

Sicilian Rock Partridge: identification and taxonomy

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The genus *Alectoris* is currently considered to comprise seven species, distributed over southern Europe, northern Africa and Arabia, and across Asia to Tibet and western China. Recent genetic studies on DNA of these partridges have yielded interesting results, especially concerning the endemic Sicilian Rock Partridge *A. graeca whitakeri* (hereafter *whitakeri*) from Sicily, Italy (Lucchini & Randi 1998, Randi et al 2003, Randi 2006). In the light of the considerable differences between this taxon and other Rock Partridge taxa regarding DNA, morphology, plumage and voice (Arrigoni degli Oddi 1929, Orlando 1956, 1967, Priolo 1970, 1984, Lucchini & Randi 1998, Randi et al 2003, Corso 2005, Randi 2006), and considering its geographic isolation, it is useful to present

an in-depth analysis of its identification characters, variability and taxonomic status.

This paper is based on c 25 years of field observations throughout Sicily, during which large numbers of birds have been observed and studied in detail. Furthermore, during 2001-08, 185 birds have been studied in the hand (122 skins in museums and private bird collections, 39 birds shot by hunters and 24 kept in captivity) as well as several birds from photographs. A description of typical *whitakeri* is given, with details on the main differences with other Rock Partridge taxa and with Chukar Partridge *A. chukar* (hereafter *chukar*), based on study of 278 specimens from other *Alectoris* taxa (127 *saxatilis*, 85 nominate *graeca*, 41 *chukar* and 25 *orlando*). The variation in plum-

97 Sicilian Rock Partridge / Siciliaanse Steenpatrijs *Alectoris (graeca) whitakeri*, adult male, Monti Iblei, Siracusa, Sicily, Italy, 21 March 2009 (Angelo Zimmiti). Singing male but no very typical characters. Indeed, the upperparts are at the lowest range of saturation and least olive-tinged and with least vinaceous hue. Also note paler rump compared with typical *whitakeri*. Throat buffish-cream as in many *whitakeri*, black collar narrow but not broken. Pale ear-coverts conspicuous, as typical of *whitakeri*. DNA of such birds needs to be analysed to be sure whether they are pure or genetically 'polluted' by other taxa (after introduction by hunters).





FIGURE 1 Rock Partridges / Steenpatrijzen *Alectoris graeca*: Sicilian Rock Partridge / Siciliaanse Steenpatrijs *A. g. whitakeri* (below), Italian Rock Partridge / Italiaanse Steenpatrijs *A. g. orlandoi* (upper right) and Alpine Rock Partridge / Alpensteenpatrijs *A. g. saxatilis* (upper left) (Lorenzo Starnini). Note differences in warm brownish olive tinge on upperparts, richness of colour of underparts, mostly in creamy areas, and differences in intensity of coloration of under-tail-coverts. Also, note differences in width and pattern of collar and in ear-coverts stripe.

age of *whitakeri* is described in detail and illustrated; also, its taxonomical status is discussed, along with some notes on conservation and on how to find and see it.

Description and identification of Rock Partridge taxa

Below are general descriptions of *whitakeri*, nominate *A g graeca* from Bulgaria, Greece and Macedonia, *A g saxatilis* from the Alps and the west of former Yugoslavia and *A g orlandoi* from the Apennines, Italy, with information on distribution and main characters. The considerable variability within and between taxa is described in a separate section. The confusion related to the precise distribution of the various subspecies is mostly due to the high variability encountered among them, which makes it hard to properly define and support subspecific geographical limits (see below).

Sicilian Rock Partridge *Alectoris (graeca) whitakeri*
Whitakeri is endemic to Sicily, distributed from sea level to above 2000-2500 m (Monte Etna), with the main concentration in mountain complexes as Monti Iblei, Monti Madonie and Monti Sicani, as well as on Monti Nebrodi and Monti Peloritani (Iapichino & Massa 1989, Sarà 1989, Corso 2005, Salvo 2005). Its presence in Sicily was already well documented in the mid-1800s, with Benoit (1840) providing information on its distribution. Possibly the first illustration was by the famous Sicilian artist Antonello da Messina, who depicted a bird in his artwork San Gerolamo nello studio (1430), now at London's National Gallery. Arrigoni degli Oddi (1929) was the first to notice differences between *whitakeri* and the other populations in Italy but the taxon was officially described by Schiebel (1934), based on three birds collected on Monte Etna in December 1933. He described the new taxon as being very similar to *A c cypriotes* (Hartert 1917, cf Barbanera et al 2009a), presenting a detailed description of the birds collected and a summary of the difference with *cypriotes*. A more detailed description was later given by Orlando (1956, 1967).

In general, *whitakeri* is the smallest and dullest *Alectoris*, and the most warm olive-brown to warm brownish with the most uniform upperparts. Compared with other *graeca* taxa, it frequently has an interrupted black collar, often spotted in front, invariably dark vermiculation on the uppertail-coverts and on all or almost all of the tail-feathers, a more contrasting and paler ear-covert stripe, warmer and more richly coloured under-

parts, a different voice and a different moult (further differences commented in detail below).

