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First record of *Sander lucioperca* (Perciformes, Percidae) in the Alqueva reservoir, Guadiana basin (SW Iberian Peninsula)

José Luís Pérez-Bote* and Rafael Roso Romero

Área de Zoología, Facultad de Ciencias, Universidad de Extremadura, Av. de Elvas s/n, 06071 Badajoz, SPAIN.

* Corresponding author: jlperez@unex.es

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ABSTRACT

First record of *Sander lucioperca* (Perciformes, Percidae) in the Alqueva reservoir, Guadiana basin (SW Iberian Peninsula)

The pikeperch *Sander lucioperca* (Linnaeus, 1758) is recorded for the first time in the Alqueva Reservoir (Guadiana River Basin, SW Iberian Peninsula). Fish were captured with trammel nets from August to October 2008. The age of specimens was comprised between two and three years old. Morphometric and meristic characteristics of specimens ($n = 9$) are reported.

Key words: Percidae, *Sander lucioperca*, Iberian Peninsula, Alqueva reservoir, Introduced species.

RESUMEN

Primera cita de* Sander lucioperca *(Perciformes, Percidae) en el embalse de Alqueva, cuenca del Guadiana (suroeste de la Península Ibérica)

Se hace referencia a la primera captura de la lucioperca Sander lucioperca *(Linnaeus, 1758) en el embalse de Alqueva (cuenca del Guadiana, suroeste de la Península Ibérica). Los ejemplares, de entre dos y tres años, fueron capturados entre agosto y octubre de 2008 con trasmallos. Se aportan datos morfométricos y merístcos de los mismos (*n = 9*).*

Palabras clave: *Percidae,* Sander lucioperca*, Península Ibérica, embalse de Alqueva, especies introducidas.*

INTRODUCTION

Pikeperch *Sander lucioperca* (Linnaeus, 1758) is the main open-water piscivorous fish in eutrophic waters in Europe (Kitchell *et al*., 1977). Favourable biotopes of pikeperch are relatively warm, productive, still or slow flowing waters that are rich in small fish (Smith *et al*., 1998). Preferred temperature of pikeperch is from 24 °C up to 29 °C. Pikeperch are favoured in highly eutrophic and turbid systems, since they have visual adaptations enhancing their foraging capacity in turbid environments (Karas & Sandström, 2002). *S. lucioperca* is found naturalised as an alien species in a large number of countries in Europe (Lever, 1996), including the UK, Denmark, Italy, Turkey, France and Holland. It has been introduced for both commercial and recreational fishing; the fish is very tasty and has high market and angling value. The first confirmed record of the pikeperch in the Iberian Peninsula dates to the end of 1970's in Gerona, Spain (Gómez-Caruana & Díaz Luna, 1991). In actuality pikeperch is present in the Duero, Ebro, Tajo, Gua-

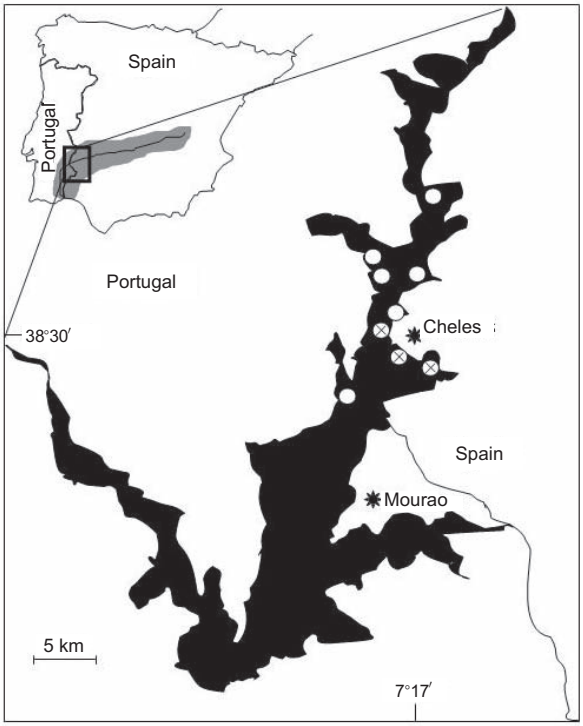

Figure 1. Guadiana basin (shaded area) and study area (darkened area) in the Iberian Peninsula. Sampling sites (o) within the Alqueva reservoir; (⊗), positive detections. *Cuenca del Guadiana (gris) y zona de estudio (oscuro). Zonas de muestreo (o) en el embalse de Alqueva; (⊗), muestreos positivos.*

diana, Júcar and Segura Iberian basins (Barros *et al*., 2000; Doadrio, 2002; Miñano *et al*., 2002; Pérez-Bote *et al*., 2004; Clavero & García-Berthou, 2006; Gante *et al*., 2008).

There was unconfirmed rumours among fishermen about the presence of pikeperch in the reservoir from some months ago. Thus this study was conducted to confirm the presence of pikeperch in the Guadiana basin.

