

Late Holocene distribution of the European Shag (*Phalacrocorax aristotelis* (Linnaeus, 1761) in Bulgaria

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Abstract. A review of the species' discovery, its breeding range and records, and the subfossil records in Bulgaria is presented.

Key words: European Shag, Bulgaria, Holocene bird record, West Black Sea region, avian bone remains

Because of its highly restricted range in the country, the species remained unregistered until 1946 when Boev (1951) reported it as a nesting species in the region of the Tyulenovo village (Dobritch town Region) in 1946 and 1950. Later on, a number of nesting sites have been found between the Tyulenovo village, Yaylite area, Cape Kaliakra, Yeni Kulak, Cape Zeleni Nos, and Rusalka. The species always nests on vertical rocks and cliffs along the coast at height up to 20 m above the sea surface, as well as rock crevices and terraces, in caves up to 30 m from the entrance (Georgiev *et al.* 2007). Single wintering individuals were registered along the South-Bulgarian Black Sea Coast. Although extremely rare in the south of the country's shore, the European Shag has been found in the samples of the prey remains of the Eurasian Eagle Owl (*Bubo bubo* (L.)) in a site near the Kosti village (Burgas Region) in the Strandzha Mountain (collected during 1996 by Dr. Boyan Milchev, University of Forestry, Sofia). An adult male has been recorded in July 2006 in the mouth of Veleka River near the Sinemorets village (Burgas Region; Hristina Samardzhieva, unpublished data).

In Bulgaria the Shag is represented by the subspecies *Ph. a. desmarestii* Payraudeau, 1826 (Dickinson & Rensen 2013). It is resident, breeding, partly migratory and regularly wintering. Its total number is estimated at 180–250 pairs (Georgiev *et al.* 2007). It is worthy to be mentioned that the Eastern border of the species' distribution in Europe passes through the country (Boev 1997; Hagemeyer & Blair 1997) (Fig. 1). Nankinov (2001) reports on migrations of the European Shag in Bulgaria exceeding 100 km along the sea coast zones.

All Pleistocene records of the species lie within the recent breeding range - Cyprus, France, Greece, Italy, Portugal, Spain, and United Kingdom (Tyrberg 1998) and Gibraltar (Tyrberg 2008).

In addition Quaternary records from Norway, Schotland, Gibraltar, Monaco have been listed by Brodkorb (1963), and these from Sardinia, Corsica, Crete, and Balearic Islands - by Boev (1999).

The only prehistoric subrecent out-of-range record of the European Shag from Bulgaria has been found in the sunken settlement of Urdoviza of the Chalcolithic - Early Bronze Age (5000 - 4000 BP (Boev & Ribarov 1990). The find has been collected in 1989-1990 by a team under the leaderships of Dr. Mihail Lazarov. It represents a well preserved axial fragment of an adult individual with all corpora vertebrorum (Fig. 2). Its comparison completely fits to morphology and size of *Ph. aristotelis*. It is the first species' subfossil record in the Black Sea region, possibly except the find from Torone (Toroni; Sithonia Peninsula) on the North Aegean Coast in Greece. It proves the former wider distribution in the Middle Holocene in SE Europe. We may only speculate if the find belonged to a breeding or migratory bird. In both cases, the find of Urdoviza proves its subrecent distribution along the Western Black Sea coast in the Bulgarian lands, including in remote localities from the recent breeding range. The site in the Kiten Bay lies ca. 150 km away from the main recent nesting colony in the vicinities of Tyulenovo village.

