

CURRENT DATA ON THE STATUS OF KNOTWEED SPECIES (*FALLOPIA*, *POLYGONUM*, *PERSICARIA*, *REYNOUTRIA*) IN WETLAND AREAS OF ROMANIAN BANAT

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Abstract. We have as our starting point a genus with very well-known species, but with a highly debated systematics and unexploited economic potential. *Polygonum* is a large and cosmopolitan genus (the online taxonomic database, Plants of the World Online recognizes 173 species, but other authors, e.g. DONG et al., 2014, in IDOUDI et al., 2024 consider about 300 species), with very common plant species in Romania's flora, known as "knotweeds". The systematics of the genus *Polygonum* is controversial and still unresolved, that's why several species have been reclassified and moved to the genera *Persicaria*, *Bistorta*, *Fagopyrum*, *Fallopia*, *Reynoutria*, *Koenigia*. CIOCĂRLAN (2009) presents 25 spontaneous and cultivated species from our country. The cultivated ones are *Fallopia aubertii* (L. Henry) Holub (*Polygonum aubertii* Louis Henri), *Persicaria orientalis* (L.) Spach (*Polygonum orientale* L.), *Reynoutria japonica* Houtt. (*Polygonum cuspidatum* Sieb. et Zucc.) and *Reynoutria sachalinensis* Nakai (*Polygonum sachalinense* Fr. Schmidt). The last two species escaped from culture and became subspontaneous and very aggressive as invasives. The spontaneous species grow in ponds and marshes, in ditches and canals, in humid forests or some are segetal and ruderal. We are discussing here those that belong to the first ecological category. That's why we have chosen the following 7 species encountered in humid areas: *Persicaria amphibia* (L.) Delarbre (*Polygonum amphibium* L.), *Persicaria hydropiper* (L.) Delarbre (*Polygonum hydropiper* L.), *Persicaria lapathifolia* (L.) Delarbre (*Polygonum lapathifolium* L.), *Persicaria minor* (Huds.) Opiz (*Polygonum minus* Hudson), *Persicaria mitis* (Schrank) Holub (*Polygonum mite* Schrank), *Persicaria maculosa* Gray (*Polygonum persicaria* L.), *Reynoutria japonica* Houtt. (*Polygonum cuspidatum* Sieb. et Zucc.). Our chorological data is corroborated with that collected in this region by TÖKES, SORAN, BOȘCAIU, GRIGORE, VICOL, OPREA et al., ARVAT, COSTE, DRĂGULESCU and other authors (from 1905 until now). We have taken into account the ecological differences, their participation in the vegetation and we draw attention to the spread of one of the very invasive species, *Reynoutria japonica* Houtt. We would like to emphasize that we look at them not only from a botanical and ecological point of view, but also from the perspective of their pharmaceutical potential, because some species contain phytochemical compounds.

Keywords: knotweed, humid area, Romanian Banat, invasive plants, economic potential

INTRODUCTION

Species from the *Polygonaceae* family (knotweed family, smartweed-buckwheat family, dock, knotweed and bistort family) are recognized by the fused stipules of the leaves, which surrounds the prominent nodes like a corset and form a specific appendage called *ochrea* or *ocrea*. These are found in most species and their morphology is an important criteria in species identification. In Romania, most species are herbaceous and are considered common weeds. CIOCĂRLAN (2009) describes only 5 genera (*Oxyria*, *Rumex*, *Rheum*, *Polygonum*, *Fagopyrum*) but includes at *Polygonum*, the genera *Fallopia* and *Reynoutria* (table 1). That's why he consider *Reynoutria japonica* Houtt. as synonym for *Polygonum cuspidatum* Sieb. et Zucc. POWO (=Plants of the World Online) presents 56 accepted *Polygonaceae* genera in the world's flora.

Polygonum genus is native in over 200 countries, including Romania. Until recently, knotweeds were considered only the *Polygonum* species, but now, under the name knotweed, we also find species from other genera, such as: *Fallopia*, *Persicaria* or *Reynoutria*, because their taxonomy has been revised. In this database are accepted 173 species from *Polygonum*, 131 from *Persicaria*, 11 from *Fallopia*, 6 from *Reynoutria*, with the following classification: Kingdom *Plantae*, Phylum *Streptophyta*, Class *Equisetopsida*, Subclass *Magnoliidae*, Order *Caryophyllales*, Family *Polygonaceae*.

