



Demystifying the living fossil: reassessing *Romanichthys valsanicola*'s evolutionary context

¹Laurențiu Burlacu, ²I. Claudiu Gavriloaie, ^{1,3}Dragoș Ș. Măntoiu,
¹Ioana G. Pușcașu, ¹Roxana I. Guță

¹ Sustainability and Environment Department, CCAT SG, Bucharest, Romania; ² Bioflux SRL, Cluj-Napoca, Romania; ³ Wilderness Research and Consultancy, Bucharest, Romania. Corresponding author: L. Burlacu, laurentiu.burlacu@ccat.ro

Abstract. *Romanichthys valsanicola*, commonly known as the asprete, is a critically endangered freshwater fish endemic to Romania's Vâlsan River. Frequently labeled a "living fossil", the species has been mischaracterized in some narratives as contemporary with dinosaurs, leading to widespread misconceptions about its evolutionary timeline. This paper critically evaluates and refutes these claims using molecular phylogenetics, fossil evidence, and ecological analysis. The findings indicate that *R. valsanicola* diverged during the late Oligocene, approximately 24.6 million years ago, long after the extinction of dinosaurs. Its status as a Tertiary relict reflects evolutionary stasis and specialization to its unique habitat, rather than antiquity. By addressing these misinterpretations, this study emphasizes the importance of precise evolutionary terminology for conservation and scientific communication. Accurate classification enhances our understanding of *R. valsanicola* as a vital component of biodiversity and informs strategies for its protection.

Key Words: asprete, endemic, evolution, living fossil, *Romanichthys valsanicola*, Vâlsan River.

Introduction. *Romanichthys valsanicola*, commonly known as the asprete, is a critically endangered freshwater fish endemic to the Vâlsan River in Romania (Dumitrescu et al 1957). As one of the most ancient members of the family Percidae, this species holds significant evolutionary and ecological value (Sloss et al 2004). Its restricted habitat and unique morphological features have made it a focal point of conservation efforts and scientific inquiry (Craig 2000). Often considered a "Tertiary relict", *R. valsanicola* provides an invaluable glimpse into the evolutionary history of freshwater ecosystems in the Carpathian region (Haponski & Stepien 2013).

However, alongside its recognition as an ancient lineage, the species has also been subject to exaggerated claims about its evolutionary status, with some accounts inaccurately labeling it as a "fossil species contemporary with dinosaurs" (Digi24 2022). The characterization of *R. valsanicola* as a "living fossil" coexisting with dinosaurs has roots in misinterpretations of its phylogenetic placement and morphological status (Prothero 2013; Werth & Shear 2014). This notion is often perpetuated by conflating its primitive traits and restricted distribution with evidence of extreme evolutionary age. While its lineage does indeed trace back millions of years, the diversification of Percidae, and by extension *R. valsanicola*, occurred well after the extinction of dinosaurs during the Cretaceous-Paleogene (K-Pg) event approximately 66 million years ago (Sloss et al 2004).

Despite the lack of fossil evidence placing *R. valsanicola* or its closest relatives in the Mesozoic era, such misconceptions persist in both popular and some scientific narratives (Haponski & Stepien 2013). The objective of this article is to critically evaluate and refute the claim that *R. valsanicola* is a fossil species contemporary with dinosaurs. By synthesizing phylogenetic, paleontological, and biogeographical evidence, this review aims to clarify the evolutionary timeline of *R. valsanicola* and reposition its significance within a scientifically accurate context. This examination not only underscores the importance of precision in evolutionary biology but also enhances our understanding of *R. valsanicola* as

a Tertiary relict, offering insights into the survival of ancient lineages in modern ecosystems.

