



New Records and a Review of Predation Events Involving Mediterranean Wormlizards (Amphisbaenia: Blanidae: *Blanus*)

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Investigating interactions between different species is one of the principal methods for filling gaps in our knowledge of biodiversity (Hortal et al. 2015). However, such research becomes more challenging when the species of interest are not easily observable. This is the case with amphisbaenians (wormlizards), approximately 200 species (Uetz et al. 2025) of elongated limbless lizards with subterranean habits (Gans 1978; Costa and Garcia 2019). Although recent advances have been made in understanding the natural history of these reptiles (e.g., Andrade et al. 2006; López 2015; Martín et al. 2021), information about predators is largely limited to stomach-content analyses, especially of snakes (e.g., Pleguezuelos

et al. 1994; Marques and Sazima 1997; Maschio et al. 2010), and incidental observations in nature (e.g., Múgica 1990; Assis et al. 2022; Honório et al. 2022).

With the advent of online citizen-science platforms, where thousands of photographic records are added daily (Maritz and Maritz 2020), our knowledge of numerous species, including amphisbaenians, has expanded substantially. Using iNaturalist (www.inaturalist.org), we found two noteworthy records of predation involving wormlizards of the genus *Blanus* (Blanidae), whose distribution spans the Iberian Peninsula and northern Morocco, some Greek islands, Türkiye, Iraq, Syria, and Lebanon (Şahin et al. 2021).

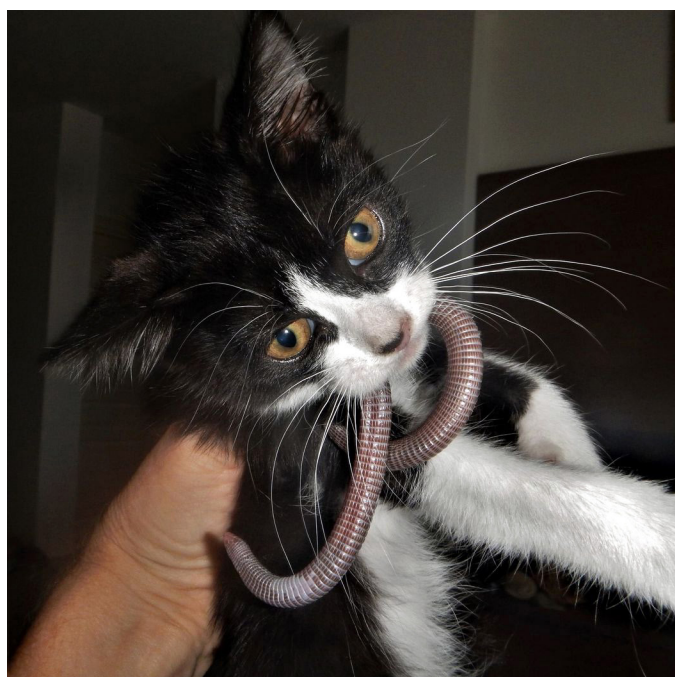


Figure 1. Attempted predation on a Turkish Wormlizard (*Blanus strauchi*) by a Domestic Cat (*Felis catus*) in Gümbet, Türkiye. Photograph by Tamsin Carlisle on iNaturalist (Carlisle 2020).



Figure 2. Predation on an Iberian Wormlizard (*Blanus cinereus*) by a Western Cattle Egret (*Ardea ibis*) in Cádiz, Spain. Photograph by b3ugaz on iNaturalist (b3ugaz 2022).

The first record (Carlisle 2020), made at 1628 h on 7 June 2020, in Gümbet, Türkiye (37.0236, 27.3896; elev. 47 m asl), documents the attempted predation of a Turkish Wormlizard, *Blanus strauchi* (Bedriaga 1884), by a Domestic Cat, *Felis catus* Linnaeus 1758 (Fig. 1). The notes accompanying the record stated that the reptile was rescued and released under a bush. The second record (b3ugaz 2022), made at 1337 h on 3 December 2022, in Cádiz, Spain (36.7750, -6.0670; elev. 48 m asl), shows the predation of an Iberian Wormlizard, *Blanus cinereus* (Vandelli 1797), by a Western Cattle Egret, *Ardea ibis* (Linnaeus 1758) (Fig. 2). Both observations were identified as “research grade,” and we confirmed the taxonomic identity of the photographed individuals based on the geographical location of each record, as species of *Blanus* generally do not coexist (Sindaco et al. 2014; Ceriaco and Bauer 2018; Şahin et al. 2021). The identification of *Ardea ibis* was based on the external morphology of the species described for Cádiz, Spain (Telfair II 2024) and confirmed by ornithologist João M.G. Capurucho (Universidade Federal de Juiz de Fora, Brazil).