MATERIAL AND METHODS

In our paper we studied 7 plant species of knotweed that grow in wet zones. We discussed their morphological traits, we updated the distribution of these species and the cenotic environment in which they grow as well the environmental conditions. We compared the available data collected in this region by TÖKES (1905), SORAN (1954), BOȘCAIU (1966, 1971), GRIGORE (1971), VICOL (1974), OPREA *et al.* (1974), ARVAT (1977), and published in scientific papers or doctoral theses, with our own field observations. Then we conducted online investigations, researching current articles about the chemical composition and possible ways of use. We prepared several tables to present accepted name and synonymy, biological and ecological indicator values, spread and habitats. The systematics of these species, we considered according to POWO and the names of the plant associations in which occur, are those published by the authors.

RESULTS AND DISCUSSIONS

Accepted name and synonymy. As a reference for Romania's flora, we used CIOCĂRLAN (2009), which considers both spontaneous and cultivated species. Compared to the new classifications on the POWO, the scientific name which he uses, in the latest rankings are now considered synonyms. In table 1, in addition to these, we also added the homotypic synonyms.

Table 1

Accepted name and synonymy			
No.	Valid name (POWO)	Name in CIOCĂRLAN (2009)	Other homotypic synonyms
1.	<i>Persicaria amphibia</i> (L.) Delarbre	<i>Polygonum amphibium</i> L.	<i>Chulusium amphibium</i> (L.) Raf., <i>Persicaria fluitans</i> Montandon
2.	<i>Persicaria hydropiper</i> (L.) Delarbre	<i>Polygonum hydropiper</i> L.	<i>Peutalis hydropiper</i> (L.) Raf.
3.	<i>Persicaria lapathifolia</i> (L.) Delarbre	<i>Polygonum lapathifolium</i> L.	<i>Polygonum persicaria</i> var. <i>lapathifolium</i> (L.) Meisn.
4.	<i>Persicaria minor</i> (Huds.) Opiz	<i>Polygonum minus</i> Hudson	<i>Peutalis minor</i> (Huds.) Raf., <i>Polygonum minus</i> Huds., <i>Polygonum persicaria</i> f. <i>minus</i> (Huds.) Beckh.
5.	<i>Persicaria mitis</i> (Schrank) Assenov	<i>Polygonum mite</i> Schrank	<i>Persicaria hydropiper</i> subsp. <i>mite</i> (Schrank) Majeed Kak
6.	<i>Persicaria maculosa</i> Gray	<i>Polygonum persicaria</i> L.	<i>Peutalis persicaria</i> (L.) Raf., <i>Polygonum lapathifolium</i> subsp. <i>maculosum</i> (Gray) Dyer & Trimen
7.	<i>Reynoutria japonica</i> Houtt.	<i>Polygonum cuspidatum</i> Sieb. et Zucc.	<i>Fallopia japonica</i> (Houtt.) Ronse Decr., <i>Polygonum reynoutria</i> Makino, <i>Tiniaria japonica</i> (Houtt.) Hedberg

Biology and morphological traits. They are annual or perennial plants, have alternate and simple leaves, with prominent nodes and ochrea, small flowers with perigon, in spike -

like inflorescences and fruits are achenes. Leaf shape, ochrea, inflorescence and perigon are considered the most frequent as a diagnostic features of plant species.

MONTEGUT (2003) proposes a determination key for helophytes by leaves particularities: if the leaves are petiolate or attenuated petiole and if the stipules are united in sheath or petiolate, forming ochrea, like some *Rumex* or *Polygonum* species.



Figure 1. Some knotweed species (original photos)

Next, he analyzes the knotweed species by leaf base, the peak and the surface of the sheath and the spike. For example, the peak of the sheath is ciliated at *Persicaria amphibia* (L.) Delarbre (*Polygonum amphibium* f. *terrestre*), slightly ciliated at *Persicaria lapathifolia* (L.) Delarbre (*Polygonum lapathifolium*), long ciliated at *Persicaria maculosa* Gray (*Polygonum persicaria*), *Persicaria mitis* (Schränk) Assenov (*Polygonum mite*), *Persicaria minor* (Huds.) Opiz (*Polygonum minus*) and nonciliated at *Persicaria hydropiper* (L.) Delarbre (*Polygonum hydropiper*). Except for *Persicaria hydropiper* (L.) Delarbre (*Polygonum hydropiper*), the others are hairy surface of the sheath.

