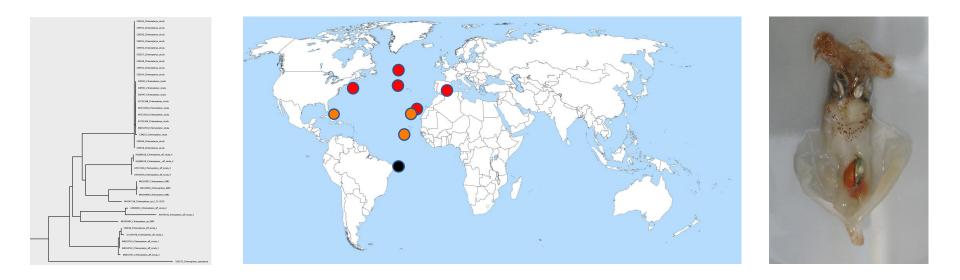
Is cryptic biodiversity a common phenomenon among Atlantic oceanic squids?



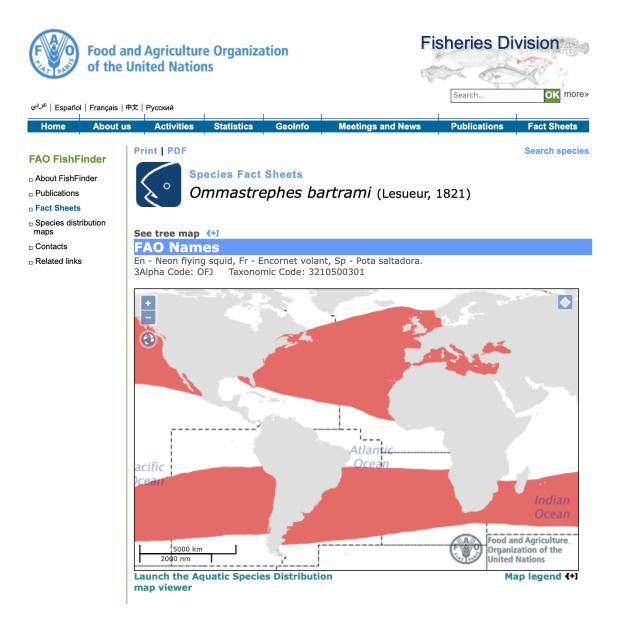
Fernando Á. Fernández-Álvarez, Roger Villanueva & A. Louise Allcock

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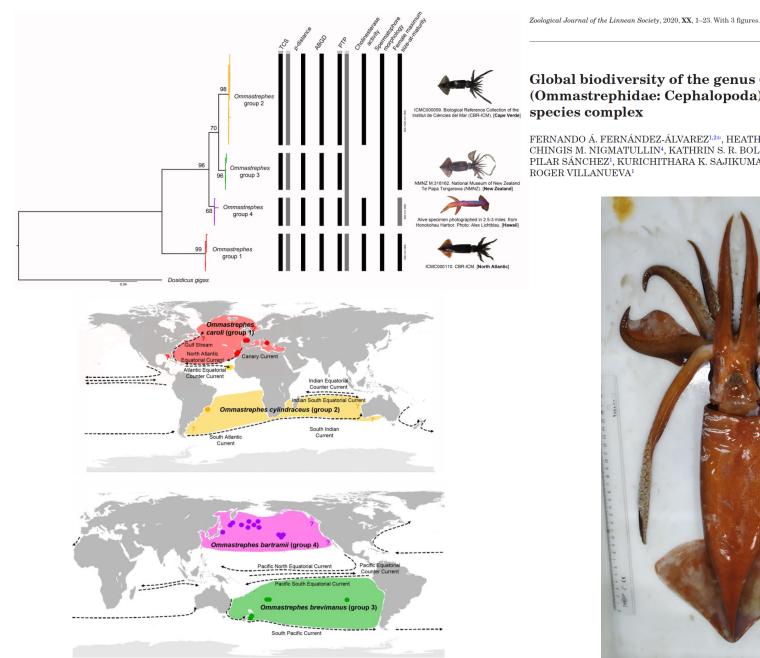