Balkan Rock Partridge *Alectoris graeca graeca*
Nominate *graeca* breeds in Greece (and Ionian islands), the Republic of Macedonia, south-western Bulgaria and possibly Albania (Cramp 1980, Snow & Perrins 1998). According to Vaurie (1965), this is the taxon found throughout the species' breeding range except for the Alps and Sicily.

Vaurie (1965) describes this taxon as paler and brighter all over, more vinaceous and with a colder brownish tinge to the scapulars and uppertail-coverts than *saxatilis*, with paler uppertail-coverts, more uniform tail-feathers, paler less rich creamy-fulvous on the underbelly or vent. For Priolo (1984), after detailed studies and direct comparison with the other taxa, nominate *graeca* appears to have a more obvious and strong vinaceous tinge on the mantle, extending onto the upperbreast; in comparison with *saxatilis* from the Alps, it shows a more greyish and less olive cast, always being duller and darker than *orlandoi* from the Apennines, with a less pale pure grey tinge and more contrasting scapulars and tertials. On the forehead, it often shows a fairly wide, striking white line over the black lores and upper bill, often continuing all along the dark eye-stripe. The central tail-feathers are often finely vermiculated, in contrast with Vaurie's observations (1965), while, unlike in *whitakeri*, the uppertail-coverts are in most cases uniform and lack dark markings or any pattern, at most just a few narrow and almost invisible darker greyish bars. The outer tail-feathers are never vermiculated, which is always the case in *whitakeri*. The pale area on the throat is normally white or greyish-white, sometimes slightly tinged with buff. The collar is normally quite narrow but is wider in birds of Albania and the Republic of Macedonia, where populations may be considered clines with *saxatilis* (Cramp 1980, Snow & Perrins 1998; pers obs). Note that there is a hybrid zone of 5-10 km between nominate *graeca* and *chukar* (mainly subspecies *A c kleini*, occurring through Thraki (Thrace) in Greece and the central Rodopi mountains in Bulgaria; Cramp (1980), Snow & Perrins (1998)) that influences phenotypical traits.

Alpine Rock Partridge *Alectoris graeca saxatilis*
Saxatilis ranges from the Alps (Austria, France, Italy, Slovenia and Switzerland) north-west to Croatia, Bosnia and Serbia and possibly south towards Montenegro (Cramp 1980, Snow & Perrins 1998). Birds from southern Montenegro, south-



98-99 Sicilian Rock Partridge / Siciliaanse Steenpatrijs *Alectoris (graeca) whitakeri*, Monti Sicani, Sicily, Italy, spring 2004 (*Andrea Ciaccio*). Note very warm and uniform brownish olive or even rusty upperparts, more intense than in other taxa, with just slightly paler, barely contrasting uppertail-coverts. This bird shows creamy or isabelline-tinged throat patch. Black collar (neck-lace) is barely broken in front, appearing just disjoint and spotted. Note obvious ear-coverts stripe, almost like Chukar Partridge *A chukar*. **100-101** Sicilian Rock Partridge / Siciliaanse Steenpatrijs *Alectoris (graeca) whitakeri*, Monti Iblei, Sicily, Italy, autumn 1999 (*Saverio Cacopardi*). Two old photographs, appearing much more bluish than bird actually was. Note very typical open broken black collar and conspicuous ear-coverts stripe.

eastern Serbia and northern Albania and the Republic of Macedonia seem to exhibit some clinal intergradation with nominate *graeca* (Cramp 1980, Priolo 1984, Snow & Perrins 1998). According to Vaurie (1965), this taxon is limited to the Alps and he regarded the other populations as belonging to nominate *graeca*. Orlando (1967) further complicated the situation, stating that the range of *saxatilis* was limited to the western Alps, as the other populations in the Alps are very similar to the population in the Apennines. Priolo (1984) claimed that the Alpine populations all belong to *saxatilis*, and that this taxon enters former Yugoslavia, intergrading here (Republic of Mace-

donia, Montenegro and southern Serbia) quite extensively with nominate *graeca*.

The upperparts vary from dark greyish, quite obviously tinged olive to extensively olive-brown, sometimes very close to *whitakeri* but generally paler, less dull, with a more contrasting paler rump and uppertail lacking an obvious brown-olive or fulvous tinge on the uppertail-coverts and rump and the extensive dark vermiculations over the uppertail and tail-feathers. The black collar is normally wider than in all other taxa, better marked and defined, becoming narrower in birds from west to east (figure 1). The throat is usually more greyish tinged, the white line over the

TABLE 1 Summary of field characters of Sicilian Rock Partridge *Alectoris (graeca) whittakeri* and their variability; in bold are key features

character	reliability
throat colour	variable; usually creamy-buff or isabelline-drab grey
black neck collar	variable; usually narrower than other <i>graeca</i> taxa and <i>chukar</i> , often broken in front (not shown by other taxa)
supercilium	variable; usually least marked and less white than other <i>graeca</i> taxa, not pronounced or absent over lores
ear-coverts	key feature ; always more pronounced and warmer than any other <i>graeca</i> taxa, closest to <i>chukar</i>
upperparts	variable; usually warmer and more saturated olive-brown, with less contrast between rump and mantle
underparts	variable; usually darker, more saturated; key feature are darker and more saturated undertail-coverts
tail	key feature ; uppertail-coverts vermiculated, t1 vermiculated/irregularly barred as well as base of all tail-feathers (never shown in other <i>graeca</i> taxa)
moult	faster than in other <i>graeca</i> taxa; however, should be verified if correlated with breeding season pattern
measurements	smallest taxon of <i>graeca</i> group



