Zootaxa 5654 (1): 001–064
https://www.mapress.com/zt/

Monograph

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

https://doi.org/10.11646/zootaxa.5654.1.1
http://zoobank.org/urn:lsid:zoobank.org:pub:EA3C943C-34B5-4574-B229-A33D37337B3C

ZOOTAXA

5654

An annotated systematical checklist of the Romanian ichthyofauna

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Magnolia Press
Auckland, New Zealand

Accepted by J. Freyhof: 4 Apr. 2025; published: 1 Jul. 2025

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An annotated systematical checklist of the Romanian ichthyofauna
(*Zootaxa* 5654)

64 pp.; 30 cm.

1 Jul. 2025

ISBN 978-1-77973-403-7 (paperback)

ISBN 978-1-77973-404-4 (Online edition)

FIRST PUBLISHED IN 2025 BY

Magnolia Press

P.O. Box 41-383

Auckland 1041

New Zealand

e-mail: magnolia@mapress.com

https://www.mapress.com/zt

ISSN 1175-5326 (Print edition)

ISSN 1175-5334 (Online edition)

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Abstract

The ichthyofauna of Romania has long constituted the object of scientific studies; however, rapid changes in both taxonomy and the composition of local fauna require constant updating of the country species list. We attempt here to give a complete checklist of Romanian ichthyofauna, including recently extinct and introduced species, and discussing doubtful records. A discussion of the taxonomical status of recorded species is also included. We discuss 272 species (plus 2 introduced hybrids) recorded for Romania, belonging to 79 families and 31 orders. The distribution and status of treated species are also briefly delineated.

Key words: Fishes, Romania, taxonomy, records, distribution, native, introduced

Introduction

The field of ichthyology was developed in Romania for a long time, since the seminal work of Antipa (1909) and going through the important synthetic work of Bănărescu (1964, 1969). However, despite the recent flourishing of this research field, an actual national synthesis is absent. The simple question "how many fish species live in Romanian waters, and which are these?" is not easily answered. Some species are mentioned for Romanian waters in the absence of precise records, others are extrapolated to occur here on the basis of their presence in nearby waters (e.g. in the Black Sea), and besides such methodological failings there is the constant challenge of an updating taxomomy, due to scientific progress. Romanian materials, of variable quality, from monographs combining vast literature and original data (Oțel 2007) to simple lists (Nalbant 2003; Bănărescu 2007), are focused either upon the whole of Romania (Cocan & Mireșan 2018—with less interest in species-level systematics) or on regional areas: the Danube Delta (Oțel 2007); Romanian fresh waters (Nalbant 2003; Bănărescu 2007); the Black Sea—all of it, not limited to Romanian waters (Radu *et al*. 2008); Romanian demersal marine areas (Maximov & Zaharia 2010); waters of Transsylvania (Nagy *et al*. 2023).

Our present work is not an attempt at a synthesis on the level of Bănărescu (1964) or Oțel (2007) but an effort to clarify which species are mentioned in literature for Romania, where exactly they have been recorded and what is their current taxonomic status.

Materials and methods

A critical analysis of extant literature was performed, endeavouring to establish the presence, distribution and taxonomic status of fishes recorded for Romania. The general distribution was taken into consideration, and therefore only such sources as giving significant range expansions or contractions since the detailed monographies of Bănărescu (1964, 1969) were taken into consideration (instead of indexing any small-scale faunistic survey). In such instances where personal and other unpublished observations, as well as collection data, can contribute to clarify the presence/distribution of some species by providing precise location records with photographs or otherwise help in the knowledge of localized species, we made use of such data. For non-native species we refer to our previous review (Iftime & Iftime 2021), in order not to repeat the vast literature quoted therein. More detailed distribution information was given for rare species, and for species where considerable new data was accumulated since the above-mentioned monographs.

We have listed separatly: A) native species, including those currently extirpated, and alien species for which there is direct or circumstantial evidence for independent reproduction; also vagrants from such natural or established populations, whose occurrence may reflect either natural sporadic dispersion, natural range expansion or post-introduction self-sustaining expansion; B) non-native species without evidence for independent reproduction and/or persistence, from those forming long-term persistent pseudopopulations (see, e.g., Reshetnikov *et al.*, 2023 for pseudopopulations of a species in a non-native setting) or kept in open-water aquaculture to those transiently reproducing but failing to persist, those transiently present and even known from to single records; C) doubtful records or species whose presence is considered probable or possible based on plausible considerations and D) demonstrably erroneous records or citations.

Results

The following species were identified:

A. Native species, reproducing non-native species and vagrants thereof

CYCLOSTOMI

ORD. PETROMYZONIFORMES
Fam. Petromyzonidae
Eudontomyzon danfordi Regan, 1911
A native, predatory species, found in various montane rivers in Transsylvania and Banat (Bănărescu 1969; Bănărescu 2002; Bănărescu 2005; Cocan & Mireșan 2018; Polyák *et al*. 2022; Nagy *et al*. 2023); records from Siret catchment were re-identified as *E. mariae* (Apetroaie,1975a; Bănărescu 2002; Bănărescu 2005) (i.e. therefore *E. vladykovi*—see below). The photographic record from Vâlsan (Argeș drainage) of a barbel showing what appears to be the mark of a lamprey bite (Petreanu, I. C. 2021, with image courtesy of Bogdan N., taken 2020) suggest the presence of *E. danfordi*, in this area.

Eudontomyzon vladykovi Oliva et Zanandrea, 1959
A native, non-predatory species, found in mountain/hill rivers in the Banat area—the Timiș and Bega catchments (Bănărescu 1969; Bănăduc *et al*. 2013; Bănăduc *et al*. 2018; Cocan & Mireșan 2018; Nagy *et al*. 2023), in the Olt drainge in Transsylvania (Bănărescu 1969 [as *E. vladykovi*]; Nagy *et al*. 2023 [as *E. mariae*]), as well as in rivers in extra-Carpathian areas (Bănărescu 1969; Apetroaie 1975a; Apetroaie 1975b; Bănărescu 2005—as *E. mariae*); occasionally found in the Danube down to the Delta (Oțel 2007; Năstase & Năvodaru 2023—as *E. mariae*).

The non-predatory eastern European *Eudontomyzon* were reclasified following molecular analyses (Li 2014; Levin *et al*. 2016; Pereira *et al*. 2021); while no Romanian samples were actually analyzed, the distribution of the described populations is such as to make likeliest that most (extra-Carpathian, Olt) Romanian "*E. mariae*" belong to typical *E. vladykovi*. The Romanian Banat *E. vladykovi* shows greater morphological similarity to *E. danfordi* than to Romanian "*E. mariae*" (Bănărescu 1969, figs. 19 vs. 17 and 22, derived from original Romanian material), which (if this would reflect their genetic closeness) would suggest the molecular-defined *danfordi*-like Drava "*E. vladykovi*" population (Pereira *et al*. 2021).

Other authors make a case for lumping most or all East European non-predatory *Eudontomyzon* into a single species, of which *E. danfordi* is the parasitic "pair species"/form; however, reproductive (in)compatibility was not tested in this case (Popov & Makhrov 2015, Li 2014); at least the Drava "*E. vladykovi*", given its extreme closeness to *E. danfordi* (Levin *et al*. 2016; Bartels *et al*. 2017; Pereira *et al*. 2021), may likely prove to be a non-predatory form of *E. danfordi*.

CHONDRICHTHYES

ORD. CARCHARHINIFORMES
Fam. Scyliorhinidae
Scyliorhinus canicula (Linnaeus, 1758)
A marine species, native to the Black Sea, but only rarely found in Romanian waters, south of the Danube Delta (Oțel 2007; Radu *et al*. 2008).

Fam. Sphyrnidae
Sphyrna zygaena (Linnaeus, 1758)
A vagrant marine species recorded once in the Romanian Black Sea (Bănărescu 1969, ap. Antipa, 1940, probably unpubl.) was subsequently accepted by most authors (Vasil'eva 2007; Oțel 2007; Radu *et al*. 2008; Parin *et al*. 2014; Yankova *et al*. 2014; Aleksandrov *et al*. 2017).

ORD. SQUALIFORMES
Fam. Squalidae
Squalus acanthias Linnaeus, 1758
A native marine species, found along all Romanian Black Sea waters (Bănărescu 1969; Oțel 2007; Vasil'eva 2007; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Maximov *et al*. 2019; Niță *et al*. 2022).

ORD. RAJIFORMES
Fam. Rajidae
Raja clavata Linnaeus, 1758
A native marine species, found along all Romanian Black Sea waters (Bănărescu 1969; Oțel 2007; Vasil'eva 2007; Maximov & Zaharia 2010; Yankova *et al*. 2014; Cocan & Mireșan 2018; Niță *et al*. 2022). It has undergone decline/range restriction (Oțel 2007).

ORD. MYLIOBATIFORMES
Fam. Dasyatidae
Dasyatis pastinaca (Linnaeus, 1758)
A native marine species, found along all Romanian Black Sea waters (Bănărescu 1969; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Maximov & Zaharia 2010; Yankova *et al*. 2014; Cocan & Mireșan 2018; Niță *et al*. 2022). Has undergone decline/range restriction (Oțel 2007).

OSTEICHTHYES

ORD. ACIPENSERIFORMES
Fam. Acipenseridae
Acipenser gueldenstaedtii Brandt & Ratzeburg, 1833
A native anadromous species, ascending the Danube (Bănărescu 1964; Radu *et al*. 2008); much afflicted by the construction of the Iron Gates dams and by overfishing/poaching, this species is at the brink of extinction in Romanian waters, natural reproduction being all but absent; the population is maintained by supportive stocking (Oțel 2007; Maximov *et al*. 2014; Cocan & Mireșan 2018; Holostenco *et al*. 2019; Iani *et al*. 2019; Dobrev Mihov *et al*. 2022; Strat & Gheorghe 2023).

Acipenser nudiventris Lovetzky, 1828
A native species; Danube catchment populations restricted to freshwater. Formerly found in the Danube and lower course of some of the main tributaries, occasionally reaching the brackish marine waters at the Danube mouths (Bănărescu 1964; Oțel 2007). Last Romanian commercial capture was in 1956 (Oțel 2007). Nowadays most likely extirpated in the area (Oțel 2007; Jarić *et al*. 2009; Strat & Gheorghe 2023); see Oțel 2007 for timeline of Romanian catches. Occasional records (latest, 2019) in the middle Danube and its tributaries might indicate the persistence of a population (Nyeste *et al*. 2020) which could extend to the Romanian Danube above the Iron Gates. Recently available for aquaculture in the Danube basin in Austria (AquaTech 2025; stock origin unspecified, possibly Russia—see Mikodina & Novosadova 2015).

Acipenser persicus Borodin, 1897
A native anadromous species, ascending the Danube. Considered formerly present in the lower Danube but currently extirpated (Kottelat & Freyhof 2007—as *A. colchicus*); some specimens provided by the Dunărea de Jos University of Galați (and presumably collected in Romania) were identified by molecular means to belong to this species (Vasil'eva & Vasil'ev 2021). It was, therefore, likely present alongside *A. gueldenstaedti* in the lower Danube, but unclear whether as a regular, breeding occurence or as a sporadic vagrant; whatever the case, the same conditions that brought about the catastrophic decline of *A. gueldenstaedtii* must have affected also *A. persicus*, however, the presence of survivors or recent vagrants is possible.

The Black Sea form of this species, *Acipenser* (*persicus*) *colchicus* Marti, 1940 has been treated as a valid species by Kottelat & Freyhof (2007). We follow Vasil'eva & Vasil'ev (2021) and treat it as a a synonym of *A. persicus*.

Acipenser ruthenus Linnaeus, 1758
A native freshwater species. Formerly in the Danube and lower course of some of the main tributaries (Bănărescu 1964; Cocan & Mireșan 2018). It maintains itself in the Danube down to the Delta arms (Oțel 2007; Strat & Gheorghe 2023) where it appears to have improved somewhat its population strength (Năstase & Năvodaru 2023). Also found in tributaries Mureș, Someș, Crișul Negru (Nagy *et al*. 2023), Prut (Oțel 2007; Bulat *et al*., 2013; Bulat *et al*., 2016); reintroduced to Crișul Repede but unclear whether it can reproduce there now (Togor *et al*., 2022).

Acipenser stellatus Pallas, 1771
A native anadromous species, ascending the Danube (Bănărescu 1964; Radu *et al*. 2008); much afflicted by the construction of the Iron Gates dams and overfishing/poaching. This species is still achieving natural reproduction in the lower reaches of the Danube, aided by supportive stocking (Oțel 2007; Maximov *et al*. 2014; Cocan & Mireșan 2018; Holostenco *et al*. 2019; Strat & Gheorghe 2023) and has improved its situation slighly (Năstase & Năvodaru 2023), and is present in the Prut river (Moshu *et al*. 2006; Oțel 2007).

Acipenser sturio Linnaeus, 1758
A native anadromous species, reproducing (see Bănărescu 1964, ap. Antipa; Oțel 2007) in the Danube mouths area and/or ascending the Danube arms in the Delta and possibly up to Galați; records upstream are doubtful (Bănărescu 1964; Bacalbașa-Dobrovici & Holcík 2000; Oțel 2007). Last captured in 1966 (Oțel 2007); nowadays considered extirpated (Oțel 2007; Jarić *et al*. 2009; Strat & Gheorghe 2023).

Huso huso (Linnaeus, 1758)
A native anadromous species, ascending the Danube (Bănărescu 1964; Radu *et al*. 2008; Cocan & Mireșan 2018); much afflicted by the construction of the Iron Gates dams and by overfishing/poaching, this species is still, however, achieving natural reproduction in the lower reaches of the Danube, aided by supported stocking, albeit it is scarcer than *Acipenser stellatus* (Oțel 2007; Maximov *et al*. 2014; Holostenco *et al*. 2019; Strat & Gheorghe 2023).

ORD. ANGUILLIFORMES
Fam. Anguillidae
Anguilla anguilla (Linnaeus, 1758)
A native (Apostolou *et al*. 2013) catadromous species; always rare in Romania, historically found in the Danube, Mureș, Olt, Someș/Bistrița Ardeleană, Cerna, Bega, Crișul Negru, and Buzău, and brackish/marine waters (Black Sea, Razim lagoon system, littoral lakes); females tend to occur deeper inland (Bănărescu 1964; Oțel 2007; Radu *et al*. 2008). A drastic all-range decline has occured in this species (Dekker & Beaulaton 2016). In Romania, still found in the Razim lagoon system, the Danube and its delta, including deltaic marine waters; stocked in Babadag lake (part of the Razim system) (Oțel 2007; Radu *et al*. 2008; Apostolou *et al*. 2013; Urdes *et al*. 2015; Cocan & Mireșan 2018; Năstase *et al*. 2022; Năstase & Năvodaru 2023). Mentioned by Yankova *et al*. 2014, but not by Țoțoiu *et al*. 2018, or Niță *et al*. 2022, which would indicate absence of recent records in the Romanian Black Sea.

Fam. Congridae
Conger conger (Linnaeus, 1758)
A native marine species, occasionally found in Romanian Black Sea waters, south of the Danube Delta (Bauchot & Saldanha 1986; Vasil'eva 2007; Oțel 2007).

ORD. CLUPEIFORMES
Fam. Engraulidae
Engraulis encrasicolus (Linnaeus, 1758)
A native marine species, found along all Romanian Black Sea waters; formerly also in the Sinoe lagoon (Bănărescu 1969; Oțel 2007; Radu *et al*. 2008; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Maximov *et al*. 2019; Niță *et al*. 2022).

Fam. Clupeidae
Sprattus sprattus (Linnaeus, 1758)
A native marine species, found along all Romanian Black Sea waters (Bănărescu 1969; Oțel 2007; Radu *et al*. 2008; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Maximov *et al*. 2019; Niță *et al*. 2022).

Fam. Ehiravidae
Clupeonella cultriventris (Nordmann, 1840)
A native anadromous/euryhaline species, found along all Romanian Black Sea waters and ascending the lower Danube; also found in littoral lakes/lagoons (Bănărescu 1969; Oțel 2007; Radu *et al*. 2008; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Niță *et al*. 2022).

Fam. Alosidae
Alosa fallax (Lacepède, 1803)
A native anadromous species, rare/sporadical in Romanian waters (Kottelat & Freyhof 2007; Vasil'eva 2007; Radu *et al*. 2008; Yankova *et al*. 2014). It is rare in Romanian (Radu *et al*. 2008), Bulgarian (Dobrovolov *et al*. 2012), Russian and adjacent (Dyldin *et al*. 2022) waters. It appears to be conspecific with *Alosa agone* (Scopoli 1786), which would then have nomenclatural priority (see Dyldin *et al*. 2022 and references quoted therein).

Alosa immaculata Bennett, 1835
A native anadromous species, found along all Romanian Black Sea waters and ascending the Danube (up to the Iron Gates dam, before its construction further upstream), formerly also in the Razim lagoon system (Bănărescu 1969; Oțel 2007; Kottelat & Freyhof 2007; Radu *et al*. 2008; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Năstase *et al*. 2022; Niță *et al*. 2022; Năstase & Năvodaru 2023).

Alosa tanaica (Grimm, 1901)
A native anadromous species, found along all Romanian Black Sea waters and ascending the Danube and the Prut; also in the Razim lagoon system (Bănărescu 1969; Oțel 2007; Radu *et al*. 2008; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Maximov *et al*. 2019; Năstase *et al*. 2022; Niță *et al*. 2022; Dyldin *et al*. 2022; Năstase & Năvodaru 2023).

Alosa immaculata and *A. tanaica* and *A. maeotica* are poorly distinguished from each other (Faria *et al*. 2006; Mezhzherin *et al*. 2009; Mezhzherin & Vernygora 2013; Faria *et al*. 2012; Vernygora *et al*. 2018; Orlova *et al*. 2024) and more research is needed to test if these are conspecific as suggested by Mezhzherin *et al*. (2009), or valid but subtly different species.

Sardina pilchardus (Walbaum, 1792)
A native marine species, sporadically found in Romanian Black Sea waters (Bănărescu 1969; Oțel 2007; Vasil'eva 2007; Yankova *et al*. 2014; Cocan & Mireșan 2018).Not mentioned by Țoțoiu *et al*. 2018, or Niță *et al*. 2022, which would indicate absence of recent records in the Romanian Black Sea.

Fam. Dorosomatidae
Sardinella aurita Valenciennes 1847
A vagrant marine species occasionally found in Romanian Black Sea waters (Bănărescu 1969; Vasil'eva 2007; Oțel 2007; Yankova *et al*. 2014).

ORD. CYPRINIFORMES
Fam. Cobitidae
Cobitis elongata Heckel et Kner, 1858
A native freshwater species, living in the Nera, Miniș and Caraș rivers; a population in the Jiu is apparently extirpated (Bănărescu 1964; Bănărescu 2005; Cocan & Mireșan 2018; Nagy *et al*. 2023).

Cobitis elongatoides Băcescu et Mayer, 1969
A nativefreshwater species of the lowland and lower hills, living in slow-flowing or stagnant water (Bănărescu 1964 [as *C. taenia* L., 1758]; Nalbant 1993 [as *C. taenia danubialis* Băcescu in Nalbant, 1993]; Bohlen & Ráb 2001; Bănărescu 2007; Oțel 2007 [as *C. danubialis* (Băcescu in Nalbant, 1993)]; Janko *et al*. 2007; Choleva *et al*. 2008; Choleva *et al*. 2014; Cocan & Mireșan 2018 [as both *C. elongatoides* and *C. taenia*]; Vasil'ev & Vasil'eva 2022; Polyák *et al*. 2022; Nagy *et al*. 2023).

Cobitis megaspila Nalbant, 1993 (*C*. [cf.] *tanaitica* Băcescu et Mayer, 1969)
A native, widespread fresh- and brackish water species of the lowlands, living in slow-flowing or stagnant water, in and along the Danube, in the Delta and the Razim lagoon system (Bănărescu 1964 [as *C. taenia* L., 1758]; Nalbant 1993; Bohlen & Ráb 2001; Bănărescu 2007 [as both *C. megaspila* and *C. tanaitica*]; Oțel 2007 [as both *C. megaspila* and *C. tanaitica*]; Janko *et al*. 2007; Choleva *et al*. 2008; Choleva *et al*. 2014; Cocan & Mireșan 2018 [as both *C. megaspila* and *C. tanaitica*]; Vasil'ev & Vasil'eva 2022; Năstase *et al*. 2022 [all as *C. tanaitica* Băcescu et Mayer, 1969]; Volkov *et al*. 2023; Năstase & Năvodaru 2023 [as both *C. megaspila* and *C. tanaitica*]). Also found in the a tributary of the Prut river in the Republic of Moldova (Volkov *et al*. 2023); it may also occur in the Prut.