Oceanic squids usually are considered to have large distribution ranges, sometimes even covering discontinuous areas





Fernández-Álvarez et al. Is cryptic biodiversity a common phenomenon among Atlantic oceanic squids? Introduction



Global biodiversity of the genus Ommastrephes (Ommastrephidae: Cephalopoda): an allopatric cryptic species complex

FERNANDO Á. FERNÁNDEZ-ÁLVAREZ^{1,2*}, HEATHER E. BRAID³, CHINGIS M. NIGMATULLIN⁴, KATHRIN S. R. BOLSTAD³, MANUEL HAIMOVICI⁵, PILAR SÁNCHEZ¹, KURICHITHARA K. SAJIKUMAR⁶, NADAKKAL RAGESH⁶ and



Fernández-Álvarez et al. Is cryptic biodiversity a common phenomenon among Atlantic oceanic squids? Introduction



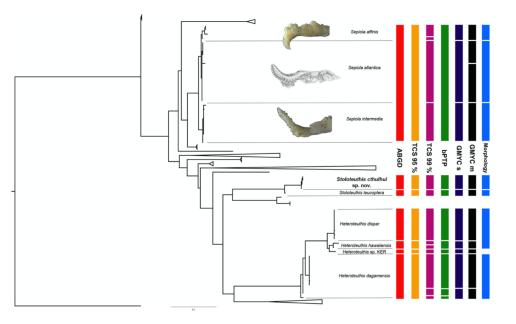
ORIGINAL RESEARCH published: 20 January 2021 doi: 10.3389/fmars.2020.632261



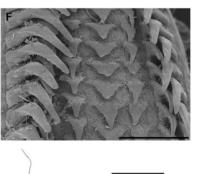
Morphological and Molecular Assessments of Bobtail Squids (Cephalopoda: Sepiolidae) Reveal a Hidden History of Biodiversity

Fernando Á. Fernández-Álvarez^{1,2*†}, Pilar Sánchez^{2†} and Roger Villanueva^{2†}

¹ Ryan Institute and School of Natural Sciences, National University of Ireland Galway, Galway, Ireland, ² Institut de Ciències del Mar (CSIC), Barcelona, Spain







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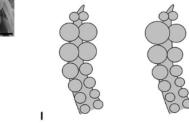
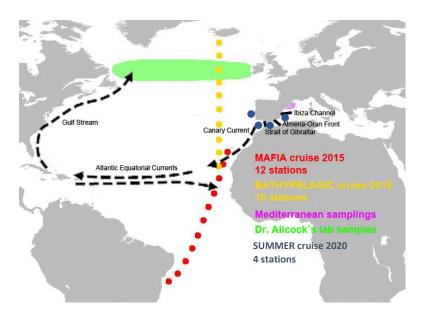


FIGURE 4 | *Stoloteuthis cthulhui* **sp. nov.** (**A**) Dorsal view of the mature female specimen 12.3 mm ML ICMC000163. (**B**) Ventral view of the mature male specimen 13.9 mm ML ICMC000164 (holotype). (**C**) Dissected arm crown showing the arrangement of the suckers of the arms of the mature male 17.9 mm ML ICMC000165. Numbers above the suckers of the right arm II depict the rows of suckers. (**D**) Lower beak of the mature specimen 16.7 mm ML ICMC000166. (**E**) Upper beak of the specimen ICMC000163. (**F**) Radula of the specimen ICMC000175, mature female 13.3 mm ML. (**H**) Spermatophore of the specimen ICMC000166. (**I**) Arrangement and relative size of arm II suckers of the male of *Stoloteuthis cthulhui* (left) and *Stoloteuthis leucoptera* (right). Scale bars: A–E, H, 1 mm; F,G, 200 μm.