FIGURE 2 Variation of black collar pattern in Sicilian Rock Partridge *Alectoris (graeca) whittakeri* (Lorenzo Starnini). Centre: typical pattern; below: broader, wider example, almost connected in front but just barely interrupted, appearing strongly spotted in front; above: narrow collar not broken, as shown by some birds (however, collar still typically narrow both in front and to sides).

forehead is often absent or narrow and the black over the lores is quite wide, wider than in *orlando* and *whittakeri*.

Italian Rock Partridge *Alectoris graeca orlando*
Orlando was first described by Priolo (1984) for the central and southern Apennines. Cramp (1980) and Snow & Perrins (1998) consider the population in this area inseparable from *saxatilis* or even nominate *graeca* and it is not recognized (or even mentioned) in Madge & McGowan (2002). Priolo (1984), however, provided a detailed study, with extensive and convincing evidence on the differences between birds from the Apennines and all other populations. He considered that there is no proof that the Alpine and Apennine populations have been in contact; indeed both taxa seem to have been isolated for a long time, as shown by

the absence of intergrades. Interestingly, some birds from the southern range reportedly tend to be closer to *whittakeri*. This has been noticed in a handful of individuals which, however, were never as deep olive-brown as *whittakeri*.

Morphologically, *orlando* appears rather distinctive and is, in fact, the most different from the other taxa regarding plumage (figure 1). It appears paler all over, purer bluish-grey than the other taxa, almost lacking any strong olive-brownish hue. The mantle shows a very pale and delicate,



FIGURE 3 Field sketches of back of Sicilian Rock Partridge / Siciliaanse Steenpatrijs *Alectoris (graeca) whitakeri* (left), Italian Rock Partridge / Italiaanse Steenpatrijs *A g orlandoi* (centre) and Alpine Rock Partridge / Alpensteenpatrijs *A g saxatilis* (right) (Lorenzo Starnini). Note that *whitakeri* is most uniform, with very vermiculated uppertail-coverts, these feathers and rump having almost same tinge and colour as mantle, with *orlandoi* being palest and *saxatilis* in between. Some *saxatilis* may look very close to *whitakeri* but rump always paler than mantle.

almost pink, vinaceous wash. The colour intensity varies as in the other taxa but less obviously, with birds in the southern part of the range (eg, Calabria) being a shade darker, almost as *saxatilis*, but lacking conspicuous strong olive tinge. The scapulars do normally not contrast with the rest of the upperparts, with the bluish-grey markings being almost the same colour as the mantle and coverts and with the surrounding vinaceous tinge being quite pale as well. Uppertail and rump are quite pale grey or even cerulean-grey, usually uniform and without dark vermiculation. In some darker, more patterned birds, however, some vermiculations have been found on the longest central uppertail-coverts, in some cases even on the central tail-feathers with almost the same pattern as in *whitakeri* but less marked and dark and therefore less striking. The underparts are also very pale, paler than in the other taxa, varying from pale buffish-cinnamon to cream. The black collar is quite narrow and regular, broader and sometimes irregular on the neck-side while often narrower at the front (on the breast) (figure 1). Some individuals, in this respect, may show an almost *whitakeri*-like collar with a very narrow dark line over the breast, sometimes even interrupted as in typical *whitakeri* (chiefly birds from southern Apennines,

for example four birds examined from Calabria; Priolo 1984; pers obs). The throat is generally paler and cleaner than in other taxa, being purer white, chiefly on chin and frontal part of the throat (figure 1). Juvenile plumage is also paler and greyer than in other taxa, especially *whitakeri*.

Genetically, Lucchini & Randi (1998) reported that: 'MtDNA suggests that nominate *graeca* could include central Apennine and central southern Balkan populations...' and 'The findings do not support the existence of a distinctive Apennine subspecies (*A. g. orlandoi*)...'. The same authors reported that 'it is possible that the variability in plumage colour is, at least partially, under environmental nongenetic control, and that phenotypic variation has not been sufficiently sampled by taxonomists'. However, Randi (2006), more recently and in light of further in-depth studies, reported: 'Nowadays, partridge populations in the Apennines are isolated and demographically independent from all the other populations. Therefore, I recommend management of the Apennine partridges as a distinct Management Unit (cf Moritz 1995), pending additional genetic analyses.' Thus, *orlandoi* is diagnosable in the field and it deserves at least subspecific recognition; it is indeed advisable to undertake further in-depth genetic studies.

other taxa



whitakeri



FIGURE 4 Tail pattern of Sicilian Rock Partridge / Siciliaanse Steenpatrijs *Alectoris (graeca) whitakeri* (below) and other Rock Partridge / Steenpatrijs *A graeca* taxa (*Lorenzo Starnini*). Note marked vermiculation on both uppertail-coverts and whole tail-feathers. In other taxa, uppertail-coverts more or less vermiculated (rarely almost in shape of dark bars), as can be central tail-feathers (t1), but tail never fully vermiculated/barring as in *whitakeri*.