Historical context of misclassification. The portrayal of *R. valsanicola* as a "living fossil" and a species contemporary with dinosaurs has gained traction over the decades, fueled by media sensationalism, conservation campaigns, and a lack of nuanced communication about its evolutionary history. Despite clear scientific evidence situating *R. valsanicola* as a Tertiary relict species, narratives linking it to the Mesozoic era continue to proliferate. Dumitrescu et al's (1957) seminal description of *R. valsanicola* established its status as an endemic species and underscored its morphological uniqueness within the Percidae family. Their comprehensive analysis focused on the ichthyological and ecological attributes of the species, setting the foundation for all subsequent research. Notably, Dumitrescu et al (1957) never suggested or entertained the hypothesis that *R. valsanicola* was contemporaneous with the dinosaurs. Instead, their work firmly situated the species within the evolutionary context of modern teleosts, emphasizing its distinctiveness as a "living fossil" due to evolutionary stasis rather than antiquity. This clarification is crucial, as later media and non-scientific narratives have propagated the erroneous association with Mesozoic timelines.

Early misinterpretations. The initial scientific descriptions of *R. valsanicola* following its discovery in 1956 by naturalist Nicolae Stoica presented it as a remarkable endemic species with primitive features. Dumitrescu et al (1957) identified *R. valsanicola* as a new genus and species, emphasizing its unique evolutionary lineage. However, their framing of the species as a "relict" from ancient times inadvertently laid the groundwork for later mischaracterizations. In the 1960s, *R. valsanicola* was often referred to as a "Tertiary relict", with its primitive traits interpreted by some as evidence of extreme evolutionary stasis. This description, while scientifically accurate, was later extrapolated into the erroneous claim of contemporaneity with dinosaurs (Ministerul Mediului, Apelor și Pădurilor 2020; Digi24 2022).

Media and conservation narratives. Over time, media coverage amplified these misconceptions, often using dramatic headlines to attract attention. Articles such as "Fish Contemporary with the Last Dinosaurs Found in Romania" (Digi24 2022) and "The Asprete: A Fossilized Witness to the Dinosaur Era" (Adevarul 2020) exemplify how the species' ancient lineage has been sensationalized. These narratives rely heavily on its rarity, endemic distribution, and morphological distinctiveness, presenting it as a "living fossil" that survived millions of years unchanged. Recent outlets, including Euronews (2022) and ProTV (2020), have further perpetuated this myth, with descriptions of *R. valsanicola* as a "dinosaur-era survivor" contributing to its portrayal as an emblem of prehistory rather than a product of Tertiary evolutionary processes.

One notable example is Alex Gavan's "Aspretele Trăiește" campaign from 2023, a high-profile conservation initiative that has successfully raised awareness about the species' plight. While the campaign has been instrumental in highlighting the ecological significance of *R. valsanicola*, it has also occasionally employed the "dinosaur-era" narrative to captivate public interest. This approach underscores a common tension in conservation messaging: balancing scientific accuracy with the need to engage and mobilize support.

Evolution of the myth. The chronology of the "living fossil" narrative reflects a growing divergence between scientific discourse and public perception. Early scientific works, such as those by Dumitrescu et al (1957), remained cautious in their interpretations, framing *R. valsanicola* as a relict without overstating its temporal significance. By the 2000s, the narrative of anecdotal references linking *R. valsanicola* to the dinosaur era, often driven by non-specialist interpretations and folklore had become entrenched in popular media, with reports frequently overlooking the Tertiary divergence of Romanichthyini from other percids approximately 24.6 million years ago (Sloss et al 2004; Haponski & Stepien 2013).

Craig (2000) notes its significant evolutionary placement as part of the Romanichthyini tribe, which diverged from other percids due to its adaptations to fast-

flowing streams and its restricted geographic range in the Vâlsan River. The species is noted for lacking a swim bladder, a typical adaptation for benthic environments in swift waters, and for its phylogenetic distinction, being a sister taxon to species within the *Zingel* genus. Craig (2000) also references the Romanichthyini tribe's adaptations, such as reduced swim bladders and dorsally concentrated breeding tubercles, traits linked to its specialized habitat and evolutionary history. These features underscore its divergence from other percids during the Tertiary period, situating the tribe as distinct within the Percidae family. This placement firmly establishes *R. valsanicola* as a Tertiary relict, emphasizing its ecological specialization rather than any direct connection to Mesozoic fauna. This evolutionary positioning strongly refutes claims of Mesozoic origin and reinforces its Tertiary lineage.