To review predation records on all seven currently recognize species of *Blanus* (Sindaco et al. 2014; Ceriaco and Bauer 2018), on 2 March 2025 we conducted a literature review on Google Scholar using the following terms in Portuguese, Spanish, and English: predação OR presa OR predador OR depredación OR predación OR depredador OR predation OR prey OR predator OR diet OR dieta AND *Blanus*, yielding 896 results, 27 of which were relevant to our study (Table 1). In addition, we searched for records in databases compiled by Schalk and Cove (2018) and Grundler (2020), as well as *Herpetological Review* (1967–2024) and the 10th volume of *Fauna Iberica* (Salvador 2014b). For all studies containing predation records, we analyzed the cited references in search of additional information. We considered records attributed to Maria’s Wormlizard (*Blanus mariae*) as pertaining to *B. cinereus* per Ceriaco and Bauer (2018).

Twenty-five species have been recorded as predators of *Blanus* spp.: 12 birds (mostly Falconiformes), one insect, seven mammals (mostly Carnivora), one lizard, and four snakes. Additionally, a doubtful record noted predation

Table 1. Published reports of predation on Mediterranean Worm Lizards (*Blanus* spp.).

Predator	Prey	Reference(s)	Locality
VERTEBRATA: AVES			
Bucerotiformes: Upupidae			
Eurasian Hoopoe (<i>Upupa epops</i>)	<i>B. oxyurus</i> ¹	Martínez (1997)	Spain: Granana: La Hoya de Guadix and Reserva Natural Eural de Corvaes
Coraciiformes: Coraciidae			
European Roller (<i>Coracias garrulus</i>)	<i>B. mettetalí</i>	Schleich et al. (1996)	Morocco
Falconiformes: Accipitridae			
Common Buzzard (<i>Buteo buteo</i>)	<i>B. oxyurus</i>	Valverde (1967), Salvador (2014b) Garzón (1974), Salvador (2014b) Múgica (1990), Salvador (2014b) Manosa and Cordero (1992)	Spain: Valladolid Spain (Midwest) Spain: Madrid Spain: Catalonia
Montagu’s Harrier (<i>Circus pigargus</i>)	<i>B. cinereus</i>	Hiraldo et al. (1975), Salvador (2014b)	Spain: Huelva: Sierra Pelada and Isla Cristina; Sevilla: Campiña de Gerena
Red Kite (<i>Milvus milvus</i>)	<i>B. cinereus</i>	Delibes and García (1984), Salvador (2014b)	Spain: Huelva, Sevilha; Cádiz: Doñana National Park
Falconidae			
Lesser Kestrel (<i>Falco naumanni</i>)	<i>B. cinereus</i>	Franco and Andrada (1977), Cramp (1980) in Martín and López (1990), Franco (1980), Salvador (2014b)	Spain (Southwest)
Common Kestrel (<i>Falco tinnunculus</i>)	<i>B. oxyurus</i> ¹	Valverde (1967), Salvador (2014b)	Spain: Almeria

Passeriformes: Lanidae

Iberian Grey Shrike (<i>Lanius meridionalis</i>)	<i>B. cinereus</i>	Valverde (1960 in Martín and López (1990), Salvador (2014b), Valverde 1967) ²	Spain: Huelva, Sevilha; Cádiz: Doñana National Park
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Pelecaniformes: Ardeidae

Western Cattle Egret (<i>Ardea ibis</i>)	<i>B. cinereus</i>	b3ugaz (2022)	Spain: Cádiz: Cádiz
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Strigiformes: Tytonidae

Barn Owl (<i>Tyto alba</i>)	<i>B. mettetali</i>	Schleich et al. (1996)	Morocco
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Strigidae

Little Owl (<i>Athene noctua</i>)	<i>B. mettetali</i>	Schleich et al. (1996)	Morocco
Pharaoh Eagle-Owl (<i>Bubo ascalaphus</i>)	<i>B. mettetali</i>	Schleich et al. (1996) ³	Morocco

