# New record of the Italian agile frog *Rana latastei* Boulenger, 1879 in Slovenian Istria

## Novi podatki o razširjenosti laške žabe *Rana latastei* Boulenger, 1879 v slovenski Istri

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Italian agile frog (*Rana latastei*) is one of Europe's most endangered amphibians; it is a strictly protected species under the Bern convention (Appendix II), listed as globally vulnerable (VU) by the IUCN (2009) (Sindaco et al. 2009) and therefore included in Annex II and IV of the EU Habitats Directive 92/43/EEC. Its distribution is fragmented, extending over less than 2000 km$^2$ area in total. This species can be found in the lowlands covered with natural semi-hygrophilous forests (Edgar et al. 2006) of the Padano Venetian plain in northern Italy and southern Switzerland, east to the Trieste in north-eastern Italy, in the Vipava River Valley in the southwestern part of Slovenia, and in Istrian regions of Slovenia and Croatia (Sindako et al. 2009, Kuljerić 2009, 2011, Glasnović 2012, Stanković & Poboljšaj 2013, Triglav Brežnik et al. 2015). In Slovenia, this species boasts the largest and healthiest populations in the Vipava River Valley (Panovec Forest). Fragments of its populations can be found spreading around the Vipava, Branica and Idrija River Valleys and in Slovenian Istria along the Dragonja River Valley and in Šavrin Hills near the border with Croatia (Poboljšaj 1998, Poboljšaj & Lešnik 2005, Edgar et al. 2006, Lešnik et al. 2011, Glasnović 2012, Stanković & Poboljšaj 2013, Triglav Brežnik et al. 2015), where it can live syntopically with other »brown frogs«, members of the family Ranidae (agile frog (*Rana dalmatina*), common frog (*Rana temporaria*)) (Edgar et al. 2006).

The first data of Italian agile frog from Slovenian Istria were gathered in 2011, in the area of woodland slopes of Suje along the Dragonja River Valley (Glasnović 2012, Lešnik et al. 2011). In 2012, a herpetological field survey was implemented to estimate the species range in this area (Stanković & Poboljšaj 2013). It was found in the Slovenian part of the Dragonja and Mirna watersheds; its habitats were found in the Dragonja River Valley and tributaries of the Mirna River (Malinska, Miklinica, Pregon, Mlaka and Reka), upper part of the Rižana tributary (Rakovec Stream) and the Lukinska Vala Valley. In 2015, the species distribution and population monitoring was carried out within the framework of the National monitoring of Natura 2000 amphibian species in Slovenia (Triglav Brežnik et al. 2015), at these already known sites. The presence and reproduction of this species in the wider area of Dragonja River Valley and its tributaries was confirmed, with the highest numbers of spawns detected in lower parts of the valley, where agricultural landscape dominates over forest residues. During this study done in 2016 and 2017, we found Italian agile frog for the first time in the Pivol Stream Valley near Izola (Fig. 1.).

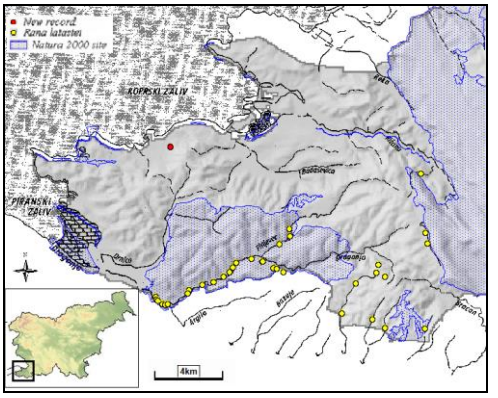


**Figure 1.** Red dot indicates a new record of the Italian Agile Frog (*Rana latastei*) at the small Pivol Stream in Koper hillsides with comparison to all known sites of this species in the Istria region (known data – 2015) in the south-west part of Slovenia.

**Slika 1.** Rdeča pika ponazarja novo najdbo laške žabe (*Rana latastei*) v majhnem Pivolskem potoku na delu Koprskega hribovja v primerjavi z znanimi najdišči v slovenski Istri (znani podatki – 2015) na jugozahodu Slovenije.

