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## Systematic Notes on Palearctic Birds. No. 4 The Choughs (*Pyrrhonorax*)

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The following notes consist of a review of *Pyrrhonorax pyrrhonorax* with description of a new race from north Africa and notes on the nomenclature and distribution of *Pyrrhonorax graculus*.

### *PYRRHORAX PYRRHORAX*

The Chough (*Pyrrhonorax pyrrhonorax*) has been divided into six races (see Hartert, 1928, *Novitates Zool.*, vol. 34, p. 353; Hartert and Steinbacher, 1932, *Die Vögel der paläarktischen Fauna*, suppl. vol., p. 27; and Mayaud, 1933, *Alauda*, p. 196). These reviews are adequate except as regards the racial status of the populations of north Africa. It is desirable also to present a brief analysis of the geographical variation, which is chiefly one of size, for the species as a whole. For the sake of clarity it is best to describe first the population of north Africa which I propose to separate as:

#### *Pyrrhonorax pyrrhonorax barbarus*, new subspecies

Similar to *P. p. docilis*, with a dull green gloss on the wing but bill distinctly longer, absolutely as well as proportionately, longer than in any other known population of the species. For other characters, see below.

TYPE: A.M.N.H. No. 290240; Rothschild Collection; adult male; Middle Atlas on the plateau at 1900 meters, Morocco; April 27, 1929; E. Hartert and E. Flükiger, collectors. Wing, 309 mm.; tail, 153; bill from skull, 63.

RANGE: North Africa (Morocco to Algeria) and Canaries (La Palma Island only).

### CHARACTER OF THE GEOGRAPHICAL VARIATIONS AND GENERAL REMARKS

The geographical variation affects coloration and to a much more important extent size and proportions.

The variation in coloration affects the color of the gloss on the upper surface of the upper part of the wing and to a slight extent on the mantle the gloss varying from bluish or purplish blue in *himalayanus* from the Himalayas to dull green in *docilis* from Iran. These two races stand at the extremes of the variation and are clearly separable on this character alone, which is not diagnostic, however, in the case of the other races, for they are more or less intermediate.

The truly diagnostic variations are in size and to a lesser extent in proportions, and in the case of *centralis* from Turkestan and *brachypus* from China and Siberia in additional variations in the shape of the wing tip and width of the primaries. It must be emphasized, as Mayaud has done, that females are distinctly smaller than males and that first year birds are distinctly smaller than adults. The failure of Hartert and Hartert and Steinbacher to separate their specimens as to sex and to state whether or not their specimens are fully adult invalidate their measurements to a large extent. All the measurements<sup>1</sup> in this paper are of fully adult and sexed specimens. In the following list all the measurements taken are given in the case of the first race but are not repeated for the other races except in those cases where they varied to an appreciable extent and thus appeared to be of diagnostic value.

### SYSTEMATIC LIST

#### *Pyrrhonorax pyrrhonorax pyrrhonorax* Linnaeus

*Upupa Pyrrhonorax* LINNAEUS, 1758, Systema naturae, ed. 10, p. 118, coasts of Egypt and England, restricted to England by Hartert, 1903, Die Vögel der paläarktischen Fauna, p. 35.

The smallest race. Measurements, eight males and five females: wing, males, 268–293 (276), females, 266–278 (271.5); tail, males, 120–141 (133), females, 125–140 (132); wing/tail index, males, 44.5–50 (48) per cent, females, 45–50 (48.5); bill from skull, males, 51–59 (54.7), females, 50–53 (52); height of the bill at the level of the nostrils, males, 12–13 (12.5), females, 12–12.5 (12.5); wing/bill index, males, 18.8–20.4 (19.6) per cent, females, 18.2–19.5 (19); tarsus, males, 49–56 (53), females, 48–54 (50); difference between the fifth and sixth primaries, the sixth being shorter by, in males, 12–15 (13), in females, 11–15 (13.6).

RANGE: Local in southwestern England, Wales, Isle of Man, Inner Hebrides, and Ireland, chiefly in the west and south.

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<sup>1</sup> Individual measurements are on record in the American Museum of Natural History and are available on request.

