

## SHORT REPORT

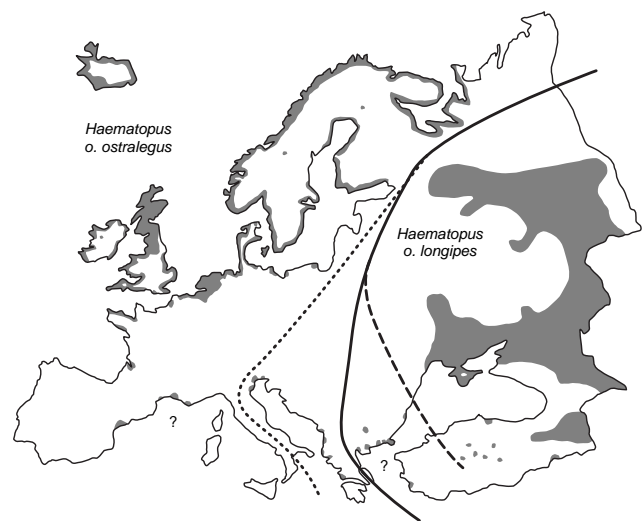
## Taxonomic status of the Oystercatcher *Haematopus ostralegus* breeding in Italy

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**Capsule** The eastern limit of *H. o. longipes* has moved 700 km westwards.

In a revision of the taxonomy of the Oystercatcher *Haematopus ostralegus* (Heppleston 1973) it was suggested that the subspecies *H. o. longipes* breeds near inland waters of southeast Russia and Siberia, whilst birds breeding in the Mediterranean were ascribed to the nominate race *ostralegus*. It is now accepted that breeders of the eastern Mediterranean, from central Anatolia (or specifically from northeastern Greece) eastward, belong to the race *longipes* (Glutz von Blotzheim *et al.* 1975, Cramp & Simmons 1983, Hockey 1996) whilst birds breeding from the eastern coastline of the Adriatic Sea westward (up to the French and Spanish coastlines) are believed to belong to the nominate race *ostralegus* (Fig. 1). For the race *longipes*, the scientific literature gives biometric measurements for only 36 birds, including live birds, skins and mounted specimens (Cramp & Simmons 1983). Furthermore, these measurements are incomplete, since only data for wing, bill and tarsus are available and few or no data are found for tail and weight of *longipes* (Glutz von Blotzheim *et al.* 1975, Cramp & Simmons 1983, Tomkovich pers. comm.).

Data are completely lacking for Italian breeders, probably due to the very small population in Italy, fewer than 20 pairs being present up to the late 1980s (Scarton *et al.* 1998). However, in the following years, the breeding population began a steady increase and a range expansion along the whole northwestern Adriatic coastline, so that the total Italian population was 127 pairs in 1999 (Rusticali *et al.* 1999a, 1999b). Though small in numbers, the population of the Adriatic coastline has been shown to be one of the most important in the Mediterranean (Valle & Scarton 1998) and has been studied from 1990 to 1999. During



**Figure 1.** Current and proposed breeding distribution of *H. o. ostralegus* and *H. o. longipes*. (—, . . .) Glutz von Blotzheim 1975; Cramp & Simmons 1983; (---) this study.

this period over 100 Oystercatchers were trapped at the nest, and measurements of these individuals have provided additional data for taxonomic assessment. Here we present data for this population and compare it with those from the literature, to demonstrate that Oystercatchers breeding along the western Adriatic coastline belong to the race *longipes*.

Data were collected from 1994 to 1999 in the Po Delta and in the Venetian Lagoon (northeast Italy: 45°15'N, 12°10'E to 44°49'N, 12°17'E), along the northwestern Adriatic coastline, one of the most important breeding areas for the species in the whole Mediterranean (Valle & Scarton 1998). In total, 116 Oystercatchers were trapped at the nest using fall-traps made of nylon wire, modified to avoid egg trampling by trapped birds (Bub 1991). The traps, which were trig-

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gered by the incubating birds sitting on the clutch, were very effective and caused no desertions or egg loss. Birds were weighed with an electronic pesola to the nearest gram, sexed and measured [wings: flattened and straightened wing chord (Svensson 1982), tail, bill: from the feather margin at the base to the tip, and tarsus-length] with an electronic caliper to the nearest 0.1 mm. The colour of the upperparts was also recorded on the basis of a subjective assessment. Birds were then uniquely ringed with numbered metal and coloured polyvinylchloride rings. All these procedures were carried out by one of us (R.R.). Trapping normally took place at least four days after the completion of the clutch and incubation had begun. Sexes were visually identified on the basis of cloacal aspect and dimensions

(Glutz von Blotzheim *et al.* 1975). Student's *t*-test, one-way ANOVA and a Tukey test were used where appropriate to test for significant differences.