102 Closed tail of Italian Rock Partridge / Italiaanse Steenpatrijs *Alectoris graeca orlandoi* (collected in Monti Appennini, Italy), Arrigoni degli Oddi collection, Museo di Scienze Naturali, Roma, Italy (*Andrea Corso*). Very pale and clean, lacking noticeable dark vermiculation. **103** Closed tail of Sicilian Rock Partridge / Siciliaanse Steenpatrijs *Alectoris (graeca) whitakeri*, collected at Monti Nebrodi, Sicily, Italy (*Andrea Corso*). Note intense and dull colour and well-marked dark vermiculations/barring.

Moult in Rock Partridge taxa

Adult post-breeding moult in all Rock Partridge taxa is complete, from May-July to August-October; post-juvenile moult is completed in June-November, except for the outer two to three primaries (p8-10), which are retained. Therefore, first adult plumage is acquired after first complete moult in first winter, with plumage appearing almost identical (possibly little duller, less clean and bright) to full adult, except that two or three outermost primaries are shorter, narrower and more

pointed, as well as more bleached and abraded. Furthermore, quite often some tertials, at least innermost ones, are also retained, chiefly in *saxatilis* (Priolo 1984).

In *whitakeri*, moult seems faster and, in first-winter, all remiges are almost invariably moulted and therefore new and adult-type. Also, hardly any tertials are retained. Interestingly, the last vestiges of juvenile plumage remain almost invariably around the neck area (collar and throat), while in other taxa, the collar is complete and adult-like



104 Sicilian Rock Partridge / Siciliaanse Steenpatrijs *Alectoris (graeca) whittakeri*, collected at Monti Nebrodi, Sicily, Italy (*Andrea Corso*). Note typical colour of fresh *whittakeri*, with intense olive tinge over mantle, rump and uppertail, being most intense and warmest of all Rock Partridge taxa. Also, note obvious ear-coverts stripe.

105 Underparts of Sicilian Rock Partridge / Siciliaanse Steenpatrijs *Alectoris (graeca) whittakeri* (collected at Monti Peloritani, Sicily, Italy), Arrigoni degli Oddi collection, Museo di Scienze Naturali, Roma, Italy (*Andrea Corso*). Note broken black collar, spotted in front, and very warm and rich creamy vent and belly.





106 Sicilian Rock Partridge / Siciliaanse Steenpatrijs *Alectoris (graeca) whitakeri*, collected at Malvagna, Nebrodi, Sicily, Italy (*Angelo Scuderi*). Even more uniform bird than in plate 104, showing homogenous upperparts of *whitakeri*.

107 Italian Rock Partridge / Italiaanse Steenpatrijs *Alectoris graeca orlandoi* (collected in Monti Appennini, Italy), Arrigoni degli Oddi collection, Museo di Scienze Naturali di Roma, Roma, Italy (*Andrea Corso*). Note paleness, this bird being duller and less cerulean than some others. Note paler rump and uppertail-coverts, contrasting with shade duller, more olive-tinged mantle.



when still two to three juvenile primaries are retained (Priolo 1984; pers obs on 37 specimens and a few wild birds)

Plumage and variability of *whitakeri* and comparison with other taxa

Head pattern and throat

In the original description of *whitakeri* by Schiebel (1934), the throat is described as isabelline, rather close to *chukar* but less warm creamy and paler. Chiefly in *whitakeri* but also in other *graeca* taxa (mainly nominate *graeca* and *saxatilis*), the throat can be almost identical to *chukar* in some birds, chiefly bleached/abraded birds, though tinged

more sandy-isabelline and paler. Priolo (1984) did not report any *whitakeri* with a cream hue on the throat and reported that it is always more or less washed drab-grey or dull greyish, chiefly on the side of the face and cheek. During the present study, several birds were seen in Sicily with more or less visible and intense creamy or buff wash over the throat; this was also noted in some preserved skins (plate 105). It would be very interesting to test DNA of all those birds to determine to what extent there is *chukar* influence, since hybridisation is possible where *chukar* has been introduced by hunters, as has happened in Sicily and other Italian and European regions (Priolo 1970, Priolo & Sarà 1985, Bricchetti & Fracasso



FIGURE 5 Variability of head pattern in Sicilian Rock Partridge / Siciliaanse Steenpatrijs *Alectoris (graeca) whitakeri* (Lorenzo Starnini). Below: typical bird, showing off-white throat with pale isabelline hue; upper right: frequent pattern with intense creamy-drab isabelline tinge; upper left: greyish tinged throat, similar to several *saxatilis*. Note ear-coverts stripe pattern and colour and black collar pattern.

2004, Baratti et al 2005, Barbanera et al 2005, 2009ab, Barilani et al 2007ab). However, back in 1934, when Schiebel described *whitakeri*, there were apparently no introduced *chukar* in Sicily, therefore also pure birds may show an isabelline or creamy tinge.