Scientific counterpoints. Scientific analyses firmly place *R. valsanicola* within the Tertiary period, diverging from the *Sander* clade during the late Oligocene, long after the extinction of dinosaurs. Its primitive traits, while remarkable, are not evidence of Mesozoic origins but rather of ecological specialization and evolutionary stasis. Fossil records and molecular phylogenetic studies, including those by Sloss et al (2004) and Haponski & Stepien (2013), clearly delineate its evolutionary timeline, refuting any claims of contemporaneity with Mesozoic fauna.

Implications for conservation. The persistence of the "living fossil" myth has significant implications for conservation. While it draws attention to the urgent need to protect *R. valsanicola*, it risks overshadowing the scientifically grounded narrative of its ecological and evolutionary significance. Campaigns like Alex Gavan's have leveraged this narrative effectively to mobilize public and institutional support, yet a more accurate framing could enhance understanding and appreciation of the species' true history and conservation needs.

Phylogenetic and evolutionary evidence. The evolutionary timeline of *R. valsanicola* is firmly situated within the Tertiary period, as demonstrated by molecular phylogenetics, fossil evidence, and morphological adaptations. Molecular phylogenetic analyses situate *R. valsanicola* within the Percidae family, diverging during the Tertiary period (Sloss et al 2004). The evolutionary history of percids, as outlined by Balon et al (1977), suggests their origin during the Upper Eocene to Lower Oligocene, approximately 40 to 30 million years ago, potentially within the Danube basin. The Miocene expansion of river networks and the gradual formation of the Paleodanube River in the Pliocene provided critical pathways for percid dispersal and specialization, a context highly relevant to the ecological and evolutionary history of *R. valsanicola*. Stepien & Haponski (2015), building on their foundational research (Haponski & Stepien 2013), illuminate the evolutionary pathways and diversification patterns of the Percidae family. Through molecular phylogenetic and biogeographical analyses, their work emphasizes the post-Cretaceous origins of Percidae, situating the family within a dynamic Tertiary evolutionary framework shaped by tectonic shifts and climatic changes across Eurasia and North America. This comprehensive genetic analysis positions *R. valsanicola* as part of a broader lineage characterized by adaptive radiation into diverse freshwater habitats. Their findings reinforce the notion that *R. valsanicola* represents a lineage deeply rooted in Tertiary evolutionary processes, countering misinterpretations of its contemporaneity with ancient Mesozoic fauna.

Molecular phylogenetics. Studies, including those by Sloss et al (2004) and Haponski & Stepien (2013), place *R. valsanicola* within the Luciopercinae subfamily of Percidae. Molecular data suggest that this lineage evolved during the Paleogene period, specifically after the extinction of dinosaurs at the end of the Cretaceous, approximately 66 million years ago. The divergence of the Romanichthyini tribe from its closest relatives, such as the *Sander* genus, is estimated to have occurred around 24.6 million years ago during the late Oligocene. These findings situate the evolution of *R. valsanicola* well after the Mesozoic era, reinforcing its classification as a Tertiary relict (Sloss et al 2004; Haponski & Stepien 2013).

Fossil evidence. The fossil record provides no evidence of Mesozoic-era fossils for the Romanichthyini tribe or related Percidae. This absence is significant because it highlights the tribe's emergence as a relatively recent evolutionary development within freshwater ecosystems. Fossil evidence from other percids, such as *Zingel* and *Sander*, also supports a timeline consistent with the diversification of Percidae during the Tertiary period. Collette (1963) provides a foundational understanding of the taxonomic distinctions within the Percidae family, emphasizing the evolutionary divergence of Romanichthyini, including *R. valsanicola*, as a specialized tribe. The study illustrates that Romanichthyini evolved from the Luciopercini during the Tertiary period, showcasing traits such as the absence of a swim bladder and adaptations to benthic life in fast-flowing streams. These traits underscore evolutionary specialization rather than extreme antiquity. Importantly, the absence of phylogenetic evidence connecting Romanichthyini to the Mesozoic era dispels any claim of contemporaneity with dinosaurs. This finding reaffirms the classification of *R. valsanicola* as a Tertiary relict species, emphasizing its evolutionary distinction within Percidae.