Of all 7 species, only *Persicaria amphibia* (L.) Delarbre (*Polygonum amphibium* L.) and *Reynoutria japonica* Houtt. (*Polygonum cuspidatum* Sieb. et Zucc.) are perennial (with rhizome), while the others are annuals. *Persicaria amphibia* (L.) Delarbre (*Polygonum amphibium* L.) is a hydrophyte and has brown ochrea. *Persicaria lapathifolia* (L.) Delarbre (*Polygonum lapathifolium* L.) has entire or very shortly ciliated ochrea, but *Persicaria maculosa* Gray (*Polygonum persicaria* L.) has ochrea with clearly ciliated edge. *Persicaria lapathifolia* (L.) Delarbre (*Polygonum lapathifolium* L.), *Persicaria maculosa* Gray (*Polygonum persicaria* L.) have dense, cylindrical inflorescences and the flowers cover each other, while *Persicaria hydropiper* (L.) Delarbre (*Polygonum hydropiper* L.), *Persicaria minor* (Huds.) Opiz (*Polygonum minus* Hudson), *Persicaria mitis* (Schrank) Assenov (*Polygonum mite* Schrank) have lax, thin inflorescences and each flower is visible. The flowers from *Persicaria minor* (Huds.) Opiz (*Polygonum minus* Hudson) have 5 stamens and from *Persicaria mitis* (Schrank) Assenov (*Polygonum mite* Schrank), 6 stamens. *Reynoutria japonica* Houtt. (*Polygonum cuspidatum* Sieb. et Zucc.) has the flowers in lax panicles (CIOCARLAN, 2009). In the figure 1, we have added original photos of some knotweed species.

Ecology. According to the water quality parameters, MONTEGUT (2003) says that in oligotrophic waters grow *P. minus*, *P. mite* (especially in dry areas in summer, sandy), *P. hydropiper* (on trampled lands and forest roads), in eutrophic waters, *P. amphibium* f. *terrestre*, *P. lapathifolium*, *P. persicaria* (muddy banks, dry in summer), and in stagnant or slow-flowing waters, *P. amphibium* f. *aquatica*. In the table 2, we present the biological and ecological indicator values according to SANDA *et al.* (2003).

Table 2

Biological and ecological indicator values (SANDA *et al.*, 2003)

No.	Valid name	Indicator		
		Bioform	Geoelement	humidity index (U)
1.	<i>Persicaria amphibia</i> (L.) Delarbre	HH	Cosm	6
2.	<i>Persicaria hydropiper</i> (L.) Delarbre	Th	Circ	5
3.	<i>Persicaria lapathifolia</i> (L.) Delarbre	Th	Cosm	4
4.	<i>Persicaria minor</i> (Huds.) Opiz	Th	Cosm	4,5
5.	<i>Persicaria mitis</i> (Schrank) Assenov	Th	Eur (Med)	5
6.	<i>Persicaria maculosa</i> Gray	Th	Cosm	4,5
7.	<i>Reynoutria japonica</i> Houtt.	G	Extr. Orient	4,5

These species are well adapted to a wide variety of soil types, including Luvic Phaeozems, Stagnic Luvisols, Pellic-gleyic Vertisols and Haplic Luvisols which were identified in our previous research in Timiș county wetlands (LATO *et al.*, 2013).

Cenotic environment. We found knotweed species in swamp vegetation, particularly along water edges or lakes banks and in periodically, flooded depressions. They are frequently found within associations of pioneer vegetation on water shores (NEACȘU & ARSENE, 2017), *Bidenti-Polygonetum hydropiperi* Lohmeyer in R. Tüxen 1950, along with species such as: *Bidens tripartita* L., *Echinochloa crus-galli* (L.) Beauv., *Potentilla reptans* L., *Alisma plantago-aquatica* L., *Lycopus europaeus* L., *Lysimachia vulgaris* L., *Xanthium strumarium* L. (for *Persicaria hydropiper* (L.) Delarbre = *Polygonum hydropiper* L.) or *Echinochloa-Polygonetum lapathifolii* Soó et Csűrös 1974, along with species such as: *Echinochloa crus-galli* (L.) Beauv., *Rorippa austriaca* (L.) Besser., *Bidens tripartita* L., *Pulicaria vulgaris* Gaertner, *Mentha pulegium* L. (for *Persicaria lapathifolia* (L.) Delarbre = *Polygonum lapathifolium* L.).

