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Short note / Nota Breve

New record of an unpublished location and a new finding in a hypogeal context for *Euproctus platycephalus* (Gravenhorst, 1829) (Urodela, Salamandridae)

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Key words

- distribution
- Sardinian Brook Newt
- hypogeal
- new record
- Sardinia

Summary

With this note the authors update the information on the distribution of the Sardinian *Euproctus platycephalus* (Gravenhorst, 1829) including two new sites of presence in Sardinia. One of these is outside the current geographical range of the species and one is hypogeous, within a catchment area where the species is known. Any new information about this rare and threatened species might improve its knowledge and promote its conservation.

Parole chiave

- distribuzione
- euprotto sardo
- ipogeo
- nuova segnalazione
- Sardegna

Riassunto

Con la presente nota gli autori aggiornano le informazioni sulla distribuzione dell'euprotto sardo *Euproctus platycephalus* (Gravenhorst, 1829) presentando due nuovi siti di presenza in Sardegna, uno inedito al di fuori dell'attuale range geografico della specie e uno ipogeo all'interno di un bacino idrografico in cui la specie è nota. Ogni nuova informazione a riguardo di questa specie rara e minacciata può infatti migliorarne la conoscenza e favorirne la conservazione.

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Introduction

The Sardinian Brook Newt *Euproctus platycephalus* (Gravenhorst, 1829) is endemic to Sardinia and it is mainly distributed in the eastern part of the island (Vignoli et al. 2016). It is mostly living in mountainous streams and pools, with well-oxygenated and generally cold water, although it is also often found in suboptimal habitats (Sindaco et al. 2006; Di Nicola et al. 2019). The species is listed as Endangered (EN) both in the global and national IUCN Red Lists (Romano et al. 2009; Andreone et al. 2013), even if evidence has previously

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suggested an overstatement with regards to extinction risk (Vignoli et al. 2016). Currently, the presence of *E. platycephalus* has been ascertained in 57 sites (Vignoli et al. 2016), despite the 34 sites recorded by Sotgiu et al. (2010), the only 14 sites recorded by Lecis & Norris (2003) and the former datum of 45 sites provided by Alcher (1975). Hence, the current distribution of *E. platycephalus* is a fundamental basis for assessing the extinction risk the species is exposed to.

Herein, we report an update of the distribution of the rare and threatened *E. platycephalus* in Sardinia, including two new sites where the species occurs, namely a site from an unpublished location and one from a hypogeal context (peculiar to this species), within a river basin where the species is known.

Results and Discussion

Two consecutive field surveys were performed in 2016 and 2017 in which the authors found two new relevant sites providing evidence of the presence of the Sardinian Brook Newt.

The first site is a brook situated on Monte Nieddu (S. Teodoro, Gallura, Province of Olbia-Tempio) at approximately 300 m a.s.l. and within a 20 km radiant of the well-described populations of the Altopiano Buddusò (Vignoli et al. 2016). This perennial brook runs through the Riu Pitrisconi water basin and its surroundings are characterised by granitic rocks and the absence of fish species in its waters [these characteristics are in line with ecological needs of the species, as discussed in Nöllert & Nöllert (2003) and in Sotgiu et al. (2010)]. We found an adult male in the brook under a submerged rock (Fig. 1A) together with, along the brook, as many as a hundred larvae at different life stages in a total of 9 pools. These findings were recorded on 25 July 2017 although the first visual observations with no data collection were occurred in 2016. This site was subsequently visited during three consecutive years between the end of July and the first half of August and the presence of *E. platycephalus* has been reconfirmed on a yearly basis (2017: data above; 2018: approximately 100 larvae; 2019: 2 adults and 89 larvae). Since Riu Pitrisconi is subject to constant anthropic pressure (canyoning, tourism), appropriate conservation actions should be prioritised particularly for the most significant reproductive areas of its water basin. Coordinates: adult male and larvae 40° 45' N, 9° 35' E (these coordinates are reported approximately for conservation reasons).

The second finding refers to a hypogeal condition, situated in the cave n°2003 SA/CA Fossa de Suergiu (Villaputzu, Su Pranu-Suergiu, Province of Sud Sardegna) at 479 m a.s.l.. This cave is located within the karstic area known as "Altopiano del Salto di Quirra", which is a military restricted area, property of the "Poligono Sperimentale e di Addestramento Interforze del Salto di Quirra" (PISQ). This site does not allow human presence except for authorised staff. The cave is characterised by a rather large vertical entrance with a negative height difference of -7 m and a total spatial length of 204 m (Bartolo et al. 1980; Speleo Club Cagliari 1986). The finding was recorded on 13 February 2016 and associated with a single adult male found in a hypogeal pool at the base of the vertical entrance of the cave (with evident fibular spurs as illustrated in Fig. 1B). The cave n°2003 is 4.66 km distant from the cave n°0004 SA/SU Grotta De Is Angurtidorgius (Villaputzu/Ulassai, Su Pranu, Province of Sud Sardegna) at 494 m a.s.l. in which a population of *E. platycephalus* has been previously reported in the literature (Sindaco et al. 2006; Angelini et al. 2014; Ball et al. 2017). These caves are located in the same karstic area, the Angurtidorgius complex (Deidda & Zanda pers. comm.; Federazione Speleologica Sarda 2020) and it is likely that the individual found in the cave n°2003 is part of a meta-population living in the hypogeal stream basin, even if genetic analysis should be performed to confirm these assumptions. Although this single specimen was situated in an area that is already known as part of the distributional range of the species, it is a rather peculiar finding since this location is relatively far away from the first case of a hypogeal observation for *E. platycephalus*, considering the low movement rate of these newts (Montori et al. 2008; Tessa G. unpublished data). The whole hypogeal population appeared to be consistent and distributed on a wide territory, but the researchers experienced difficulties to obtain access to the military area that limited further field investigations.

Fig. 1 *- Adult male Sardinian Brook Newts from Monte Nieddu (A) and Fossa de Suergiu (B). Photocredits: Tommaso Baldrati (A) and Matteo R. Di Nicola (B). / Maschi adulti di euprotto sardo trovati sul Monte Nieddu (A) e nella Fossa de Suergiu (B). Foto di: Tommaso Baldrati (A) e Matteo R. Di Nicola (B).*

The present note provides two new records of the distributional range of the Sardinian Brook Newt, from those recently reported by Vignoli et al. (2016). The authors would like to highlight the importance of maintaining population field monitoring of *E. platycephalus*, which is often considered as one of the most elusive and threatened amphibian species within Italy and Europe. Previous authors have discussed a number of factors that are contributing to an increase in the extinction risk for this species and these include habitat loss and fragmentation, pollution, water catchment, alloctonous species, predatory fishes [e.g. salmonids, which however may not have such a large impact, as suggested by Bovero et al. (2005)], long droughts, tourism, poaching with disruptive methods, captures for illegal collections and chytridiomycosis (Bovero et al. 2008) (Romano et al. 2009; Casula et al. 2010; Andreone et al. 2013; Di Nicola & Mezzadri 2018; Di Nicola et al. 2019).

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