

Abstract

Fast and Furious: High Growth Rates of European Catfish (*Silurus glanis*) in Its Invaded Range [†]

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[†] Presented at the XI Iberian Congress of Ichthyology, Vila Real, Portugal, 23–27 June 2026.

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Abstract

Freshwater ecosystems in southern Europe are increasingly impacted by fish invasions from central and northern regions, often facilitated by warmer climates and reduced natural-enemy pressure. The European catfish (*Silurus glanis*), the largest freshwater fish in Europe, is now widely established across various southern European basins, where its high fecundity, ecological plasticity, and predatory behaviour pose significant risks to native communities. Despite its rapid spread, growth dynamics across native and non-native populations remains scatteredly described in studies with different approaches. Objective: This study compares growth rates between native populations in the Czech Republic and non-native populations in Portugal, Spain, and Italy, and assesses whether growth rates are influenced by introduction timelines, reflecting differences in population age and invasion stage. Methodology: Nine populations spanning the native range (central Europe) and non-native range (southern Europe) were analysed. A total of 427 different vertebrae were used to age the fish and growth was modelled using the von Bertalanffy growth function. Generalised linear models were used to identify environmental and demographic predictors of variation in the growth coefficient (K). Moreover, mark-recapture data from the native populations was also analysed. Results: Preliminary results indicate substantial variation in growth among populations, with higher growth rates exhibited in non-native populations (Iberian), while native populations showed consistently lower growth rates. Growth was primarily associated with population age and minimum temperature, decreasing with increasing population age and increasing under warmer thermal conditions. These patterns suggest faster growth in recently established and warmer populations. Conclusions: Growth dynamics of European catfish vary markedly across native and non-native ranges, driven mainly by thermal conditions and invasion history. Faster growth in warmer and recently established populations may enhance invasion success by accelerating size-at-age and reproductive potential. This study highlights the importance of integrating



Academic Editor: Alberto Teodorico Correia

Published: 17 June 2026

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environmental and demographic factors to improve predictions of invasion dynamics and ecological impacts in freshwater ecosystems.

Keywords: biological invasions; von Bartallanfy; GLM's; ageing; mark-recapture

Author Contributions: Conceptualisation, B.C., I.V., F.R. and L.V.; methodology B.C., I.V., F.R. and L.V.; software, B.C.; validation, B.C., I.V. and L.V.; formal analysis, B.C.; investigation, B.C., I.V., F.R., D.D., M.M., D.R., R.R., J.K., M.V., M.Č., C.F.-D., A.P.M., J.S., P.V. and L.V.; resources, I.V., F.R. and L.V.; data curation, B.C., I.V. and L.V.; writing—original draft preparation, B.C.; writing—review and editing B.C., I.V., F.R., M.Č. and L.V.; visualisation, B.C.; supervision, I.V., F.R. and L.V.; project administration, I.V., F.R. and L.V.; funding acquisition, I.V., F.R. and L.V. All authors have read and agreed to the published version of the manuscript.

Funding: This study was conducted within the framework of the project LIFE PREDATOR co-funded by the European Commission under the EU LIFE Nature & Biodiversity 422 Project programme (GA101074458). MARE—Marine and Environmental Sciences Centre—was financed by the FCT (UID/04292/2025, <https://doi.org/10.54499/UID/04292/2025>) and the PRR (UID/PRR/04292/2025, <https://doi.org/10.54499/UID/PRR/04292/2025>). ARNET—Aquatic Research Infrastructure Network—was financed by FCT (LA/P/0069/2020, <https://doi.org/10.54499/LA/P/0069/2020>). FCT funding was awarded to the institution “Centro de Ecologia, Evolução e Alterações Ambientais” with reference UID/00329/2025. D. Dias (2023.01409.BD, <https://doi.org/10.54499/2023.01409.BD>) is supported by FCT with a PhD grant. R. Rivaes (2024.09047.CEECIND) and F. Ribeiro (CEEC/0482/2020, <https://doi.org/10.54499/2020.00482.CEECIND/CP1595/CT0001>) are supported by individuals' contracts from FCT. The presenting author acknowledges the financial support provided by the Gasterosteus Fund of the Iberian Society of Ichthyology (SIBIC), through the Gasterosteus Grant covering the SIBIC 2026 congress registration fee.

Institutional Review Board Statement: In accordance with the ruling legislation in the countries, specimens were euthanized accordingly with the law. In the non-native countries this species is considered as an invasive fish and it is legally mandatory to sacrifice this invasive species.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study are available upon request from the corresponding author.

Conflicts of Interest: Agustín P. Monteoliva were employed by the company Ecohydros S.L. The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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