Bohlen & Ráb (2001) and most subsequent workers considered *C. megaspila* to be a synonym of *C. elongatoides*, and the second *C. taenia*-group Romanian species to be *C. tanaitica*. Volkov *et al*. 2023 suggest that a) the Danube Delta *C*. „*tanaitica*" populations are a distinct species from the north-Pontic *C. tanaitica* (upon grounds of microsatellite DNA-informed analyses; however, the two clustering versions are not fully congruent, which may furnish a caveat for the validity of this split) and b) *C. megaspila* Nalbant, 1993 is available for this species as its type material most likely included pure specimens thereof (however, as long as the type material of *C. megaspila* has not been re-assessed with the same molecular tools as used by Volkov *et al*. 2023, a caveat still remains as for the availability of *C. megaspila*). Gynogenetic diploid or triploid hybrids between *C. elongatoides* and *C. megaspila* are common across the range of both parental species (Bohlen & Ráb 2001; Janko *et al*. 2007; Choleva *et al*. 2008; Choleva *et al*. 2014; Vasil'ev & Vasil'eva 2022; Volkov *et al*. 2023). Mezhzherin & Pavlenko 2007 claimed even more diversity for the "lower Danube" *Cobitis*, including tetraploid hybrids and hybrids having chromosome sets from two alleged undescribed/unidentified species (besides *C. elongatoides* and *C. megaspila* [as *C. tanaitica*]), but this was not confirmed by subsequent research (see references quoted above).

Sabanejewia balcanica (Karaman, 1922)
A native, widespread freshwater species, found in rivers from the montane areas downstream, in both intra- and extra-Carpathian drainages (Bănărescu 1964; Bănărescu *et al*. 1972 [as *S. aurata balcanica*]; Bănărescu 2007; Kottelat & Freyhof 2007; Cocan & Mireșan 2018; Polyák *et al*. 2022; Nagy *et al*. 2023 [as *S*. sp., including *balcanica* and *bulgarica*]). *Sabanejewia bulgarica* (Drensky, 1928), found in the Danube and the lower course of some of its tributaries (but going quite high up the Tisza) (Bănărescu 1964; Bănărescu *et al*. 1972 [both as *S. aurata bulgarica*]; Bănărescu 2007 [as *S. balcanica bulgarica*], Oțel 2007; Kottelat & Freyhof 2007; Cocan & Mireșan 2018; Polyák *et al*. 2022; Nagy *et al*. 2023 [as *S*. sp., including *balcanica* and *bulgarica*]; Năstase & Năvodaru 2023) and *Sabanejewia vallachica* (Nalbant, 1957), found in the Ialomița, Buzău and some lower Siret tributaries (Bănărescu 1964; Bănărescu *et al*. 1972 [both as *S. aurata vallachica*]; Bănărescu 2007; Kottelat & Freyhof 2007; Cocan & Mireșan 2018), should be better treated as belonging to *S. balcanica*; their taxonomical history is complex. Thus, *S. balcanica*, *S. bulgarica* and *S. vallachica* were long seen as subspecies of *S. aurata* (De Filippi, 1873) which intergrade in some places and allegedly do not intergrade in others (Bănărescu 1964; Bănărescu *et al*. 1972), then as forms of *S. balcanica* (Kottelat 1997), and later as distinct species: Nalbant 2003—even treating the upper Mureș local form as a species, *S. radnensis* (Bănărescu *et al*. 1960), which was not followed by other authors except Bănărescu (2004, 2007); Bănărescu 2004—attributing Danube-drainage *S. balcanica*/*S. bulgarica* to *S. montana* (Vladykov, 1925), an opinion he later abandoned (Bănărescu 2007); Kottelat & Freyhof 2007. All forms in Romania are variable, encompassing much the same range of variability, and clearly intergrade wherever they meet (Iftime 2002); mtDNA studies have grouped all Romanian forms into a "Danubian-Balkanian complex" (Perdices *et al*. 2003), more or less structured into lineages defined by drainage catchment/area (Perdices *et al*. 2003; Bartoňová *et al*. 2008), such lineages cutting across morphological forms, which are to a large extent ecological (Križek *et al*. 2020; Fedorčák *et al*. 2023). However, there is significant discordance between the mtDNA-informed and the nuclear-informed clustering of the "Danubian-Balkanian complex" (Vasil'eva *et al*. 2022) and its alleged species are

not well defined by diagnostic characters (Vasil'eva & Vasil'ev 2023); this, as well the morphological overlap and intergradation, suggest the "Danubian-Balkanian complex" should better be treated as a single species, for which *S. balcanica* would have priority.

Sabanejewia romanica (Băcescu, 1943)
A native, relatively restricted freshwater rheophilic species, found in the Argeș, Vedea, Olt, Jiu, Topolnița, Cerna and middle Mureș drainage catchments, in montane and hill areas (Bănărescu 1964; Bănărescu 2005; Kottelat & Freyhof 2007; Cocan & Mireșan 2018; Marić *et al*. 2022; Nagy *et al*. 2023). Recorded from the Prut (Moshu *et al*, 2006) but most likely in error, not being found in the Prut or any waterbody of the Republic of Moldova (Bulat *et al*. 2013; Bulat 2017). Not a Romanian endemic (as long considered) for it is also found in adjacent Serbia (Marić *et al*. 2022).

Misgurnus fossilis (Linnaeus, 1758)
A native, widespread freshwater species, living in slow-flowing or stagnant water (including the Razim lagoon), in both intra- and extra-Carpathian drainages (Bănărescu 1964; Wilhelm *et al*. 2002; Oțel 2007; Imecs *et al*. 2011; Imecs & Nagy 2016; Cocan & Mireșan 2018; Năstase *et al*. 2022; Togor *et al*. 2022; Nagy *et al*. 2023). Has undergone severe decline/range reduction (Wilhelm *et al*. 2002; Imecs *et al*. 2011; Imecs & Nagy 2016; Togor *et al*. 2022).

Fam. Nemacheilidae
Barbatula barbatula (Linnaeus, 1758)
A native, widespread freshwater species, found in rivers in the montane and hill areas, in both intra- and extra-Carpathian drainages (Bănărescu 1964; Cocan & Mireșan 2018; Nagy *et al*. 2023); isolated populations in the Romanian Plain (Nalbant 1976; Bănărescu & Nalbant 1980).

Fam. Cyprinidae
Carassius auratus (Linnaeus, 1758)
A widespread species, found in Romania under two forms, often described as (putative) species: *Carassius gibelio* (Bloch, 1783), a native (at least for the Danube and its large tributaries; see discussion by Oțel 2019; Iftime & Iftime 2021, and literature quoted therein), partly gynogenetic, fresh- and brackish-water form, living in slow-flowing or stagnant waters, now widespread in lowland and hill areas, partly as a result of stocking (Bănărescu 1964; Manea 1985; Oțel 2007; Cocan & Mireșan 2018; Oțe, 2019; Iftime & Iftime 2021; Nagy *et al*. 2023; Drăgan *et al*. 2024), and the Asian *Carassius auratus*, which is non-native, found in ornamental and other fishponds, and occasionally as an escape (Oțel 2019; Iftime & Iftime 2021).

The two putative *Carassius* species above might be regarded as forms of the same species: *C. auratus*, as they overlap morphologically (Oțel 2019; Comia & Morris 2024), they are not distinct in some phyletic analyses, and *C. gibelio* is not exclusively gynogenetic, but alternatively, reversibly gynogenetic and sexual, with evidence of gene flow between it (as the sexual form) and *C. auratus* (Gu *et al*. 2022; Jacques *et al*. 2024, and literature quoted therein) in a context of recurrently variable intraspecific ploidy (Qin *et al*. 2013; Luo *et al*. 2014; Liu *et al*. 2017; Li *et al*. 2018).

Carassius carassius (Linnaeus, 1758)
A native fresh- and-brackish-water species, living in stagnant waters (and only accidentally and suboptimally in river courses), formerly widespread in lowland and hill areas, nowadays surviving in the Danube Delta and limited, dispersed points in the rest of the country (Bănărescu 1964; Bănărescu 2005; Oțel 2007; Cocan & Mireșan 2018; Nagy *et al*. 2023; Năstase & Năvodaru 2023).

Cyprinus carpio Linnaeus, 1758
A native, widespread freshwater species of the lowland and lower hills, living in slow-flowing or stagnant water; abundantly supplemented by cultivated stocks (Bănărescu 1964; Manea 1985; Oțel 2007; Cocan & Mireșan 2018; Polyák *et al*. 2022; Nagy *et al*. 2023; Năstase & Năvodaru 2023).

The koi, an ornamental breed selected in Japan, is worth mentioning as it is thought to originate from the

Asian species *Cyprinus rubrofuscus* Lacépède, 1803 (Kottelat & Freyhof 2007). There are no precise data upon the introduction time, origin and distribution of koi in Romania; it is found in ornamental urban waterbodies (e.g. in Bucharest—A. Iftime obs.) as well as in some fishponds. While *C. rubrofuscus* is widely accepted as distinct from *C. carpio* (Kottelat & Freyhof 2007; Fricke *et al*. 2025; Froese & Pauly 2025), it seems to be very close to *C. carpio*; various aspects, including the overall genetic structure of *C. carpio* s. l.; (Xu *et al*. 2014; Tsipas *et al*. 2017; Xu *et al*. 2019; Zhu *et al*. 2023, Nielsen *et al*. 2010; Kuts *et al*. 2021) and the mix-up of domesticated koi, at least some strains thereof being admixed with European carps (de Kock & Gomelsky 2015), suggest its status as a valid species should be revised (as suggested by Zhu *et al*. 2023).

Barbus barbus (Linnaeus, 1758)
A native, widespread freshwater species, found in rivers from the plain to the low montane level (Bănărescu 1964; Oțel 2007; Cocan & Mireșan 2018; Nagy *et al*. 2023).

Barbus balcanicus Kotlik, Tsigenopoulos, Rab et Berrebi, 2002
A native, widespread freshwater species, found in rivers in the montane and hill areas, in some south-west Romanian drainages: Timiș, Caraș, Nera, minor Danube tributaries in the Iron Gates area, Cerna, Jiu, Olt (Bănărescu 1964 [as *B*. *meridionalis petenyi*]; Kotlík *et al*. 2002; Iftime, 2004; Cocan & Mireșan 2018; Nagy *et al*. 2023).

Barbus biharicus Antal, László, Kotlík, Moszár, Czeglédi, Oldal, Kemenesi, Jakab et Nagy, 2016
A native, moderately widespread freshwater species, found in rivers in the montane and hill areas, in some west Romanian drainages: Crișul Repede, Crișul Negru, Crișul Alb (Bănărescu 1964; Bănărescu *et al*., 1997 [both as *B*. *meridionalis petenyi*]; Antal *et al*. 2016; Cocan & Mireșan 2018; Telcean *et al*. 2020; Nagy *et al*. 2023).

Barbus carpathicus Kotlik, Tsigenopoulos, Rab et Berrebi, 2002
A native, widespread freshwater species, found in rivers in the montane and hill areas, in both intra- and extra-Carpathian drainages: Someș, Barcău, Tisza, Vișeu, Siret, Prut (Bănărescu 1964 [as *B. meridionalis petenyi*]; Kotlík *et al*. 2002; Roman 2013; Roman, 2015; Cocan & Mireșan 2018; Polyák *et al*. 2022; Nagy *et al*. 2023).

Barbus petenyi Heckel, 1852
A native, widespread freshwater species, found in rivers in the montane and hill areas, in both intra- and extra-Carpathian drainages: Mureș, Timiș, Olt, Argeș, Ialomița (Bănărescu 1964 [as *B*. *meridionalis petenyi*]; Kotlík *et al*., 2002; Iftime, 2004; Cocan & Mireșan 2018; Nagy *et al*. 2023).

See Iftime 2004 for evidence for reproductive incompatibility for at least *B. balcanicus* and *B. petenyi*. The exact limit between the range of *B. petenyi* (known to occur in the Ialomița—Kotlík *et al*. 2002) and *B. carpathicus* (known to occur in the upper Siret and Prut drainages in Ukraine—Roman 2013; Roman 2015—and doubtlessly occurring in the Romanian drainage of those rivers as well) is unknown; while *B. carpathicus* most likely ranges throughout the Siret and Prut drainages, it is not impossible that *B. petenyi* be found in the lower Siret tributaries (such as the Buzău or Putna).

Fam. Xenocyprididae
Hypophthalmichthys molitrix (Cuvier et Valenciennes, 1844)
A non-native species, found in aquaculture (with occasional escapes) and frequently stocked for commercial fishing; unassisted reproduction was documented in the Danube and its Delta at least in some favourable years, but stocking and escape from farms also occur (Staraș & Oțel 1999; Iftime & Iftime 2021; Jawdhari *et al* 2022; Năstase *et al*. 2022; Năstase & Năvodaru 2023; see also Drăgan *et al*. 2024, who, however, miss the Danube Delta in the given distribution).

Hypophthalmichthys (*Aristichthys*) *nobilis* (Richardson, 1845)
A non-native species, found in aquaculture (with occasional escapes) and frequently stocked for commercial fishing; unassisted reproduction is doubtful, but possible, at least sporadically (Iftime & Iftime 2021; Jawdhari *et al* 2022; Năstase & Năvodaru 2023; see also Drăgan *et al*. 2024, who, however, miss the Danube Delta in the given distribution).

Ctenopharyngodon idella (Cuvier et Valenciennes, 1844)
A non-native species, found in aquaculture (with occasional escapes) and frequently stocked for game and commercial fishing; unassisted reproduction is doubtful, but possible, at least sporadically (Giurcă 1980; Iftime & Iftime 2021; Năstase & Năvodaru 2023; see also Drăgan *et al*. 2024, who, however, miss the Danube Delta in the given distribution).

Fam. Tincidae
Tinca tinca (Linnaeus, 1758)
A native, widespread freshwater species, living in stagnant or slow-flowing water, in plain or hill areas, in both intra- and extra-Carpathian drainages, in and along the Danube and its major tributaries, the Danube Delta and littoral lakes/lagoons (Bănărescu 1964; Oțel 2007; Cocan & Mireșan 2018; Năstase *et al*. 2022; Nagy *et al*. 2023; Năstase & Năvodaru 2023). Has undergone a considerable decline, but has recovered to some extent (Oțel 2007).

Fam. Acheilognathidae
Rhodeus amarus (Bloch, 1782)
A native, widespread freshwater species, living in stagnant or slow-flowing water, in plain or hill areas, in both intra- and extra-Carpathian drainages, in and along the Danube and its major tributaries, the Danube Delta and some littoral lakes/lagoons (Bănărescu 1964 [as a subspecies of *R. sericeus* (Pallas, 1776)]; Oțel 2007; Cocan & Mireșan 2018; Năstase *et al*. 2022; Nagy *et al*. 2023; Năstase & Năvodaru 2023). Bartáková *et al*. (2019) notice several distinct, mtDNA-defined lineages, of which two (not described, however, as distinct species and apparently intergrading as shown by nuclear DNA data) occur in Romania.

Fam. Gobionidae
Gobio gobio (Linnaeus, 1758) (s. l.?)
A native, widespread freshwater species, found in rivers and sometimes in adjacent stagnant waterbodies, from the plain to the low montane level, in intra- and extra-Carpathian waters (Bănărescu 1964 [as *G. gobio obtusirostris*]; Bănărescu 1999a [as *G. gobio gobio*]; Cocan & Mireșan 2018; Nagy *et al*. 2023). *Gobio gobio* sensu Bănărescu 1999a was split into several (putative) species (see Kottelat & Freyhof 2007 for their distribution). Of these, the following live in Romania: *G. gobio* s. str., probably widespread in the extra-Carpathian area, though limited molecular sampling was available (Bulat 2017; Tákacs *et al*. 2021); a widespread intra-Carpathian form ("*Gobio* sp. 1" in Tákacs *et al*. 2021; "*Gobio gobio* sensu lato" in Nagy *et al*. 2023) which is distinct in a mtDNA-informed molecular analysis and may pertain to *G. gobio* s. str. or be a distinct putative species (for which *muresius* Jászfalusi, 1951 may be available) (Tákacs *et al*. 2021); *G. carpathicus* Vladykov, 1925, formerly considered to be more widespread in the Carpathian catchment area but limited in Romania (if present at all) to the the Tisza drainage in the Maramureș area (Cocan & Mireșan 2018; Tákacs *et al*. 2021; Polyák *et al*. 2022; Nagy *et al*. 2023 [giving the Tisza/Maramureș records under "*Gobio gobio* sensu lato"]); and *G. obtusirostris* Valenciennes, 1842, from (at least) the Caraș, Nera and Cerna drainages in the Banat area (Cocan & Mireșan 2018; Tákacs *et al*. 2021; Nagy *et al*. 2023). However, further investigation has shown that the above-mentioned putative *Gobio* species do hybridize in extensive areas (Zangl *et al*. 2020). Treating them (or part of them) together as a "continuum", "*Gobio gobio* sensu lato" (cf. Tákacs *et al*. 2018; Nagy *et al*. 2023), likely corresponding to a single biological species, is probably justified as their genetic distance is small, their diagnosis difficult (Tákacs *et al*. 2022), their mitochondrial and nuclear lineages are quite discrepant (Zangl *et al*. 2020) and their reproductive isolation is not explored.

Romanogobio antipai (Bănărescu, 1953)
A native, localized freshwater rheophilic species, found in the lower Danube and the lower reaches of some of its tributaries (Bănărescu 1964; Bănărescu 1999b [as *Gobio kessleri antipai*]; Nalbant 2003; Bănărescu 2005 [as *Gobio kessleri antipai*]; Oțel 2007; Nowak *et al*. 2009; Cocan & Mireșan 2018; Bogutskaya *et al*. 2019, rediscovering it after a 24-year lapse, do not excude the possibility that *R. antipai* is an ecotype of either *R. kesslerii* or *R. vladykovi*.

Romanogobio carpathorossicus (Vladykov, 1931)
A native, widespread freshwater species, found in rivers from the plain to the low montane level, in intra- and extra-

Carpathian drainages: Tisza, Someș, Crișul Repede, Crișul Alb, Crișul Negru, Mureș, Timiș, Bega, Caraș, Nera, Jiu, Argeș (Bănărescu 1964 [as *Gobio kessleri kessleri, G. k. banaticus* Bănărescu 1960, and intergrades thereof]; Bănărescu 1999b [as *G. k. kessleri*, form *carpathorossicus*, *G. k. banaticus*, and intergrades thereof]; Nalbant,2003 [as *Romanogobio banaticus*]; Cocan & Mireșan 2018 [as *Romanogobio banaticus*]; Friedrich *et al*. 2018 [including *banaticus*]; Bogutskaya *et al*. 2019 [as *R. kesslerii banaticus*]; Polyák *et al*. 2022 [as *R. kesslerii*]; Bănăduc *et al*. 2023c [as *R. banaticus*]; Nagy *et al*. 2023 [as *R. kesslerii*]; Schmid 2023). Schmid (2023) also describes a closely similar form, distinct in a mtDNA-informed molecular analysis, as *Romanogobio* sp. Olt, as it was found in the middle and lower Olt drainage.

Friedrich *et al*. 2018 demonstrate the identity of *R. carpathorossicus* and *R. banaticus* (Bănărescu 1960) with priority for the former name. Some subsequent workers (Polyák *et al*. 2022; Nagy *et al*. 2023) do not separate *R. carpathorossicus* from *R. kesslerii*.

Romanogobio kesslerii (Dybowski, 1862)
A native, widespread freshwater rheophilic species, found in rivers from the plain to the low montane level, in extra-Carpathian drainages: Ialomița, Siret, presumably Prut as well (Bănărescu 1964; Bănărescu 1999b [as *Gobio kessleri kessleri*]; Nalbant 2003; Kottelat & Freyhof 2007; Cocan & Mireșan 2018; Friedrich *et al*. 2018; Schmid 2023).

A caveat for hybridization/intergradation, as in the case of *Gobio* forms, should apply for all these *R. kesslerii*-split taxa/forms above (see Bogutskaya *et al*., 2019 for their extreme morphological closeness; Polyák *et al*. 2022; Nagy *et al*. 2023 for the treatment together of at least *R. carpathorossicus* and *R. kesslerii*).

Romanogobio uranoscopus (Agassiz, 1828)
A native, widespread freshwater species, found in rivers in the montane and hill areas, in both intra- and extra-Carpathian drainages (Bănărescu 1964 [as *Gobio uranoscopus*]; Bănărescu, 2005; Kottelat & Freyhof 2007; Cocan & Mireșan 2018; Polyák *et al*. 2022; Nagy *et al*. 2023).