Throat colour is quite variable in all *graeca* taxa, and not always a valid separating character between *graeca* taxa and *chukar*, contrary to statements in modern field guides (eg. Harris et al 1996, Svensson et al 1999, 2009). Indeed, in *chukar*, the throat is almost always creamy or buff creamy, more or less rich and bright (depending on individual variation, subspecies and bleaching/abra-

sion) but in *graeca* taxa not always as white, off-white or greyish white as illustrated in field guides. In nominate *graeca* and *orlandoii*, the throat is usually white or off-white more or less washed greyish, paler than in *chukar* and not creamy (whereas in eastern and southernmost subspecies such as *sinaica*, *werae* and *kurdestanica*, the throat tends to become paler and cleaner).

Any white over the forehead is very limited and absent in most *whitakeri* (closer again to *chukar*), and usually off-white or mixed with grey, therefore less conspicuous and striking than in *saxatilis* and nominate *graeca*; it is usually least striking in *orlandoii* but strong variability was found during



108 Sicilian Rock Partridge / Siciliaanse Steenpatrijs *Alectoris (graeca) whitakeri*, Monti Nebrodi, Sicily, Italy (*Andrea Corso*). Close-up view showing variegated colour of throat as in some birds, being mixed drab greyish-isabelline. **109** Sicilian Rock Partridge / Siciliaanse Steenpatrijs *Alectoris (graeca) whitakeri*, collected at Monti Nebrodi, Sicily, Italy (*Andrea Corso*). Bird with whiter and cleaner throat and unbroken collar. **110** Alpine Rock Partridge / Alpensteenpatrijs *Alectoris graeca saxatilis* (collected at Brescia, Brescia, Italy), Arrigoni degli Oddi collection, Museo di Scienze Naturali, Roma, Italy (*Andrea Corso*). Note width of collar at sides, intense greyish-tinged throat, and near absence of ear-coverts stripe. **111** Sicilian Rock Partridge / Siciliaanse Steenpatrijs *Alectoris (graeca) whitakeri* (collected at Monte Etna, Sicily, Italy), Arrigoni degli Oddi collection, Museo di Scienze Naturali, Roma, Italy (*Andrea Corso*). Note width of collar at sides, broken collar in front, spotted, white creamy-tinged throat, visible ear-coverts stripe.

the present study in Italian taxa. The white or pale supercilium is also variable, more extensive in *saxatilis* and *orlandoi*. Interestingly, in this character, *whitakeri* is most different from *chukar* which has a broader and paler supercilium, not reaching the forehead or diffusely so.

Ear-coverts

Compared with the other taxa, the ear-coverts are normally most contrasting and paler in *whitakeri*, drab pale brown, rarely tinged pale rufous or pale

rusty, obviously contrasting with the black eye-stripe/collar, almost like *chukar*, in which, however, they are much more reddish or rusty. In other taxa, the ear-coverts are rather variable, usually partly black and partly brownish or dark brown, quite often not strongly contrasting and therefore not standing out (figure 1). This is one of the most striking and typical characters of *whitakeri*, contributing to the strong resemblance to *chukar* (together with upperparts saturation and hue, and necklace pattern).



112-115 Sicilian Rock Partridge / Siciliaanse Steenpatrijs *Alectoris (graeca) whitakeri*, collected at Malvagna, Sicily, Italy, late autumn (Angelo Scuderi). Specimen photographed from different angles to show all typical characters.

Collar

The collar is typically irregular, spotted or even interrupted in *whitakeri* (figure 2), in many birds usually narrower in front, over centre of throat. In some birds, it is narrower than in other taxa, except for *orlandoi*, though in others quite broad and V-shaped in front, often bi-forked or as open 'V'. It is similar to *chukar* also with regard to the V-shaped necklace. In other taxa, it is usually rounder in front, less V-shaped but variable. The collar is typically widest in *saxatilis*, narrowest in *orlandoi* but again highly variable in all taxa. Priolo (1984) reported that the rear edge of the collar in *saxatilis* is usually more regular, less spotted or streaked than in other taxa; this is in most cases true but several skins with a quite irregular rear edge have been found during this study (plate 110).

Upperparts

The upperparts of *whitakeri* are quite variable in hue and saturation, strong brownish olive or warm brown-olive with a vinaceous cast only over the scapulars, tertials and centre of mantle. The rump and neck are usually almost concolorous olive-brown or warm brownish, with the rump just a shade paler than the rest of the upperparts.

The upperparts of *whitakeri* are the darkest and warmest of all Rock Partridge taxa, with the most intense olive tinge. Some *saxatilis* can also be rather dark on the upperparts, and some can be quite brownish olive with darkest individuals close, if not identical, to palest *whitakeri* but usually more vinaceous than olive or cold olive-brownish. In *saxatilis*, however, the rump and uppertail-coverts are usually paler than in *whitakeri*, more grey or greyish tinged and contrasting



116 Sicilian Rock Partridge / Siciliaanse Steenpatrijs *Alectoris (graeca) whitakeri*, collected at Malvagna, Sicily, Italy, late autumn (*Angelo Scuderi*). Same specimen as in plate 112-115.