Persicaria hydropiper (L.) Delarbre (published as *Polygonum hydropiper* L.) appears in: *Scirpo-Phragmitetum* W. Koch 1926 (Sânandrei, NEACȘU, 2008), *Typhaetum angustifoliae* Pignatti 1953 (Pișchia, NEACȘU, 2008), *Glycerietum maximae* Hueck 1931 (Sânandrei, NEACȘU, 2008), *Eleocharidetum palustris* Schennikow 1919 (Surdac, NEACȘU, 2008), *Leersietum oryzoides* Krause 1955 em. Pass. 1957 (Surdac, NEACȘU, 2008), *Caricetum ripariae* Knapp et Stoffer 1962 (Sânandrei, NEACȘU, 2008), *Polygono hydropiperi-Bidentetum* Lohm. 1950 (Surdac, NEACȘU, 2008), *Salicetum albae* Issler 1924 s.l. (Surdac, NEACȘU, 2008), *Lemnetum minoris* Oberd. 1957 Th. Muller et Gors 1960 (Lugoj, VICOL, 1974), *Glycerietum maximae* (Nowinski 1928) Heuck 1931 (Lugoj, VICOL, 1974), *Heleocharietum palustris* Schennikow 1919 (Lugoj, VICOL, 1974), *Leersietum oryzoides* Krause 1955 emend. Pass. 1957 (Lugoj, VICOL, 1974), *Polygoneto-Bidentetum* (W. Koch 1926) Lohm. 1950 (Lugoj, VICOL, 1974), *Salicetum albae* Issler 1924 (Timiș river valley, Lugoj area, VICOL, 1974), *Heleocharietum acicularis* (Baumann 1911) W. Koch 1926 (Timiș-Bega interfluve, GRIGORE, 1971), *Potametum natantis* Soó 1927 (Lugoj, BOȘCAIU, 1966), *Eleocharidetum acicularis* (Baumann 11) W. Koch 1926 (Lugoj, BOȘCAIU, 1966), *Caricetum acutiformis-ripariae* Soó (1927) 1930 (Satchinez, ARSENE et al., in STĂNESCU, 2005).

Persicaria lapathifolia (L.) Delarbre (published as *Polygonum lapathifolium* L.) is mentioned in: *Glycerietum maximae* Hueck 1931 (Sânandrei, NEACȘU, 2008), *Eleocharidetum palustris* Schennikow 1919 (Pișchia, Surduc, NEACȘU, 2008), *Leersietum oryzoides* Krause 1955 em. Pass. 1957 (Surdac, NEACȘU, 2008), *Echinochloo-Polygonetum lapathifolii* (Ujvárosi 1940) Soó et Csűrös (1944) 1947 (Pișchia, Surduc, NEACȘU, 2008), *Echinochloo-Polygonetum lapathifolii* Soó et Csűr. 1944 (Timiș-Bega interfluve, GRIGORE, 1971), *Salici-Populetum* (Tx. 1931) Mej-Drees 1936 (Timiș-Bega interfluve, GRIGORE, 1971), *Eleocharietum acicularis* Hvtc. 1933 *eleocharetosum acicularis* Ubr. 1961 (Timiș-Bega interfluve, GRIGORE, 1971), *Bidenteto-Polygonetum hydropiperis* (W. Koch 1926) Lohm. 1950 *bidentetosum tripartiti* Tim.-Bdrg. 1959 (Timiș-Bega interfluve, GRIGORE, 1971), *Caricetum acutiformis-ripariae* Soó (1927) 1930 (Satchinez, ARSENE et al., in STĂNESCU, 2005).

Persicaria maculosa Gray (published as *Polygonum persicaria* L.) appears in: *Glycerietum maximae* Hueck 1931 (Sânandrei, NEACȘU, 2008), *Eleocharidetum palustris* Schennikow 1919 (Surdac, NEACȘU, 2008), *Caricetum ripariae* Knapp et Stoffer 1962 / *Caricetum acutiformis-ripariae* Soó (1927) 1930 (Sânandrei, NEACȘU, 2008, Satchinez, ARSENE et al., in STĂNESCU, 2005), again in *Echinochloo-Polygonetum lapathifolii* (Ujvárosi 1940) Soó et Csűrös (1944) 1947 (Timiș-Bega interfluve, GRIGORE, 1971), *Polygono hydropiperi-Bidentetum* Lohm. 1950 (Timiș-Bega interfluve, GRIGORE, 1971).