VERTEBRATA: MAMMALIA**Artiodactyla: Suidae**

Wild Boar (<i>Sus scrofa</i>)	<i>B. cinereus</i>	Garzón et al. (1984) in López (2009), Gonzales (1984), Salvador (2014b)	Spain: Huelva, Sevilha; Cádiz: Doñana National Park
	<i>B. oxyurus</i> ¹	Abaigar (1993), Schley and Roper (2003)	Spain: Almería: Sierra Nevada and Sierra de Baza-Filabres

Carnivora: Canidae

Red Fox (<i>Vulpes vulpes</i>)	<i>B. cinereus</i> ⁴	Amores (1975), Salvador (2014b)	Spain: Córdoba, Huelva; Sevilla: Sierra Morena
	<i>B. cinereus</i>	Fedriani (1996)	Spain: Huelva: Doñana National Park: Coto del Rey

Felidae

Domestic Cat (<i>Felis catus</i>)	<i>B. strauchi</i>	Carlisle (2020)	Türkiye: Muğla: Gümbet
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Herpestidae

Egyptian Mongoose (<i>Herpestes ichneumon</i>)	<i>B. cinereus</i> ⁴ <i>B. cinereus</i>	Delibes et al. (1984), Salvador (2014b) Bandeira et al. (2018)	Spain Portugal
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Mustelidae

Beech Marten (<i>Martes foina</i>)	<i>B. cinereus</i> ⁴	Amores (1980) in López (2009)	Southwestern Spain
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Viverridae

Common Genet (<i>Genetta genetta</i>)	<i>B. oxyurus</i> ¹	Delibes (1974), Salvador (2014b)	Spain: Cáceres: La Moheda de Gata
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Rodentia: Gliridae

Garden Dormouse (<i>Eliomys quercinus</i>)	<i>B. cinereus</i>	Palacios (1975) in Salvador (2014a, 2014b)	Spain: Huelva, Sevilha; Cádiz: Doñana National Park
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VERTEBRATA: SQUAMATA (lizards and snakes)**Lacertidae**

Ocellated Lizard (<i>Timon lepidus</i>)	<i>B. oxyurus</i> ¹	Castilla et al. (1991), Salvador (2014b)	Spain: Cáceres, Toledo, and Ciudad Real
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Colubridae

Horseshoe Whipsnake (<i>Hemorrhois hippocrepis</i>)	<i>B. cinereus</i>	Pleguezuelos and Moreno (1990), Salvador (2014b)	Southeastern Iberian Peninsula
Western False Smooth Snake (<i>Macroprotodon brevis</i>)	<i>B. cinereus</i>	Hiraldo (1974) ⁵ , Salvador (2014b)	Spain: Huelva, El Rocío: Arroyo de le Rocina
	<i>B. cinereus</i> ⁴	Pleguezuelos et al. (1994) ⁵ , Salvador (2014b)	Iberian Peninsula
	<i>B. mettetali</i>	Joger et al. (2009)	
	<i>B. mettetali</i>	Bons and Saint-Girons (1963), Schleich et al. (1996) ⁵	Morocco
Montpellier Snake (<i>Malpolon monspessulanus</i>)	<i>B. tingitanus</i>	Pleguezuelos et al. (1994)	Morocco
	<i>B. mettetali</i>	Bons and Saint-Girons (1963), Schleich et al. (1996)	Morocco
	<i>B. mettetali</i>	Bons and Saint-Girons (1963), Schleich et al. (1996)	Morocco
Ladder Snake (<i>Zamenis scalaris</i>)	<i>B. cinereus</i>	Díaz-Paniagua (1976), Salvador (2014b)	Spain: Sevilla, Huelva, Cádiz, and Córdoba
Ladder Snake (<i>Zamenis scalaris</i>)	<i>B. oxyurus</i> ¹	Valverde (1967) ⁶	Spain: Almería: Taberna

Viperidae

Lataste's Viper (<i>Vipera latastei</i>)	<i>B. cinereus</i> ⁴	Bea and Braña (1988), Santos et al. (2007, 2008), Salvador (2014b)	Iberian Peninsula
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HEXAPODA: INSECTA**Coleoptera: Staphylinidae**