Romanogobio vladykovi (Fang, 1943)
A native, widespread freshwater species, found in the Danube and its tributary rivers, from the plain to the low montane level, in both intra- and extra-Carpathian waters (Bănărescu 1964; Bănărescu 2005 [as a subspecies of *Gobio albipinnatus* Lukasch, 1933]; Oțel 2007; Cocan & Mireșan 2018; Polyák *et al*. 2022; Nagy *et al*. 2023).

Pseudorasbora parva (Schlegel, 1842)
A non-native freshwater species, accidentally introduced in aquaculture alongside economically valuable species, escaped and now freely reproducing and abundant all over the country in lowland, hill and occasionally lower montane waters (Iftime & Iftime 2021; Drăgan *et al*. 2024).

Fam. Leuciscidae
Abramis brama (Linnaeus, 1758)
A native, widespread fresh- and brackish-water species, living in slow-flowing or stagnant water (including the Razim lagoon), in both intra- and extra-Carpathian drainages (Bănărescu 1964; Oțel 2007; Cocan & Mireșan 2018; Năstase *et al*. 2022; Nagy *et al*. 2023).

Alburnoides cf. *bipunctatus* (Bloch, 1782)
A native, widespread freshwater rheophilic species, found in many rivers from the plains to the montane areas, in both intra- and extra-Carpathian drainages, including the Danube; rare in the Delta (Bănărescu 1964; Bulat *et al*. 2013; Cocan & Mireșan 2018; Nagy *et al*. 2023). According to Stierandová *et al*. (2016) *A. bipunctatus* should be split into several nuclear- and mitochondrial-defined species, of which an unnamed one occurs in southern Romania (Nera, „Mevadica" [Mehadica], Cerna, Gilort, Olt), the rest of the Romanian populations being unassigned; intra-Carpathian ones might conceivably belong to the species retaining the name *A. bipunctatus*.

Alburnus alburnus (Linnaeus, 1758)
A native, widespread fresh- and brackish-water species, living in stagnant or slow-flowing water, in plain or hill

areas, in most waters of both intra- and extra-Carpathian drainages, including the Danube Delta and the Razim lagoon system (Bănărescu 1964; Oțel 2007; Cocan & Mireșan 2018; Năstase *et al*. 2022; Nagy *et al*. 2023).

Alburnus danubicus Antipa, 1909

A native, localized fresh- and brackish-water species, living in flowing or stagnant water in the lower Danube (below the Iron Gates), its Delta, the Razim lagoon system, the Black Sea from the Danube mouths to Agigea, and the Siutghiol littoral lake (Bănărescu 1964 [as *Chalcalburnus chalcoides mento* (Agassiz, 1832)]; Oțel 2007 [as *Chalcalburnus chalcoides* (Güldenstädt, 1772)]; Freyhof & Kottelat 2007 [as both *A. danubicus* and *A. sarmaticus* Freyhof et Kottelat, 2007]; Kottelat & Freyhof 2007 [as both *A. danubicus* and *A. sarmaticus*]; Halasi-Kovács, 2017; Cocan & Mireșan 2018 [as both *A. danubicus* and *A. sarmaticus*]). *Alburnus danubicus* s. str. was considered extinct (Freyhof & Kottelat 2007; Kottelat & Freyhof 2007; Cocan & Mireșan 2018; Stefanov, 2019) and *A. sarmaticus* extremely rare (Oțel 2007; Freyhof & Kottelat 2007; Kottelat & Freyhof 2007; Boltachov 2009; Stefanov & Trickova 2011; Cocan & Mireșan 2018; Stefanov 2019). A sedentary or limited-range potamodromous population was found in the Danube between Tutrakan and Vetren, opposite Călărași county, Romania (Stefanov 2019), and another right below the Porțile de Fier II dam (Bănărescu, pers. comm.); the latter survives as attested by recent catch-and-release records which allowed provisional identification as *A. sarmaticus* (Szilagyi, F., 2021, via Moraru, M. F., Ichthyology of Romania Facebook group; Moraru & Oțel id.; Fig. 1), i.e. *A. danubicus* (see taxonomical discussion below).

FIGURE 1. *Alburnus* cf. *danubicus*, captured (and released), Danube at Gârla Mare, 2021, photo Francisc Szilagyi (used here with permission).

The shemayas (*Alburnus* species, formerly treated as *Chalcalburnus*) are morphologically very similar; however, Freyhof & Kottelat 2007 recognize two distinct lower Danube species (*A. danubicus*, considered extinct, and *A. sarmaticus*, still present and with a wider Pontic distribution). *Alburnus mento*-group shemayas are largely overlapping in diagnostic features (Parin *et al*. 2014; Halasi-Kovács 2017), hence the call for treating all those in the Pontic drainage as a single taxon (Parin *et al*. 2014) despite the possible validity of some Pontic species (Parin

et al., 2014). Later, Halasi-Kovács (2017) argues for the synonymy of *A. sarmaticus* and *A. danubicus*, including a neotype designation for the latter, while in parallel Bogutskaya *et al*. (2017) not only maintain these two species, but describe *A. sava* as distinct from both; however, Harka & Halasi-Kovács (2024) solve the conundrum by treating the Danubian group as represented by two species (*A. danubicus,* which includes *A. sarmaticus*, and the distinct *A. sava*) which we follow here, under the caveat of a fluid taxonomy, as molecular and morphological studies show that the diversity of the shemayas might be overestimated (Bektas *et al*. 2020, Bayçelebi *et al*. 2021).

Ballerus ballerus (Linnaeus, 1758)
A native, widespread fresh- and brackish-water species, living in slow-flowing or stagnant water, in both intra- and extra-Carpathian drainages: Danube above the Delta, Mureș, Prut; formerly also the Criș, Someș, Olt (Bănărescu 1964; Oțel 2007; Cocan & Mireșan 2018; Nagy *et al*. 2023).

Ballerus sapa (Pallas, 1811)
A native, widespread fresh- and brackish-water species, living in slow-flowing water in both intra- and extra-Carpathian drainages: Danube, Mureș, Criș, Someș, Prut; formerly also the Timiș, Siret, Olt and the Razim lagoon (Bănărescu 1964; Oțel 2007; Cocan & Mireșan 2018; Năstase *et al*. 2022; Nagy *et al*. 2023).

Blicca bjoerkna (Linnaeus, 1758)
A native, widespread fresh- and brackish-water species, living in slow-flowing or stagnant water (including the Razim lagoon), in both intra- and extra-Carpathian drainages (Bănărescu 1964; Oțel 2007; Cocan & Mireșan 2018; Năstase *et al*. 2022; Nagy *et al*. 2023).

Chondrostoma nasus (Linnaeus, 1758)
A native, widespread freshwater rheophilic species, found in many rivers from the plains to the lower montane areas, in both intra- and extra-Carpathian drainages, including the Danube; rare in the Delta (Bănărescu 1964; Oțel 2007; Bulat *et al*. 2013; Cocan & Mireșan 2018; Nagy *et al*. 2023).

Leucaspius delineatus (Heckel, 1843)
A native, widespread freshwater species, living in stagnant or slow-flowing water, in plain or hill areas, in both intra- and extra-Carpathian drainages, including the Danube Delta (Bănărescu 1964; Oțel 2007; Cocan & Mireșan 2018; Nagy *et al*. 2023).

Leuciscus aspius (Linnaeus, 1758)
A native, widespread fresh- and brackish-water species, living in both flowing and stagnant water, in both intra- and extra-Carpathian drainages, and even in the sea, at the mouths of the Danube (Bănărescu 1964; Oțel 2007 [as *Aspius aspius*]; Cocan & Mireșan 2018; Năstase *et al*. 2022; Nagy *et al*. 2023).

Leuciscus idus (Linnaeus, 1758)
A native, widespread fresh- and brackish-water species, living in slow-flowing or stagnant water, in both intra- and extra-Carpathian drainages: Danube including its the Delta (and the Razim lagoon), lower course of its main tributaries; nowadays much reduced in range, persisting mainly in the Danube and sporadically in the tributaries: the Mureș, Timiș, Bega and Prut (Bănărescu 1964; Oțel 2007; Cocan & Mireșan 2018; Nagy *et al*. 2023).

Leuciscus leuciscus (Linnaeus, 1758)
A native, widespread but sparsely distributed freshwater species, formerly found in many rivers in the montane and hill areas, in both intra- and extra-Carpathian drainages: Mureș, Olt, Siret, Prut, Someș, Jiu etc., but surviving only in the Tisza, Tur, Crasna, Criș, Bega drainages, the upper Olt, and possibly the Prut, sporadically everywhere (Bănărescu 1964; Bănărescu 2005; Moshu *et al*. 2006; Cocan & Mireșan 2018; Pârvulescu 2018; Togor *et al*. 2022; Nagy *et al*. 2023).

Pelecus cultratus (Linnaeus, 1758)
A native, widespread fresh- and brackish-water species, living in flowing or stagnant water (including the Razim lagoon system), in the Danube and large rivers, both intra- and extra-Carpathian (Bănărescu 1964; Oțel 2007; Cocan & Mireșan 2018); nowadays found in the Danube, the Danube delta (including the Razim lagoon system), the Siret and the Prut (Oțel 2007; Ion *et al*. 2009; Bulat *et al*. 2013; Năstase *et al*. 2022; Năstase & Năvodaru 2023). Not found in recent sampling in Transsylvania (Bănăduc *et al*. 2023b; Nagy *et al*. 2023).

Petroleuciscus borysthenicus (Kessler 1859)
A native, localized freshwater species, living in slow-flowing or stagnant water, in the Danube Delta and the Valea Gurbanului creek, the Neajlov river near its confluence with Valea Gurbanului, in the Comana area, Giurgiu county, (Bănărescu 1964; Crăciun 1996; Meșter *et al*. 2003; Bănărescu 2005; Oțel 2007; Cocan & Mireșan 2018; Năstase *et al*. 2022; Năstase & Năvodaru 2023). One isolated record in the Mureș River (Nalbant 1995) was erroneous (Nalbant, ex verbis). The Comana population was described by Crăciun (1996) (as a sideline upon studying its ethology) as "*Leuciscus borysthenicus* ssp. *celesticus*", which was deformed into "*L. celensis*" by Meșter *et al*. 2003. Nalbant (2003) commented that Crăciun "described the spawning habits of this species, naming it fortuitously *celesticus*. Although his action is not completely in accordance with the ICZN rules, it could represent the first description of this species" and accepted it as *L. celesticus*. While possibly available, *celesticus* is likely not valid (Bănărescu 2005; Oțel 2007), and certainly not so as a distinct species; the morphological features emphasized by Crăciun (1996) for *celesticus* are visible in illustrated specimens from other areas: a darker lateral band (Oțel 2007; Kottelat & Freyhof 2007), a bluish sheen (Bulat 2017), and the intensely red eye is also part of the known variation (Kottelat & Freyhof 2007); a molecular phyletic analysis found the Comana population and the Danube Delta one significantly less different from each other than other conspecific populations treated by the same study (Durand *et al*. 2000).

Rutilus frisii (Nordmann, 1840)
A native, relatively localized brackish-water/anadromous species, living in the north Pontic shallow, freshened marine areas and associated drainages; in Romania, one nineteenth century record from the lower Danube (Nordmann 1840, ap. Antipa 1909), one from the "Danube mouths" in 1939 and one more record (1956) in the Razim lagoon (Leonte & Ruga 1956; Bănărescu 1964; Oțel 2007; Cocan & Mireșan 2018); said to appear sporadically in the Ukrainian part of the Danube Delta (Bănăduc *et al*. 2023a). Archeological Mesolithic records show that the species anciently used to ascend the Danube at least up to the Iron Gates area (Živaljević *et al*. 2017; Bălășescu *et al*. 2022).

Rutilus lacustris (Pallas 1814)
A native, relatively localized brackish-water/anadromous species, living in the northern Pontic shallow, freshened marine areas and associated drainages; in Romania, sporadically found in the sea and the Razim lagoon system, ascending the Danube and probably the Prut (Popescu & Ruga 1956; Bănărescu 1964; Usatâi, 2004; Alexandrov *et al*. 2004; Freyhof & Kottelat 2007; Ion *et al*. 2009; Gheorghe *et al*. 2010; Cocan & Mireșan 2018—all as *R. heckelii* (Nordmann, 1840). Levin *et al*. (2017) showed that *R. heckelii* is a synonym.

Rutilus rutilus (Linnaeus, 1758)
A native, widespread fresh- and brackish-water species, living in slow-flowing or stagnant water (including the Razim lagoon), in both intra- and extra-Carpathian drainages (Bănărescu 1964; Oțel 2007; Cocan & Mireșan 2018; Năstase *et al*. 2022; Nagy *et al*. 2023). Hybridisation between *R. rutilus* and *R. lacustris* is expected to occur in the coastal lakes and the lower Danube (Freyhof, J., pers. comm.).

Rutilus virgo (Heckel, 1852)
A native, relatively localized freshwater species, found in rivers in the montane and hill area, found in the Tur river (Bănărescu 1964; Polyák *et al*. 2022), apparently extending from a contiguous population in the Hungarian sector of the same river (Wilhelm 2008; Sallai & Juhás, 2021; Polyák *et al*. 2022), and was recorded in the Stânca-Costești reservoir, which is common to Romania and the Republic of Moldova, by researchers from the latter country (Bulat *et al*. 2022). It is also mentioned as being currently found in the Danube above the Iron Gates (Živaljević *et al*. 2017) but was not recorded from the Romanian side until 2025 when a specimen was caught at Svinița (Togor, A., 2025, via Ichthyology of Romania Facebook group; Fig. 2).

FIGURE 2. *Rutilus virgo*, breeding male, captured (and released), Danube at Svinița, April 2025, still frame from film by Andrei Togor (used here with permission).

Scardinius erythrophthalmus (Linnaeus, 1758)
A native, widespread fresh- and brackish-water species, living in slow-flowing or stagnant water (including the Razim lagoon), in both intra- and extra-Carpathian drainages (Bănărescu 1964; Oțel 2007; Cocan & Mireșan 2018; Năstase *et al*. 2022; Nagy *et al*. 2023).

Scardinius racovitzai Müller, 1958, a native, endemic putative species of thermal freshwaters, formerly found in the "Ochiul Țiganului" pond on the Pețea (Peța) thermal-fed rivulet in Bihor (Bănărescu 1964 [as *S. erythrophthalmus racovitzai*]; Bănărescu 2002; Bănărescu 2005; Kottelat & Freyhof 2007; Cocan & Mireșan 2018), is nowadays extinct in the wild as the pond dried following thermal water overexploitation, but maintained and propagated in captivity (Müller *et al*. 2018). *Scardinius racovitzai* is less constrained by high temperature than previously believed (Grigoraș *et al*. 2015), and "doesn't form its own separate clade" in a nuclear- and mtDNA-informed phyletic analysis (Popescu *et al*. 2017), and it overlaps in all defining morphological features with *S. erythrophthalmus* (see Bănărescu 1964, Kottelat & Freyhof 2007 and, e.g., Szlachciak & Strachowska 2010 for such features in both species), and is likely a thermal-adapted population of *S. erythrophthalmus* (Müller *et al*. 2018).

Squalius cephalus (Linnaeus, 1758)
A native, widespread freshwater species, found in many rivers from the plains to the lower montane areas, in both intra- and extra-Carpathian drainages, including the Danube (Bănărescu 1964; Oțel 2007; Cocan & Mireșan 2018; Nagy *et al*. 2023).

Telestes souffia (Risso, 1826)
A native, localized freshwater rheophilic species, found in rivers in the montane and hill area, in the Tisza and the drainage of its tributary Vișeu in the Maramureș area (Bănărescu 1964 [as *Leuciscus souffia*]; Bănărescu 2005; Cocan & Mireșan 2018; Curtean-Bănăduc *et al*. 2018; Polyák *et al*. 2022; Nagy *et al*. 2023).

Vimba vimba (Linnaeus, 1758)
A native, widespread fresh- and brackish-water species, living in flowing or stagnant water (including the Razim lagoon system), in the Danube and large rivers, both intra- and extra-Carpathian (Bănărescu 1964; Oțel 2007; Ion *et al*. 2009; Bulat *et al*. 2016; Cocan & Mireșan 2018; Năstase *et al*. 2022; Nagy *et al*. 2023).

Phoxinus marsilii Heckel, 1836
A native, widespread freshwater rheophilic species, found in many rivers (and some associated lakes) in the hill and montane areas, in both intra- and extra-Carpathian drainages (Bănărescu 1964; Cocan & Mireșan 2018; Nagy *et al*. 2023—all as *Phoxinus phoxinus* (Linnaeus, 1758)); isolated populations in the Romanian Plain (Nalbant 1976; Bănărescu & Nalbant 1980—as *P. phoxinus*).

Romanian *Phoxinus* populations were previously attributed to *P. phoxinus*; subsequent splitting has shown that (despite few Romanian material being available for molecular analysis) most Romanian populations probably belong to *P. marsilii*, which is certainly spread in Romanian Transylvania, as well as in nearby Hungary, Ukraine and Moldova (Palandačić *et al*. 2020, Denys *et al*. 2020).

ORD. SILURIFORMES
Fam. Siluridae
Silurus glanis Linnaeus, 1758
A native, widespread freshwater species, living in stagnant or slow-flowing water, in plain or hill areas, in both intra- and extra-Carpathian drainages, in and along the Danube and its major tributaries, the Danube Delta and some littoral lakes/lagoons (Bănărescu 1964; Oțel 2007; Cocan & Mireșan 2018; Năstase *et al*. 2022; Nagy *et al*. 2023).

Fam. Ictaluridae
Ameiurus melas (Rafinesque, 1820)
A non-native freshwater species, spreading from introductions beyond the country, with freely reproducing, self-sustaining and expanding populations, and found in several catchments, both intra- and extra-Carpathian (Iftime & Iftime 2021; Nagy *et al*. 2023; Drăgan *et al*. 2024).

Ameiurus nebulosus (Le Sueur, 1819)
A non-native freshwater species, introduced deliberately and spreading from introductions beyond the country, freely reproducing, self-sustaining populations and found in several catchments, both intra- and extra-Carpathian (Iftime & Iftime 2021; Nagy *et al*. 2023; Drăgan *et al*. 2024).

ORD. SALMONIFORMES
Fam. Esocidae
Esox lucius Linnaeus, 1758
A native, widespread fresh- and brackish-water species living in stagnant or slow-flowing water, in plain or hill areas, in both intra- and extra-Carpathian drainages, in and along the Danube and its major tributaries, the Danube Delta and some littoral lakes/lagoons (Bănărescu 1964; Oțel 2007; Cocan & Mireșan 2018; Năstase *et al*. 2022; Nagy *et al*. 2023; Năstase & Năvodaru 2023).

Fam. Umbridae
Umbra krameri Walbaum, 1792
A native, localized freshwater species, living in stagnant or slow-flowing water, in plain or low hill areas, it was found in both intra- and extra-Carpathian areas: various areas of the Danube Delta and the Razim lagoon system (Tulcea county), the Eced marshes (now extinct here), ponds at Urziceni (old records) and the Homorodu Vechi river (Satu-Mare county), Ier River and its backwaters at Săcuieni, Cherechiu, Cadea, Ciocaia, Simian and Resighea, Ieru Morii

and Rât creeks, creeks at Curtuișeni and Scărișoara Nouă (Bihor county—with severe range reduction in the area), Timișul Mort at Obad (Timiș county), ponds at Izvoarele, Plosca and Cătane (Mehedinți county—old records), the Jieț River and its canals/backwaters at Căciulătești, Sadova, Ostroveni, Rojiște/Tâmburești (Dolj county), Țigănești and Cerveni (Teleorman county—old records), ponds at Crânguri (old records), Comana pond and Gurbanu creek (Giurgiu county), Tânganu creek, Colentina river and its ponds/lakes near Bucharest (Ilfov county—old records), ponds at Vasilați, Gălbinași and Frăsinet (Călărași county—old records), Cristești pond near Iași (now extirpated) and possibly near Pașcani (uncertain data) and in the Teiva pond, where reintroduced from the Republic of Moldova where it still occurs in backwaters of the Prut (Iași county) (Bănărescu 1964; Bănărescu *et al*. 1995; Wilhelm 1998; Wilhelm *et al*. 2002; Bănărescu 2005; Oțel 2007; Davideanu 2008; Telcean *et al*. 2014; Covaciu-Marcov *et al*. 2018; Cocan & Mireșan 2018; Năstase *et al*. 2022; Lațiu *et al*. 2023; Nagy *et al*. 2023; Năstase & Năvodaru 2023). An environmental DNA study claimed detection of this species' presence in the lower Danube and the lower Argeș in Romania (Pont *et al*. 2021).