200 samples: 12 oegopsid species

Different:

Families (7)

Lifestyles









Ancistrocheirus lesueurii



Liocranchia reindhartii



Helicocranchia pfefferi



Mastigoteuthis aggassizzi



Chtenopteryx sicula



Leachia atlantica



Galiteuthis armata





Grimalditeuthis bonplandi

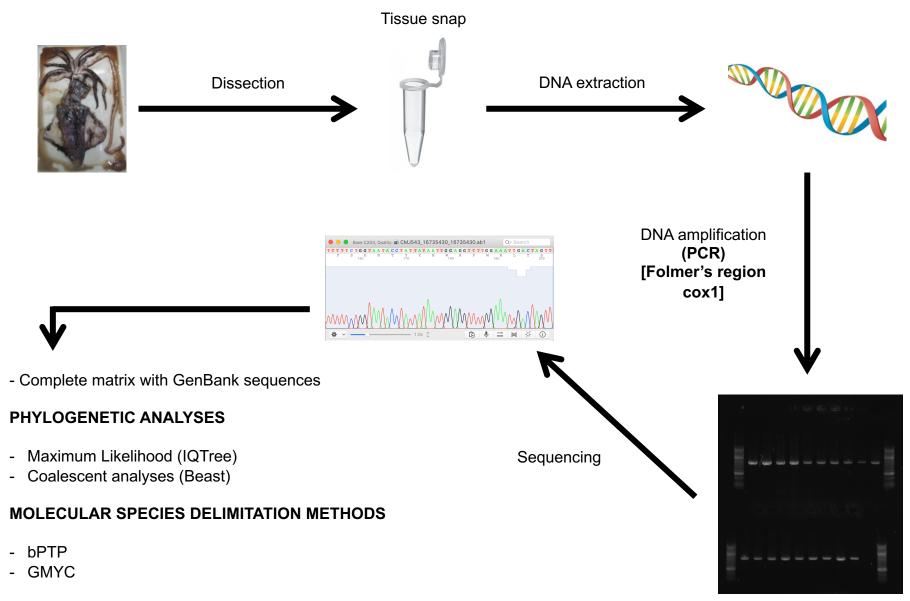






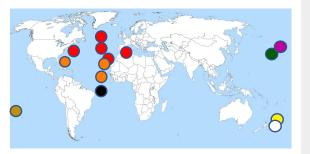






DISTANCE ANALYSES

Cthenopteryx sicula (Verany 1851)

