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based on work in the Albert National Park. On pages 53–54 Verheyen records no fewer than fourteen species perching on hippo, the Hammerkop (*Scopus umbretta*) and Pied Kingfisher (*Ceryle rudis*) apparently both doing so while fishing.

Footnote:— R. Meinertzhagen in *The Birds of Arabia* (1954), p. 471 writes under Crab Plovers: “On Mafia Island I have seen them perched on the backs of basking hippopotami who were themselves asleep in seawater on a coral reef.”

A new name for *Estrilda astrild angolensis* Reichenow

by MELVIN A. TRAYLOR

Received 26th June, 1961

In his revision of the Estrildinae, Delacour (1943, *Zoologica*, 28: 69–86) failed to note that *Estrilda astrild angolensis* Reichenow (1902, *Orn. Monatsb.*, 10: 173) is preoccupied by *Estrilda a. angolensis* (*Fringilla angolensis* Linnaeus, 1758, *Syst. Nat.*, ed. 10, 1: 182) when *Uraeginthus* is united with *Estrilda*. For those who follow Delacour's generic revision, a new name is necessary for *E. a. angolensis* Reichenow, and I propose:

Estrilda astrild malanje nom. nov.

for *Estrilda astrild angolensis* Reichenow, 1902, preoccupied by *Estrilda angolensis angolensis* (*Fringilla angolensis* Linnaeus, 1758).

Notes on the taxonomy of the Indigo Birds

by C. M. N. WHITE

Received 3rd May, 1961

The Indigo Birds are parasitic weavers, sometimes placed in the genus *Hypochoera*, but better included in the genus *Vidua* since their female and non breeding male plumages are very similar to those of other species of *Vidua*. The breeding males are of uniform dark colour varying from matt blackish purple to glossy purple, blue or green with a metallic lustre. The taxonomy of the Indigo Birds and the number of species has always been the subject of much doubt. Sclater (1930) arranged them in five species; Grant and Praed (1949) recognised eight species; Chapin (1954) lists five as occurring or likely to occur in the Congo but adds that there may only be three; Wolters (1960) discusses the possibility of only two species. Whatever the number of species, the uncertainty of how to distinguish females and non breeding males is even greater than the separation of males. Only Grant and Praed (1955) claim that their males are associated with distinguishable females. Characters used to distinguish breeding males are the colour and degree of the metallic gloss, colour of flight feathers, and colour of bill and feet. These characters have been used either separately or in various combinations. The present note arises primarily from an investigation of the position in Central Africa but considers data from other parts of Africa. About 170 breeding males and 40 females from South and Central Africa and Tanganyika were available through the kindness of the Transvaal Museum and the National Museum, Bulawayo to whom I am greatly indebted for the loan of material. The data is analysed firstly by geographical areas.

1. *South Africa (south of the Limpopo)*

Roberts recognised three species in this area, but McLachlan and Liversidge consider that there are only two. Seventeen males examined consist of seven dull purplish birds and ten bluish green birds. The former have whitish bills and correspond to *V. funerea*; the latter have red bills and correspond to *V. amauropteryx*. Data on the colour of the feet is inadequately recorded on the labels but all birds from this area are believed to have reddish feet. The seven females available from south of the Limpopo appear to be indistinguishable although some are labelled as *funerea* and others as *amauropteryx*. Neither Roberts nor McLachlan and Liversidge suggest any means by which females can be separated apart from the assumption that female *amauropteryx* have red bills. The red bill of male *amauropteryx* is very persistent in skins many years old, but there is no sign that this is true of females.

2. *Southern Rhodesia north to the Zambezi Valley from the Caprivi Strip to about Tete*

Thirteen breeding males correspond to *funerea*, all from Southern Rhodesia; 25 from Southern Rhodesia and 18 from the Zambezi Valley correspond to *amauropteryx*; one from Southern Rhodesia, one from the Zambezi Valley and one from Nata, Bechuanaland correspond to *amauropteryx* but have whitish bills as in *funerea*. In this area *amauropteryx* type males have red feet as in South Africa, but *funerea* males usually have brown or pinkish or whitish feet. Eleven females were available from this area. One from Melsetter agrees with South African females, the remainder are more tawny above with much better defined black streaking compared with the browner backed and more obscurely streaked South African females. Thus from South Africa to the Zambezi there is evidence of geographical variation in females but no evidence that two apparent species of males are associated with distinguishable females.