117 Sicilian Rock Partridge / Siciliaanse Steenpatrijs *Alectoris (graeca) whitakeri* (collected at Monte Etna, Sicily, Italy), Museo ornitologico di Randazzo, collezione Angelo Priolo, Italy (*Andrea Corso*). Bird with broken collar and creamy tinged throat.

more with mantle; the same applies for the neck side and/or neck base. Nominate *graeca* is paler, more diffusely and intensely tinged greyish or cerulean-grey, though some birds are duller and darker, approaching *whitakeri*. The median upperwing-coverts in *whitakeri* show the least amount of greyish-bluish tinge on the inner web. The upperparts of *orlandoi* are the palest and the most cerulean-grey to cold greyish.

Underparts

The underparts of *whitakeri* are quite variable in saturation and brightness, both through individual variability and also related to the freshness of feathers (influenced by, eg, sun-bleaching, abrasion and fading). Usually, however, the area from lower breast to undertail-coverts is deep cinnamon buff or buffish creamy, darker and purer than in other taxa (figure 1, plate 119), with the undertail-coverts being richest and most saturated in colour. Nominate *graeca* is paler in these areas, while *orlandoi* is darker than nominate *graeca* but duller and less rich cinnamon-buff than *whitakeri*. In *whitakeri*, the upper breast is grey or dull ceru-

lean-grey, tinged brownish or brownish-olive due to the brownish feather tips, with some birds being paler, cleaner grey and others duller, darker with a more intense olive hue all over the breast.

Tail

In *whitakeri*, typically the longest uppertail-coverts and usually all tail-feathers show some fine dusky vermiculation, usually irregular but sometimes as dark barring (Orlando 1956, Priolo, 1970, 1984; figure 4, plate 102). Cramp (1980) and Snow & Perrins (1998) report that only the two central tail-feathers (t1) are finely mottled dusky; however, most birds – if not all – show this pattern at the base of all tail-feathers (figure 2). Several birds of other taxa (notably nominate *graeca* and *saxatilis*, and a few *orlandoi* from Calabria) show t1 with a vermiculated or mottled base, more rarely also with some sparse and thinner marks on the longest uppertail-coverts. C 20-25% of the analysed birds/skins from Italy show a mottled t1, while it is just visible on the longest uppertail-coverts in 9%. Very few birds (five *saxatilis* and three *orlandoi*) show barely visible mottling also on some of the



118 Sicilian Rock Partridge / Siciliaanse Steenpatrijs *Alectoris (graeca) whitakeri*, collected at Monti Nebrodi, Sicily, Italy, in winter (Andrea Corso).



119 Sicilian Rock Partridge / Siciliaanse Steenpatrijs *Alectoris (graeca) whitakeri*, collected at Monti Nebrodi, Sicily, Italy (Angelo Scuderi). Note richly coloured underparts with intense creamy coloration, especially very saturated and deeply coloured undertail-coverts.

other tail-feathers. Nominata *graeca* shows more often mottling on t1, rarely with barely visible vermiculations also on the uppertail-coverts (three birds out of 40). However, contrary to previous literature that mainly refers to the central pair (t1) and the uppertail-coverts, the truly typical *whitakeri* character are the dark vermiculations on the base of the complete tail (figure 4), which, during the present study, was not found as conspicuously in any individual of the other taxa.

Biometrics

Whitakeri is on average smaller than other taxa, with an average wing length of 166 mm in males and 154 mm in females (smallest 150 mm), compared with 170 (male) and 159 mm (female) in nominate *graeca*, 169 and 161 mm in *orlandoi*, and 171 and 162 mm in *saxatilis* (Priolo 1970, 1984, Cramp 1980, Corso 2005; pers obs). The average weight of adults is c 540 g (male) and c 450 g (female), compared with, respectively, c 650 g and c 550 g in *saxatilis* (Priolo 1970, Corso 2005).

Separation of *whitakeri* from *chukar*

Whitakeri is, as already noticed in the original description by Schiebel (1934), quite similar to *chukar*, mostly to *A c cypristes* (Hartert 1917). Indeed, *whitakeri* is closest to *chukar* of all *Alectoris* taxa. Contrary to statements in birding field guides such as Harris et al (1996), Svensson et al (1999) and other references, collar shape is not a valid identification character, being also V-shaped in *whitakeri*, as well as in some other taxa (mainly *orlandoi*). The same applies to the variable throat patch colour, being almost creamy or isabelline in some *whitakeri* and also other taxa.

The main plumage differences between *chukar* and *whitakeri* are: **1** black to the base of bill is more extensive, reaching the gape and base of the lower mandible in *whitakeri*; **2** narrower or almost absent pale supercilium in *whitakeri*; **3** black band over lore and forehead more restricted in *whitakeri*; **4** lower mantle, rump, uppertail-coverts and central tail-feathers greyer in *chukar*; **5** paler drab-brown stripe on ear-coverts area (more rufous or deeper rusty in *chukar*); and **6** in-hand differences in bar pattern of flank-feathers.