*Pyrrhonorax pyrrhonorax erythrorhamphus* Vieillot

*Coracia erythrorhamphos* VIEILLOT, 1817, Nouveau dictionnaire d'histoire naturelle, vol. 8, p. 12, Alps.

Wing, tail, and bill average longer than in nominate *pyrrhonorax*, gloss very slightly greener. Measurements, three males, two females, and two unsexed (for additional measurements, see Mayaud): wing, 265–308 (293); tail, 130–145 (138); bill, 54–59 (56.3).

RANGE: Local in the Alps, Pyrenees, and Iberian Peninsula; formerly (see Mayaud) in other parts of coastal and central France and the Channel and Mediterranean islands except Crete (*docilis*).

*Pyrrhonorax pyrrhonorax barbarus* Vaurie

*Pyrrhonorax pyrrhonorax barbarus* VAURIE, as above.

Wing and tail average longer than in *erythrorhamphus*, gloss distinctly greener and similar to that of *docilis* but mantle slightly more glossy and general plumage less dull. Bill absolutely and proportionately longer than in any other race, and higher. Twenty-two specimens measured from Canaries, Morocco, and Algeria. As these populations are identical the following measurements are those of the largest series, eight males and four females from Morocco: wing, males, 295–309 (303), females, 275–284 (280); tail, males, 141–153 (146), females, 131–147 (138); bill, males, 62–67 (63.5), females, 55–58 (57).

These populations, probably on account of their greenish gloss, were formerly thought to be identical with or were referred to *docilis*, but the differences in the bill characters are as follows: *barbarus*, 17 males, bill length, 61–67 (63.2); bill height, 13–15 (14); wing/bill index, 20–22.4 (21); in 11 males of *docilis* from Iran, bill length, 52–61 (57); height, 12.5–14 (13); wing/bill index, 15.7–19 (18). In all the other races the average bill length in males varies from 60 in *himalayanus* to 51 in *centralis* and probably less in *brachypus*, the height from 13.3 in *himalayanus* to 11 in *centralis*, and the index from 18.9 in *himalayanus* to about 18 in the other races.

RANGE: As cited in the description.

*Pyrrhonorax pyrrhonorax docilis* Gmelin

*Corvus docilis* GMELIN, 1774, Reise durch Russland, vol. 3, p. 365, pl. 39, Gilan, northern Iran.

Wing distinctly longer but bill shorter than in *barbarus*, gloss greenish as in *barbarus* but whole plumage somewhat duller. Specimens examined from Crete, Asia Minor, the Near East, southern Transcaasia, and all

parts of Iran are identical. Measurements from Iran, 11 males and 13 females: wing, males, 306–330 (315), females, 280–307 (295); tail as in *barbarus*.

Eighteen specimens, adults as well as first year birds, examined from Afghanistan in the northeast (Badakhshan), north central, east, and south are intermediate between similar series of *docilis* from Iran and of *himalayanus* from the Himalayas. Meinertzhagen (1938, Ibis, p. 498) states that specimens from north central Afghanistan are not separable from the population of the Himalayas, but my specimens vary in coloration from specimens that are almost as bluish as *himalayanus* from Punjab Himalayas and Kashmir to others that are identically greenish with *docilis* from Iran, the series as a whole being distinctly closer to the latter. As specimens from the eastern Himalayas average very slightly bluer than specimens from Punjab and Kashmir, a westward cline towards the greenish could probably be demonstrated. The proportions are intermediate in Afghanistan. For instance, the wing/tail index in adult males is, in *himalayanus* 49.5–54 (50.5) per cent, in *docilis* from Afghanistan 47–51 (49), in *docilis* from Iran 43–49 (46.5).

RANGE: Crete, Asia Minor, and the Caucasus, the Near East and parts of the Syrian Desert to northern Arabia, northern Iraq (Kurdistan), Iran, southern Transcaspia (Kopet Dagh), Afghanistan, and Baluchistan. The population which formerly bred in the southern Urals may have been referable to this race.

*Pyrrhocorax pyrrhocorax himalayanus* Gould

*Fregilus himalayanus* GOULD, 1862, Proc. Zool. Soc. London, p. 125, Himalayas.

