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Short Communication

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Omar F. Al-Sheikhly, Mukhtar K. Haba, Nadheer A. Faza'a & Ra'ad H. Al-Asady

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First record of colour aberration in Basra Reed Warbler *Acrocephalus griseldis* (Hartlaub, 1891) (Passeriformes: Acrocephalidae) from Central Marshes of southern Iraq, with notes on its intraspecific/interspecific behavior

Omar F. Al-Sheikhly [1], Mukhtar K. Haba [2], Nadheer A. Faza'a [3] & Ra'ad H. Al-Asady [4]

[1] Iraqi Green Climate Organization (IGCO), Al-Salhyiah, Al-Salhiyah complex, District 222-42-9-2, Baghdad, Iraq
[2] Iraqi Green Climate Organization (IGCO), Al-Mustansriyah, District 506, 26-5, Baghdad, Iraq
[3] Department of Biology, College of Science for Women, University of Baghdad, Al-Jadriyah, District 224-25-01, Baghdad, Iraq
[4] Independent researcher, Al-Chebaeish District, Al-Sahagi village, 003-12, ThiQar-Iraq
[1] alsheikhlyomar@gmail.com (corresponding author), [2] muktar@iqgreenclimate.org, [3] nadheerabood@gmail.com, [4] raadhhh12340000@gmail.com

Abstract: Pigment disorders such as albinism, leucism and progressive greying, which cause the absence of melanin pigments in all or parts of the plumage and bare parts, have been reported in many wild bird populations including *Acrocephalus* warblers. Basra Reed Warbler *Acrocephalus griseldis* (Hartlaub, 1891) is a restricted-range species confined to the extensive reed beds of Mesopotamian marshes. It is listed as Endangered due to breeding habitat degradation, water scarcity and climate change. In April 2018, a partly white plumaged Basra Reed Warbler was sighted in Central Marshes in southern Iraq. This is the first report of such a plumage aberration in this species. The nature of the aberration involved an intraspecific/interspecific behavior of the white plumaged Basra Reed Warbler are described.

Keywords: *Acrocephalus*, Central Marshes, colour aberrations, partial leucism, progressive greying, White Basra Reed Warbler.

Abnormal white feathers have been reported in many wild bird populations and can be caused by different aberrations. Leucism (Greek *Leukos* = white), for example, is a partial or total lack of melanin in feathers and skin (van Grouw 2012, 2013). The lack of melanin is due to the congenital and heritable absence of pigment cells from some or all of those skin areas where they would normally provide the growing feather with melanin pigment. In leucistic birds, the amount of white can vary from just a few feathers (= partial leucistic) to all-white individuals, which always possess colourless skin as well. Partially leucistic birds can have a normal-coloured bill and legs depending on where the colourless feathers occur, but the white pattern caused by partial leucism is normally patchy and bilaterally symmetrical—typical examples include a few white outer flight feathers on both wings and/or some white feathers in the face and on the belly. Leucistic birds always have pigmented eyes (van Grouw 2014). Leucism is caused by the expression of mutant alleles which affect the migration of melanoblasts (early melanin pigment cells) from the embryonic neural crest to the skin, resulting in un-pigmented (white) feathers

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and pink skin in those areas where melanoblasts are lacking (van Grouw 2014). Another more common cause for aberrant white feathers is progressive greying, a generic term for different aberrations which cause a progressive loss of melanin with successive moults. In the early stages of progressive greying the affected white feathers are usually spread randomly over the bird, which can eventually become white. Some forms of progressive greying are related solely to age while others are heritable, but more commonly the causes are unknown.

Progressive greying is the most common cause of white feathers in birds, and does not affect the eye colour (van Grouw 2012, 2013, 2018). Cases of aberrant white plumage in Acrocephalus warblers have been recorded (Holyoak, 1978; Bensch et al. 2000). Basra Reed Warbler *Acrocephalus griseldis* (Hartlaub, 1891) is a restricted-range species, a common breeding summer visitor confined to the extensive thickets/reedbeds of central and southern marshlands of Iraq and at one site in western Iraq (Fadhel 2007; Salim et al. 2012). It breeds in Israel and Kuwait; passage migrant in Saudi Arabia; vagrant in Syria and Cyprus (Yésou et al. 2007; Perlman & Shanni 2008; Porter & Aspinal 2010). Basra Reed Warbler is a long distant migrant to the subtropical or tropical zones of eastern Africa. It winters in Sudan, Ethiopia, southern Somalia, southeastern Kenya, eastern Tanzania, southern Malawi and Mozambique (Baker 1997; Urban et al. 1997; Kennerley & Pearson 2010). It listed as Endangered due to rapid decrease of its breeding habitats, water scarcity and management, and climate change (Birdlife International 2018).