The high numbers of ringed breeding birds allow us to describe in detail the biometrics of the Italian population and to make meaningful comparisons with other populations of *H. ostralegus*.

A summary of our biometric data and those from other populations is presented in Table 1.

The wing length of Adriatic breeding birds is longer than that of *longipes* birds reported in the literature, and highly significant differences exist over the four populations of Table 1, both for males (ANOVA,  $F_{3,615} = 31.18$ ,  $P < 0.001$ ) and females ( $F_{3,582} = 40.2$ ,  $P < 0.001$ ). Moreover, the differences between Italian birds and

**Table 1.** Biometrics of breeding Italian Oystercatchers (mean  $\pm$  1 sd) compared with data from *longipes* and *ostralegus* populations; only data regarding breeding and live birds (apart from source 6) were considered.

Measurement	<i>Haematopus ostralegus longipes</i>		<i>Haematopus ostralegus ostralegus</i>		
	Ex-USSR <sup>1,2a,2b</sup>	Italian Adriatic coastline <sup>3</sup>	Netherlands, E Wadden Sea <sup>4</sup>	Great Britain, Skokholm <sup>5</sup>	Great Britain (skins) <sup>6</sup>
<b>Males</b>					
Wing (mm)	256.4 <sup>1</sup> (245.5–261.0; <i>n</i> = 10)	269.1 $\pm$ 6.3 <sup>§</sup> (258–284; <i>n</i> = 47)	259.8 $\pm$ 6.8° ( <i>n</i> = 517)	257.9 $\pm$ 5.5° (245–272; <i>n</i> = 40)	256 $\pm$ 7.1° (243–266; <i>n</i> = 15)
Bill (mm)	78.1 <sup>1</sup> (69.0–91.8; <i>n</i> = 11)	77.8 $\pm$ 3.0 <sup>§</sup> (70.0–82.7; <i>n</i> = 47)	69.9 $\pm$ 3.2° ( <i>n</i> = 532)	73.0 $\pm$ 3.3+ (66–82; <i>n</i> = 47)	69.8 $\pm$ 3.4° (62–75; <i>n</i> = 14)
Tarsus (mm)	54.4 <sup>1</sup> (51.5–56.6; <i>n</i> = 10)	57.9 $\pm$ 1.8 (53.3–61.8; <i>n</i> = 47)			
Tail (mm)		109.0 $\pm$ 2.8 ( <i>n</i> = 17)			
<b>Females</b>					
Wing (mm)	263.4 <sup>1</sup> (247.0–272.5; <i>n</i> = 17)	270.2 $\pm$ 6.0 <sup>§</sup> (258–285; <i>n</i> = 69)	262.5 $\pm$ 5.8° ( <i>n</i> = 467)	259.3 $\pm$ 6.5° (247–272; <i>n</i> = 36)	263 $\pm$ 5.9° (252–276; <i>n</i> = 14)
Bill (mm)	85.7 <sup>1</sup> (66.5–98.2; <i>n</i> = 16)	86.1 $\pm$ 4.9 <sup>§</sup> (75.3–95.4; <i>n</i> = 69)	78.2 $\pm$ 3.8° ( <i>n</i> = 487)	83.8 $\pm$ 3.4+ (77–92; <i>n</i> = 49)	77.1 $\pm$ 3.3° (70–83; <i>n</i> = 13)
Tarsus (mm)	54.5 <sup>1</sup> (51.5–59.8; <i>n</i> = 16)	59.2 $\pm$ 2.1 (53.8–65.3; <i>n</i> = 69)			
Tail (mm)		108.7 $\pm$ 3.9 ( <i>n</i> = 48)			

Data sharing the same symbol are not different at a 0.05 level; no statistical comparisons were possible with ex-USSR data. <sup>1</sup>Aral Sea and SE Caspian Sea; <sup>2a</sup>Kazakhstan and Uzbekistan, Dementiev & Gladkov 1951 in Glutz von Blotzheim *et al.* 1975; <sup>2b</sup>elsewhere in ex-USSR, Dementiev & Gladkov 1951 in Glutz von Blotzheim *et al.* 1975; <sup>3</sup>present study; <sup>4</sup>Hulscher & Ens in Lambeck, 1995; <sup>5</sup>Harris, 1967; <sup>6</sup>Cramp & Simmons, 1983. °Arithmetic mean of 1, 2a and 2b.

each other population are highly significant (Tukey test,  $P < 0.001$ ) for both sexes.