120 Details of scapulars and mantle side of Sicilian Rock Partridge / Siciliaanse Steenpatrijs *Alectoris (graeca) whittakeri*, collected at Monte Etna, Sicily, Italy (Andrea Corso). Note intense vinaceous tinge and cerulean centre of some feathers.

Taxonomy of *whittakeri*

In *Alectoris* partridges, seven species are nowadays recognized: Chukar Partridge (from eastern Bulgaria, Aegean islands and Turkey east to eastern China), Rock Partridge, Przevalski's Partridge *A magna* (China), Philby's Partridge *A philbyi* (south-western Arabia), Barbary Partridge *A barbara* (northern Africa), Red-legged Partridge *A rufa* (south-western Europe) and Arabian Partridge *A melanocephala* (southern Arabia). Until the 1960s, four of these, Chukar, Rock, Przevalski's and Philby's, were treated as conspecific, i.e. as subspecies of *A graeca* (Watson 1962, Voous 1977, del Hoyo et al 1994, Dickinson 2003).

Schiebel (1934) described *whittakeri* as a new subspecies and it was accepted as a distinct Rock Partridge subspecies by Vaurie (1965). Angelo Priolo published detailed descriptions (Priolo 1970, 1984) and also stressed the importance of its conservation (Priolo 1970, Priolo & Sarà 1985), as did Massa (1975). Corso (2005) proposed to regard *whittakeri* as a separate species, being allopatric and morphologically rather close to Cyprus Chukar (Cramp 1980), supported by the genetic

studies of Randi et al (1992, 2003) and Lucchini & Randi (1998); this treatment was later supported by Randi (2006), based on the previous morphological studies by Priolo (1970, 1984; Angelo Priolo pers comm).

According to Lucchini & Randi (1998), Randi (1996), Randi et al (1992) and more recently Randi et al (2003) and Randi (2006), *whittakeri* is genetically the most distinctive taxon of all Rock Partridge taxa and distinct from Chukar Partridge as well. In a study of the mitochondrial DNA (mtDNA) control region, 22 different haplotypes were identified among 323 Rock Partridges (Randi et al 2003). Phylogenetic analyses grouped these into two major groups. One of these included all samples of *whittakeri* from Sicily, and the other contained all the other sampled populations. The two groups on average differ 3.5%, which corresponds to 65% of the average distance between closely related species of *Alectoris*. Coalescent estimates of divergence times suggested that *whittakeri* was separated from all the other taxa 200 000-500 000 years ago. Even though Rock Partridge plumage is rather variable and some subspecies show overlap in many characters, typical *whittakeri* appears rather distinctive and different, being diagnosable in the field. Many plumage characters are distinctive and measurements are different, as well as moult pattern. The song also sounds different but any vocal differences clearly need further elaboration.

This island population has been separated from all the other populations for a long time and no overlap in breeding areas exists (Randi et al 1992, 2003, Randi 1996, 2006, Lucchini & Randi 1998). Hybrids are supposed to be fertile, as seen in captivity, but this is also the case for other species of *Alectoris*, and other Rock Partridge taxa are known to hybridize with Chukar Partridge and Red-legged Partridge in natural areas where introductions took place (Barilani et al 2007a, 2007b, Barbanera et al 2009b). According to Randi (2006): 'Phylogeographic and genetic data are concordant in indicating that the Sicilian Partridge (*A. g. whittakeri*) meets the criteria for an Evolutionary Significant Unit (ESU: Moritz, 1995).' The molecular evidence and the morphological differences described and illustrated here suggest that Sicilian Rock Partridge *Alectoris whittakeri* represents a unique lineage and is best regarded as a separate species according to the criteria outlined by Helbig et al (2002).

Conservation of *whittakeri*

Priolo (1970), Massa (1975), Priolo & Sarà (1985), Palumbo & Lo Valvo (1999), Corso (2005) and



121 Sicilian Rock Partridge / Siciliaanse Steenpatrijs *Alectoris (graeca) whitakeri*, Monti Iblei, Pantalica, Siracusa, Sicily, Italy, 2 October 2005 (Carmelo Milluzzo). Note that this bird is not saturated in upperparts coloration, with rump and uppertail-coverts slightly but visibly paler than mantle, atypically for *whitakeri*. Note, however, contrasting pale ear-coverts, narrow collar, almost broken in front, very dark and colourfull undertail-coverts.

Randi (2006) all express great concern about the conservation status of *whitakeri* because it still is a game bird, with hunting open almost all over Sicily. It is one of few endemic taxa in Europe, decreasing due to habitat loss and destruction, pollution, and genetic pollution (see below). Therefore, it is highly questionable that the Italian government and the Sicilian region administration still permits hunting (*whitakeri* is listed in Annex I of the Birds Directive); 100s if not 1000s of birds are killed every year all over the island. Hunters are allowed to shoot a maximum of five birds per season but in fact they sometimes each kill as many as one to five each day of hunting.