Devil's Coach Horse Beetle (<i>Ocypus olens</i>)	<i>B. cinereus</i>	Fuentes and Antance (2021)	Spain: Soria: Miño de Medinaceli/Conquezucla
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¹Prey cited as *Blanus cinereus*.²Predator cited as *Lanius excubitor*.³Predator cited as *Bubo bubo*.⁴Prey is either *Blanus cinereus* or *Blanus oxyurus*.⁵Predator cited as *Macroprotodon cucullatus ibericus*.⁶Questionable record.

by a Ladder Snake (*Zamenis scalaris*) on a Central Iberian Wormlizard (*Blanus oxyurus* Wagler 1824) (formerly *Blanus vandellii* Ceriaco and Bauer 2018; see Sánchez-Vialas et al. 2024) (Table 1). Most predation records pertain to *B. cinereus* or *B. oxyurus*. To the best of our knowledge, no published

records document predation on the Cilician Wormlizard (*Blanus aporus* Werner 1898) or the Levant Wormlizard (*B. alexandri* Sindaco, Kornilios, Sacchi, and Lymberakis 2014). We did not include a record of the Eurasian Pygmy-Owl, *Glaucidium passerinum* (Linnaeus 1758) as a predator of the

Moroccan Wormlizard (*B. mettetali* Bons 1963) (Schleich et al. 1996), as this species of owl does not occur within the range of *B. mettetali* (Holt et al. 2020).

Most, but not all records of *B. cinereus/oxymyrmex* in Table 1 are cited in the *Enciclopedia Virtual de los Vertebrados Españoles* (López 2009, 2015; Salvador 2014a) and *Fauna Iberica* (Salvador 2014b). In addition to the new records herein (Carlisle 2020; b3ugaz 2022), predation by a Eurasian Hoopoe (*Upupa epops*) (Martínez 1997), a Devil's Coach Horse Beetle (*Ocypus olens*) (Fuentes and Antance 2021), and the possible predation by *Zamenis scalaris* (Valverde 1967) were not cited in the *Enciclopedia*, and predation by a Stone Marten (*Martes foina*) (Amores 1980 in López 2009) was not cited by Salvador (2014b). A report of predation on *Blanus* spp. by a Blue Rock Thrush, *Monticola solitarius* (Linnaeus 1758) (Hellmich 1984; Bakkal 2014), is uncertain.

Domestic cats are the mammalian predators that cause the greatest impact on native terrestrial vertebrate fauna, with over 2,000 native species identified as their prey, particularly birds, reptiles, and mammals (Lepczyk et al. 2023). They have contributed directly to the extinction of many species worldwide (Doherty et al. 2016; Lepczyk et al. 2023) and are included in the list of the *100 of the World's Worst Invasive Alien Species* (Lowe et al. 2000). Based on our review, no previous records documented predation on *B. strauchi*. The attempted predation by *Felis catus* reported here thus represents the first known case of (attempted) predation on this wormlizard.

In contrast to domestic cats, the Western Cattle Egret (*Ardea ibis*) is a widespread native species that occurs in the Americas, Europe, Africa, parts of Asia, and the Middle East (Telfair II 2024). It is usually found foraging in association with grazing animals, feeding on arthropods, small amphibians, reptiles and fish (Hussein and Rezk 2016; Telfair II 2024). *Ardea ibis* is the fifth species of bird and the first peleciform to be recorded as a predator of *Blanus cinereus* (Table 1).

Our study highlights the importance of integrating literature reviews and citizen science to enhance our understanding of predator-prey interactions, particularly for elusive taxa such as species of *Blanus*. Comprehensive literature reviews are essential for consolidating existing knowledge and identifying key gaps in research, as they provide a broader perspective on species interactions and ecological roles (e.g., Schalk and Cove 2018; Grundler 2020; Lepczyk et al. 2023). Despite our efforts, significant gaps remain, especially concerning the predators of the species of *Blanus* in the eastern parts of the generic range (*B. aporus*, and *B. alexandri*). Given the challenges of direct observations and specimen collection for subterranean reptiles, online citizen-science platforms, particularly iNaturalist, represent powerful tools for uncovering new ecological interactions (Maritz and Maritz 2020). Expanding the use of citizen science for studying cryptic species will be

crucial in refining our understanding of their ecological roles and conservation needs.

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