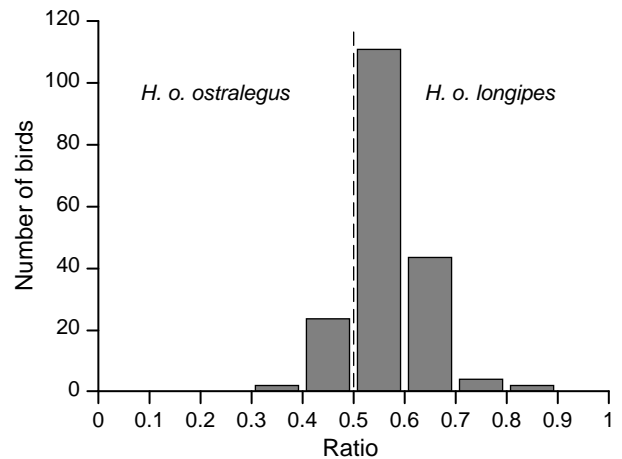
Similar differences are found in tarsus-length, which is on average almost 8 mm longer in both males and females than that of Dutch bird skins (not presented in Table 1) reported by Cramp & Simmons 1983 (males:  $50.1 \pm 1.8$  mm,  $n = 65$ ; females:  $51.5 \pm 1.7$  mm,  $n = 51$ ). The large difference among the two populations cannot be due to measurements made on skins since it is known that tarsus-length is not affected by shrinking (Engelmoer *et al.* 1983). In the same way, the tarsus of Northern Russia birds is shorter than that of Italian birds (Kandalaksha Bay, Lambeck *et al.* 1995; males:  $49.1 \pm 1.4$  mm,  $n = 29$ ; females:  $50.8 \pm 1.8$  mm,  $n = 24$ ). Differences among these three sets of data are highly significant (males:  $F_{2,138} = 8.1$ ,  $P < 0.01$ ; females:  $F_{2,141} = 9.3$ ,  $P < 0.001$ ).

It is recognized that individual bill length varies considerably due to growth and abrasion, but a population average remains fairly stable (Engelmoer & Roselar 1988). The bill length of Italian birds is closer to the two Aral sea and Kazakhstan birds than to the other European populations considered here. Statistical differences were detected among bill length of birds of the four sites reported in Table 1 (ANOVA,  $F_{3,636} = 96.8$ ,  $P < 0.001$  for males and  $F_{3,614} = 105.4$ ,  $P < 0.001$  for females). Mean bill length of Italian birds was highly significantly different (Tukey test,  $P < 0.001$  for males and  $P < 0.05$  for females) from all the other populations, with Dutch and British birds having the same means, different from that of Skokolm island birds.

The distribution of the bill length/nasal groove ratio among 183 Italian birds (the 116 birds whose data are presented above plus 67 additional breeding birds) is presented in Fig. 2. Only 24 birds had a ratio lower than or equal to 0.5, whereas of the other 159 birds (86.8% of the total), 48 had a ratio higher than 0.6. The ratio considered typical of *longipes* is less than 0.5 (Cramp & Simmons 1983, Prater *et al.*, 1997) so the Adriatic birds belong to that race. For the 24 birds with a ratio smaller than 0.50, their tarsus had a mean length of  $57.8 \pm 2.4$  mm, much higher than typical *ostralegus* birds.

Birds captured in the Po Delta, although biometrically consistent with *longipes*, showed large variations in the colour of the upperparts, ranging from glossy black (20%), through intermediate (30%) to brown (50%). Males were usually more faded than females.

Even Oystercatchers captured along the Adriatic coast during the post-breeding period appear to belong to the race *longipes* (wing:  $265.4 \pm 5.3$  mm; bill:  $79.4 \pm$



**Figure 2.** Distribution of nasal groove to bill length ratio for Oystercatchers breeding along the Italian Adriatic coast ( $n = 183$ ). ---, Threshold value between *longipes* and *ostralegus* is indicated; for birds falling in the *ostralegus* sector, see text.

6.2 mm; tarsus:  $56.4 \pm 3.1$  mm; weight:  $520 \pm 78$  g, nasal groove to bill ratio:  $0.53 \pm 0.07$ ,  $n = 52$ ) suggesting that the race *ostralegus* does not move along the northwestern Adriatic coastline during post-breeding migration.

Based on these data, we believe that Oystercatchers breeding along the northwestern Adriatic coastline belong to the race *longipes*, since they have longer bill and tarsus measurements than Oystercatchers of the western race. As a consequence, it also seems reasonable to suggest that Oystercatchers breeding along the coastline of Albania and Montenegro (Valle & Scarton 1998) should also be ascribed to *longipes*, since they are located between two populations (Italian and Greek), both belonging to this race (Fig. 1). At present, it is uncertain whether Adriatic birds belonged to *longipes* in the past or whether it is the result of a recent ( $< 10$  years) immigration of birds from the western limit of *longipes*, where the population has been increasing (Zhmud pers. comm. for the Black Sea Region). There is also some data suggesting a recent northwest expansion of the *longipes* race in Belarus (Nikiforov 1998).

It appears therefore that the limit of the breeding range of the *Haematopus ostralegus longipes* should be moved further westward in the Mediterranean, to include the entire Adriatic coastline.

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