be a synonym of *L. lepidion*, while 77.4% consider it to be a valid species. Most of the authors following the first criterion were Iberian researchers or colleagues, more closely related to and knowledgeable about this synonymy-related research, while the valid species criterion was predominantly adopted by northern authors, who may have been less familiar with synonymy-related manuscripts.

Only a careful check of the taxonomic literature will allow the user to know that the name has changed over time to a more recent valid one (Costello 2020). However, an exhaustive review of all scientific names included in an investigation would be tedious and time-consuming. Therefore, consulting the more accessible online biodiversity databases, mainly the well-known WoRMS and FB, or large-scale taxonomic reviews, will be easier and faster. Nevertheless, if databases are not updated regularly, they will be a major source of errors.

There are discrepancies in the assessment of scientific names between ECoF and FB (Froese & Pauly 2024).The latter may have some delays when dealing with cases of synonymy or crypticity compared to the former, where these operations are much faster. To compensate for this problem, FB has incorporated a taxonomic warning at the top of the species summary page, as in the case of the synonymy of *L. eques*. However, we believe that this can only generate user confusion, as mentioned above, and that a period of more than 10 years since Bañón *et al*. (2013) seems more than enough time to incorporate this synonymy into FB. It is unclear whether there are other reasons for this delay.

Unfortunately, the case of *L. eques* is not unique, although the total number of species involved remains unknown. A comparable case can be observed with two other gadiform fishes, namely *Gaidropsarus guttatus* and *Gaidropsarus biscayensis*. Based on recent taxonomic revisions (Barros-García *et al*., 2018, 2022), these two species are considered synonyms of *Gaidropsarus mediterraneus* and *Gaidropsarus macrophthalmus*, respectively, by ECoF, what does not

happen in FB and WoRMS, where no taxonomic warning is given either.

The ECoF is the authoritative reference for the taxonomic names of fishes, updating, completing and correcting the data almost in real time (Fricke *et al*., 2024). However, WoRMS employs FB as the reference database for fishes (WoRMS Editorial Board 2024). Given that WoRMS data are used by over 120 other organisations or data systems in 35 countries (Vandepitte *et al*., 2018), there is a considerable risk that an error or inaccuracy in FB will be transferred via WoRMS to many other databases with a consequent general acceptance of any error.

Changes in biodiversity data quality over time need to be carefully assessed and, if possible, taken into account when analysing aging datasets (Tessarolo *et al*., 2017). In fact, the creation of a centralized, freely accessible global database of organism names that can highlight conflicting classifications, nomenclatural problems and taxonomic issues has been proposed (Costello *et al*., 2018).

Author contributions

RB collected most of the data and wrote the draft manuscript. DBG and ADC carried out the original molecular analyses of the *Lepidion* species. JCA and FB performed the sampling and provided the specimens. All authors critically reviewed and approved the manuscript.

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References

Bañón, R., Arronte, J.C., Vázquez-Dorado, S., del Río, J.L. & de Carlos, A. (2013) DNA barcoding of the genus *Lepidion* (Gadiformes: Moridae) with recognition of *Lepidion eques* as a junior synonym of *Lepidion lepidion*. *Molecular Ecology Resources*, 13(2), 189–199. https://doi.org/10.1111/1755-0998.12045

Barros-García, D., Bañón, R., Arronte, J.C. & de Carlos, A. (2016) New data reinforcing the taxonomic status of *Lepidion eques* as synonym of *Lepidion lepidion* (Teleostei, Gadiformes). *Biochemical Systematics and Ecology*, 68, 6–10. https://doi.org/10.1016/j.bse.2016.06.017

Barros-García, D., Bañón, R., Arronte, J.C., Fernández-Peralta, L., García, R., Iglésias, S.P., Sellos, D.Y., Barreiros J.P., Comesaña, A.S. & de Carlos, A. (2018) New insights into the systematics of North Atlantic *Gaidropsarus* (Gadiformes, Gadidae): flagging synonymies and hidden diversity. *Marine Biology Research*, 14(1), 17–29. https://doi.org/10.1080/17451000.2017.1367403

Barros-García, D., Froufe, E., Bañón, R., Arronte, J.C., Baldó, F. & de Carlos, A. (2020) Phylogeography highlights two different Atlantic/Mediterranean lineages and a phenotypic latitudinal gradient for the deep-sea Morid Codling *Lepidion lepidio*n (Gadiformes: Moridae). *Deep-Sea Research Part I*, 157, 103212. https://doi.org/10.1016/j.dsr.2019.103212.

Barros-García, D., Comesaña, A.S., Bañón, R., Baldó, F., Arronte, J.C., Froufe, E. & de Carlos, A. (2022) Multilocus species delimitation analyses show junior synonyms and deep-sea unknown species of genus *Gaidropsarus* (Teleostei: Gadiformes) in the North Atlantic/Mediterranean Sea area. *Marine Biology*, 169, 131. https://doi.org/10.1007/s00227-022-04118-8

Bini, G. (1970) *Atlante dei pesci delle coste Italiane, Vol III, Osteitti*. Mondo Sommerso, Rome, 177 pp.

Cohen, D.M. (1986) Moridae. *In*: Whitehead, P.J.P., Bauchot, M.-L., Hureau, J.-C., Nielsen, J. & Tortonese, E. (Eds.), *Fishes of the Northeastern Atlantic and the Mediterranean, vol. 2*. UNESCO, Paris, pp. 713–723.