Fam. Coregonidae

Coregonus ladogae Pravdin, Golubev et Belyaeva, 1938

A non-native freshwater species, deliberately introduced and grown in aquaculture, also introduced in a few montane lakes and reservoirs (Lake Roșu, the Bicaz reservoir and a dam lake in Harghita county, Eastern Carpathians; Vidraru and Vidra reservoirs, Southern Carpathians; Făerag Lake, Western Carpathians); it is unclear whether it survives to this day (Iftime & Iftime 2021, and sources quoted therein).

Coregonus maraenoides Polyakov, 1874

A non-native freshwater species, deliberately introduced (see Bănărescu, 1964 for its Lake Peipsi origin) and grown in aquaculture, also introduced in a few montane lakes and reservoirs (same as the previous species); it is unclear whether it survives, it certainly did so until 2010 in Vidraru lake (Iftime & Iftime 2021, and sources quoted therein).

An undetermined *Coregonus* species, most likely one of the two above, still occurs in the Tarnița reservoir area (Nagy *et al*. 2023). The long-time persistence of such populations (Vidraru, Tarnița) likely implies reproduction.

Fam. Thymallidae

Thymallus thymallus (Linnaeus, 1758)

A native freshwater species, found in large mountain rivers, formerly across much of the Romanian Carpathian range; nowadays the range has contracted, but reintroduction has also taken place (Bănărescu 1964; Bănărescu 2005; Cocan & Mireșan 2018; Polyák *et al*. 2022; Nagy *et al*. 2023).

Fam. Salmonidae

Hucho hucho (Linnaeus, 1758)

A native freshwater species, found in large mountain rivers, formerly across much of the Romanian Carpathian range, including the Danube in the Iron Gates area; nowadays very much reduced, native populations still persist in the Maramureș area (Tisza, Vișeu, Vaser, Ruscova and Frumușeaua rivers); many attempts at reintroduction have been made, but apparently with success only in the upper Mureș area (Bănărescu 1964; Bănărescu 2005; Cocan & Mireșan 2018; Curtean-Bănăduc *et al*. 2019; Nagy *et al*. 2023). Not found by Polyák *et al*. 2022 in their sampling of the Tisza catchment, which included all Maramureș rivers listed above.

Oncorhynchus mykiss (Walbaum, 1792)

A non-native freshwater/anadromous species, deliberately introduced and widely grown in aquaculture and stocked in montane rivers and lakes (Iftime & Iftime 2021; Nagy *et al*. 2023; Drăgan *et al*. 2024). There is local evidence that it has established self-sustaining populations. In northern Romania a population has persisted for about 60 years without any additional stocking (Ardelean & Beres 2000). Juveniles were also found in the upper Lotru River catchment (Southern Carpathians), without stocking (Lucan C. 2023) In recent years, adult specimens have been sporadically recorded in the Romanian waters of the Black Sea, probably escaped from aquaculture practiced by the countries bordering the Black Sea coasts (V. Oțel obs.). There are experiments to grow it in seawater in Romania as well (Nenciu *et al*. 2022).

Salmo trutta Linnaeus, 1758
A native freshwater/anadromous species, found in mountain rivers and lakes in the whole Romanian Carpathian range (Bănărescu 1964; Kottelat & Freyhof 2007; Cocan & Mireșan 2018; Nagy *et al*. 2023); and along all Romanian Black Sea waters and ascending the Danube (as the anadromous morph, often treated as *Salmo labrax* Pallas, 1811: Bănărescu 1969 [as *Salmo trutta labrax*]; Bănărescu 2005; Oțel 2007; Radu *et al*. 2008; Yankova *et al*. 2014; Cocan & Mireșan 2018; Lațiu *et al*. 2020; Niță *et al*. 2022; Năstase & Năvodaru 2023 [all as *Salmo labrax*]). Freshwater potamodromous forms attributed to *S. labrax* were described from an intra-Carpathian drainage (Beliș-Fântânele dam lake, Someșul Cald river) (Lațiu *et al*. 2020); however, Nagy *et al*. 2023 only found *S. trutta* in intra-Carpathian areas.

Various relocations of native stocks and introduction of *S. trutta* stocks from Central/Western Europe have occurred (Decei 1981; Popa *et al*. 2009—documenting the presence of Atlantic-lineage *S. trutta*; Škraba Jurlina *et al*, 2020 and quoted literature—documenting the same in the Iron Gates dam lake, opposite the Romanian shore). Kottelat & Freyhof 2007 admit both *S. trutta* and *S. labrax* for Romania. The two lineages hybridise both naturally and as a result of translocation (see, e.g., the discussions in Škraba Jurlina *et al*. 2020; Hashemzadeh Segherloo *et al*. 2021; Guinand *et al*. 2021; Lerceteau-Köhler *et al*. 2013; Englmaier *et al*. 2024 on this conundrum) leading to genetic homogenization/co-occurence. This, together with genetic structure (at least in some analyses, anadromous *S. labrax* appears closer to anadromous *S. trutta* than to montane freshwater *S. trutta*—Dudu *et al*. 2011, on Romanian samples; in other analyses it is vice versa—e.g. Kalayci *et al*. 2018), therefore, pending additional data, we group them as *S. trutta* (cf., e.g., Vasil'eva 2007; Parin *et al*. 2014; Kalayci *et al.* 2018; Nagy *et al*. 2023).

Salvelinus fontinalis (Mitchill, 1815)
A non-native freshwater species, deliberately introduced and grown in aquaculture and stocked in montane rivers; Bănărescu (1964) suggests it does reproduce independently in rivers, and it is locally persistent over long periods (Iftime & Iftime 2021 and sources quoted therein; Nagy *et al*. 2023; Drăgan *et al*. 2024).

ORD. ZEIFORMES
Fam. Zeidae
Zeus faber Linnaeus, 1758
A marine species, native to the Black Sea, but only rarely found in Romanian waters (Cărăușu 1952; Bănărescu 1964 [as both *Z. faber* and its synonym *Z. pungio* Cuvier, 1829—see Fricke *et al*. 2025]; Vasil'eva 2007; Radu *et al*. 2008; Cocan & Mireșan 2018).

ORD. GADIFORMES
Fam. Gaidropsaridae
Gaidropsarus mediterraneus (Linnaeus, 1758)
A native marine species, found in the whole of the Romanian Black Sea waters (Bănărescu 1964; Abaza *et al*. 2005; Oțel 2007; Radu *et al*. 2008; Maximov & Zaharia 2010; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Niță *et al*. 2022).

Fam. Lotidae
Lota lota (Linnaeus, 1758)
A native, widespread freshwater species living in large, cold rivers (and rarely associated lakes), from the mouths of the Danube to the montane areas. Nowadays much restricted in range, it is still to be found in the Danube (and Delta), the upper Mureș and upper Olt, the Tisza and Tur, the Timiș, and possibly the Putna and Bega (Bănărescu 1964; Bănărescu 2005; Oțel 2007; Cocan & Mireșan 2018; Polyák *et al*. 2022; Nagy *et al*. 2023; Năstase & Năvodaru 2023); reintroduced to Crișul Repede (Togor *et al*. 2022).

Fam. Gadidae
Merlangius merlangus (Linnaeus, 1758)
A native marine species, found along all Romanian Black Sea waters (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Maximov & Zaharia 2010;Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Maximov *et al*. 2019; Niță *et al*. 2022).

ORD. OPHIDIIFORMES
Fam. Ophidiidae
Ophidion rochei Muller, 1845
A native marine species, formerly found along all Romanian Black Sea waters but nowadays restricted to the southern areas; quite rare (Bănărescu 1964; Abaza *et al*. 2005; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Maximov & Zaharia 2010; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Niță *et al*. 2022).

ORD. GOBIIFORMES
Fam. Odontobutidae
Perccottus glenii Dybowsky, 1877
A non-native freshwater species (which can, however, occasionally adapt to brackish water), spread into Romania from introductions beyond the country, now freely reproducing and abundant in numerous drainages all over the country, including the Danube and Delta (Iftime & Iftime 2021; Drăgan *et al*. 2024).

Fam. Oxudercidae
Knipowitschia caucasica (Berg, 1916)
A native euryhaline species, found in the Danube Delta, including the Razim lagoon complex, sporadically in Romanian Black Sea waters (Danube Delta area, near Tăbăcărie-Constanța), the littoral lake Tașaul, as well as along the Danube at Jijila lake and at Dervent (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Yankova *et al*. 2014; Cocan & Mireșan 2018; Năstase *et al*. 2022; Năstase & Năvodaru 2023). *Knipowitschia cameliae* Nalbant et Oțel, 1995 is a synonym (Iftime & Oțel 2021).

Knipowitschia longecaudata (Kessler, 1877)
A native brackish-water species, found in the Danube mouth area at Sulina, as well as in the Sinoe area in the Razim lagoon complex (Bănărescu 1964; Vasil'eva 2007; Kottelat & Freyhof 2007; Cocan & Mireșan 2018; Buhaciuc-Ioniță, unpublished [2021 record from Periboina, Sinoe area, Oțel id.]).

Pomatoschistus marmoratus (Risso, 1810)
A native marine/euryhaline species, formerly found along all Romanian Black Sea waters and numerous littoral lakes, including the Razim lagoon complex (Bănărescu 1964 [as *P. microps leopardinus* (Nordmann, 1840)]); nowadays absent in the Razim complex and likely restricted to the sea (Oțel 2007; Vasil'eva 2007; Maximov & Zaharia 2010 [as *P. microps leopardinus*]; Yankova *et al*. 2014; Țoțoiu *et al*. 2018 [as *P. microps leopardinus*]; Cocan & Mireșan 2018; Niță *et al*. 2022).

Pomatoschistus minutus (Pallas, 1767)
A native marine species, rarely found along the Romanian Black Sea waters; claimed to occur all along (Bănărescu 1964; Vasil'eva 2007; Maximov & Zaharia 2010; Yankova *et al*. 2014; Niță *et al*. 2022), but a quite rare species, being absent in the Danube Delta marine sector (not recorded in the data of Oțel 2007); the specimens in the collection of the "Grigore Antipa" National Museum of Natural History, previously determined as pertaining to this species, were in fact *P. marmoratus*. Found in neighbouring waters of Ukraine (Manilo 2020) and Bulgaria (Vasilev *et al*. 2012); one specimen photographed underwater by us at Mangalia can be identified, at least provisionally (cf. Kovačić *et al*. 2022) as *P. minutus* (Fig. 3—as compared with *P. marmoratus*).

Fam. Gobiidae
Aphia minuta (Risso, 1810)
A native marine species, found along all Romanian Black Sea waters (Bănărescu 1964; Abaza *et al*. 2005; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Yankova *et al*. 2014; Cocan & Mireșan 2018; Niță *et al*. 2022).

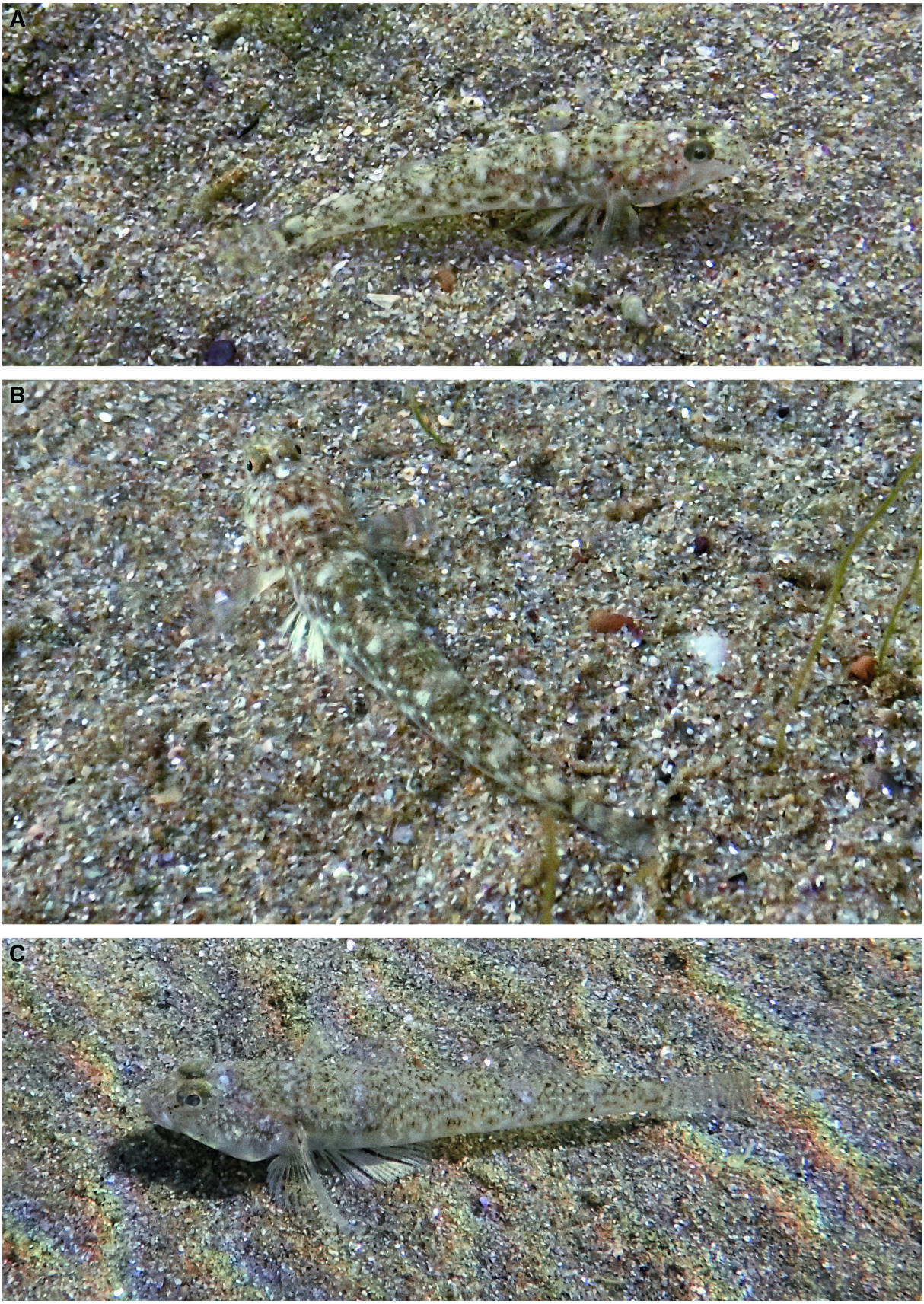

FIGURE 3. *Pomatoschistus minutus*, photographed underwater at Mangalia, Black Sea, 2023, photo Al. Iftime. A: lateral view, showing snout longer than eye diameter, T-shaped blotch on caudal fin base; B: dorsal view of the same specimen, showing (barely visible) scalation before the first dorsal; C: *P. marmoratus*, same location and year, photo Al. Iftime, showing eye diameter larger than snout length, dark chin patch.

Babka gymnotrachelus (Kessler, 1857)
A native fresh- and brackish-water species, found along the Danube and its tributaries (especially in eastern Romania, but also in intra-Carpathian waters), as well as in all the Delta and the Razim complex, and in the sea in freshened areas such as the Danube mouths (Bănărescu 1964; Moshu *et al*. 2006; Oțel 2007; Vasil'eva 2007; Kottelat & Freyhof 2007; Radu *et al*. 2008; Vasilev *et al*. 2012; Roche *et al*. 2013; Yankova *et al*. 2014; Cocan *et al*. 2016a; Năstase *et al*. 2022).

Benthophiloides brauneri Beling et Iljin, 1927
A native, fresh- and brackish-water species, found in the lower Danube and its Delta (Bănărescu 1964; Bănărescu 2005; Oțel 2007; Vasil'eva 2007; Kottelat & Freyhof 2007; Cocan & Mireșan 2018); mentions in the southern Black Sea waters of Romania (Nicolaev *et al*. 2004; Yankova *et al*. 2014) may be explained by the presence of the species in the Shabla-Ezerets coastal lake of Bulgaria (Vasilev *et al*. 2012), whence specimens may have dispersed. A recent record of this species in the Danube, made from the Bulgarian side, pertains to common river waters marking the boundary with Romania (Stefanov & Kutsarov 2018); an environmental DNA study claimed detection of this species' presence in the lower Danube and the lower Prut in Romania (Pont *et al*. 2021).

Benthophilus nudus Berg, 1898
A native euryhaline species, found along all Romanian Black Sea waters, the Danube up to the Iron Gates area, as well as in all the Delta and the Razim complex and possibly the Prut river (Bănărescu 1964 [as *B. stellatus*]; Moshu *et al*. 2006 [as *B. stellatus*]; Oțel 2007 [as *B. stellatus*]; Vasil'eva 2007 [as *B. stellatus*]; Kottelat & Freyhof 2007; Maximov & Zaharia 2010 [as *B. stellatus*]; Vasilev *et al*., 2012 [as *B. stellatus*]; Cocan & Mireșan 2018 [as both *B. nudus* and *B. stellatus*]; Manilo 2020).

Caspiosoma caspium (Kessler, 1877)
A native marine/fresh- and brackish-water species, sporadically found in fresh and marine waters of Romania (Nalbant 2003; Maximov & Zaharia 2010; Cocan & Mireșan 2018), most likely near the Danube Delta, for it was also found from the Ukrainian side in common border waters in the Danube Delta area (Smirnov 2009). However, it was "not recorded in waterbodies of Ukraine in the last few years" (Manilo, 2020) (although it was found in 2021 in the lower Dniester in the Republic of Moldova—Bulat *et al*. 2021).

Gobius cobitis Pallas, 1811
A native marine species, sporadically found in Romanian Black Sea waters (Cărăușu, 1952 [uncertain record]; Miller, 1986; Nicolaev *et al*., 2004; Vasil'eva 2007; Maximov & Zaharia 2010; Yankova *et al*. 2014; Niță *et al*. 2022). A recent photographic record for the Romanian littoral between the Jupiter and Neptun resorts (43.859655 N, 28.607688 E) (Petreanu, 2022, via Ichthyology of Romania Facebook group; Dounis id.; Fig. 4).

Gobius niger Linnaeus, 1758
A native marine species, found along all Romanian Black Sea waters (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Maximov & Zaharia 2010; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Niță *et al*. 2022).

Gobius ophiocephalus Pallas, 1811
A native marine species, formerly found along all Romanian Black Sea waters and in the Razim lagoon complex (Bănărescu 1964); nowadays only sporadically in the southern waters (Bănărescu, 2005 [as *Zosterisessor ophiocephalus*]; Oțel 2007 [as *Zosterisessor ophiocephalus*]; Vasil'eva 2007; Radu *et al*. 2008 [as *Zosterisessor ophiocephalus*]; Cocan & Mireșan 2018 [as *Zosterisessor ophiocephalus*]). Micu & Todorova 2007 found it in dives in an area including both Bulgarian and Romanian waters, but do not precisely mention where.

Gobius paganellus Linnaeus, 1758
A native marine species, rarely found in Romanian Black Sea waters, especially in the southern areas (Miller 1986; Nicolaev *et al*. 2004; Yankova *et al*. 2014; Cocan & Mireșan 2018). Ukrainian records around Snake Island (cf. Manilo 2020 and quoted sources) are subject to caution (Parin *et al*. 2014), therefore one should be careful of extrapolating the species' presence in adjacent Romanian waters; Micu & Todorova, 2007 found it in dives in an

area including both Bulgarian and Romanian waters, but do not precisely mention where; Vasilev *et al*. 2012 give its Bulgarian distribution as extending right up to the Romanian border. Photographed by us underwater at Mangalia (Fig. 5).

FIGURE 4. *Gobius cobitis*, Jupiter/Neptun, Black Sea, 2022, photo C. Petreanu (used here with permission).

Mesogobius batrachocephalus (Pallas, 1811)
A native marine/euryhaline species, formerly found along all Romanian Black Sea waters, as well as in the Razim complex and in the Siutghiol littoral lake; nowadays absent in Siutghiol, Razim and the coastal marine waters of the Delta (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Kottelat & Freyhof 2007; Maximov & Zaharia 2010; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Maximov *et al*. 2019; Năstase *et al*. 2022; Niță *et al*. 2022).

Neogobius fluviatilis (Pallas, 1811)
A native fresh- and brackish-water species, found along the Danube and some of its tributaries (up to intra-Carpathian areas), as well as in all the Delta, Razim complex and some littoral lakes, and in the sea in freshened areas such as the Danube mouths (Bănărescu 1964; Moshu *et al*. 2006; Oțel 2007; Vasil'eva 2007; Kottelat & Freyhof 2007; Vasilev *et al*. 2012; Roche *et al*. 2013; Yankova *et al*. 2014; Cocan *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Năstase *et al*. 2022; Polyák *et al*. 2022; Nagy *et al*. 2023).