In springs of 2016 and 2017, we conducted a herpetological survey of the Pivol Stream on the western part of Izola slopes, close to the newly built motorway Koper – Izola. The entire water flow of the Pivol Stream was investigated,

extending from the agricultural landscape on the bottom of the valley to the top end of the valley in the hillsides overgrown by the association of hop and pubescent oak (*Ostryo – Quercetum pubescentis*). When we found first adults of the Italian agile frog, we conducted additional spawn counts (Heyer at al. 1994, Arnold 2002, Veenvliet & Kus Veenvliet 2003, Lešnik et al. 2011). We found a total of three new breeding sites of the Italian agile frog in the waters of Pivol Stream and its surroundings (Fig. 1) in both years of the investigation.

The first breeding site (No. 1, Fig. 2) was found near the highest end of Pivol Stream, although not in it, but in its vicinity, in smaller water bodies or puddles formed by spring rain in both years of the amphibian inventory. This breeding site was located 200 m upstream over the motorway, in the area with forest covered hillsides, where a small number of spawns (around five) were detected. The second (No. 2, Fig. 2) and the third (No. 3, Fig. 2) breeding sites were discovered inside the Pivol Stream, just 100 m downstream below the motorway, where the stream's waterflow slows down, in a small restricted area located at a distance of 0.5 km from the forest. Forest covered hillsides had been transformed here into agricultural landscape, with an abundance of riparian vegetation along the newly built small and medium sized water bodies (impoundment No. 2 and accumulation No. 3). We found spawn in a newly built small water body (8×8 m) (No. 2, Fig. 2), constructed as an impoundment for the purpose of slowing down the Pivol Stream waterflow, and at the site approximately 30 m downstream where this water body extends into a small accumulation (30×10 m) (No. 3, Fig. 2), which is used for water irrigation purposes. At the breeding site No. 2, the highest numbers of spawn were found (the number of Italian agile frog spawn was around 15). At the breeding site No. 3, only a small number of Italian agile frog spawn was found (around 5), although the number could possibly have been much higher, as intransparent or cloudy water was detected during both years of our investigations. At No. 2 and No. 3 sites, other amphibian species were breeding together with the Italian agile frog in the same water body, such as brown Agile frog species, the spawn of which was found in higher numbers, and two other species, like common newt (*Lissotriton vulgaris*) and common toad (*Bufo bufo*).

At all three investigated breeding sites we found only a small number of the Italian agile frog spawn (a total of around 20 per year) and few adults. When compared to the agile frog, the ratio of spawns was 1:4 (Italian agile frog : agile frog). It has been observed that when these two species breed in the same water body, the reproductive success of Italian agile frog is reduced compared to agile frog (Hettyey & Pearman 2003, Edgar et al. 2006). This was also observed at other breeding sites in Slovenian Istria with both species present (Triglav Brežnik et al. 2015). It has to be noted that the number of Italian agile frog spawn and spawn of other amphibian species depends on precipitation and humidity conditions at potential breeding sites, which vary each spring.


**Figure 2.** Male Italian agile frog found at the newly found breeding place No. 2 in the Pivol Stream in 2016. Red marks with numbers denote three new Italian Agile frog breeding sites located around the newly built Izola – Koper motorway (photo: G. Triglav Brežnik).

**Slika 2.** Samec laške žabe, najden na mrestišču št. 2 v Pivolskem potoku. Rdeče oznake ponazarjajo tri nova mrestišča laške žabe v okolici novega odseka hitre ceste Izola – Koper (foto: G. Triglav Brežnik).

New data on distribution of the Italian agile frog in the small Pivol Stream and its vicinity in Koper hillsides and in the outskirts of the town of Izola suggest that this species boasts a larger area of distribution in the Slovenian part of Istria than previously known. We can expect to find more fragments of the Italian agile frog habitats at small tributaries of smaller streams running into Koper Bay. Additional research is needed to find potential new sites and to estimate population size of this species in the area.

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