Cohen, D.M., Inada, T., Iwamoto, T. & Scialabba, N. (1990) *FAO Species Catalogue, Gadiform Fishes of the World (Order Gadiformes)*, *An Annotated and Illustrated Catalogue of Cods, Hakes, Grenadiers and Other Gadiform Fishes Known to Date*, vol. 10. FAO, Rome, 442 pp.

Collett, R. (1905) Fiske indsamlede under "Michael Sarss" togter i Nordhavet 1900-1902. *Report on Norwegian Fishery and Marine Investigations*, 2(3), 1–151.

Costello, M.J., Horton, T. & Kroh, A. (2018) Sustainable biodiversity databasing: international, collaborative, dynamic, centralised. *Trends in Ecology & Evolution*, 33(11), 803–805. https://doi.org/10.1016/j.tree.2018.08.006

Costello, M.J. (2020) Taxonomy as the key to life. *Megataxa*, 1(2), 105–113. https://doi.org/10.11646/megataxa.1.2.1

Díaz, S. & Malhi, Y. (2022) Biodiversity: concepts, patterns, trends, and perspectives. *Annual Review of Environment and Resources*, 47, 31–63. https://doi.org/10.1146/annurev-environ-120120-054300

Fricke, R., Eschmeyer, W.N. & Van der Laan, R. (2024) Eschmeyer's catalog of fishes: genera, species, references. Available from: http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp (last accessed 10.6.2024)

Froese, R. & Pauly, D. (2024) FishBase. World Wide Web electronic publication. Available from: www.fishbase.org, version (02/2024) (last accessed 10.06.2024)

GBIF.org (15 October 2024) GBIF Occurrence Download https://doi.org/10.15468/dl.z47pyf

Grey, M. (1956) The distribution of fishes found below a depth of 2000 meters. *Fieldiana Zoology*, 36(2), 73–337.

Günther, A. (1887) Report on the deep-sea fishes collected by H.M.S. Challenger during the years 1873-76. *Report on the Scientific Results of the Voyage of H.M.S. Challenger*, 22 (57), 1–268.

Korostelev, N.B., Maltsev, I.V. & Orlov, A.M. (2023) First data on the age and growth of schmidt'scod *Lepidion schmidti* (Moridae) from waters of the Emperor Seamounts (Northwestern Pacific). *Journal of Marine Science and Engineering*, 11, 1212. https://doi.org/10.3390/jmse11061212

Maurin, C. (1968) Ecologie ichthyologique des fonds chalutables atlantiques (de la baie ibéro-marocaine à la Mauritanie) et de la Méditerranée occidentale. *Revue des Travaux de l'Institut des Pêches Maritimes*, 32(1), 1–147.

Norman, J.R. (1935). Coast fishes. Part I. The south Atlantic. *Discovery Reports*, 12, 1–58.

OBIS (2024) Ocean Biogeographic Information System. Intergovernmental Oceanographic Commission of UNESCO. www.iobis.org (last accessed 17 Oct. 2024).

Padial, J.M., Miralles, A., De la Riva, I. & Vences, M. (2010) The integrative future of taxonomy. *Frontiers in Zoology*, 7, 16. https://doi.org/10.1186/1742-9994-7-16

Raimbault, R. (1963) Notes sur certaines espèces ichthyologiques capturées au cours des campagnes de l'Institut des Pêches en Méditerranée (1957-61). *Revue des travaux de l'Institut des pêches maritimes*, 27, 161–176.

Risso, A. (1810) *Ichtyologie de Nice ou histoire naturelle des poisons du département des Alpes maritimes*. Schoell, F., Paris, 448 pp.

Roule, L. (1919) Poissons provenant des campagnes du yacht 'Princesse Alice' (1891-1913) et du yacht 'Hirondelle II' (1914). *Résultats des Campagnes scientifiques du Prince Albert Ier de Monaco*, 52, 1–191.

Svetovidov, A.N. (1948) Treskoobraznye (Gadiformes). Fauna SSSR. *Zoologicheskii Institut Akademii Nauk SSSR* 34, Ryby 9, 4, 1–222

Templeman, W. (1970) A review of the morid fish genus *Lepidion* of the North Atlantic with first records of *Lepidion eques* from the western North Atlantic. *Journal of the Fisheries Research Board of Canada*, 27, 457–498.

Tessarolo, G., Ladle, R.J., Rangel, T.F. & Hortal, J. (2017) Temporal degradation of data limits biodiversity research. *Ecology and Evolution*, 7, 6863–6870. https://doi.org/10.1002/ece3.3259

Vandepitte, L., Vanhoorne, B., Decock, W., Vranken, S., Lanssens, T., Dekeyzer, S., Verfaille, K., Horton, T., Kroh, A., Hernandez, F. & Mees, J. (2018) A decade of the World Register of Marine Species – General insights and experiences from the Data Management Team: Where are we, what have we learned and how can we continue? *PLoS ONE*, 13(4), e0194599. https://doi.org/10.1371/journal.pone.0194599

WoRMS Editorial Board (2024) World Register of Marine Species. Available from: https://www.marinespecies.org at VLIZ. (10.6.2024). https://doi.org/10.14284/170