GRIGORE (1971) found *Persicaria mitis* (Schränk) Assenov (published as *Polygonum mite* Schrank) in reed sub-associations - *typhosum angustifoliae* Sauer 1937 and *typhosum latifoliae* Soó 1964 of the association *Typhetum angustifolio-latifoliae* (Eggl. 1933) Schmale 1939, in Timiș-Bega interfluve. Also, we found the species on alluvial soils, on the outskirts of willows, *Salicetum albae* Issler 1924 s.l. (between 2006-2024, surroundings of the Surduc lake), *Bidenti-Polygonetum hydropiperi* Lohmeyer in R. Tüxen 1950 (between 2006-2024, only in a few phytocenoses near the Surduc lake) and at Pișchia in *Iretum pseudacori* Eggl. 1933 (summer of 2006).

VICOL (1974) found *Persicaria minor* (Huds.) Opiz (published as *Polygonum minus* Hudson) in Lugoj area, near a former brick factory, in several phytocenosis from *Heleocharietum palustris* Schennikow 1919 and *Bidenti-Polygonetum hydropiperi* Lohmeyer in R. Tüxen 1950 (cited as *Polygoneto-Bidentetum* (W. Koch 1926) Lohm. 1950). The species is also found in the flora of Locva Mountains (COSTE, 1974), in a few localities from Caraș-

Severin county (in the meadows), and in the interfluvial area Timiș-Pogonîș-Bârzava (ARVAT, 1977).

Persicaria amphibia (L.) Delarbre is characteristic species for *Polygono-Potamogeton natantis* Soó 1964 (Sânandrei, Liebling, NEACȘU, 2008, Lugo, VICOL, 1974), a vegetational association with high conservative value (DONIȚĂ *et al.*, 2005). This association regresses if the water level drops but the characteristic species, *Potamogeton natans* L. and *Persicaria amphibia* (L.) Delarbre (*Polygonum amphibium* L.) persist through the terrestrial forms. Also appears in: *Lemnetum minoris* (Oberd. 1957) Müller et Görs 1960 (Liebling, Surduc, NEACȘU, 2008), *Myriophyllo-Potamogeton* Soó 1934 (Sânandrei, Liebling, Pișchia, NEACȘU, 2008), *Trapa natantis* Müller et Görs 1960 (Liebling, NEACȘU, 2008), *Typhaetum angustifoliae* Pignatti 1953 (Sânandrei, NEACȘU, 2008), *Leersietum oryzoides* Krause 1955 em. Pass. 1957 (Surduc, NEACȘU, 2008), *Agrostidetum stoloniferae* (Ujvárosi 1941) Burduja *et al.* 1956, *Myriophyllo-Potamogeton* Soó 1934 (at Sudriaș, published as *Myriophyllo (spicatum)-Potamogeton (crispus)* Soó 1934, by Vicol, 1974), *Echinochloa-Polygonum lapathifolii* (Ujvárosi 1940) Soó et Csűrös (1944) 1947 (in Timiș-Bega interfluvial, GRIGORE, 1971), *Scirpo-Phragmitetum* W. Koch 1926 (Timiș-Bega interfluvial, GRIGORE, 1971), *Schoenoplectetum lacustris* Egger 1933 (Timiș-Bega interfluvial, GRIGORE, 1971), *Glycerietum maximae* Hueck 1931 (Timiș-Bega interfluvial, GRIGORE, 1971), *Caricetum ripariae* Knapp et Stoffer 1962 (published as *Caricetum acutiformis-ripariae* Soó 1927, Timiș-Bega interfluvial, GRIGORE, 1971, Satchinez, ARSENE *et al.*, in STĂNESCU, 2005), *Scirpeto-Phragmitetum* (Satchinez, OPREA *et al.*, 1974). BOȘCAIU (1971) mentioned *Polygonum bistorta* L., today synonym for *Bistorta officinalis* Delarbre, at Muntele Mic.

Reynoutria japonica Houtt. is a particularly dangerous invasive plant due to the extensive system of rhizomes, that can reach even 20 meter in length and grow to a depth of 2-3 meter or even more. ANASTASIU *et al.* (2019) draw attention to the spread of this plant along rivers is poor waste management practices. It is mostly found near a bridge that crosses a flowing water, where people usually throw vegetable waste from their gardens. DRĂGULESCU (2013) found the species in a few localities in Caraș-Severin county, but in recent years, this has spread widely in Timiș and Caraș-Severin counties.

Occasionally, *Persicaria orientalis* (L.) Spach (*Polygonum orientale* L.) is cultivated ornamentally (CIOCARLAN, 2009, URZICEANU *et al.*, 2020). SÎRBU & OPREA (2011) consider it naturalized in Romania, but with a rare-sporadic presence.