Morphological adaptations. The retention of primitive traits in *R. valsanicola* does not imply contemporaneity with dinosaurs. Instead, these traits reflect ecological specialization and the limited selective pressures of its highly specific habitat in the Vâlsan River. Adaptations such as the absence of a swim bladder, which is suited for benthic environments, and concentrated breeding tubercles are indicative of evolutionary stasis rather than antiquity. These characteristics highlight the species' ecological niche rather than a direct connection to the Mesozoic fauna.

Biogeographical context

Isolation as a tertiary relict. *R. valsanicola*'s status as a Tertiary relict is intrinsically tied to the geophysical and climatic transformations of the Carpathian region during the Miocene-Pleistocene periods. These epochs, spanning approximately 23 million to 11,700 years ago, were characterized by extensive tectonic activity and glacial cycles that fragmented habitats and isolated freshwater ecosystems (Sloss et al 2004; Haponski & Stepien 2013). The uplift of the Carpathians and the activity along the Periadriatic fault system, which separates the Adriatic and Eurasian tectonic plates, created fast-flowing streams and rivers. These dynamic geological changes established ideal conditions for the ecological specialization observed in *R. valsanicola* (Craig 2000). Physical barriers imposed by these tectonic shifts limited gene flow and facilitated the emergence of endemic species, anchoring *R. valsanicola* in its highly restricted range within the Vâlsan River.

As a result of this habitat fragmentation, *R. valsanicola* evolved distinct morphological and ecological traits adapted to benthic life in swift currents (Craig 2000). Its isolation underscores the critical role of geographic and climatic events, including Adriatic tectonic activity, in shaping its evolutionary trajectory. This isolation has preserved its lineage and contributed to its survival as a unique representative of ancient percid fishes. The ichthyofaunal composition of the Argeş River basin, as outlined by Bănărescu et al (1995), demonstrates evolutionary adaptations unique to the native species of the region. Their seminal study provides a detailed account of the basin's ecological dynamics, emphasizing the interplay between environmental pressures and the morphological as well as behavioral traits of the ichthyofauna. By situating these species within the broader evolutionary framework of freshwater ecosystems in the Balkans, the authors underline the importance of historical hydrogeographical changes in shaping local biodiversity. Notably, this work highlights the evolutionary resilience and adaptability of endemic species like *R. valsanicola* within a highly specialized niche. Furthermore, it is important to clarify that neither Bănărescu et al (1995) promoted the often-misinterpreted hypothesis of *R. valsanicola* being contemporaneous with the dinosaurs. Instead, their findings situated the species firmly within the evolutionary timelines of the Tertiary period. These insights reinforce the critical role of the Argeş basin as a reservoir of unique evolutionary trajectories and as a focal point for conservation efforts aimed at preserving Romania's freshwater biodiversity.

The evolutionary history and distribution of *R. valsanicola* align closely with the broader ichthyogeographical framework of the Balkan Peninsula, as outlined by Economidis & Bănărescu (1991). The ichthyofauna of this region reflects a dynamic interplay between ancient endemics and more recent colonizers, shaped by geological events and climatic fluctuations. *R. valsanicola*, a highly localized and critically endangered species endemic to the Vâlsan River, likely emerged during the Tertiary period, consistent with the region's endemic taxa. The palaeogeographical isolation of the Balkan Peninsula during the Oligocene and Miocene, combined with its subsequent connection to Central Europe during the Pliocene and Pleistocene, provided opportunities for the diversification and retention of endemic lineages like *R. valsanicola*. Economidis & Bănărescu (1991) identified river captures as a key mechanism of dispersal in the region, but *R. valsanicola* exemplifies a lineage that became restricted to its isolated habitat, underscoring its ecological specificity and vulnerability. By situating *R. valsanicola* within this evolutionary and zoogeographical context, we see strong evidence that its origins and diversification are firmly rooted in Tertiary processes, reinforcing its significance as a relic of the region's rich biogeographical history.