FIGURE 5. *Gobius paganellus*, photographed underwater at Mangalia, Black Sea, 2015, photo Al. Iftime.

Neogobius melanostomus (Pallas, 1811)
A native euryhaline species, found along all Romanian Black Sea waters and along the Danube and its tributaries (up to intra-Carpathian areas), as well as in all the Delta, Razim complex and littoral lakes (Bănărescu 1964; Moshu *et al*. 2006; Oțel 2007; Vasil'eva 2007; Kottelat & Freyhof 2007; Radu *et al*. 2008; Maximov & Zaharia 2010; Vasilev *et al*. 2012; Roche *et al*. 2013; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Năstase *et al*. 2022; Niță *et al*. 2022; Nagy *et al*. 2023).

Ponticola cephalargoides (Pinchuk, 1976)
A native marine species, found along all Romanian Black Sea waters (Borcea 1934 [part of *Gobius cephalarges* (non) Pallas, 1814; figs. 18, 19 and 20 on plate III depict this species—Manilo 2014]; Miller 1986; Pinchuk *et al*. 2003; Vasil'eva 2007; Vasilev *et al*. 2012; Yankova *et al*. 2014; Cocan & Mireșan 2018; Manilo 2020). Has declined in some areas of the Black Sea (Pinchuk *et al*. 2003) and appears to be rare in Romanian waters. Photographed by us underwater at Mangalia (Fig. 6).

Ponticola eurycephalus (Kessler, 1874)
A native marine/euryhaline species, found rarely along all Romanian Black Sea waters and more frequently in the Danube arms and in all the Delta, including the Razim complex (Borcea 1934 [part of *Gobius cephalarges* (non) Pallas, 1814; fig. 27 at p. 69, reproduced by Bănărescu 1964, fig. 373 at p. 842, depicts this species—Manilo 2014]; Miller 1986; Oțel *et al*. 1994; Oțel 2007; Vasil'eva 2007; Kottelat & Freyhof 2007; Vasilev *et al*. 2012; Yankova *et al*. 2014; Cocan & Mireșan 2018; Manilo 2020; Năstase *et al*. 2022). Photographed by us underwater at Mangalia (Fig. 7).

FIGURE 6. *Ponticola cephalargoides*, male with darkened coloration, photographed underwater at Mangalia, Black Sea, 2015, photo Al. Iftime.

Ponticola kessleri (Gunther, 1861)
A native fresh- and brackish-water species, found along the Danube and its tributaries, as well as in all the Delta and the Razim complex, and in the sea in freshened areas such as the Danube mouths (Bănărescu 1964; Moshu *et al*. 2006; Oțel 2007; Vasil'eva 2007; Kottelat & Freyhof 2007; Radu *et al*. 2008; Vasilev *et al*., 2012; Roche *et al*. 2013; Yankova *et al*. 2014; Cocan & Mireșan 2018; Năstase *et al*. 2022).

Ponticola ratan (Nordmann, 1840)
A native marine/brackish-water species, sporadically found in Romanian Black Sea waters, especially in the northern areas, adjacent to the Danube Delta (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Maximov & Zaharia 2010; Yankova *et al*. 2014; Cocan *et al*. 2016b; Cocan & Mireșan 2018).

Ponticola syrman (Nordmann, 1840)
A native brackish-water species, found in the Razim lagoon complex and in the sea in freshened areas such as the Danube mouths (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Kottelat & Freyhof 2007; Yankova *et al*. 2014; Cocan & Mireșan 2018; Năstase *et al*., 2022).

Proterorhinus marmoratus (Pallas, 1811)
A native marine/brackish-water species, found along all Romanian Black Sea waters as well as in some littoral lakes (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Manilo, 2020; Cocan & Mireșan 2018; Niță *et al*. 2022). Disappeared (or very rare) in Romanian Black Sea waters with the destruction of the *Zostera* beds (Oțel 2007).

FIGURE 7. *Ponticola eurycephalus*, photographed underwater at Mangalia, Black Sea, 2015, photo Al. Iftime.

Proterorhinus semilunaris (Heckel, 1837)
A native fresh- and brackish-water species, found along along the Danube and its tributaries (up to intra-Carpathian areas), as well as in all the Delta and the Razim complex and in some inland wetlands (Bănărescu 1964 [as part of *P. marmoratus*]; Moshu *et al*. 2006 [as part of *P. marmoratus*]; Oțel 2007 [as part of *P. marmoratus*]; Kottelat & Freyhof 2007; Roche *et al*. 2013; Cocan & Mireșan 2018 [as both part of *P. marmoratus* and as *P. semilunaris*]; Manilo 2020; Năstase *et al*. 2022 [as *P. marmoratus*]; Nagy *et al*. 2023).

The mtDNA-informed split between the mainly marine *P. marmoratus* and the fresh- and brackish-water *P. semilunaris* (Stepien & Tumeo 2006; Kottelat & Freyhof 2007; Sorokin *et al*. 2011; Slynko *et al*. 2013) allows purely marine Romanian populations to be attributed to *P. marmoratus*, while fresh- and brackish-water ones to *P. semilunaris* (Kottelat & Freyhof 2007; Manilo 2020), though actual genetic sampling of Romanian populations was minimal.

ORD. SYNGNATHIFORMES
Fam. Mullidae
Mullus barbatus Linnaeus, 1758
A native marine species, found along all Romanian Black Sea waters (Bănărescu 1964); recently apparently not found in the Danube mouths area (Oțel 2007; Vasil'eva 2007; Maximov & Zaharia 2010; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Maximov *et al*. 2019; Niță *et al*. 2022).

The Pontic population is sometimes treated as a full species, *Mullus ponticus* Essipov, 1927 (Echreshavi *et al*. 2022) or as *Mullus barbatus*, with *ponticus* as a subspecies thereof (Uiblein *et al*. 2024).

Mullus surmuletus Linnaeus, 1758
A native marine species, found in southern Romanian Black Sea waters (Micu & Todorova 2007; Maximov & Zaharia 2010; Cocan & Mireșan 2018; Niță *et al*. 2022).

Fam. Callionymidae
Callionymus lyra Linnaeus, 1758
A native marine species, found (probably sporadically) in the Romanian Black Sea waters (Fricke, 1986); it is recorded from the 2 Mai-Vama Veche Marine Reserve (Maximov & Zaharia 2010; Niță *et al*. 2012; Niță *et al*. 2022).

Callionymus pusillus Delaroche, 1809
A native marine species, found in the southern Romanian Black Sea waters (Bănărescu 1964 [as *C. festivus* Pallas, 1811]; Abaza *et al*. 2005; Vasil'eva 2007; Oțel 2007; Radu *et al*. 2008; Maximov & Zaharia 2010; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Niță *et al*. 2022).

Callionymus risso Le Sueur, 1814
A native marine species, found along all Romanian Black Sea waters (Bănărescu 1964 [as *C. belenus* Risso, 1826]; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Maximov & Zaharia 2010; Yankova *et al*. 2014; Cocan & Mireșan 2018; Niță *et al*. 2022).

Fam. Syngnathidae
Nerophis ophidion (Linnaeus, 1758)
A native marine species, formerly found along all Romanian Black Sea waters (nowadays only along the southern waters) (Bănărescu 1964; Abaza *et al*. 2005; Oțel 2007; Vasil'eva 2007; Yankova *et al*. 2014; Cocan & Mireșan 2018; Niță *et al*. 2022).

Hippocampus guttulatus Cuvier, 1829
A native marine species, formerly found along all Romanian Black Sea waters (Bănărescu 1964); nowadays only along the southern waters and in the Portița area (Abaza *et al*. 2005; Oțel 2007; Vasil'eva 2007 [as *H. hippocampus,* but see own synonymy list and discussion in Iftime, 2023]; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Niță *et al*. 2022; Iftime 2023). Yankova *et al*. 2014 only list *H. hippocampus* for the Black Sea (including Romania); as the more common seahorse in the Black Sea is the long-snouted seahorse *H. guttulatus*, and given the rarity of *H. hippocampus* proper (the short-snouted seahorse) in the Black Sea and the frequent taxonomic confusions (see the discussion in Iftime 2023), the paper certainly means *H. guttulatus* by this.

Hippocampus hippocampus (Linnaeus, 1758)
A native marine species, recorded from a sample taken in the 1980s in the marine Danube Delta area (Iftime 2023). Also mentioned by Dawson 1986 for the whole of the Pontic basin, but see discussion in Iftime 2023.

Syngnathus abaster Risso, 1826
A native euryhaline species, found along all Romanian Black Sea waters, the Razim-Sinoe lagoon, littoral lakes, the Danube Delta and along the Danube (all its Romanian course) and Prut rivers (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Yankova *et al*. 2014; Cocan & Mireșan 2018; Smederevac-Lalić *et al*. 2019; Năstase *et al*. 2022).

Syngnathus schmidti Popov, 1928
A native marine species, formerly found along all Romanian Black Sea waters (Bănărescu 1964), nowadays rare, not found in recent years in the Danube Delta area (Oțel 2007; Vasil'eva 2007; Cocan & Mireșan 2018; Niță *et al*. 2022).

Syngnathus tenuirostris Rathke, 1837
A native marine species, formerly found along all Romanian Black Sea waters (Bănărescu 1964); nowadays only

along southern waters and in the Portița area (Abaza *et al*. 2005; Oțel 2007; Vasil'eva 2007; Yankova *et al*. 2014; Cocan & Mireșan 2018; Niță *et al*. 2022).

Syngnathus typhle Linnaeus, 1758
A native marine species, formerly found along all Romanian Black Sea waters and in the Razim-Sinoe lagoon system (Bănărescu 1964); nowadays only along the southern waters and in the Portița area (Abaza *et al*. 2005; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Niță *et al*. 2022).

Syngnathus variegatus Pallas, 1811
A native marine species, formerly found along all Romanian Black Sea waters (Bănărescu 1964); nowadays only along the southern waters (Oțel 2007; Vasil'eva 2007; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Niță *et al*. 2022).

ORD. SCOMBRIFORMES
Fam. Pomatomidae
Pomatomus saltatrix (Linnaeus, 1758)
A native marine species, found along most of the Romanian Black Sea waters, except for the Danube mouths area (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Yankova *et al*. 2014; Cocan & Mireșan 2018; Maximov *et al*., 2019; Niță *et al*. 2022).

Fam. Scombridae
Sarda sarda (Bloch, 1793)
A native, marine species, formerly found along all Romanian coast (Bănărescu 1964), but the migrating stock has limited itself to southern (Turkish and Bulgarian) Black Sea waters since the 1970s; gradually, after 2000, the species has reappared in Romanian waters (Oțel 2007; Vasil'eva 2007; Yankova *et al*. 2014; Yankova, 2015; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Niță *et al*. 2022), but after a partial recovery is now again on the decrease because of pollution in the NW Black Sea, dense shipping traffic and overfishing (Rădulescu 2023).

Scomber colias Gmelin, 1789
A native, marine species, sporadically found along the southern Romanian coast (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008 [as *S. japonicus* Houttuyn, 1782, of which *S. colias* was transiently considered a synonym—see Parin *et al*. 2014]; Yankova *et al*. 2014 [as *S. japonicus*]).

Scomber scombrus Linnaeus, 1758
A native marine species, formerly found along all Romanian coast (Bănărescu 1964), but the stock that used to migrate in the Black Sea collapsed in the 1970s, nowadays the species is found only sporadically (Oțel 2007; Vasil'eva 2007; Yankova *et al*. 2014; Cocan & Mireșan 2018; Boltachev & Karpova 2019; Niță *et al*. 2022).

Thunnus thynnus (Linnaeus, 1758)
A native, marine species, formerly found sporadically offshore in Romanian waters (Cărăușu, 1952; Bănărescu 1964; Vasil'eva 2007; Oțel 2007; Cocan & Mireșan 2018), but the population that used to migrate into the Black Sea vanished in the 1980s (MacKenzie & Mariani 2012).

ORD. ANABANTIFORMES
Fam. Osphronemidae
Subfam. Macropodusinae
Macropodus opercularis (Linnaeus, 1758)
A non-native freshwater species, released into thermal waters (Băile Felix and Pețea, Bihor county) from aquaria; there are indications of reproduction and multi-year persistence in Băile Felix (Iftime & Iftime 2021, and literature quoted therein).

Subfam. Trichogastrinae
Trichopodus trichopterus (Pallas, 1770)
A non-native freshwater species, released into thermal waters (Băile Felix and Peța, Bihor county) from aquaria; there are indications of reproduction and multi-year persistence in Băile Felix (Iftime & Iftime 2021, and literature quoted therein).

ORD. CARANGIFORMES
Fam. Scophthalmidae
Scophthalmus maeoticus (Pallas, 1814)
A native marine species, found along all Romanian Black Sea waters (Bănărescu 1964; Oțel 2007 [as *Psetta maeotica*]; Vasil'eva 2007; Radu *et al*. 2008 [as *Psetta maxima maeotica*]; Maximov & Zaharia 2010 [as *Psetta maxima maeotica*]; Yankova *et al*. 2014 [as both *Psetta maxima* and *Scophthalmus maeoticus*]; Țoțoiu *et al*. 2018 [as *Psetta maxima*]; Cocan & Mireșan 2018; Maximov *et al*. 2019 [as *Psetta maxima maeotica*]; Niță *et al*. 2022).

Scophthalmus rhombus (Linnaeus, 1758)
A native marine species, found sporadically in Romanian Black Sea waters (Bănărescu 1964; Vasil'eva 2007; Oțel 2007; Radu *et al*. 2008; Yankova *et al*. 2014; Cocan & Mireșan 2018).

Fam. Pleuronectidae
Subfam. Pleuronectinae
Platichthys flesus (Linnaeus, 1758)
A native marine/euryhaline species, found along all Romanian Black Sea waters; formerly also in all Razim lagoon complex and in the Siutghiol littoral lake (Bănărescu 1964 [as *Pleuronectes flesus*]); nowadays only in the Sinoe lagoon; also found (till today) in the Roșuleț freshwater lake in the Danube Delta (Oțel 2007; Radu *et al*. 2008; Maximov & Zaharia 2010; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Niță *et al*. 2022).

Fam. Soleidae
Pegusa nasuta (Pallas, 1811)
A native marine species, found along all Romanian Black Sea waters (Bănărescu 1964 [as *Solea lascaris*]; Oțel 2007 [as *Pegusa lascaris*]; Vasil'eva 2007; Maximov & Zaharia 2010 [as *Solea nasuta*]; Cocan & Mireșan 2018 [as both *Pegusa lascaris* and *P. nasuta*]; Niță *et al*. 2022 [as *Pegusa lascaris*]).

Morphometric data given by Cărăușu (1952), Bănărescu (1964) and Oțel (2007) from Romanian material allow identification of Romanian *Pegusa* as *P. nasuta* (as opposed to *P. lascaris*) following the criteria of Chanet *et al*. (2011).

Solea solea (Linnaeus, 1758)
A native marine species, found sporadically in Romanian Black Sea waters, especially southern ones (Nicolaev *et al*. 2004 [as *Solea vulgaris*]; Maximov & Zaharia 2010 [as *Solea vulgaris*]; Cocan & Mireșan 2018).

Fam. Sphyraenidae
Sphyraena sphyraena (Linnaeus, 1758)
A native marine species, very rarely found in the Romanian Black Sea waters (Bănărescu 1964; Vasil'eva 2007; Radu *et al*. 2008; Yankova *et al*. 2014).

Fam. Xiphiidae
Xiphias gladius Linnaeus, 1758
A native marine species, formerly found sporadically in Romanian Black Sea waters (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Yankova *et al*. 2014; Cocan & Mireșan 2018), but the population that used to migrate into the Black Sea collapsed in the 1970s. There are no recent records in Romania but the species has been recently recorded from Türkiye (Di Natale 2021).

Fam. Carangidae
Subfam. Caranginae
Trachurus mediterraneus (Steindachner, 1868)
A native, marine species, found along all Romanian Black Sea waters (Bănărescu 1964); but the stock has declined severely since the 1990s (Oțel 2007; Vasil'eva 2007; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Niță *et al*. 2022).

The Pontic population, most often treated as a subspecies, is sometimes split as *T. ponticus* Aleev, 1956 (Fricke *et al*. 2025). Typical Mediterranean and Black Sea stocks apparently interbreed in the Marmara Sea area (Dobrovolov 2000; Turan 2004), and a "giant", nowadays absent Black Sea form may have been such a hybrid (Dobrovolov 2000; Zuyev & Skuratovskaya, 2024). It is difficult, given the current data, to ascertain whether this hybridization is introgressive with some selection against the hybrids (as vaguely suggested by the extinction of the "giant" putative hybrids), and therefore the stocks may be distinct species, or intraspecific, with "giant" morphology determined by transient variations in food availability, as argued by Slynko *et al*. 2018; we follow the latter perspective.

Trachurus trachurus (Linnaeus, 1758)
A marine species, native to the Black Sea, but only accidentally found in Romanian waters (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Cocan & Mireșan 2018).

Subfam. Trachinotinae
Trachinotus ovatus (Linnaeus, 1758)
A vagrant marine species occasionally found in Romanian Black Sea waters (Marcoci, V., 2023 via Ichthyology of Romania Facebook group; Iftime & Oțel id.; Fig. 8). This species was previously recorded in the Bosporus close to the Black Sea, its northward expansion being then considered possible (Bilecenoğlu & Öztürk 2019), and then it was found in the Black Sea off Türkiye (Uzer *et al*. 2024) and Bulgaria (Stefanov 2024).

FIGURE 8. *Trachinotus ovatus*, subadult, photographed underwater at Constanța, Black Sea, 2023, photo Valentin Marcoci (used here with permission).

ORD. ATHERINIFORMES
Fam. Atherinidae
Subfam. Atherininae
Atherina boyeri Risso, 1810
A native marine/euryhaline species, found along all Romanian Black Sea waters, in the Razim lagoon complex and in some littoral lakes (Bănărescu 1964 [as *Atherina mochon pontica*]; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Yankova *et al*. 2014 [as *Atherina pontica*]; Cocan & Mireșan 2018; Năstase *et al*. 2022; Niță *et al*. 2022).

Atherina hepsetus Linnaeus, 1758
A native marine/euryhaline species, found along all Romanian Black Sea waters (but rarer in the northern sector) (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Niță *et al*. 2022).

ORD. BELONIFORMES
Fam. Belonidae
Belone belone (Linnaeus, 1758)
A native marine species, formerly found along all Romanian Black Sea waters and in the Sinoe lagoon; nowadays only in the sea, particularly in the southern and central sectors (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018 [as *Belone euxini* Günther 1866]; Niță *et al*. 2022).

The Pontic population is sometimes treated as a full species, *Belone euxini* Günther, 1866 (Froese & Pauly 2025, and references quoted therein) or as part of *Belone belone* (Fricke *et al*. 2025, and literature quoted therein; Yankova *et al*. 2023).

ORD. CYPRINODONTIFORMES
Fam. Poecilidae
Gambusia holbrooki Girard, 1859
A non-native species, introduced widely in littoral lakes and around urban centers; established in littoral lakes, transiently successful in other places but also extinct in some introduction spots (Iftime & Iftime 2021; Iftime & Iftime 2022).

ORD. MUGILIFORMES
Fam. Mugilidae
Chelon auratus (Risso, 1810)
A native marine/euryhaline species, found along all Romanian Black Sea waters, and sporadically in the Razim-Sinoe lagoon system and in some littoral lakes (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Yankova *et al*. 2014; Cocan & Mireșan 2018; Niță *et al*. 2022).

Chelon ramada (Risso, 1827)
A native marine species, rarely found in the southern Romanian Black Sea waters (Bănărescu 1964; Vasil'eva 2007; Oțel 2007; Radu *et al*. 2008; Yankova *et al*. 2014; Cocan & Mireșan 2018; Niță *et al*. 2022).

Chelon saliens (Risso, 1810)
A native marine/brackish-water species, found along all Romanian Black Sea waters and in the Razim-Sinoe lagoon system (Bănărescu 1964); nowadays only in the sea, where quite rare (Oțel 2007; Vasil'eva 2007; Yankova *et al*. 2014; Cocan & Mireșan 2018; Niță *et al*. 2022).