Material and Methods

On 29 April 2018, a singing adult Basra Reed Warbler with distinctive partial white plumage was sighted at Ishan Al Ghubbah-Central Marshes (31.059^{0}N 47.018^{0}E; elvation 1m above sea level) in Al-Chebaeish district of ThiQar Province in southern Iraq. The local ecological landscape is an aquatic habitat of dense and extensive *Typha*/*Phragmites* sp. vegetation mixed with a few terrestrial muddy embankments. The White Basra Reed Warbler was loudly singing/displaying near its probable foraging/nesting territory; it was carefully observed for two hours from an elevated vantage point (c. 5–15 m in distance). The field observations/remarks were made using Swarovski EL 8x32 binocular; photographic documentation was made by Canon EOS Kiss X6i with a 400mm telephoto lens (Image 1a,c,e). On 30 April 2018, the bird was trapped using a 30mm mesh mist net in order to obtain further morphological notes. Trapping and handling wild animals for scientific research was permitted by the letter No. 141 issued from the College of Sciences /University of Baghdad on 15 January 2018. The bird was gently extracted from the net, carefully handled, the plumage was examined, and photographed using Nikon SLR D5200 with 18x55mm lens for about (5–10) minutes (Image 1b,d,f). In order to reduce stress on the bird caused from trapping/handling, no morphometric measurements were taken. The bird was released at the same trapping/capturing area and its behavioral reflexes were carefully monitored for about 30 minutes. It showed normal behavioral and active territorial performance afterward. The species' descriptive field identification remarks were noted following Kennerley & Pearson (2010). The naming of the white plumage followed the identification key for colour aberrations described by Mahabal et al. (2016).

Results

This is the first documentation of a Basra Reed Warbler in the marshes of southern Iraq with aberrant white feathers. The white bird showed distinctive features of Basra Reed Warbler, including the proportionately longer bill than other *Acrocephalus* allies. The body lacks the distinctive cold olive-brown coloration and the buffy-brown suffusion of the breast sides and flanks, long prominent supercilium on head. The visual hand examination showed white feathers covering 70–80 % of the body. The bare parts (eyes, bill, and legs) were of normal coloration. The body feathers with normal olive-brown coloration were unevenly distributed mainly in nape, ear-coverts, neck-side, throat, scapular, rump, uppertail-coverts, and lower flanks. The bill was long, slim, with concave sides and narrow tip. It had normal coloration of dark grey upper mandible, fleshy-pinkish lower mandible with dusky sides near the tip, and bright-orange commisure. The eyes were normal coloured with dark chestnut-brown iris with dark pupil and pale eye-ring (Image 1f). The tarsi are pale-grey with dark toes. The wing was long and pointed reaching behind the longest uppertail-coverts. The wing point was formed by the emarginated primary feather p3. First primary was minute and much shorter than primary coverts (pc). Wings had extensive white feathers in primaries, secondaries, primary coverts, median covets, and lesser coverts. The tail was rounded but shorter than Great Reed Warbler *Acrocephalus arundinaceus* (Temminck & Schlegel 1847), and also had white tail feathers (t) except for t2, t4, and t12 which were normal coloured. The distribution of white feathers especially in the wing seemed to follow a symmetrical pattern. The left