The largest race with the exception of the bill (see *barbarus*), and the bluest, tail absolutely and proportionately longer than in the preceding races but not so long proportionately as in *centralis* and *brachypus*. Measurements, eight males and six females: wing, males, 310–323 (318), females, 278–305 (296); tail, males, 154–172 (162.5), females, 152–161 (156); bill, males, 56–64 (60), females, 51–57 (54); tarsus, males, 50–55 (52), females, 42–53 (49).

RANGE: Western Sinkiang (Yarkand), western Kun lun and Karakoram, Himalayas and neighboring regions of Tibet, northern Burma (?), northern Yunnan eastward through Sikang to western Szechwan.

*Pyrrhocorax pyrrhocorax centralis* Stresemann

*Pyrrhocorax pyrrhocorax centralis* STRESEMANN, 1928, Jour. Ornith., vol. 76, p. 344, Djarkent, Russian Turkestan.

Coloration similar to that of *himalayanus* but somewhat less rich purplish blue, smaller in every measurement but tail proportionately longer, bill less high and more slender, primaries narrower, and wing tip more pointed (gap between the fifth and sixth primaries wider). As this race departs from all the preceding in several ways, full measurements are given. Djarkent and western Tian Shan, four males and 11 females: wing, males, 284–305 (295), females, 277–308 (287); tail, males, 146–164 (155), females, 143–160 (151); wing/tail index, males, 50–55.5 (53) per cent, females, 50–55 (52.7); bill, males, 48–53 (51), females, 48–57 (52); height of bill, males, 10–11.5 (11), females, 10–12 (11); wing/bill index, males, 16.6–18 (17.7), females, 16.6–19.5 (18); tarsus, males, 42–50 (47), females, 40–48 (44); the sixth primary falls short of the fifth by, in males, 20–24 (23), in females, 20–32 (23.5).

RANGE: Russian Turkestan (Djarkent, western Tian Shan, Ferghana and Bukhara, Alai and Pamirs).

*Pyrrhonorax pyrrhonorax brachypus* Swinhoe

*Fregilus graculus* (L.) var. *brachypus* SWINHOE, 1871, Proc. Zool. Soc. London, p. 383, Peking.

*Pyrrhonorax pyrrhonorax stresemanni* KEVE, 1943, Anz. Akad. Wiss., Vienna, vol. 80, p. 17, Sayans. (New synonymy.)

Wing and tail apparently shorter, and tarsus said to be shorter and bill thicker than in *centralis*. My material is insufficient. A male supposedly from Shansi and a female from Shantung measure: wing, male, 280, female, 275; tail, male, 145, female, 135; tarsus, male, 46, female, 43; the bill is slightly higher than in *centralis*, male and female, 12.5. One of the two specimens has the bill very slightly thicker, but the other is identical with *centralis*.

Whether or not *centralis* can be maintained as distinct from *brachypus* is open to question. Dementiev (1933, L'Oiseau, p. 738) recognizes it, stating that its tarsus is rarely shorter than 47, whereas it never exceeds 46.5 in *brachypus*, but this is not confirmed by my good series of *centralis*, and Dementiev adds that Stegmann considers it to be a synonym of *brachypus*. A series measured by me from Urga in northern Mongolia does have, however, a short tarsus: male, 40, 40, 43, 45; female, 39, 40. It is not separable from *centralis* in any other character; the bill is identical and the wing and tail are long, wing, males, 270–300 (289), females, 260, 277; tail, males, 155–162 (156), females, 146, 149. Kozlova (1933, Ibis, p. 329) emphasizes that the population of northern Mongolia is *brachypus*, not *centralis*, and states, as do all the other Russian authors, that all the Siberian populations are *brachypus*.

Keve has separated the populations of the Sayans as *stresemanni* on the basis of a single specimen which he states has a more slender bill than *centralis* and *brachypus*, but his description is not otherwise diagnostic. He had no specimens of *brachypus* which would be essential, and the shape of the bill varies individually in *centralis* and apparently (see above) does so also in *brachypus*. He does not state where in the Sayans his specimen comes from, although there are several Sayans of some 1500 kilometers in extent. These populations and those of the Altai may require further study, as stated by Dementiev, but until adequate comparisons are made, *stresemanni* is not acceptable.