Mugil cephalus Linnaeus, 1758
A native marine/euryhaline species, formerly found along all Romanian Black Sea waters, in the Razim-Sinoe lagoon system and in some littoral lakes (Bănărescu 1964); nowadays only in the sea and (occasionally) the Razim lagoon system, more frequently in the southern and central marine sectors (Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Maximov *et al*. 2019; Năstase *et al*. 2022; Niță *et al*. 2022).

Planiliza haematocheilus (Temminck et Schlegel, 1845)
A non-native native marine/euryhaline species, spread to Romanian Black Sea waters from introductions beyond the country; found all along the Romanian Black Sea waters and transiently in the Sinoe lagoon (Oțel 2007; Vasil'eva 2007 [both as *Liza haematocheila*]; Radu *et al*. 2008 [as *Mugil soiuy* Basilewsky, 1855]; Yankova *et al*. 2014 [as *Liza haematocheila*]; Cocan & Mireșan 2018 [as *Liza haematocheila*]; Iftime & Iftime 2021; Niță *et al*. 2022).

ORD. BLENNIIFORMES
Fam. Pomacentridae
Chromis chromis (Linnaeus, 1758)
A native marine species, found sporadically in the southern/rocky areas of the Romanian Black Sea waters (Bănărescu 1964; Vasil'eva 2007; Oțel 2007; Radu *et al*. 2008; Yankova *et al*. 2014; Cocan & Mireșan 2018; Marcoci 2023-2024). Micu & Todorova 2007 found it in dives in an area including both Bulgarian and Romanian waters, but do not precisely mention where.

Fam. Gobiesocidae
Diplecogaster euxinica Murgoci, 1964
A native marine species, found near Sulina in 1948 (Bănărescu 1964; Oțel 2007; [both as *D. bimaculata euxinica*]; Vasil'eva 2007 [as *D. bimaculata* (Bonnaterre, 1788)]; Yankova *et al*. 2014 [as *D. bimaculata bimaculata* (Bonnaterre, 1788)]; Cocan & Mireșan 2018). Also claimed to have been recorded sometimes between 1952-1998 in the 2 Mai-Vama Veche Marine Reserve area (or the southern Romanian Black Sea waters) but to have probably gone extinct by 2001-2003 (Nicolaev *et al*. 2004 [as *D. bimaculata euxinica*]).

Lepadogaster lepadogaster (Bonnaterre, 1788)
A native marine species, found in Romanian Black Sea waters at Agigea (Bănărescu 1964; Vasil'eva 2007; Radu *et al*. 2008; Yankova *et al*. 2014). Also claimed to have been recorded sometimes between 1952-1998 in the 2 Mai-Vama Veche Marine Reserve area (or the southern Romanian Black Sea waters) but to have probably gone extinct by 2001-2003 (Nicolaev *et al*. 2004).

Lepadogaster candolii Risso, 1810
Claimed to have been recorded sometimes between 1952-1998 in the 2 Mai-Vama Veche Marine Reserve area (or the southern Romanian Black Sea waters) but to have probably extirpated by 2001-2003 (Nicolaev *et al*. 2004). Mentioned by Briggs, 1986, Oțel 2007, Yankova *et al*. 2014 and Cocan & Mireșan 2018 as present in Romanian waters. Bănărescu (1964) and Radu *et al*. (2008) expressly state that it was not found in Romanian waters (Bănărescu 1964 considered that it may exist, though no specimens were found). Clear evidence of its presence only emerged from a recent observation from Constanța, 2017 (Marcoci, V., unpubl.; Iftime & Oțel id., Fig. 9).

Fam. Tripterygiidae
Tripterigyon tripteronotus (Risso, 1810)
A native marine species, specimens of which were found along in Romanian Black Sea waters at Agigea (Bănărescu 1964; Oțel 2007; Yankova *et al*. 2014). Also claimed to have been recorded sometimes between 1952-1998 in the 2 Mai-Vama Veche Marine Reserve area (or the southern Romanian Black Sea waters) (Nicolaev *et al*. 2004).

Fam. Blenniidae
Blennius ocellaris Linnaeus, 1759
A native marine species, sporadically found in the Romanian Black Sea waters (Abaza *et al*. 2005; Oțel 2007; Radu *et al*. 2008). Apparently, fry and larvae were not found at the Romanian coast (Radu *et al*. 2008).

Aidablennius sphynx (Val., 1836)
A native marine species, found along all Romanian Black Sea waters, more frequently in the southern and central sectors (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Maximov & Zaharia 2010; Yankova *et al*. 2014; Niță *et al*. 2022).

FIGURE 9. *Lepadogaster candolii*, with caudal fin amputated (probably by a crab's pincer), captured at Constanța, Black Sea, 2017, photo Valentin Marcoci (used here with permission).

Coryphoblennius galerita (Linnaeus, 1758)
A native marine species, found in the southern Romanian Black Sea waters (Bănărescu 1964; Abaza *et al*. 2005; Vasil'eva 2007; Oțel 2007; Radu *et al*. 2008; Maximov & Zaharia 2010; Yankova *et al*. 2014; Cocan & Mireșan 2018).

Parablennius sanguinolentus (Pall., 1811)
A native marine species, found along all Romanian Black Sea waters, more frequently in the southern and central sectors (Bănărescu 1964; Abaza *et al*. 2005; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Maximov & Zaharia 2010; Yankova *et al*. 2014; Cocan & Mireșan 2018; Niță *et al*. 2022).

Parablennius tentacularis (Brunnich, 1768)
A native marine species, found along all Romanian Black Sea waters, more frequently in the southern and central sectors (Bănărescu 1964; Abaza *et al*. 2005; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Maximov & Zaharia 2010; Yankova *et al*. 2014; Cocan & Mireșan 2018; Niță *et al*. 2022).

Parablennius zvonimiri (Kolombatovic, 1892)
A native marine species, found in the southern Romanian Black Sea waters (Bănărescu 1964; Vasil'eva 2007; Oțel 2007; Radu *et al*. 2008; Maximov & Zaharia 2010; Yankova *et al*. 2014; Cocan & Mireșan 2018).

Salaria pavo (Risso, 1810)
A native marine species, found in the southern Romanian Black Sea waters (Bănărescu 1964; Abaza *et al*. 2005; Vasil'eva 2007; Oțel 2007; Radu *et al*. 2008; Maximov & Zaharia 2010; Yankova *et al*. 2014; Cocan & Mireșan 2018).

ORD. PERCIFORMES
Fam. Serranidae
Serranus scriba (Linnaeus, 1758)
A native marine species, sporadically found in Romanian Black Sea waters (Bănărescu 1964; Vasil'eva 2007; Oțel 2007; Maximov & Zaharia 2010; Cocan & Mireșan 2018; Marcoci 2023-2024).

Serranus cabrilla (Linnaeus, 1758)
A native marine species, sporadically found in Romanian Black Sea waters (Bănărescu 1964; Vasil'eva 2007; Maximov & Zaharia 2010; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018).

Fam. Percidae
Gymnocephalus baloni Holcik et Hensel, 1974
A native, widespread rheophilic freshwater species, found in both intra- and extra-Carpathian drainages, in and along the Danube (including the Delta) and some of its major tributaries (Bănărescu 1994; Oțel 1999; Bănărescu 2005; Oțel 2007; Bulat *et al*. 2013; Nagy *et al*. 2023; Năstase & Năvodaru 2023).

Gymnocephalus cernua (Linnaeus, 1758)
A native, widespread fresh- and brackish-water species living in stagnant or slow-flowing water, from the plain to lower montane areas, in both intra- and extra-Carpathian drainages, in and along the Danube and its major tributaries, the Danube Delta and the Razim lagoon complex (Bănărescu 1964; Oțel 2007; Cocan & Mireșan 2018; Năstase *et al*. 2022; Nagy *et al*. 2023; Năstase & Năvodaru 2023).

Gymnocephalus schraetser (Linnaeus, 1758)
A native, widespread freshwater species, mainly rheophilic, found in both intra- and extra-Carpathian drainages, in and along the Danube and its major tributaries, the Danube Delta and occasionally the Razim lagoon complex (Bănărescu 1964; Bănărescu 2005; Oțel 2007; Cocan & Mireșan 2018; Nagy *et al*. 2023; Năstase & Năvodaru 2023).

Perca fluviatilis Linnaeus, 1758
A native, widespread fresh- and brackish-water species living in stagnant or slow-flowing water, from the plain to lower montane areas, in both intra- and extra-Carpathian drainages, in and along the Danube and its major tributaries, the Danube Delta, the Razim lagoon complex and some littoral lakes (Bănărescu 1964; Oțel 2007; Cocan & Mireșan 2018; Năstase *et al*. 2022; Nagy *et al*. 2023).

Percarina demidoffi Nordmann, 1840
A native (naturally expanding), mainly brackish-water species found in the Razim lagoon complex and some freshened marine waters adjacent to the Danube Delta, where it appeared in the 1980s (Oțel & Bănărescu 1985; Oțel 2007; Kottelat & Freyhof 2007; Cocan & Mireșan 2018). Not found in recent years in the Razim complex (Năstase *et al*. 2022).

Romanichthys valsanicola Dumitrescu, Bănărescu et Stoica, 1957
A native, endemic rheophilic freshwater species; formerly found in the upper hill-area course of the Argeș and its tributaries Vâlsan and Râul Doamnei (Argeș county), it only survives in the Vâlsan (Bănărescu 1964; Bănărescu, 2005; Kottelat & Freyhof 2007; Telcean *et al*. 2011; Cocan & Mireșan 2018; Burlacu *et al*. 2023).

Sander lucioperca (Linnaeus, 1758)
A native, widespread fresh- and brackish-water species living in stagnant or slow-flowing water, from the plain to lower montane areas, in both intra- and extra-Carpathian drainages, in and along the Danube and its major tributaries, the Danube Delta, the Razim lagoon complex and some littoral lakes, as well as freshened marine areas near the Danube Delta (Bănărescu 1964; Oțel 2007; Cocan & Mireșan 2018; Năstase *et al*. 2022; Nagy *et al*. 2023).

Sander volgensis (Gmelin, 1788)
A native, rare fresh- and brackish-water species living flowing, rarely stagnant water, from the plain to hill areas, in both intra- and extra-Carpathian drainages, in and along the Danube and its major tributaries, the Danube Delta, the Razim lagoon complex and the marine mouths of the Danube; recent records in the Danube Delta, Iron Gates area of the Danube, Someș, Crișul Repede and Crișul Negru (Bănărescu 1964; Bănărescu 2005; Oțel 2007; Cocan & Mireșan 2018; Nagy *et al*. 2023; Năstase & Năvodaru 2023).

Zingel streber (Siebold, 1863)
A native freshwater rheophilic species found in both intra- and extra-Carpathian drainages, in and along the Danube (including the Delta) and its major tributaries; has declined significantly (Bănărescu 1964; Bănărescu 2005; Oțel 2007; Cocan & Mireșan 2018; Polyák *et al*. 2022; Nagy *et al*. 2023; Năstase & Năvodaru 2023).

Zingel zingel (Linnaeus, 1766)
A native freshwater rheophilic species found in both intra- and extra-Carpathian drainages, in and along the Danube (including the Delta) and its major tributaries; has declined significantly (Bănărescu 1964; Bănărescu 2005; Oțel 2007; Cocan & Mireșan 2018; Polyák *et al*. 2022; Nagy *et al*. 2023; Năstase & Năvodaru 2023).

Fam. Trachinidae
Trachinus draco Linnaeus, 1758
A native marine species, found along all Romanian Black Sea waters, especially the southern ones (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Maximov & Zaharia 2010; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Niță *et al*. 2022).

Fam. Triglidae
Chelidonichthys lucerna (Linnaeus, 1758)
A native marine species, found along all Romanian Black Sea waters (Bănărescu 1964), nowadays much reduced in frequency (Oțel 2007; Vasil'eva 2007; Maximov & Zaharia 2010; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Niță *et al*. 2022).

Chelidonichthys cuculus (Linnaeus, 1758)
A native marine species, found (probably sporadically) in (southern) Romanian Black Sea waters (Nicolaev *et al*. 2004; Maximov & Zaharia 2010).

Fam. Scorpaenidae
Scorpaena porcus Linnaeus, 1758
A native marine species, found along all Romanian Black Sea waters (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Maximov & Zaharia 2010; Yankova *et al*. 2014; Cocan & Mireșan 2018; Niță *et al*. 2022).

Scorpaena notata Rafinesque, 1810
A native marine species, rarely found along all Romanian Black Sea waters (Radu *et al*. 2008; Maximov & Zaharia 2010; Yankova *et al*. 2014; Stefanov 2021; Niță *et al*. 2022).

Sebastes schlegelii Hilgendorf, 1880
A non-native native marine species, spread to Romanian Black Sea waters from introductions beyond the country (with ballast water or, likelier in our opinion, together with the oyster *Magallana gigas*, brought in for aquaculture[1]—Karpova *et al*. 2021; Ivanova *et al*. 2024); firstly found in 2022 when a juvenile specimen was photographed underwater (Marcoci, V., 2022 via Ichthyology of Romania Facebook group; Iftime id[2].; Fig. 10) then in 2023 when several specimens were captured ca. 2 miles off the harbour of Constanţa (Gherghe, M., 2023, via Marcoci, V., Ichthyology of Romania Facebook group; Marcoci & Iftime id.; Fig. 11) then in February 2024 in the Pescărie cove between Constanța and Mamaia (Bîlbă, A., 2024, via Ichthyology of Romania Facebook group; Niță & Oțel id.).

1 See, e.g., Krapal *et al*. 2019 for the introduction of *Magallana gigas* in the Black Sea.
2 Our first identification of this was as *Epinephelus coioides* (Hamilton, 1822), but enhanced images and better available comparative images of juvenile *S. schlegelii* made us change our mind. See also Karpova *et al.* 2019 for a similar mistake (where *S. schlegelii* was taken for *Epinephelus caninus*).

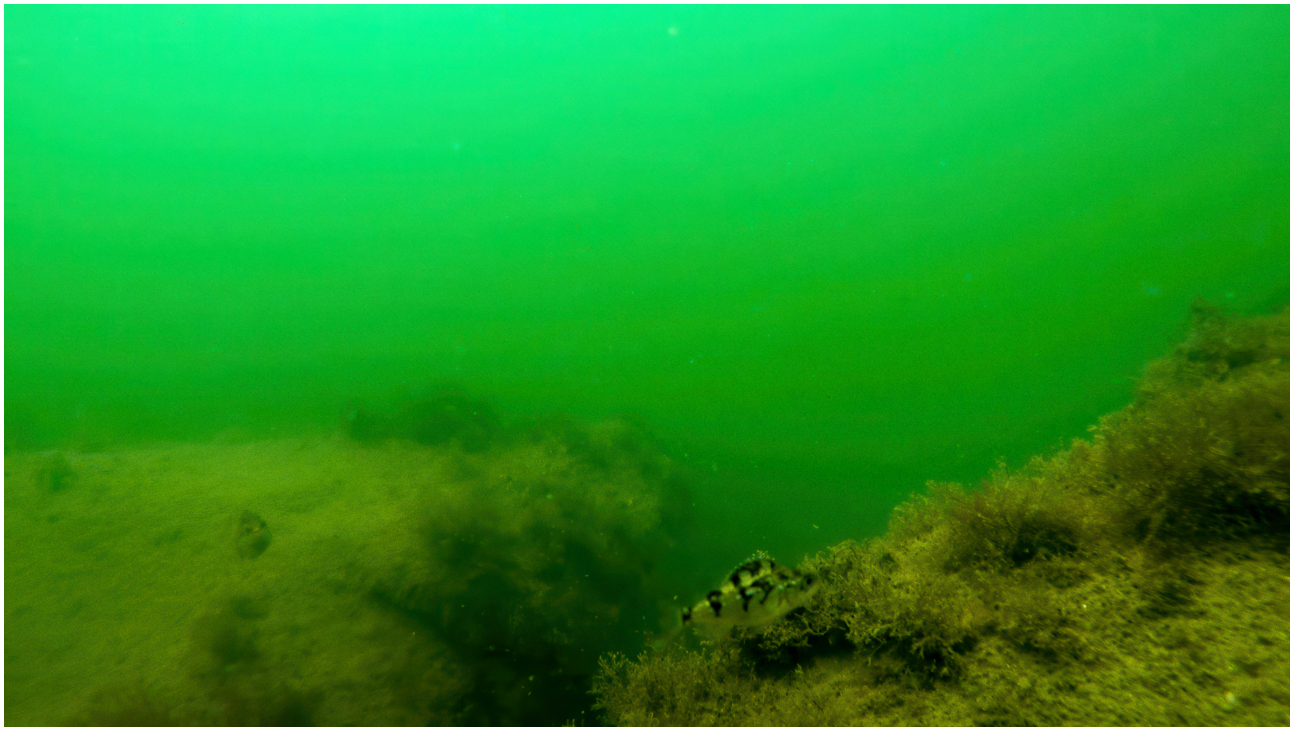

FIGURE 10. *Sebastes schlegelii*, juvenile/subadult, photographed underwater at Mamaia, Black Sea, 2022, photo Valentin Marcoci (used here with permission).

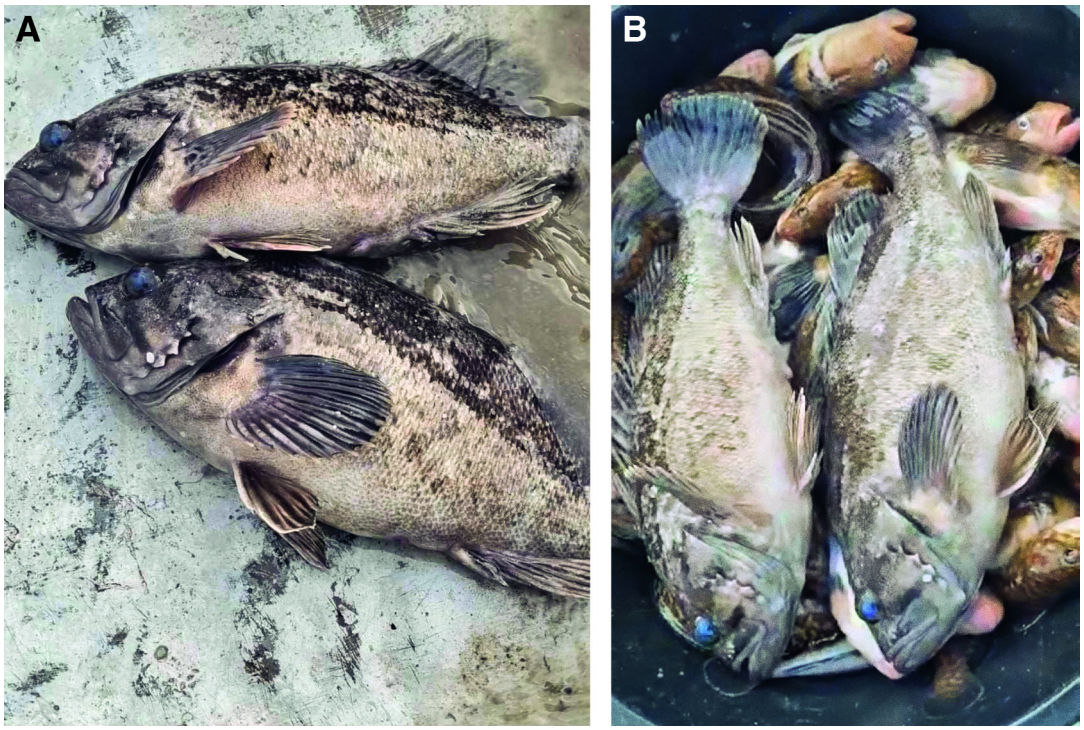

FIGURE 11. *Sebastes schlegelii*, captured off Constanţa, Black Sea, 2023. A: detail of two specimens, photo Marian Gherghe (used here with permission). B: two specimens with associated capture, still frame from film by Marian Gherghe (used here with permission).