Contrasting Mesozoic distributions. Unlike the marine-dominated ecosystems of the Mesozoic era, modern percids, including *R. valsanicola*, are products of freshwater diversification in the Northern Hemisphere during the Tertiary period. The Mesozoic was largely defined by shallow epicontinental seas and estuarine environments, which hosted ancestors of many modern fish lineages but not the percids as we recognize them today (Haponski & Stepien 2013). Percidae, including the Romanichthyini tribe, emerged much later in geologic history, with significant diversification occurring after the Cretaceous-Paleogene extinction event approximately 66 million years ago (Sloss et al 2004).

This distinction is critical to understanding *R. valsanicola*'s biogeographical and evolutionary context. Its emergence in freshwater systems during the Paleogene and its subsequent adaptation to Carpathian streams align with a broader pattern of freshwater fish evolution in the Northern Hemisphere (Craig 2000). These factors firmly situate *R. valsanicola* as a product of post-Mesozoic diversification, reinforcing its identity as a Tertiary relict rather than a direct descendant of Mesozoic fauna.

Critical analysis of the "living fossil" concept. The label "living fossil" is often misunderstood, leading to widespread misconceptions about species such as *R. valsanicola*. This misunderstanding stems primarily from a failure to clearly differentiate between evolutionary stasis, chronological context, and phylogenetic relationships. The term "living fossil" is frequently misused to imply that such species are direct, unchanged relics of ancient eras, sometimes even suggesting contemporaneity with extinct taxa such as the dinosaurs. However, this view oversimplifies the complexities of evolutionary processes and ecological adaptation.

Misinterpreting ancient traits. Ancient traits are frequently misconstrued as evidence of extreme age. However, the retention of such traits in species like *R. valsanicola* reflects ecological specialization and evolutionary stasis rather than a direct link to ancient time periods. Lidgard & Love (2018) argue that the concept of a "living fossil" should focus on stasis rather than chronological antiquity. This perspective clarifies that stasis results from ecological niches where selective pressures favor conserving certain traits over innovation, not an indication of uninterrupted survival since the Mesozoic era.

In our context, Coburn & Gaglione (1992) demonstrated that the scale morphology of *R. valsanicola* reflects ecological specialization and evolutionary stasis, rather than extreme antiquity. Their findings show that these traits emerged during the Tertiary period, aligning with post-Mesozoic diversification, and effectively debunk the notion of the species' contemporaneity with ancient lineages.

Ignoring distinctions between Mesozoic fossils and Tertiary relicts. The term "living fossil" often blurs the line between species with Mesozoic fossil records and those that emerged after the Cretaceous-Paleogene extinction event. Prothero (2013) highlights that

fossilized traits do not imply a species existed during the age of dinosaurs unless direct fossil evidence links the species to that time. In the case of *R. valsanicola*, its phylogenetic divergence as part of the Romanichthyini tribe occurred well within the Tertiary period (Sloss et al 2004), demonstrating its emergence long after the Mesozoic.

Overlooking phylogenetic distinctions. The phylogenetic distinction between species surviving mass extinctions and those emerging post-extinction is critical but often overlooked. Werth & Shear (2014) emphasized that living fossils are often mistakenly associated with survival through major extinction events. In reality, species like *R. valsanicola* evolved as part of post-extinction diversification processes. This evolutionary placement underscores its status as a Tertiary relict, rather than a survivor from the Mesozoic era.