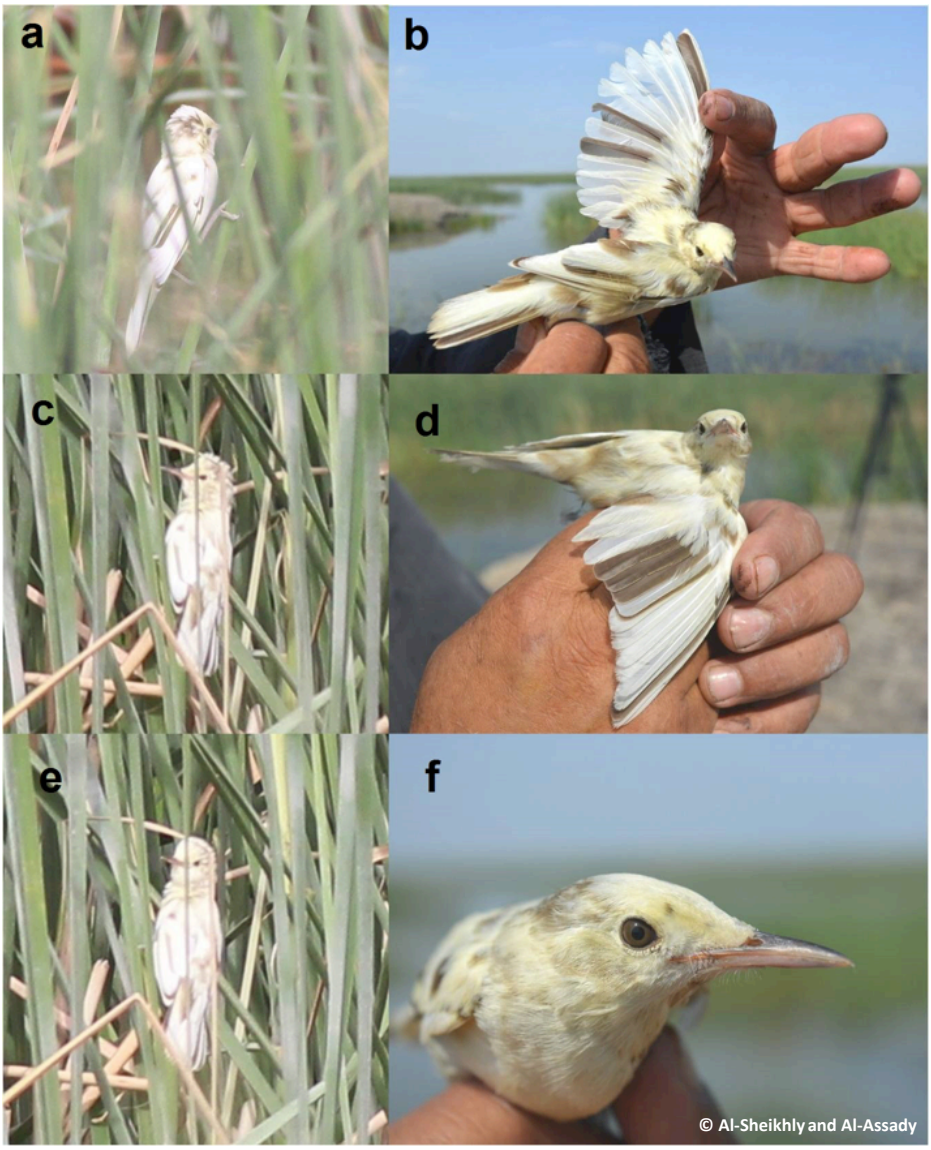

Image 1. (a, c, e) adult Basra Reed Warbler with white (advanced progressive greying) plumage, Ishan Al Ghubbah-Central Marshes, Southern Iraq; hand examination showing (b) left wing; (d) right wings; (e) head.

Table 1. wing and tail formula of white-plumage Basra Reed Warbler *Acrocephalus griseldis*: RW: right wing; LW: left wing; p: primary feather (shaft, inner/outer webs); s: secondary feather; te: tertials feather; t: tail feather; o: white feather; ●: normal- feather; *: moulted.

	Primaries									Secondaries						Tertials				Tail (left to right orientation)										
	p1	p2	p3	p4	p5	p6	p7	p8	p9	p10	s1	s2	s3	s4	s5	s6	te1	te2	te3	t1	t2	t3	t4	t5	t6	t7	t8	t9	t10	t11	t12
RW	o	o	o	●	o	o	o	o	o	o	●	o	●	●	●	o	o	o	●	o	●	o	●	o	o	o	o	o	o	o	●
LW	o	o	o	●	o	o	o	o	o	o*	●	o	●	o	o	o	o	o	●												

and right wing showed normal coloration in p4, s1, s3, and te3 feathers while the rest were white. S4 and s5 feathers were normally coloured only in the right wing (Image 1b,d). The wing and tail formulae are shown in Table (1).