3. *Northern Rhodesia and south Nyasaland*

Males of the *funerea* type occur throughout (Northern Rhodesia 25, S. Nyasaland 11). Males of the *amauropteryx* type occur in the Southern, Central and Eastern provinces of Northern Rhodesia and in S. Nyasaland (Northern Rhodesia 18, S. Nyasaland 7). In addition males resembling *amauropteryx* in colour but with whitish bills occur—six from Northern Rhodesia and 13 from S. Nyasaland as well as seven from Rukwa in S. W. Tanganyika. These white billed *amauropteryx* include a few unusually glossy green individuals, others are like the *amauropteryx* aggregate. Females from the south and centre of Northern Rhodesia and from S. Nyasaland agree with those of Southern Rhodesia except for one dark bird from S. Nyasaland which is like South African females. Females from the north of Northern Rhodesia are however dark and appear indistinguishable from South African females.

4. *Katanga and Kasai*

No red billed and red footed *amauropteryx* are known to me from this area but in the Kasai birds of similar colour, often rather more lustrous than many *amauropteryx* and with brownish feet and white bill, occur.

Chapin treated these as a form of *amauropteryx* under the trinomial *camerunensis*. It is however doubtful if they can be separated from the white billed *amauropteryx* of N. E. Northern Rhodesia or Rukwa which often have pinkish or whitish brown instead of red feet.

The pattern of variation in Southern and Central Africa

We have now seen that two types of male breeding plumage occur throughout this area if a distinction is based on colour of the body plumage. One varies from dull matt purplish black to more glossy purple. Grant and Praed with 16 of the more glossy purple males and four of the matt males suggest that these comprise two species, *funerea* and *nigerrima* respectively. With 60 such males before me it appears that no such distinction can be made since there is complete intergradation from matt to glossy purple. A few males are exceptionally rich lustrous purple and might on such criteria qualify as yet another species. I conclude that *nigerrima* must fall away as a species. All these birds may therefore be called *funerea*; the only geographical variation is that the feet are redder south of the Limpopo, pinker, whiter or browner further north. The second type of male is glossy blue green or green. Its flight feathers are often, especially in more northern birds, blacker than those of *funerea*, but some individuals differ very little in this respect. A cline of decreasing red in the colour of bill and feet runs from south to north since about as far as the Zambezi valley both bill and feet are normally red, in south Nyasaland and in Northern Rhodesia the bill is often white and the feet sometimes pinkish or brownish whilst in the Kasai no red bills or feet are found. The species known as *codringtoni*, described from Petauke in the Eastern Province of Northern Rhodesia is such an intermediate bird, having whitish bill, pink feet and rather blackish primaries and a strong green body gloss. Its supposed larger size is not a fact since its dimensions agree with other red billed and white billed *amauropteryx*. In my view therefore *amauropteryx* can be used for convenience for all these green birds irrespective of the colour of bills and feet which has clearly no specific significance. Accordingly I consider that *codringtoni* falls away as a species; for the same reason there is no reason to regard *camerunensis* as a species.

The number of species in Southern and Central Africa

On the evidence thus far presented, breeding males in these areas may be thought to comprise two species, *funerea* and *amauropteryx*. There is little evidence that these two very similar species have any peculiarities which keep them apart in life. At Chilanga near Lusaka C. W. Benson has found both occurring in the same area without any distinction in habitat, behaviour, voice or other observable features. In Southern Rhodesia M. P. Stuart Irwin informs me that whilst he thought that the scatter pattern of singing males suggested two species, he feels that further observation is needed to confirm this. The statement in the Southern Rhodesia Check List that *amauropteryx* is found about townships must therefore be regarded as requiring further study. No such peculiarity has been noted in Northern Rhodesia. Both "species" where they occur in South and Central Africa are alike in size, have no field characters to distinguish them, and have apparently identical females in any given locality. Such variation

as is found in females is geographical and in view of its pattern of distribution rather difficult to interpret. Statements in the literature which claim differences between females of supposedly different species are highly unsatisfactory. In the first place there is no indication as to how females have been assigned to a given species. Very few Indigo Bird females have been deliberately collected with males, and it appears to be largely an assumption that if a particular type of male has been collected in a given locality a female from the same locality is probably of the same species. Since three types of male may occur together in Northern Rhodesia and Nyasaland (*funerea*, *amauropteryx* and white billed *amauropteryx*) any such assumption is unjustified. Meise (1937) has recorded of birds from the Matengo highlands that female *amauropteryx* is greyer and less yellowish than females of *funerea*, whilst in my material females from the Zambezi valley areas where only *amauropteryx* type males have been collected are of the tawny yellowish type. Grant and Praed have claimed that female *nigerrima* is quite different from all other females, yet it is quite obvious that there is no species *nigerrima* as it has been defined on male characters. Chapin on the other hand has written "I must confess that I cannot distinguish between females of some of the species most commonly recognised". Thus there seems likely to be some geographical variation in female plumages though its extent and significance cannot as yet be evaluated. There is as yet no good evidence that the supposed males of different species have distinctive females. In fact all the available data point in precisely the opposite direction.