Genetic pollution is also a major problem related to hunting: every season, hunters release many Rock Partridges. The law requires these to be *whitakeri* but no checks are carried out or they occur without any knowledge of how to discern the various taxa. Consequently, it is possible to encounter any *graeca* subspecies in Sicily or even *chukar*, so the risk of genetic pollution is rather high (Priolo 1970, Priolo & Sarà 1985, Randi 2006, Barilani et al 2007a), similar to the situation with

this and other species of *Alectoris* elsewhere in the Mediterranean (Baratti et al 2005, Barbanera et al 2005, 2009, Barilani et al 2007ab). If hunting of this species is not prohibited as soon as possible all over Sicily, preventing (further) genetic pollution, the extinction of this taxon will be inevitable.

NB: all dead birds photographed and studied for this paper have been confiscated from poachers.

Where and when to see *whitakeri*?

Whitakeri breeds in wide areas mainly throughout the Sicilian mountains, with small or sparse numbers throughout the territory (Corso 2005). There is a healthy population within the protected area around Monte Etna, whereas it is generally scarcer along the coast and apparently almost absent or very scarce in the vast flatlands of Piana di Catania and along the south-eastern coast (but locally present at just 200-250 m above sea level). The easiest sites to see it are Monte Etna, Monti Madonie, Lo Zingaro Nature Reserve near Palermo, Monti Iblei and Monti Sicani, respectively around Siracusa and Ragusa and north to Agrigento and Sciacca.

The best period of the year would be during courtship or periods of male singing, from February to April, with good opportunities also when families are around, mainly from May to July. The best times of the day are late evening just before sunset and early morning at or just after sunrise.

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Samenvatting

SICILIAANSE STEENPATRIJS: HERKENNING EN TAXONOMIE Europese Steenpatrijs *Alectoris graeca* kent een aantal ondersoorten (nominaat *graeca*, *orlandoi*, *saxatilis* en *whitakeri*). In dit artikel wordt een beschrijving gegeven van voorkomen, verspreiding en kenmerken van deze vier taxa. Siciliaanse Steenpatrijs *A g whitakeri* is een endemisch taxon van Sicilië, Italië. In dit artikel word en de kenmerken van *whitakeri* uitgebreid beschreven en vergeleken met de andere taxa en met Aziatische Steenpatrijs *A chukar*, gebaseerd op balgenonderzoek, onderzoek aan levende vogels in de hand en in gevangenschap, veldstudies en bestudering van foto's.

Whitakeri verschilt in een aantal kenmerken van de andere ondersoorten en vertoont op een aantal punten meer overeenkomsten met Aziatische Steenpatrijs. De belangrijkste morfologische kenmerken zijn: **1** keelkleur: variabel, meestal warm crèmekleurig tot izabelkleurig bleek grijs; **2** zwarte halsband: variabel, meestal dunner dan in andere *graeca*-taxa en *chukar*, vaak onderbroken op de middenborst (bij andere taxa altijd gesloten); **3** wenkbrauwstreep: variabel, meestal minder wit en minder uitgesproken dan in andere *graeca*-taxa en afwezig of onduidelijk ter hoogte van teugel; **4** oordekveren: altijd meer uitgesproken dan in andere *graeca*-taxa en meer lijkend op Aziatische Steenpatrijs (sleutelkenmerk); **5** bovendelen: variabel, meestal warmer gekleurd en met diepere olijfbuine tint dan in andere *graeca*-taxa, met minder contrast tussen stuit en mantel; **6** onderdelen: variabel, meestal donkerder en dieper gekleurd dan in andere *graeca*-taxa; onderstaartdekveren warmst gekleurd en donkerder dan bij andere taxa (sleutelkenmerk); en **7** staart: bovenstaartdekveren gemarmerd, t1 en basis van alle staartpenen gemarmerd of onregelmatig gebandeerd (bandering afwezig op basis van staartpenen bij andere *graeca*-taxa; sleutelkenmerk). Daarnaast zijn er verschillen in rui (*whitakeri* ruit sneller dan andere *graeca*-taxa; dit is echter mogelijk gerelateerd aan de meer zuidelijke en warmere broedgebieden) en biometrie (*whitakeri* is het kleinste taxon uit de *graeca*-groep). Er zijn ook verschillen vastgesteld in de zang maar nog niet nader uitgewerkt. Genetisch verschilt *whitakeri* significant van de andere *graeca*-taxa. Op basis van de consistente morfologische en biometrische verschillen, het verschil in rui, de genetische verschillen en het geïsoleerde broedgebied pleit de auteur voor soortstatus van *whitakeri*.

Whitakeri broedt in verschillende delen van Sicilië. De meest kansrijke locaties zijn Monte Etna, Monti Madonie, natuurreservaat Lo Zingaro bij Palermo en Monti Iblei en Monti Sicani, respectievelijk rondom Siracusa en Ragusa en noordelijk tot Agrigento en Sciacca. De beste periode om *whitakeri* te zien is februari-april als mannetjes zingen en mei-juli als familie-groepjes kunnen worden aangetroffen.

Whitakeri is een bedreigd taxon. Bedreigingen bestaan voornamelijk uit de jacht (ondanks beschermingsmaatregelen en jachtquota worden er jaarlijks 100en of mogelijk 1000en exemplaren geschoten) en genetische 'vervuiling' door hybridisatie met voor de jacht uitgezette Aziatische Steenpatrijzen of andere *Alectoris*-taxa.

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