RANGE: Central and northern China from Kansu and Shensi through Shansi and Shantung north to Hopeh and Manchuria, northern Mongolia and Transbaicalia, the Sayans north on the upper Yenisei to Novoselovo, eastern Kuznetsk Mountains, western Altai to the Tarbagatai.

#### THE POPULATION OF ABYSSINIA

The species is said to occur in the highlands of Abyssinia above 10,000 feet. Most of the records in the literature are sight records, but there are apparently four specimens in London. Hartert (1928) who has examined one specimen states that it is *pontifex* [= *docilis*], and Grant and Mackworth-Praed, who have examined the four specimens (1943, Bull. Brit. Ornith. Club, vol. 63, p. 54), do likewise. These views are not necessarily correct and more critical examination is required, for these authors include under *docilis* very diverse populations such as *barbarus*, and the population of Abyssinia is extremely isolated by some 2500 kilometers from the nearest known population of *docilis*.

#### PYRRHOCORAX GRACULUS

The division of the Alpine Chough (*Pyrrhocorax graculus*) into a smaller race (nominated *graculus*, type locality, Alps) and a larger eastern race is now almost universally admitted. The eastern race is called *forsythi* Stoliczka, 1874 (type locality, Ladak), but material that I have examined suggests that this name should be replaced by the older *digitatus* Hemprich and Ehrenberg, 1833, type locality, Syria.

This material does not include specimens from the Near East, but I find that a good series from Luristan in the western Zagros, a region with close zoogeographical affinities with the mountains of Syria, is not separable from the populations of the Himalayas. According to Hartert and Steinbacher (1932, p. 28), who question whether *forsythi* should not be replaced by *digitatus*, the latter was described as having a long wing (280 mm.) and large feet and bill, and these characters are precisely those

which separate the populations of the Zagros and Himalayas from nominate *graculus* examined from the Alps. The measurements (see below) of the populations of the Zagros and Himalayas are very similar or identical, and their feet are identically strong and large, very distinctly more so than in nominate *graculus*. The tarsus is somewhat longer in males from the Zagros, but the difference is slight and may be due to the sample, for females are identical in the Zagros and Himalayas.

As is so often the case, the two races appear to replace each other in northern Iran at the southeastern corner of the Caspian. Stresemann (1928, Jour. Ornith., vol. 76, p. 344) states that two specimens from Gilan in the western Caspian districts agree in every way with nominate *graculus* from the Alps, Taurus, and Caucasus, wing length "♂ 273, ♀ 261," but a single specimen that I have examined from the region of Gurgan has large and heavy feet and is much closer in its measurements (male: wing, 280; bill, 39; tarsus, 47) to *digitatus*. The range of the two races can apparently be defined as follows: nominate *graculus*: Europe and Morocco, Crete, Asia Minor and Caucasus to the southern Caspian districts; *P. p. digitatus*, the Near East, Zagros, and Khorasan eastward.

Measurements, of fully adult specimens only, are:

Nominate *graculus*, Alps: wing, males, 255, 260, 263, 271, 271, 275, 279; females, 245, 253, 256, 265, 267; bill from skull, males, 36, 36, 36.5, 37, 39, 40; females, 35, 36, 37, 37, 37; tarsus, males, 39, 40, 40, 42, 43, 44, 44; females, 38, 39, 39, 40, 42.

*Pyrrhocorax pyrrhocorax digitatus*, Luristan: wing, males, 283, 288, 288; females, 266, 266, 270, 273; bill, males, 41, 42, 43; females, 39, 39, 41, 41; tarsus, males, 49, 50, 51; females, 39, 39, 41, 41. Eastern Himalayas: wing, males, 280, 284, 285, 287, 289; females, 275, 275, 278; bill, males, 40, 41, 41, 41, 42; females, 37, 38, 38.5; tarsus, males, 42, 43, 45, 47, 49; females, 40, 40, 41.