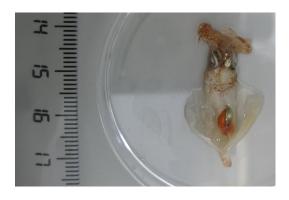


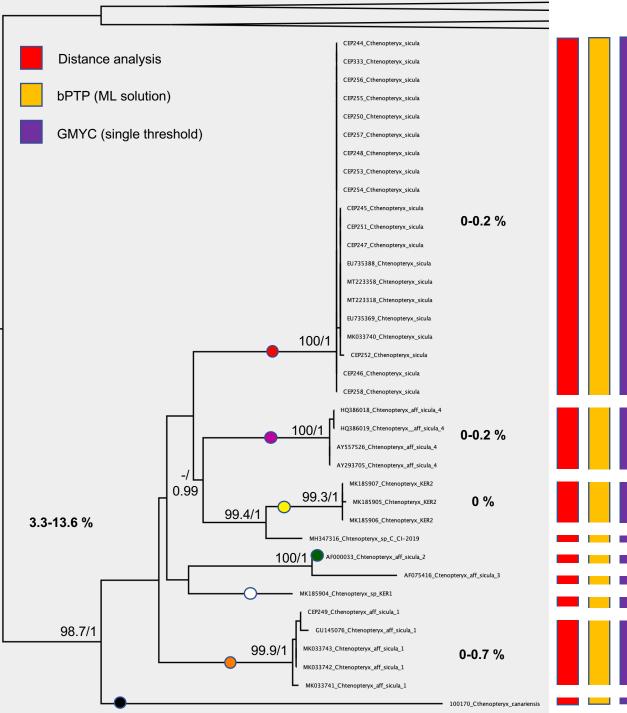
C. sicula

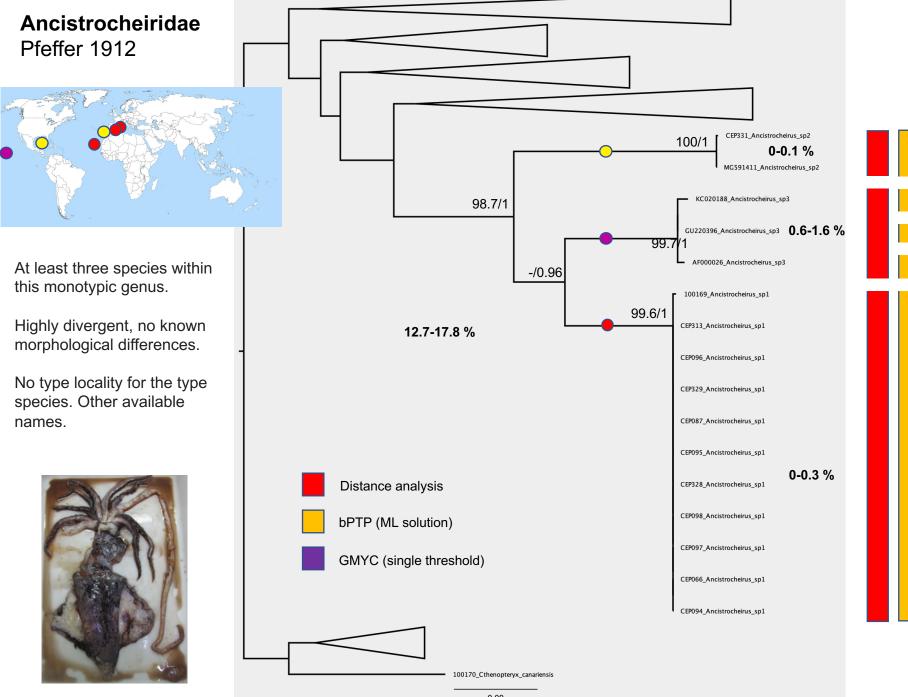
4 cryptic species:

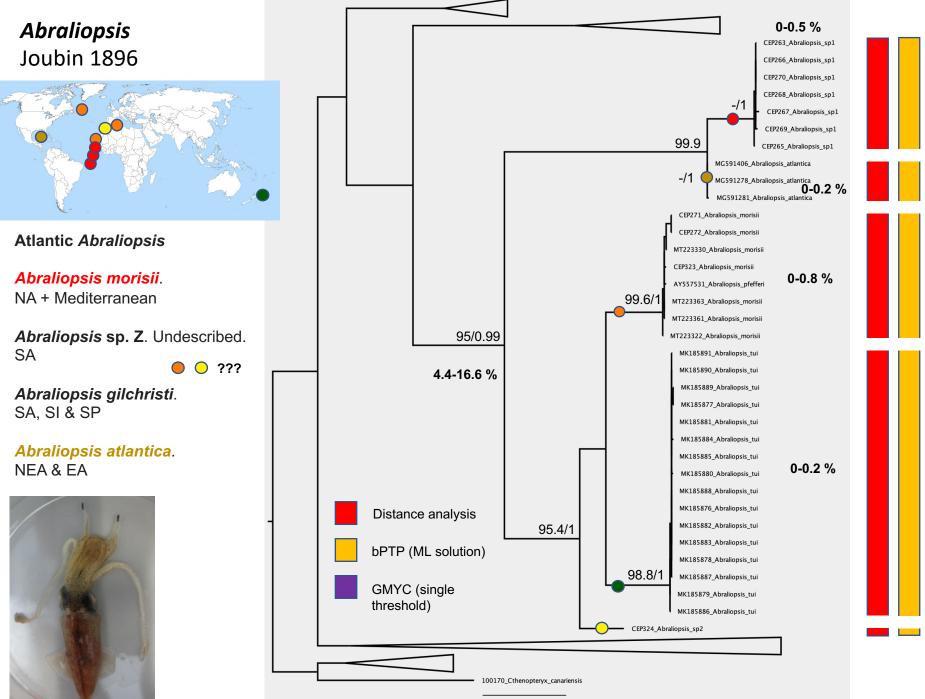
2 Atlantic, including nominal species

2 Pacific









0.09

Galiteuthis armata Joubin, 1898

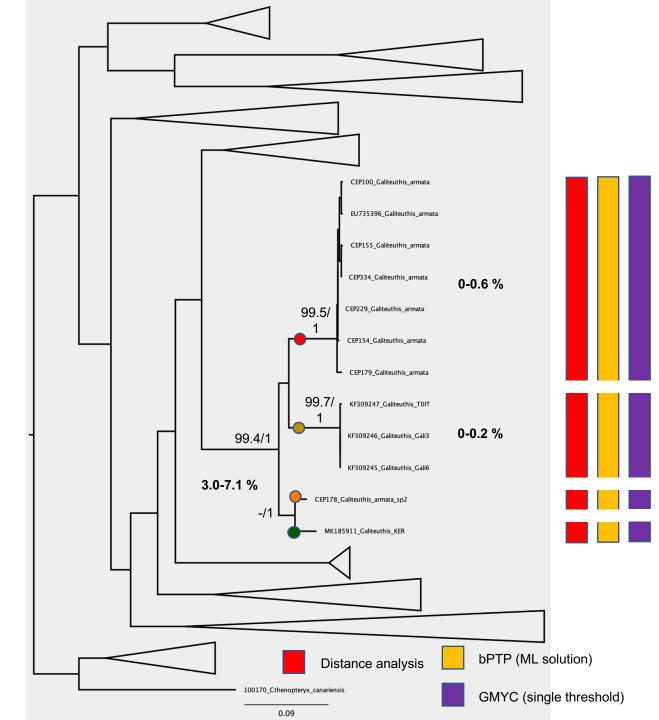


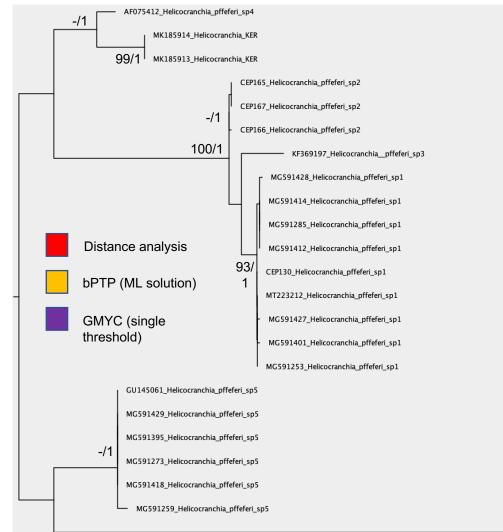
There is a single Atlantic species of *Galiteuthis*.

Our data suggest that there are three Atlantic species.

Low levels of divergence.