Fam. Gasterosteidae

Gasterosteus aculeatus Linnaeus, 1758

A native euryhaline species, found along all Romanian Black Sea waters, as well as in the Danube Delta, Razim lagoon complex, some littoral lakes and some inner waters (the Danube ca. 100 km upstream; the Siret up to Piscu, Galați county; the Prut). It migrates from the sea to coastal lakes, lagoons, Danube mouths etc., but also includes sedentary lacustrine populations (Băcescu & Mayer 1956; Bănărescu 1964; Oțel 2007; Radu *et al*. 2008; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Niță *et al*. 2022). Nowadays rare in the sea (Oțel 2007 gives it as absent, but see Țoțoiu *et al*. 2018, and Niță *et al*. 2022, who still give it as present in the recent years), and recently not found in the Razim complex (Năstase *et al*. 2022). There are differences in morphology between the marine populations and some of the lacustrine ones (Băcescu & Mayer 1956; Bănărescu 1964; Denys *et al*. 2015)—such is the case of *Gasterosteus crenobiontus* Băcescu et Mayer, 1956, an endemic putative species, previously found in and area of freshwater springs at the inland end of lake Tekirghiol, isolated from the sea (and from marine *G. aculeatus*) by the hypersaline waters of the lake. Described as a form of *G. aculeatus* (Băcescu & Mayer 1956), then treated as a subspecies (Bănărescu 1964; Bănărescu 1994) then as a full species (Kottelat 1997; Nalbant 2003; Kottelat & Freyhof 2007; Cocan & Mireșan 2018). However, this population was put in contact with the marine *G. aculeatus* when the Tekirghiol was freshened by irrigation outflows (presumably, in the 1970s-1980s), and it was merged into the marine-origin, typical-form *G. aculeatus* by massive crossing, showing biological conspecificity and erasing distinctness (Bănărescu 1994; Bănărescu 2007 [does not mention *crenobiontus*, but only *G. aculeatus*]).

Pungitius platygaster (Kessler, 1859)

A native fresh- and brackish-water species, found along the Danube and its backwaters all along its Romanian course, its tributaries and associated lakes in the plains of southern Romania as well as the Prut and the lower Siret, also the Danube Delta, the Danube mouths in the sea, the Razim lagoon complex and some littoral lakes (Băcescu & Mayer, 1956; Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Yankova *et al*. 2014; Năstase *et al*. 2022).

Fam. Cottidae

Cottus gobio Linnaeus, 1758

A native, freshwater, mainly rheophilic species found in both intra- and extra-Carpathian drainages, in montane waters along (almost) all the Romanian Carpathian range (Bănărescu 1964; Freyhof *et al*. 2005; Kottelat & Freyhof 2007; Cocan & Mireșan 2018; Polyák *et al*. 2022; Nagy *et al*. 2023).

Cottus transsilvaniae Freyhof, Kottelat et Nolte, 2005

A native, freshwater rheophilic species found in the Brătia river and associated rivers in the upper Argeș drainage (Freyhof *et al*. 2005; Kottelat & Freyhof 2007; Freyhof & Kottelat 2008; Cocan & Mireșan 2018). It differs notably in body proportions from *C. gobio*, with which it is apparently not syntopic (Freyhof *et al*. 2005). Specimens photographed by us in Brătia exhibit the characteristic body proportions (Fig. 12).

Alpinocottus poecilopus (Heckel, 1836)

A native, freshwater, rheophilic species found in both intra- and extra-Carpathian drainages, in montane waters along the northern part of the Eastern Carpathians (Vișeu, Săpânța, Iza, Moldova, Moldavian Bistrița drainages, possibly also the Trotuș); rarely syntopic with *C. gobio*, generally more upstream dwelling (Bănărescu 1964; Kottelat & Freyhof 2007; Cocan & Mireșan 2018; Polyák *et al*. 2022; Nagy *et al*. 2023).

ORD. CENTRARCHIFORMES

Fam. Centrarchidae

Lepomis gibbosus (Linnaeus, 1758)

A non-native freshwater species, spread into Romania from introductions beyond the country, now freely reproducing and abundant all over the country, including the Danube and Delta (Iftime & Iftime 2021; Drăgan *et al*. 2024).

FIGURE 12. *Cottus transsilvaniae*, showing characteristic body proportions, photographed in Brătia River, 2008, photo Al. Iftime.

Micropterus nigricans (Cuvier, 1828)
A non-native freshwater species, stocked into several lakes in Romania, in montane areas and in and around Bucharest (Iftime & Iftime 2021 [as *M. salmoides* (Lacepède, 1802)]); there is multi-year persistence and juveniles/subadults were seen in one place, suggesting reproduction (pers. obs., 2021—Fig. 13).

ORD. LABRIFORMES
Fam. Labridae
Coris julis (Linnaeus, 1758)
A native marine species, occasionally found along southern Romanian Black Sea waters (Bănărescu 1964; Vasil'eva 2007; Oțel 2007; Maximov & Zaharia 2010; Yankova *et al*. 2014; Cocan & Mireșan 2018).

Ctenolabris rupestris (Linnaeus, 1758)
A native marine species, found along all Romanian Black Sea waters, especially the southern ones (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Yankova *et al*. 2014; Cocan & Mireșan 2018).

Labrus viridis Linnaeus, 1758
A native marine species, found along all Romanian Black Sea waters (Bănărescu 1964; Vasil'eva 2007; Oțel 2007; Radu *et al*. 2008; Maximov & Zaharia 2010; Yankova *et al*. 2014; Cocan & Mireșan 2018).

Symphodus cinereus (Bonnaterre, 1788)
A native marine species, found along all Romanian Black Sea waters, especially the southern ones (Bănărescu 1964 [as *Crenilabrus griseus* (L., 1758) (i. e. *C. griseus* (Gmelin, 1789)—see Vasil'eva 2007)]; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Maximov & Zaharia 2010; Yankova *et al*. 2014; Cocan & Mireșan 2018; Niță *et al*. 2022).

FIGURE 13. *Micropterus nigricans* subadult, together with small *Perca fluviatilis* and adult *Lepomis gibbosus*, photographed in a lake in National Stadium Park, Bucharest, 2021, photo Al. Iftime.

Symphodus ocellatus (Forsskål, 1775)
A native marine species, found in the central and southern Romanian Black Sea waters (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Maximov & Zaharia 2010; Yankova *et al*. 2014; Cocan & Mireșan 2018; Niță *et al*. 2022).

Symphodus roissali (Risso, 1810)
A native marine species, found along all Romanian Black Sea waters, especially the southern ones (Bănărescu 1964 [as *Crenilabrus quinquemaculatus* (Bloch, 1792) (i. e. *C. quinquemaculatus* (Risso, 1827), synonym of *S. roissali*—see Vasil'eva 2007)]; Oțel 2007; Vasil'eva 2007; Maximov & Zaharia 2010; Yankova *et al*. 2014; Cocan & Mireșan 2018; Niță *et al*. 2022).

Symphodus rostratus (Bloch, 1775)
A native marine species, found along southern Romanian Black Sea waters (Bănărescu 1964 [as *Crenilabrus scina* (Forsskål, 1775)—see Fricke *et al*. 2025 for taxonomy]; Vasil'eva 2007 [as *Symphodus scina*]; Oțel 2007; Radu *et al*. 2008; Maximov & Zaharia 2010; Yankova *et al*. 2014; Cocan & Mireșan 2018; Niță *et al*. 2022).

Symphodus tinca (Linnaeus, 1758)
A native marine species, found along all Romanian Black Sea waters, especially the southern ones (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Yankova *et al*. 2014; Cocan & Mireșan 2018; Niță *et al*. 2022).

Fam. Ammodytidae
Gymnammodytes cicerellus (Rafinesque, 1810)
A native marine species, found along all Romanian Black Sea waters, especially the southern ones (Bănărescu 1964; Oțel 2007; Radu *et al*. 2008; Vasil'eva 2007; Yankova *et al*. 2014; Niță *et al*. 2022).

Fam. Uranoscopidae
Uranoscopus scaber Linnaeus, 1758
A native marine species, found along all Romanian Black Sea waters, especially the southern ones (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Maximov & Zaharia 2010; Yankova *et al*. 2014; Cocan & Mireșan 2018; Niță *et al*. 2022).

ORD. ACANTHURIFORMES
Fam. Moronidae
Dicentrarchus labrax (Linnaeus, 1758)
A native marine species, rarely found along all Romanian Black Sea waters, especially around Portița (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Yankova *et al*. 2014; Niță *et al*. 2022). It also enters freshwater: recently found on the Danube arm of Sfântu Gheorghe, 2 kms. above mouth (Ionescu, T., unpublished 2021 record via Ichthyology of Romania Facebook group, Ionescu & Oțel id.).

Fam. Sciaenidae
Sciaena umbra Linnaeus, 1758
A native marine species, rarely found along all Romanian Black Sea waters, especially the central and southern sectors (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Niță *et al*. 2022).

Umbrina cirrosa (Linnaeus, 1758)
A native marine species, rarely found along all Romanian Black Sea waters (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Yankova *et al*. 2014; Țoțoiu *et al*. 2018; Cocan & Mireșan 2018; Niță *et al*. 2022).

Fam. Sparidae
Boops boops (Linnaeus, 1758)
A native marine species, rarely found along all Romanian Black Sea waters; absent or very rare in later (post-1990) years (Bănărescu 1964; Tortonese & Cautiș, 1967; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Maximov & Zaharia 2010; Yankova *et al*. 2014; Cocan & Mireșan 2018).

Centracanthus cirrus Rafinesque, 1810
A native (naturally expanding—Zaitsev 2000) marine species, sporadically found in Romanian Black Sea waters (Abaza *et al*. 2005; Oțel 2007; Yankova *et al*. 2014).

Dentex dentex (Linnaeus, 1758)
A native marine species, rarely found in Romanian Black Sea waters; absent or very rare in later years (Bănărescu 1964; Tortonese & Cautiș, 1967; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Maximov & Zaharia 2010; Yankova *et al*. 2014; Cocan & Mireșan 2018).

Diplodus annularis (Linnaeus, 1758)
A native marine species, found in the central and southern Romanian Black Sea waters; absent or very rare in later years (Bănărescu 1964; Tortonese & Cautiș 1967; Oțel 2007; Vasil'eva 2007; Radu *et al*. 2008; Yankova *et al*. 2014; Cocan & Mireșan 2018), but found by Marcoci (2024, pers. comm.).

Diplodus puntazzo (Cetti, 1784)
A native marine species, rarely found along all Romanian Black Sea waters (Bănărescu 1964; Tortonese & Cautiș 1967; Oțel 2007; Yankova *et al*. 2014, Cocan & Mireșan 2018; Niță *et al*. 2022; Marcoci,2023-2024).
Diplodus sargus (Linnaeus, 1758)
A native marine species, rarely/sporadically found in Romanian Black Sea waters (Tortonese & Cautiș 1967; Oțel 2007; Maximov & Zaharia 2010; Yankova *et al*. 2014).

Lithognathus mormyrus (Linnaeus, 1758)
A native (naturally expanding - Gus'kov *et al*. 2022) marine species occasionally found in Romanian Black Sea waters (Stanciu & Ilie 1980; Oțel 2007).

Oblada melanura (Linnaeus, 1758)
A native marine species, sporadically found in Romanian Black Sea waters; absent or very rare in later years (Tortonese & Cautiș 1967; Oțel 2007; Maximov & Zaharia 2010; Yankova *et al*. 2014), but found by Marcoci (2024, pers. comm.).

Pagellus erythrinus (Linnaeus, 1758)
A native marine species, sporadically found in Romanian Black Sea waters; absent or very rare in later years (Bănărescu 1964; Tortonese & Cautiș 1967; Vasil'eva 2007; Oțel 2007; Yankova *et al*. 2014).

Sarpa salpa (Linnaeus, 1758)
A native marine species, rarely found in Romanian Black Sea waters; absent or very rare in later years (Bănărescu 1964; Tortonese & Cautiș 1967; Vasil'eva 2007; Oțel 2007; Radu *et al*. 2008; Yankova *et al*. 2014).

Sparus aurata Linnaeus, 1758
A native marine species, sporadically found in Romanian Black Sea waters; absent or very rare in later years (Bănărescu 1964; Tortonese & Cautiș 1967; Vasil'eva 2007; Oțel 2007; Maximov & Zaharia 2010; Yankova *et al*. 2014; Cocan & Mireșan 2018) but recently found again in some numbers in the sea (Marcoci in Euronews Romania 2023).

Spicara smaris (Linnaeus, 1758)
A native marine species, rarely found along all Romanian Black Sea waters (Bănărescu 1964; Oțel 2007; Vasil'eva 2007; Yankova *et al*. 2014; Cocan & Mireșan 2018).

Spicara maena (Linnaeus, 1758)
A native marine species, rarely found in Romanian Black Sea waters (Oțel 2007; Maximov & Zaharia 2010; Marcoci 2023-2024[3]).

Spicara flexuosum Rafinesque, 1810
A native marine species, sporadically found in Romanian Black Sea waters (Vasil'eva 2007; Maximov & Zaharia 2010; Yankova *et al*. 2014; Cocan & Mireșan 2018).

Spondyliosoma cantharus (Linnaeus, 1758)
A native marine species, sporadically found in Romanian Black Sea waters; absent or very rare in later years (Tortonese & Cautiș 1967; Maximov & Zaharia 2010).

ORD. LOPHIIFORMES
Fam. Lophiidae
Lophius piscatorius Linnaeus, 1758
A native marine species, found very rarely in Romanian Black Sea waters (Radu *et al*. 2008; Yankova *et al*. 2014).

3 This source does not identify the species, but the images are good enough to determine that this is *S. maena* following the criteria of Șalcioğlu *et al*. 2021.

B) Non-native species without evidence for independent reproduction (including those kept/stocked in open-water aquaculture, i.e. fishponds and lake stocking) and/or persistence

OSTEICHTHYES

ORD. ACIPENSERIFORMES
Fam. Acipenseridae
Acipenser baeri Brandt, 1869
Occasionally escaped from aquaculture—in Prut, from Ukraine (Iftime & Iftime 2021, and literature quoted therein).; also frequently stocked in various lakes throughout the country (see, e.g., Balta Corata 1 2022, Cabane Harghita 2025, Vladimirescu 2013).

Fam. Polyodontidae
Polyodon spathula (Walbaum, 1792)
Occasionally escaped from aquaculture, e.g. in Argeș, the Danube (Iftime & Iftime 2021).

ORD. CYPRINIFORMES
Fam. Catostomidae
Subfam. Ictiobinae
Ictiobus bubalus (Rafinesque, 1818)
A non-native species, previously maintained in aquaculture (Nucet, Dâmbovița county; Danube Delta) but apparently no longer present (Iftime & Iftime 2021).

Ictiobus cyprinellus (Valenciennes, 1844)
A non-native species, previously maintained in aquaculture (Nucet, Danube Delta) and occasionally still stocked as game fish, e.g. near Iași (Iftime & Iftime 2021 and sources quoted therein).

Ictiobus niger (Rafinesque, 1819)
A non-native species, apparently still found in aquaculture/fishponds (Nucet) (Iftime & Iftime 2021 and sources quoted therein).

Fam. Cyprinidae
Pethia conchonius (Hamilton, 1822)
A non-native species, found in aquaria and occasionally as a release (Bucharest—Iftime & Iftime 2021).

Pethia ticto (Hamilton, 1822)
A non-native species, found in aquaria and occasionally as a release (Bucharest—Iftime & Iftime 2021).

Fam. Xenocyprididae
Ochetobius elongatus (Kner, 1867)
A non-native species, accidentally introduced in aquaculture alongside economically valuable species (likely in ponds at Nucet, where most experimental aquaculture occurred; this is valable for all adventive, not established Asian fishes); nowadays doubtlessly eliminated (Iftime & Iftime 2021).

Pseudobrama simoni (Bleeker, 1865)
A non-native species, accidentally introduced in aquaculture alongside economically valuable species; nowadays doubtlessly eliminated (Iftime & Iftime 2021).

Xenocypris macrolepis Bleeker, 1871
A non-native species, accidentally introduced in aquaculture alongside economically valuable species; nowadays doubtlessly eliminated (Iftime & Iftime 2021).

Mylopharingodon piceus (Richardson, 1845)
A non-native species, found in aquaculture in small numbers (Iftime & Iftime 2021).

Squaliobarbus curriculus (Richardson, 1846)
A non-native species, accidentally introduced in aquaculture alongside economically valuable species; nowadays doubtlessly eliminated (Iftime & Iftime 2021).

Subfam. Cultrinae
Hemiculter bleekeri Warpachowsky, 1887
A non-native species, accidentally introduced in aquaculture alongside economically valuable species; nowadays doubtlessly eliminated (Iftime & Iftime, 2022).

Hemiculter leucisculus (Basilewsky, 1855)
A non-native species, accidentally introduced in aquaculture alongside economically valuable species; nowadays doubtlessly eliminated (Iftime & Iftime 2021).

Megalobrama terminalis (Richardson, 1846)
A non-native species, previously maintained in aquaculture but apparently no longer present (Iftime & Iftime 2021).

Parabramis pekinensis (Basilewsky, 1855)
A non-native species, previously maintained in aquaculture but apparently no longer present (Iftime & Iftime 2021).

Pseudolaubuca engraulis (Nichols, 1925)
A non-native species, accidentally introduced in aquaculture alongside economically valuable species; nowadays doubtlessly eliminated (Iftime & Iftime 2021).

Toxabramis argentifer Abbott, 1901
A non-native species, accidentally introduced in aquaculture alongside economically valuable species; nowadays doubtlessly eliminated (Iftime & Iftime 2021).

ORD. CHARACIFORMES
Fam. Serrasalmidae
Subfam. Colossomatinae
Piaractus brachypomus (Cuvier, 1818)
A non-native species, found in aquaria and occasionally as a release (Danube, Someș, Firiza—see Iftime & Iftime 2021, and literature quoted therein).

Subfam. Serrasalminae
Pygocentrus nattereri Kner, 1858
A non-native species, found in aquaria and occasionally as a release, e.g. in Crișul Repede (Nagy *et al*. 2023).

ORD. SILURIFORMES
Fam. Clariidae
Clarias gariepinus (Burchell, 1822)
A non-native freshwater species, introduced deliberately in aquaculture and as gamefish (Iftime & Iftime 2021), as summer-only stocking in lakes (see, e.g., Cabane Harghita 2025).

Clarias gariepinus X *Heterobranchus longifilis* Valenciennes, 1840
A non-native freshwater hybrid, introduced deliberately in aquaculture (Iftime & Iftime 2021; Năstase & Năvodaru 2023).

Fam. Ictaluridae
Ictalurus punctatus (Rafinesque, 1814)
A non-native freshwater species, introduced deliberately in aquaculture and spreading from introductions beyond the country, found in some fishponds and in the Prut river (Iftime & Iftime 2021). Also recorded in recent years in the Danube arms in the Delta (Bălan, M., Sevastian, A., Togor, A., unpublished records via Ichthyology of Romania Facebook group, with our [V. Oțel] contribution to identification).

ORD. SALMONIFORMES
Fam. Coregonidae
Coregonus peled (Gmelin, 1789)
A non-native freshwater species, deliberately introduced and grown in aquaculture, also introduced in a few alpine lakes (Retezat) and reservoirs; its present-day survival is unclear, but highly unlikely (Iftime & Iftime 2021).

Fam. Salmonidae
Salvelinus umbla (Linnaeus, 1758)
A non-native freshwater species, deliberately introduced (from Austria—Togor, A. pers. comm.) and grown in aquaculture (Iftime & Iftime 2021 [as *S. alpinus* (Linnaeus, 1758—but see discussion in Kottelat 1997; Kottelat & Freyhof 2007]); also found in free waters, namely in the Beliș-Fântânele reservoir on the Someșul Cald river, where it was, presumably, illegally introduced (Nagy *et al*. 2023 [as *S. alpinus* (Linnaeus, 1758]); there are more undocumented introductions—Togor, A. pers. comm.

ORD. CYPRINODONTIFORMES
Fam. Poecilidae
Subfam. Poeciliinae
Poecilia reticulata Peters, 1860
A non-native species, transiently found in thermal water (Băile Felix, 1 Mai), event reproducing for some time, e.g. in 1991 (Freyhof, J., pers. comm.) and other urban ponds (Bucharest) as an aquarium release, but not established (Iftime & Iftime 2021).

Poecilia sphenops Valenciennes, 1846
A non-native species, transiently found in thermal water ponds (Băile Felix, 1 Mai) as an aquarium release; unclear whether established (Iftime & Iftime 2021).

Xiphophorus helleri Heckel, 1848
A non-native species, transiently found in thermal water (Băile Felix, 1 Mai) and other urban ponds (Bucharest) as an aquarium release, but not established (Iftime & Iftime 2021).

Xiphophorus maculatus (Günther, 1866)
A non-native species, transiently found in urban ponds (Bucharest) as an aquarium release, but not established (Iftime & Iftime 2021).

ORD. CICHLIFORMES
Fam. Cichlidae
Subfam. Pseudocrenilabrinae
Chindongo demasoni (Konings, 1994)
A non-native species, transiently found in urban ponds as an aquarium release, but not surviving the end of the warm season (Bucharest—Iftime & Iftime 2021).

Lithochromis rufus Seehausen et Lippitsch, 1998
A non-native species, transiently found in urban ponds as an aquarium release, but not surviving the end of the warm season (Bucharest—Iftime & Iftime 2021).