Refutation of the dinosaur contemporaneity claim. The claim that *R. valsanicola* is a species contemporary with dinosaurs lacks scientific credibility. This assertion can be refuted through three key counterarguments based on temporal disparity, ecological incompatibility, and the absence of fossil evidence. The isolation of *R. valsanicola* during the Pliocene, approximately 5.3 to 2.6 million years ago, firmly establishes that it could not have been contemporary with dinosaurs, which went extinct 66 million years ago. Collette & Bănărescu (1995) emphasized the species' confinement to the Argeş River system and its specialization as the most lotic-adapted European percid. These findings highlight its evolution within the ecological and geological context of the Tertiary period, shaped by the freshwater ecosystems that expanded during the Miocene and Pliocene, rather than any association with the predominantly marine habitats of the Mesozoic. The species' unique adaptations, such as convergence with Etheostomatini and its inability to spread through Pliocene lakes, further reinforce that its evolutionary pressures arose long after the extinction of dinosaurs. Consequently, the notion of *R. valsanicola* as a "dinosaur-era survivor" is incompatible with its evolutionary timeline, reaffirming its status as a Tertiary relict shaped by post-Mesozoic environmental and biogeographical changes. The findings of Bruner (2011) provide critical phylogenetic evidence that further refutes the notion of *R. valsanicola* being contemporary with dinosaurs. Bruner's detailed osteological analysis of Percidae situates *R. valsanicola* within the Romanichthyini tribe, emphasizing its distinct morphological adaptations that align with post-Cretaceous evolutionary events. His study highlights that the divergence of Romanichthyini from other percid groups occurred during the late Oligocene, approximately 24.6 million years ago, following the extinction of dinosaurs. Additionally, Bruner (2011) notes that the morphological traits of *R. valsanicola* - including reduced swim bladders and adaptations to benthic habitats - reflect specialization to freshwater ecosystems shaped by Tertiary geological and ecological conditions. These findings directly counter claims of a Mesozoic origin, reinforcing *R. valsanicola*'s classification as a Tertiary relict and situating its evolutionary history firmly within a post-dinosaur context. The findings of Coburn & Gaglione (1992) provide crucial insights into the evolutionary stasis observed in *R. valsanicola* through a comparative study of percid scale morphology. Their research highlights that the specialized scale structures of *R. valsanicola* reflect adaptations to benthic environments in fast-flowing freshwater habitats. These adaptations are indicative of evolutionary stasis, where certain morphological traits are conserved due to ecological specialization rather than extreme antiquity. Coburn & Gaglione (1992) further emphasize that the scale morphology of *R. valsanicola* aligns with traits developed in the Tertiary period, long after the extinction of dinosaurs. This evidence undermines the claim of contemporaneity with ancient lineages, situating the species within a context of post-Mesozoic diversification and reinforcing its classification as a Tertiary relict.

Temporal disparity. Dinosaurs went extinct approximately 66 million years ago during the Cretaceous-Paleogene extinction event. The Percidae family, which includes *R. valsanicola*, diversified well after this event. Molecular phylogenetic studies, such as those by Sloss et al (2004) and Haponski & Stepien (2013), place the divergence of the Romanichthyini tribe from other percids around 24.6 million years ago during the late

Oligocene. This timeline confirms that *R. valsanicola* evolved long after the extinction of dinosaurs, firmly situating its lineage within the Tertiary period.

Ecological incompatibility. The ecosystems of the Mesozoic era were predominantly marine and estuarine, dominated by shallow epicontinental seas. These habitats were unsuitable for early percids, which are exclusively freshwater fishes. The adaptation of *R. valsanicola* to fast-flowing, freshwater river systems in the Carpathians reflects ecological conditions that emerged well after the Mesozoic. As Prothero (2013) explains, the diversification of freshwater ecosystems in the Tertiary period provided niches that facilitated the evolution of modern percids, including *R. valsanicola*.

No fossil evidence. There is no fossil evidence linking the Romanichthyini tribe or its related genera to Mesozoic deposits. Fossil records of Percidae begin in the Tertiary period, with no indication of earlier forms existing during the Mesozoic. The absence of Romanichthyini fossils from Mesozoic strata further invalidates claims of their contemporaneity with dinosaurs. This point is critical, as fossil evidence is a fundamental requirement for establishing a lineage's presence in a given era (Werth & Shear 2014).

In conclusion, the claim that *R. valsanicola* coexisted with dinosaurs is not supported by scientific evidence. The species' evolutionary timeline, ecological specialization, and fossil record firmly situate it as a Tertiary relict, a product of post-Mesozoic diversification rather than a survivor from the age of dinosaurs.

Implications for conservation and scientific communication. The accurate classification of *R. valsanicola* is essential for developing effective conservation strategies and fostering a deeper understanding of its ecological and evolutionary significance. Mischaracterizations, such as labeling it a "living fossil" or asserting its contemporaneity with dinosaurs, can distract from these goals by creating misleading narratives.