Spread and habitats. The knotweed species have a wide distribution in Banat (table 3) being identified at: surroundings of Timișoara (TÖKES, 1905), Liebling (SORAN, 1954, 1956), Lugo (BOȘCAIU, 1966, VICOL, 1974), Timiș-Bega interfluvial (GRIGORE, 1971), Locva Mountains (COSTE, 1974), Timiș-Pogonîș-Bârzava (ARVAT, 1977), Satchinez (OPREA *et al.*, 1970, 1974, ARSENE *et al.*, in STĂNESCU, 2005), Pișchia, Surduc, Sânandrei, Liebling (NEACȘU, 2008), Timiș river basin (DRĂGULESCU, 2013).

Possible uses. Some parts of plants as rhizomes, leaves, flowers of some species are very appreciated for herbal medicine. For example, *P. minus* has high pharmacological potential (CHRISTAPHER *et al.*, 2015), *P. cuspidatum* is used in Asian traditional medicine (THURSTON & PYSY, 2021, KE *et al.*, 2023). IDOUDI *et al.* (2024) published a review about ethnomedicinal, phytochemical, pharmacological activities, toxicology, and phytopharmaceutical formulation of genus *Polygonum* and show that these species have a very complex phytochemical composition: phenolic compounds (phenolic acids, flavonoids, tannins, stilbenes), volatile compounds, fatty acid, polysaccharides, bioactive compounds.

Pharmacological uses are practically unlimited: antipyretic, antidiuretic, gastroprotective, hepatoprotective, antiparasitic, antidiabetic, anticancer, antitumoral, neuropharmacological, antimicrobial, antiinflammatory, antioxidant.

The genus *Polygonum* is very interesting for its phytochemical composition, but it is not the only one, also other polygonaceae have high potential.

Table 3

Spread and habitat type			
No.	Species	Found at:	Habitats
1.	<i>Persicaria amphibia</i> (L.) Delarbre	Surduc, Pișchia, Liebling, Sânanndrei, Sudriaș, Lugoj, Timiș-Bega, Satchinez, Timiș drainage basin, Locva Mountains, Timiș-Pogoniș-Bârzava, surroundings of Timișoara	Humid areas, aquatic vegetation
2.	<i>Persicaria hydropiper</i> (L.) Delarbre	Surduc, Pișchia, Liebling, Sânanndrei, Lugoj, Timiș-Bega, Satchinez, Cerna valley, Timiș drainage basin, Locva Mountains, Timiș-Pogoniș-Bârzava, surroundings of Timișoara	Humid areas, on water shores, swamp vegetation
3.	<i>Persicaria lapathifolia</i> (L.) Delarbre	Surduc, Pișchia, Sânanndrei, Timiș-Bega, Satchinez, Timiș drainage basin, Locva Mountains, Timiș-Pogoniș-Bârzava, surroundings of Timișoara	Humid areas, flooded depressions, swamp vegetation, lakes banks
4.	<i>Persicaria minor</i> (Huds.)	Lugoj, Locva Mountains, Timiș-Pogoniș-Bârzava	Swamp vegetation, meadows
5.	<i>Persicaria mitis</i> (Schrank) Assenov	Surduc, Pișchia, Liebling, Timiș-Bega interfluvium, Timiș drainage basin, Locva Mountains, Timiș-Pogoniș-Bârzava	Humid areas, swamp vegetation
6.	<i>Persicaria maculosa</i> Gray	Surduc, Pișchia, Sânanndrei, Satchinez, Timiș-Bega interfluvium, Liebling, Timiș drainage basin, Locva Mountains, Timiș-Pogoniș-Bârzava	Humid areas, water shores
7.	<i>Reynoutria japonica</i> Houtt.	Timiș drainage basin, Caraș-Severin, Timiș county (unpublished data)	Roadside, bridges, water shores

CONCLUSIONS

We found 7 species of knotweed which grow in wetlands areas in the Romanian Banat: *Persicaria amphibia* (L.) Delarbre, *Persicaria hydropiper* (L.) Delarbre, *Persicaria lapathifolia* (L.) Delarbre, *Persicaria minor* (Huds.) Opiz, *Persicaria mitis* (Schrank) Assenov, *Persicaria maculosa* Gray, *Reynoutria japonica* Houtt.

In terms of distribution (abundance and frequency), the most suitable habitats for these species are shallow waters and their shores with pioneer vegetation. Given the climatic variations in recent years, maintaining consistent populations depends on the stability of the water level and the low intensity of anthropogenic activities.

The economic potential of these species is relatively underexplored, especially regarding microbiological activity (the interaction with microbial strains), an aspect that we aim to address in future research.

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