ORD. ACANTHURIFORMES
Fam. Moronidae
Morone saxatilis (Walbaum, 1792) X *Morone chrysops* (Rafinesque, 1820)
A non-native freshwater hybrid, stocked deliberately in some lakes, near Bucharest (Iftime & Iftime 2021).

C) doubtful records, probable/possible occurrences

CYCLOSTOMI

ORD. PETROMYZONIFORMES
Fam. Petromyzonidae
Lampetra sp.
Two specimens from the Toplița rivulet, a tributary of the Moldova river in the Siret drainage, were attributed to *Lampetra planeri* (Bloch, 1784) (Bănărescu 1969 and literature quoted therein; Cocan & Mireșan 2018); they were described as "rather *Lampetra planeri* than *Eudontomyzon mariae*" (Apetroaie 1975) or referred to aberrant "*E. mariae*" (Bănărescu 2004), i.e. *E. vladykovi* (see above). Anadromous *Lampetra* are known from the Black Sea (Kottelat & Freyhof 2007; Naseka & Diripasko, 2008; Li 2014), and, as *Lampetra fluviatilis* (Linnaeus, 1758) is very similar to, and apparently conspecific with (and senior synonym of), *L. planeri* (Popov & Makhrov, 2015; see also supporting results in Rüber *et al*. 2023, though without concluding thus) and *Lampetra-Eudontomyzon* hybrids are known (Levin *et al*. 2016), sporadic anadromous *L. fluviatilis* may hypothetically have generated *L. planeri*-like hybrids as mentioned above.

CHONDRICHTHYES

ORD. CARCHARHINIFORMES
Fam. Carcharhinidae
Prionace glauca (Linnaeus, 1758)
A vagrant marine species allegedly found in Romanian Black Sea waters (Cărăușu 1952; Aleksandrov *et al*. 2017). Cărăușu only mentioned the species for the Black Sea, but given that no other Pontic riverine country claims this record, and the information has emerged that it (probably?) pertains to the Danube Delta area (Aleksandrov *et al*. 2017) then it must by necessity belong to Romania; still, we cannot consider it otherwise than doubtful.

ORD. SQUALIFORMES
Fam. Squalidae
Squalus blainville (Risso, 1827)
A marine species, native to the Black Sea, mentioned for the 2 Mai-Vama Veche Marine Reserve and/or the southern Romanian marine waters (Zaharia *et al*. 2002); however, later works on the same protected area give the species as „extinct" here (Nicolaev *et al*., 2004) or do not mention it (Niță *et al*. 2012); it is not given for Romania by any other authors (Bănărescu 1969; Oțel 2007; Radu *et al*. 2008; Yankova *et al*. 2014; Niță *et al*. 2022).

OSTEICHTHYES

ORD. CLUPEIFORMES
Fam. Alosidae
Alosa maeotica (Grimm, 1901)
A native marine species, found (sporadically) along all Romanian Black Sea waters and entering the Razim lagoon system and the Danube mouths (Bănărescu 1969; Radu *et al*. 2008; Yankova *et al*. 2014; Cocan & Mireșan 2018; Niță *et al*. 2022). Oțel (2007) considers its presence doubtful in Romanian waters (as not a single individual could be confirmed). It has disappeared (or at least became extremely rare) in the north-western Black Sea (Mezhzherin & Vernygora, 2013) and was not found even in the Azov Sea, in a recent sample (Vernygora *et al*., 2018).

ORD. CYPRINIFORMES
Fam. Cobitidae
Cobitis strumicae Karaman, 1955
A freshwater species, it is mentioned (as *Cobitis peschevi* Sivkov et Dobrovolov, 1984) as present in Romania (Nalbant, 2003), without any reference to specimens, location or literature record(s). Its presence is doubtful since no definite records are known for *C. strumicae*, a Bulgarian endemic, for the Danube river (which is shared with Romania): Stefanov (2007) considers its presence in the Danube and lower course of Danubian tributaries questionable, and other resources give the range of *C. strumicae* as not touching the Danube (Vassilev & Pehlivanov, 2005; Choleva *et al*. 2008; Stefanov 2019).

Fam. Leuciscidae
Alburnus sava Bogutskaya, Zupančič, Jelić, Diripasko et Naseka, 2017
A native, localized freshwater species, living in flowing water in the middle Danube (above the Iron Gates) and its tributaries (Bănărescu, 1964 [as *Chalcalburnus chalcoides mento*]; Kottelat & Freyhof 2007 [as *Alburnus sarmaticus*]; Bogutskaya *et al*. 2017). Romanian records above the Iron Gates (of which there is at least one in the Danube, see Bănărescu 1964, and one in the Mureș, see Halasi-Kovács 2017) probably pertain to this species (Bogutskaya *et al*. 2017; Halasi-Kovács 2017; Harka & Halasi-Kovács 2024), but this should be checked upon specimens, if available. It survives in the Kolpa river (Sava river catchment) (Kottelat & Freyhof 2007; Bogutskaya *et al*. 2017), Danube and Tisza (Halasi-Kovács 2017; Harka & Halasi-Kovács 2024), but was not recorded recently in or near Romania.

Phoxinus csikii Hankó, 1922
A native, relatively widespread freshwater rheophilic species, found in the Serbian Danube area (Denys *et al*. 2020; Palandačić *et al*. 2020); Romanian populations from adjacent Romanian areas, e.g. the Danube affluents of the Iron Gates area (Bănărescu *et al*. 1975) might conceivably belong to this species.

ORD. CHARACIFORMES
Fam. Serrasalmidae
Piaractus mesopotamicus (Holmberg, 1887)
A non-native species, found as a release from aquaria/aquaculture (Drăgan *et al*. 2024)—unfortunately, no image, which would have cleared possible confusion with *P. brachypomus*, accompanies this first record for Romania.

ORD. SYNGNATHIFORMES
Fam. Syngnathidae
Syngnathus acus Linnaeus, 1758
A native marine species, mentioned for Romania (Dawson 1986; Yankova *et al*. 2014; Cocan & Mireșan 2018) and more specifically for Constanța and Costinești (Nenciu *et al*. 2016). However, the former studies do not give specific references for Romania, and Nenciu *et al*. 2016 do not show photos of this species or discuss its identification, therefore, as there are no other records for Romania, the risk of a confusion (e.g. with *S. tenuirostris*—see Vasil'eva 2007) cannot be fully cleared.

ORD. GOBIIFORMES
Fam. Gobiidae
Gobius bucchichi Steindachner, 1870
A native marine species, rarely or sporadically found in Romanian Black Sea waters, especially in the southern areas (Miller 1986; Nicolaev *et al*. 2004; Yankova *et al*. 2014). Micu & Todorova 2007 found it in dives in an area including both Bulgarian and Romanian waters, but do not precisely mention where; Vasilev *et al*. 2012 record it quite away from the Romanian waters. *Gobius bucchichi* alone occurs in the Black Sea; the recently described, similar and often confused *G. incognitus* Kovačić et Šanda 2016 does not (Kovačić *et al*. 2023); nevertheless, the Romanian presence of *G. bucchichi* needs confirmation (M. Kovačić, pers. comm.).

Ponticola platyrostris (Pallas, 1811)
A native marine species, sporadically found in Romanian Black Sea waters, especially in the southern areas (Nicolaev *et al*. 2004; Maximov & Zaharia 2010). Manilo (2020) considers the Romanian records as erroneous (quoting for Romanian presence Radu *et al*. 2008, who however do not precisely mention this species for the Romanian waters, but only for the Black Sea; yet Nicolaev *et al*. 2004, Abaza *et al*. 2005, and Maximov & Zaharia 2010 do mention *P. platyrostris* for Romanian marine waters). Also not found in Bulgaria (Vasilev *et al*. 2012; Manilo 2020). In the absence of precise records, specimens, photographs etc., one cannot decide whether the Romanian mentions were erroneous; a confusion with *P. eurycephalus* is still very much possible.

ORD. CICHLIFORMES
Fam. Cichlidae
Subfam. Pseudocrenilabrinae
Oreochromis niloticus (Linnaeus, 1758)
A non-native species, found in aquaculture; presence/survival in free waters is doubtful (Iftime & Iftime 2021).

ORD. ANABANTIFORMES
Fam. Osphronemidae
Subfam. Macropodusinae
Betta splendens Regan, 1810
A non-native freshwater species, quoted as having (probably) been released into thermal waters from aquaria; most likely not persisting (Iftime & Iftime 2021).

ORD. CARANGIFORMES
Fam. Bothidae
Arnoglossus kessleri Schmidt, 1915
A native marine species, found (probably sporadically at best) in Romanian Black Sea waters (Nielsen 1986; Yankova *et al*. 2014; Cocan & Mireșan 2018); an uncertain presence according to Maximov & Zaharia (2010). Micu & Todorova, 2007 found it in dives in an area including both Bulgarian and Romanian waters, but do not precisely mention where.

Fam. Soleidae
Buglossidium luteum (Risso, 1810)
A marine species, native to the Black Sea, quoted for the Romanian Black Sea waters as an uncertain presence (Maximov & Zaharia 2010).

ORD. BLENIIFORMES
Fam. Gobiesocidae
Apletodon dentatus (Facciola, 1887)
Claimed to have been recorded sometimes between 1952-1998 in the 2 Mai-Vama Veche Marine Reserve area (or the southern Romanian Black Sea waters) but to have probably extirpated by 2001-2003 (Nicolaev *et al*., 2004 [as *A. microcephalus bacescui*]). Mentioned by Briggs, 1986, Vasil'eva 2007, Oțel 2007, Yankova *et al*. 2014 and Cocan & Mireșan 2018 [as *A. bacescui*] as present in Romanian waters. Bănărescu (1964) [as *A. microcephalus bacescui* (Antoniu-Murgoci, 1940)] expressly states that it was not found in Romanian waters. Substantiated Black Sea records pertain to Cape Kaliakra and the Burgas gulf area (Antoniu-Murgoci 1940, ap. Bănărescu 1964), the central Turkish Black Sea coast near Sinop (Bat *et al*. 2006) and the Crimea (Karpova *et al*. 2017; Shaganov & Koulish 2018), none of which currently belongs to Romania (however, Cape Kaliakra did in 1940, when *A. m. bacescui* was described by Antoniu-Murgoci, hence probably part of the confusion). The 1952-1998 records of Nicolaev *et al*. 2004 are not substantiated with specimens or images (or references thereof) and therefore difficult to either accept or refute—as in the case of other gobiesocids.

The Black Sea population of this species is sometimes split as *A. bacescui* (Murgoci 1940[4]) (e.g. Froese & Pauly 2025) but has been argued to represent at most a subspecies of *A. dentatus* (Briggs 1986; Karpova *et al*. 2017; Gus'kov *et al*. 2022; Fricke *et al*. 2025).

4 Which should be in fact Antoniu-Murgoci, 1940 (see Bănărescu 1964).

ORD. PERCIFORMES
Fam. Serranidae
Serranus hepatus (Linnaeus, 1758)
A native marine species, sporadically (or potentially) found in Romanian Black Sea waters (Yankova *et al*. 2014; Cocan & Mireșan 2018). The presence is questionable since the actual record(s) referred to by the first quoted source do not pertain to Romania, and the second does not give any record or reference for the species' Romanian occurrence.

Fam. Percidae
Gymnocephalus acerina (Guldenstaedt, 1774)
A native, widespread rheophilic freshwater species, allegedly recorded in the Prut river (Moshu *et al*. 2006). The authors do not provide an image or mention depositing a specimen. There is no other record for this species for the Prut (Usatâi 2004; Davideanu, 2008; Ion *et al*. 2009; Bulat *et al*. 2013; Bulat *et al*. 2016; Bulat 2017) or for Romania; it does not occur westwards of the Dniester drainage (Kottelat & Freyhof 2007; Bulat 2017). However, an artificial translocation of this species into the Prut drainage, when stocking other fishes from the Dniester catchment in Moldova, cannot be entirely ruled out; whether it witnessed such an accidental translocation (not resulting in establishment), or is simply a mistake, the record of Moshu *et al*. 2006 remains doubtful.

Sander marinus (Cuvier, 1828)
A native, marine/brackish-water species possibly found in the marine waters adjacent to the Danube Delta, which area is included in its range, as such or including all of the Romanian seashore (Haponski & Stepien 2013; Karimov 2020). Indications from fishermen as to the extremely rare presence in the sea of a darker, narrower-snouted pikeperch led Antipa (1909) to suspect that this species may occur (or had occurred) in Romanian waters, though he himself never acquired one. The species is found in the Dniepr-Bug estuary (Roman *et al*. 2018) and apparently extends to the Bulgarian shores (Vassilev & Pehlivanov 2005); though not listed by Stefanov (2007), it was filmed in Bulgarian marine waters, not far from Romania (Kovtun 2014); therefore it may well reside in or transit the intervening Romanian marine waters, though not a single specimen was yet scientifically recorded.

ORD. CENTRARCHIFORMES
Fam. Centrarchidae
Micropterus dolomieu (Lacepede, 1802)
A non-native freshwater species, a record of which (from Covasna county) needs to be confirmed (Iftime & Iftime 2021).

D) unwarranted/erroneous records/citations

Several more species are included in general distribution maps/species lists for the Romanian Black Sea shore: Chondrichthyes: Ord. Squatiniformes, Fam. Squatinidae: *Squatina squatina* (Linnaeus, 1758) (Roux 1986); Ord. Myliobatiformes, Fam. Gymnuridae: *Gymnura altavela* (Linnaeus, 1758) (McEachran & Capapé 1986); Osteichthyes: Ord. Scombriformes, Fam. Scombridae: *Auxis rochei* (Risso, 1810) (Froese & Pauly 2025), *Euthynnus alletteratus* (Rafinesque, 1810) (Froese & Pauly 2025); Ord. Perciformes, Fam. Triglidae: *Eutrigla gurnardus* (Linnaeus, 1758) (Hureau 1986; Cocan & Mireșan 2018); Ord. Acanthuriformes, Fam. Sciaenidae: *Argyrosomus regius* (Asso y del Rio, 1801) (Chao 1986; Cocan & Mireșan 2018); Ord. Lophiiformes, Fam. Lophiidae: *Lophius budegassa* Spinola, 1807 (Caruso 1986); Ord. Tetraodontiformes, Fam. Balistidae: *Balistes capriscus* Gmelin, 1789 [as *B. carolinensis*] (Tortonese 1986). None of these is mentioned by any Romanian author (other than Cocan & Mireșan 2018) and all are explicitely stated by Vasil'eva 2007 and Yankova *et al*. 2014 not to occur in Romanian waters; these are most likely unwarranted extrapolations for presence on the Romanian shore from the fact of known occurrence in the Black Sea. The same is valid for *Epinephelus caninus* (Valenciennes, 1843) and *E. costae* (Steindachner, 1878), quoted by Froese & Pauly (2025) as present in Romania, but they are absent from even the Black Sea (Karpova *et al.* 2019; Karakulak *et al.* 2025). At present, they cannot be included in the Romanian checklist, though their future record in Romanian waters is by no way impossible.

Other erroneous records: Ord. Salmoniformes, Fam. Salmonidae: *Salvelinus namaycush* (Walbaum, 1792)—included by Cocan & Mireșan 2018 on the list of Romanian fishes, quoting Bănărescu 1964, Decei 1981, Manea 1985 and Nalbant 2003, none of which mention this species as being ever introduced to Romania; Cocan & Mireșan 2018 possibly mistake mentions of lake trouts, i.e. the lake morph of *Salmo trutta*, for *Salvelinus namaycush* which is also called "lake trout" in North America; Ord. Cypriniformes, Fam. Cobitidae: *Sabanejewia aurata* (De Filippi, 1863) (Cocan & Mireșan 2018; Froese & Pauly 2025);Fam. Cyprinidae: *Barbus cyclolepis* Heckel, 1837 (Cocan & Mireșan 2018; Froese & Pauly 2025); *Barbus borysthenicus* Dybowski, 1862, (Moshu *et al*. 2006—as "*Barbus barbus* (L., 1758) / *Barbus barbus borysthenicus* Dybowski, 1862"; Bulat *et al*. 2013); Fam. Leuciscidae: *Alburnus chalcoides* (Güldenstädt, 1772) (Cocan & Mireșan 2018; Froese & Pauly 2024), at least in some cases, most probably, as a technical artifact or misunderstanding of the taxonomical splitting process (see Kottelat & Freyhof 2007; Movchan 2009; Roman 2015 for these species and their true range); Ord. Carangiformes, Fam. Soleidae: *Pegusa lascaris* (Risso, 1810) (Cocan & Mireșan 2018; Froese & Pauly 2025)—probably also as an artifact of taxonomical splitting, whereas *P. nasuta* applies to Pontic populations previously included in *P. lascaris* (Vasil'eva 2007), though Froese & Pauly (2025) give both species as ranging into the Black Sea; nevertheless, as discussed above, morphological data available for Romanian specimens allow them to be attributed, so far, to *P. nasuta* alone.

The total tally of species mentioned for Romania is of 220 species currently or lately having Romanian (reproductive) populations or at least circumstantial indications thereof, or sporadic/expanding into Romanian waters (including four species most probably now extirpated from Romania: *Acipenser nudiventris*, *Acipenser persicus*, *Acipenser sturio*, *Thunnus thynnus*; other listed species have not been recorded in Romania for a quite long time and may be likewise be extirpated, or merely undetected—see comments above); 32 non-native species which do (did) not independently reproduce/persist, including 2 stocked alien hybrids[5]; 20 potentially occurring or doubtfully recorded species; and 16 unwarantedly/erroneously claimed species.

Discussion

The Romanian ichthyological record is considerably enriched as compared with previous synthetic works, such as the 187 species recorded by Bănărescu (1964, 1969). This is partly due to splitting taxa, but also to new records of species, both native/naturally expanding and non-native. One can note the dynamic condition of the fish fauna, as species are extinct or not recorded recently while other species are recorded either as sporadic occurrences pertaining to natural dispersion or as anthropogenic introductions, mostly unsuccessful. Full certainty as to the presence of some species cannot be achieved, and in other instances records are quoted without giving exact data upon the specimens found and the location of their capture; yet, while such recording is clearly suboptimal, it cannot be altogether dismised. The continuous change, the predominant nature of which is anthropogenic, in the condition of aquatic habitats, is the main reason for the intense dynamic of Romanian ichthyofauna, with more and more new introduced/adventive or naturally expanding species found, but also with extinctions and/or sudden rarefactions of well-known native species. The need for a continuous, comprehensive scientific recording of the Romanian ichthyofauna is underlined by this continuous change, as the knowledge of the biodiversity status at a certain point and of its dynamic is essential for both conservation and sustainable management.

Acknowledgements

The authors express their gratitude to Marian Gherghe, Valentin Marcoci, Mihnea Florian Moraru, Cătălin Petreanu, Francisc Szilagyi and Andrei Togor (all from Romania) for providing photographic and film records of faunistically important species; to Marcel Bălan, Adrian Bîlbă, Elena Buhaciuc-Ioniță, Tudor Ionescu, Valentin Marcoci, Aurelian Sevastian, Andrei Togor (all from Romania) for sharing faunistic/behaviour records; to Petru M. Bănărescu (Romania, †2009), Nina Bogutskaya (Slovenia), Jörg Freyhof (Germany), Oana Iftime (Romania), Cüneyt Kaya (Türkiye), Maurice Kottelat (Switzerland), Marcelo Kovačić (Croatia), Claudiu Lucan (Romania), András Attila Nagy (Romania), Teodor T. Nalbant (Romania, †2011), Thomas J. Near (USA), Rafet Çağrı Öztürk (Türkiye), Martin Reichard (Czechia), Zoltán Sallai (Hungary), Felix A. H. Sperling (Canada), Tihomir Stefanov

5 Other hybrids (e.g. between sturgeon or cyprinid species—see Bănărescu 1964) were not discussed; however, since these alien hybrids are not sporadic but cultivated and stocked in mass quantities, we took them into account.

(Bulgaria), Ekaterina Denisovna Vasil'eva (Russia), Steven Joseph Weiss (Austria) for providing literature and/or useful discussions.

Note added in proof

While our paper was in publication, this paper appeared: Brownstein, C.D. & Near, T.J. (2025) Towards a phylogenetic taxonomy of sturgeons (Acipenseriformes: Acipenseridae). Bulletin of the Peabody Museum of Natural History, 66 (1): 3–24, https://doi.org/10.3374/014.066.0101, a multi-character phyletic analysis of the sturgeons of the world. The main suggested taxonomic implication for the Romanian ichthyology would be the treatment of *Huso huso* and all Romanian *Acipenser*, except *A. sturio*, as congeneric (under *Huso*). The full taxonomic impact of this study remains to be seen.

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