The two species *funerea* and *amauropteryx* as now defined extend into West Africa. There they are smaller than in southern Africa but of similar size so that the two species in so far as they vary geographically in size do so in an identical manner, and remain alike in size where they occur. The evidence for recognising two species thus resolves itself into the fact that breeding males can be divided into two series, of black or purple birds on the one hand and blue green or green birds on the other. The supposed differences in colour of bill and feet as specific characters fall away since as the ranges proceed northwards the two converge in this respect through loss of red in these parts of *amauropteryx*. Instead of there being two species in southern and central Africa it would from all the evidence appear equally possible that there is only a single species with polymorphic males, or perhaps better, dimorphic males (purple or green in very simple terms). The degree of gloss varies widely within an area, and occasional very lustrous individuals occur; *nigerrima* represents one extreme of this variation, with very little lustre, whilst the very glossy green *nigeriae*, of which few specimens are known, appears to be no more than an extreme variation of the green birds in the opposite direction.

It may be suggested that the melanisation of the flight feathers in East African populations of *amauropteryx* type birds, which seems not to occur or to be less marked in *funerea* type birds points against an explanation through polymorphism. But the distinction is less clear cut than much of the literature implies. Thus in East Africa Indigo Birds are often called *V. chalybeata orientalis* on account of their blackish primaries. Yet as Chapin observes *orientalis* shows a resemblance to *amauropteryx*; again in the Kivu area he found difficulty in drawing a line

between what he calls *funerea purpurascens* and *chalybeata orientalis*. He notes that males from Usumbura, otherwise agreeing with *orientalis*, have rather brownish primaries. Moreover in East Africa birds with a purplish gloss but melanised primaries occur so that the possibility that only green birds are affected by this character seems to fall away. I have examined males of *orientalis* from Bagamoyo and the Amala river which agree well with white billed *amauropteryx* and whose blackish primaries can be matched with individuals from further south. In view of the overlap in characters it is very difficult to believe that *orientalis* is in fact a form of another species.

Further evidence against regarding the blackness of the primaries as a specific character (as distinct from perhaps having significance as geographical variation) is provided by Serle's collection from south-east Nigeria. He obtained 31 males assigned to *camerunensis* (greenish), five assigned to *wilsoni* (purplish) and one assigned to *nigeriae* (glossy green). Thus his series corresponds to *funerea* and *amauropteryx* in Central Africa with one extreme green variant. But in West Africa all these three forms apparently have brown primaries, so that any specific difference there cannot be linked to the colour of the primaries. Unfortunately he only collected a single female.

Apart from the question of three forms (*chalybeata*, *neumanni* and *ultramarina*) generally recognised but not examined by me, it would seem that all the other Indigo Birds can be treated as either two species (*funerea* and *amauropteryx*) or as a single polymorphic species. Whilst no categorical answer can be given as to which of these alternatives is correct, the evidence to date leans heavily in favour of the latter. An important question which may throw light upon this is whether the mouth pattern of juvenile Indigo Birds indicates the existence of more than one species, a point upon which I have traced no information. If in fact the variation in Indigo Birds is explicable as balanced polymorphism maintained by a balance of selective agencies which favour such diversity, it is doubtful whether any trinomial nomenclature should be applied to the species until the genetic mechanism involved is better understood, and any trinomials can be given some biological significance.

I am greatly indebted to C. W. Benson who examined this material with me, and to M. P. Stuart Irwin for his comments on this paper.

On the distribution of the races of the Paradise Flycatcher *Terpsiphone viridis* (Müller) in Southern Africa

by W. J. LAWSON

Received 15th May, 1961

Terpsiphone viridis (Müller) occurs throughout most of Africa, from the Cape Province almost to the Sahara and to Eritrea and south-west Arabia, with about ten races deserving recognition (*vide* Chapin 1953). It is a highly variable species with some of the races exhibiting phenomenal variation in coloration within the formal taxonomic unit.