MATERIALS & METHODS

The Alqueva reservoir, located in the southwestern Iberian Peninsula along 85 km of the main course of the Guadiana River, constitutes the biggest artificial lake on the Iberian Peninsula. The dam was closed on February 2002. It can store 45 000 hm^3 of water, with a dentiform surface of 25 000 ha. The catchment area is 55 000 km^2. Sampling was performed at 9 sites over the Spanish and Portuguese flooded areas near the municipality of Cheles (Spain), from June to October 2008 (Fig. 1). Pikeperch were sampled twice a month using gillnets of mesh size (stretched mesh) of 36, 40, 44, 50 and 64 mm and trammel nets of mesh size of 56, 80, 100, 120 and 140 mm. Sampling was carried in periods of 24 hours. All fishes were identified and counted. Specimens of pikeperch were measured (± 1 mm) and weighted (± 1 g). Some scales near the pelvic region were caught for age determination (Lappalainen *et al*., 2006).

RESULTS AND DISCUSSION

According to previous studies a total of 13 exotic fish species inhabits the Guadiana river basin (Hermoso *et al*., 2008) and references therein and Gante *et al.,*2008). In recent surveys pikeperch was not located in the Spanish (Hermoso *et al.*, 2008) and Portuguese areas of the basin (Ribeiro *et al*., 2006). Other species captured in this study were: *Luciobarbus comizo, L. microcephalus, L. steindachneri, Pseudochondrostoma willkommii, Ameilurus melas, Micropterus salmoides, Cyprinus carpio and Carassius auratus.*

The specimens collected in Alqueva reservoir (August: 4 specimens, September: 2 specimens; October: 3 specimens) ranged from 352.1 to 376 mm TL (mean: 33.26, S.D.: 1.21), and weighed from 395 g to 425 g (mean: 412 g, S.D.: 15). Their ages were comprised between 2+ and 3+ years. In other Iberian populations the size of pikeperch ranged between 3101-57.5 cm TL (age: 3+ – 5+ years; Segura basin; Miñano *et al*., 2002) and between 29.35-45.16 cm TL (age: 2+ – 5+ years; Tajo basin, Pérez-Bote *et al.*, 2004).There is little difference in the mean values for morphological characters between Guadiana pikeperch (Table 1) and those of the Middle Danube (Krpo-Cetkovic & Stamenkovic, 1996) and the River Lee in England (Copp *et al*., 2003). Meristically, the Guadiana pikeperch were indistinguishable and showed a range of values similar to those reported for populations in other areas as central Europe (Oliva & Safranek, 1962) and England (Copp *et al*., 2003).

Table 1. Morphometric and meristic characteristics of *Sander lucioperca* from the Alqueva reservoir. *Características morfométricas y merísticas de* Sander lucioperca *en el embalse de Alqueva.*

Morphometrics (n = 9)	Range (cm)	% TL (mean ± S.D.)
Total length (TL)	36.7-37.6	—
Fork length	34.0-35.3	99.9 ± 1.0
Standard length	30.2-31.1	82.6 ± 0.4
Body depth	6.2-6.9	17.8 ± 0.9
Predorsal distance	9.8-10.5	27.5 ± 0.8
Head length	9.0-9.3	24.7 ± 0.01
Eye diameter	1.4-1.6	4.1± 0.1
Preorbital distance	2.1-2.7	6.0 ± 0.2
Postorbital distance	5.5-5.7	15.0 ± 0.1
Prepectoral distance	8.9-9.3	24.6 ± 0.3
Prepelvic distance	9.9-10.2	27.1 ± 0.1
Preanal distance	18.0-18.2	48.7 ± 0.3
Base of dorsal fin	1.5-1.6	42.4 ± 1.0
Base of pectoral fin	1.3-1.7	4.1 ± 0.9
Base of anal fin	3.6-4.2	10.5 ± 0.9
Base of pelvic fin	1.3-1.5	3.7 ± 0.3
Pectoral fin	5.3-5.4	14.4 ± 0.3
Pelvic fin	5.4-6.0	15.4 ± 1.3
Upper jaw	3.7-3.9	10.3 ± 0.1
Meristic counts (n = 9)		
First dorsal fin spines	13-14	
Second dorsal fin spines	1-3	
Second dorsal fin rays	21-23	
Anal fin rays	2-3	
Anal fin spines	10-12	

The occurrence of pikeperch in this area is not a surprise, and may be related with its commercial and recreational value. In the Iberian Peninsula, fishermen are known to be responsible for the most recent invasions (Elvira & Almodóvar, 2001). The Guadiana River fish community was dominated by native species prior to the construction of Alqueva dam, whereas the fish community is now dominated by introduced species. According with its life-characteristics (Ribeiro *et al*., 2008) we predict a notable success for *S. lucioperca* in the Alqueva reservoir, as has occurred with other introduced species in the Iberian waters. Public awareness and effective control of illegal introductions are needed to avoid future introductions (Filipe *et al*., 2002; Ribeiro *et al*., 2006).

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