Burlacu et al (2023) provide a detailed exploration of the ecological, behavioral, and evolutionary characteristics of *R. valsanicola*, emphasizing the environmental and phylogenetic factors crucial for its survival. Their study underscores the importance of understanding the ecosystem carrying capacity of the Vâlsan River, which supports this highly specialized and critically endangered species. *R. valsanicola* occupies a unique ecological niche as a benthic feeder in fast-flowing freshwater habitats with high oxygenation, relying on a diet of benthic macroinvertebrates. These behavioral adaptations, shaped by millions of years of evolutionary pressure, highlight its stringent habitat requirements and its vulnerability to environmental disruptions.

Additionally, Burlacu et al's (2023) work situates the species within a broader phylogenetic framework, pointing to its divergence within the Romanichthyini tribe approximately 24.6 million years ago during the late Oligocene. This evolutionary trajectory, likely influenced by tectonic activity that redefined the hydrological systems of the region, establishes *R. valsanicola* as a Tertiary relict. These findings align with other studies on the Percidae family, reinforcing that the species is not a living fossil contemporaneous with the dinosaurs, as frequently misconstrued in popular narratives, but rather an evolutionary survivor from a more recent geological epoch.

Importance of accurate classification. Accurately situating *R. valsanicola* as a Tertiary relict highlights its unique adaptations and ecological role, aiding targeted conservation measures. By focusing on its evolutionary stasis and specialized habitat in the Vâlsan River, conservation efforts can prioritize maintaining its ecological conditions, such as preserving fast-flowing streams and protecting against habitat degradation. Scientific clarity ensures that resources are directed toward meaningful actions rather than perpetuating misconceptions.

Risks of misleading narratives. The perpetuation of myths, such as *R. valsanicola* being a "dinosaur-era survivor", can detract from understanding its true ecological and evolutionary importance. Such myths may shift focus toward sensationalized narratives at the expense of scientific rigor, leading to public confusion and misinformed conservation

priorities. Conservation campaigns and media outreach should strive to balance public engagement with factual accuracy to effectively communicate the species' significance.

In summary, integrating accurate scientific knowledge into conservation strategies and public discourse is vital for ensuring the long-term survival of *R. valsanicola* and enhancing its role as a model for understanding evolutionary stasis and adaptation.

Conclusions. The evidence unequivocally refutes the claim that *Romanichthys valsanicola* is a species contemporary with dinosaurs. Molecular phylogenetics place its divergence from other percids during the late Oligocene, around 24.6 million years ago, long after the extinction of dinosaurs. Its adaptation to freshwater habitats in the Carpathian region, alongside the absence of Mesozoic-era fossils, reinforces its classification as a Tertiary relict rather than a Mesozoic holdover. This precise classification underscores the species' evolutionary significance as an example of stasis and adaptation rather than antiquity. Using accurate evolutionary terminology is essential not only for scientific communication but also for effective conservation. By focusing on the true ecological and evolutionary context of *Romanichthys valsanicola*, we can ensure that public and scientific discourse reflects its rightful place as a unique and invaluable component of modern biodiversity.

Conflict of interest. The authors declare that there is no conflict of interest.

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Authors:

Laurențiu Burlacu, Sustainability and Environment Department, CCAT SG, Calea Floreasca 175, Bucharest, Romania, e-mail: laurentiu.burlacu@ccat.ro

Claudiu Gavriloaie, SC Bioflux SRL Cluj-Napoca, 54 Ceahlau Street, 400488 Cluj-Napoca, Romania, e-mail: claudiugavriloaie@gmail.com

Dragoș Ștefan Măntoiu, Sustainability and Environment Department, CCAT SG, Calea Floreasca 175, Bucharest, Romania; Wilderness Research and Consultancy, Poștașului Street, No. 39-41, Bucharest, Romania e-mail: dragos.mantoiu@wilderness-research.com

Ioana Gabriela Pușcașu, Sustainability and Environment Department, CCAT SG, Calea Floreasca 175, Bucharest, Romania, e-mail: ioana.puscasu@ccat.ro

Roxana Iulia Guță, Sustainability and Environment Department, CCAT SG, Calea Floreasca 175, Bucharest, Romania, e-mail: roxana.guta@ccat.ro

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