Breeding behavior: The white Basra Reed Warbler was observed loudly singing and actively displaying in dense reed beds, which suggests an adult male (Image

1c,e) that our field observations indicated was paired with a normal-coloured bird, possibly an adult female, which we observed leaping/flying around the same probable foraging/breeding territory. Both birds were observed carrying nesting materials (*Typha*/*Phragmites* dry roots) and entering into a specific location inside dense reedbeds, occupying a certain nesting territory, and performing normal displaying/territorial behavior. We did not observe interference from other normal coloured conspecific individuals or other sympatric species such as Great Reed Warbler, Indian Reed Warbler *Acrocephalus* (*Stentoreus*) *brunnescens* (Jerdon, 1839), and Common Reed Warbler *Acrocephalus scirpaceus* (Hermann, 1804), or from natural predators such as raptors and small mammals.

Discussion

There are no previous reports of white-plumage aberrations in *Acrocephalus* warblers from the Iraqi marshes, particularly in Basra Reed Warbler. As this bird still had normal coloured feathers in its plumage and normal coloured eyes and skin, we could exclude albinism (Mahabal et al. 2016). Based on the amount and distribution of white feathers, compared with the characteristics of partial leucism and progressive greying mentioned in the 'introduction', we believe the aberrant plumage of this individual is most likely the result of a form of progressive greying. The normal coloured body feathers were randomly distributed but the white wing feathers distribution was in a more or less symmetrical pattern. This, however, can be explained by the fact that birds moult their feathers in a symmetrical way and when these still coloured feathers did grow, the loss of pigment may not have yet fully set in. The white pattern in partial leucism is already present in juvenile plumage and does not change with age (van Grouw 2013; 2014). However, the white Basra Reed Warbler was a breeding adult so we do not have information regarding its juvenile plumage. The amount and distribution of the white feathers, however, suggests almost certainly an advanced stage of progressive greying. The occurrence of white plumaged birds in the wild is not uncommon; birds with white feathers in natural populations rarely exceed 1% (Sage 1963; Santos 1981). Bensch et al. (2000) reported an increased frequency of individuals with white feathers in recently founded inbred populations of Great Reed Warbler in Sweden. Aberrant white feathers in birds may have consequences, it may cause a special challenge in the wild (Nogueira & Alves 2011). It is believed to reduce the species ability to camouflage and make them vulnerable to predation (Santos 1981; Pomarede 1991; Alaja & Mikkola 1997; Ellegren et al. 1997; Collins 2003), but yet, in many species no evidence has been obtained (van Grouw pers. comm. 2018). In our case, these statements were noted. In general, Basra Reed Warbler has cryptic and enigmatic behavior (Fadhel 2007). The white Basra Reed Warbler was observed in a monotonic landscape (dense reed beds) where other conspecific individuals and/or sympatric species may interfere. Its breeding behavior was apparently not affected; however, the species intraspecific/interspecific competition in the Iraqi marshes is still obscure. In certain cases, birds with plumage aberrations reproduced successfully and survived several years in the wild (Alaja & Mikkola 1997; Forrest & Naveen 2000). This may explain the survival and normal breeding behavior of the white Basra Reed Warbler throughout the ecoregion of the Iraqi marshes and possibly elsewhere within its wintering range. The current observation was rather surprising; since there are no previous records on such plumage condition in Basra Reed Warbler. In Henderson Island Reed-Warbler *Acrocephalus taiti* (Ogilvie-Grant 1913) and Pitcairn Island Reed-Warbler *Acrocephalus vaughani* (Sharpe 1900); however, Progressive greying, probably an inheritable form, occurs very frequently in these populations and does not seem to affect their behavior (van Grouw pers. comm. 2018). Further monitoring for white-plumaged Basra Reed Warbler individuals in wintering grounds and ringing stations across the species geographical range is required for a more comprehensive evaluation of the aberration involved.

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