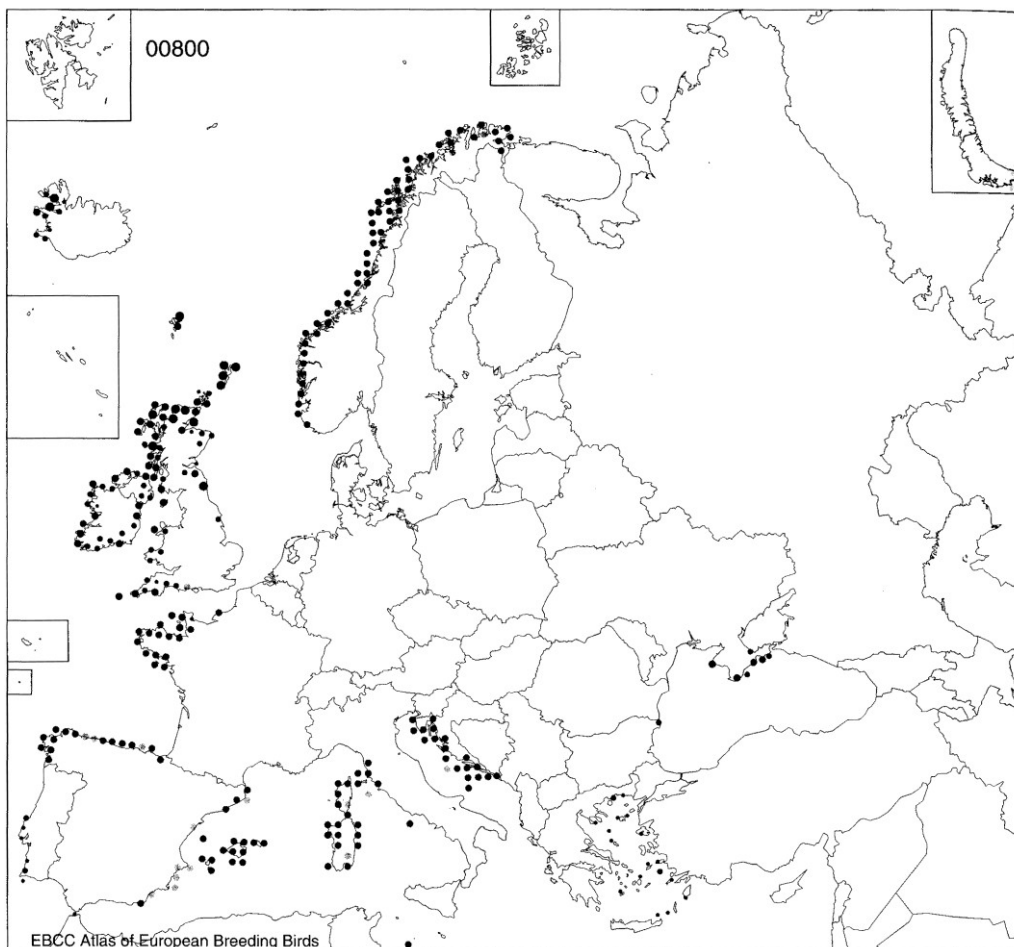


Fig. 1. Recent breeding distribution of the European Shag in Europe (after Hagemeyer & Blair, 1997).

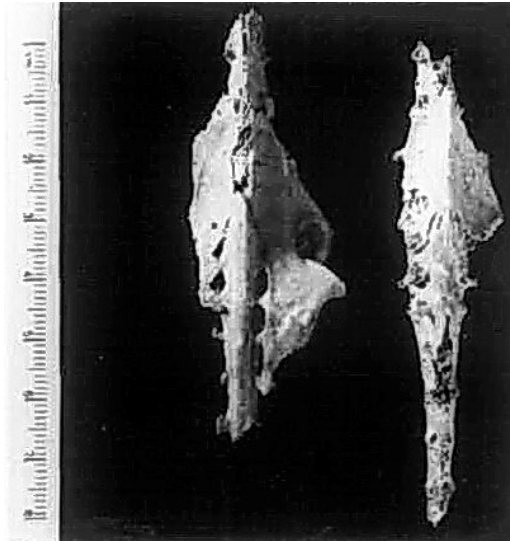


Fig. 2. Finds of synsacra of two cormorant species from the Chalcolithic-Early-Bronze Age settlement Urdoviza: Great Cormorant (*Phalacrocorax carbo* – left) and European Shag (*Phalacrocorax aristotelis* – right). Photo: B. Andreev.

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