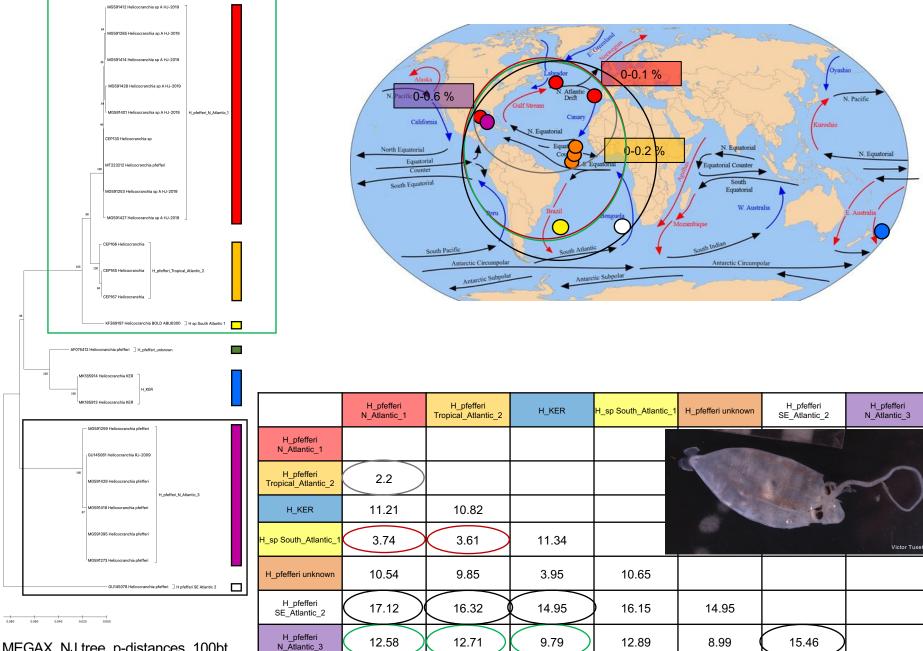




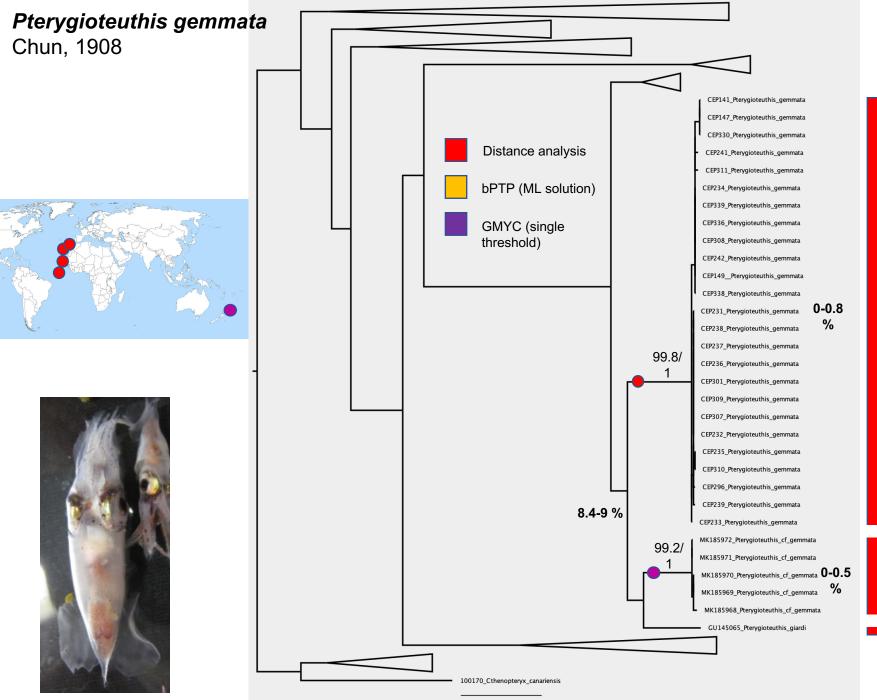








MEGAX, NJ tree, p-distances, 100bt



50 % of the tested species revealed cryptic lineages

Number of Atlantic cryptic lineages range from two (*C. sicula*, *Ancistrocheirus* spp.) to three (*G. armata*) and four (*H. pffeferi*)

Not clear how many cryptic lineages are included within Abraliopsis spp. At least two.

The divergence values among cryptic lineages of individuals of the same nominal species range from 2.2 to 17 %, likely representing different stages of divergence since each putative speciation phenomena

Molecular species delimitation methods were generally consistent and useful for species cryptic biodiversity within Atlantic oceanic squids

The Canary and the Atlantic Equatorial currents can be responsible of some of the cases of isolation and subsequent speciation, but more studies including larger number of specimens are necessary to test this hypothesis

It is necessary to develop more studies focussed on molecularly and morphologically assess the diversity of these animals at a global scale

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THANKS!!!

for your attention



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