

Reliable characteristics

Accurately differentiating the subspecies is extremely difficult, and there is some confusion about reliable characteristics. Several of the criteria that we have employed in recent years are no longer as dependable as they were.

Size

P.c.sinensis is, on average, smaller than *P.c.carbo*, but there is much overlap and significant differences between male and female in each subspecies. In the field, dimensions are usually irrelevant.

Plumage colour

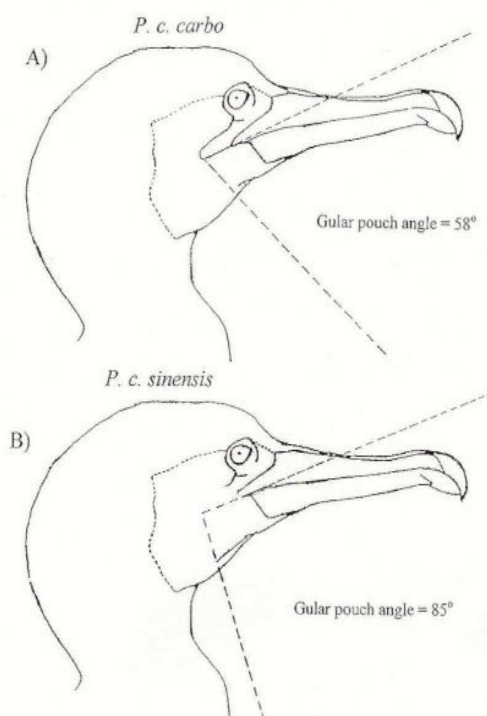
Some older field guides suggest that the plumage of *P.c.sinensis* has a green gloss and *P.c.carbo* is blue/purple, but this has now been largely discounted. The colour appears to be dependent on the stage of the reproductive cycle: the green on *P.c.sinensis* becomes bluish once birds start to incubate.

White head

White feathering (filoplumes) on the head has been suggested as an identification criteria, but this too is unreliable. Both subspecies acquire white heads prior to breeding, with some evidence that older birds have whiter heads. As an illustration, in a colony in coastal France comprised entirely of *P.c.carbo*, 92% of early breeders had white head feathers, while none of the later breeders showed this feature. The white head fades from egg-laying onwards, so while *P.c.sinensis* may average more white filoplumes at its peak than *P.c.carbo*, this is not a reliable character since it is dependent on the stage of breeding. Perhaps one reason why it has been tempting to record white-headed birds at inland sites as *P.c.sinensis* is because only a proportion of birds in any breeding colony show the characteristic. However, we now know that in the UK, inland colonies have a longer breeding season than coastal colonies, with the first eggs laid in February. Thus, breeding in Cambridgeshire is much less synchronous than on the coast, so proportionally fewer birds have white heads at any point in the season. In Cambridgeshire, birds that start the breeding season with white feathering have either lost it or left the area by early April.

Gular pouch

The yellow-orange area of skin at the base of the lower mandible, the gular pouch, dissipates heat from the cormorant's body. More than a decade ago, Per Alström suggested that the gular pouch is a different shape on the two subspecies, but only recently has this been critically assessed. Using skins of known subspecies, Stuart Newson has shown that the angle of the gular pouch is a reliable character for assigning the majority of birds to subspecies.



Measured as per the illustration, reproduced from Newson (2000), Great Cormorants with a gular pouch angle of less than 65 degrees are *P.c.carbo* (A), while those greater than 76 degrees are *P.c.sinensis* (B). Individuals with a gular pouch angle of 66-75 degrees (which account for around 10% of birds studied in the hand) cannot be reliably identified, perhaps because they are hybrids. It appears that the gular pouch angle is smallest (c.45 degrees) in *P.c.carbo* birds

at the northern edge of the range, in Greenland, and greatest (c.110 degrees) in *P.c.sinensis* at the eastern end of the range, in China. British birders, at the southern end of *P.c.carbo* and the western end of *P.c.sinensis*, thus have a unique identification challenge!

Field identification

Of course, field conditions are very different to measuring the gular pouch in the laboratory (on dead birds!), so even observers with considerable experience of this feature find it difficult to determine the subspecies of every individual. Great Cormorants spend a great deal of time perched, so there are plenty of opportunities to assess the gular pouch, but it usually takes a while before an individual bird holds its head at 90 degrees to its body and in good profile to the observer. Having spent many hours watching Great Cormorants through a telescope at Paxton Pits, where both subspecies are known to occur regularly, I would suggest that, unless supported by colour-ring data, records of *P.c.sinensis* in Britain are unreliable on the basis of field sighting alone unless the gular pouch is at the 'extreme' end of the range (i.e. 90 degrees or greater).

References

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