the contrary, few traces of genes for dark plumage appear in the continent's interior suggests that interbreeding must have some limits. Different breeding cycles and behaviour of migratory and the resident birds, and the possibility of some selection against dark morphs could account for the limits. At the very least, the occurrence of migratory and resident populations together might offer an explanation for the confusing morphology, distribution, and taxonomy of these birds.

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The *Egretta garzetta* complex in East Africa: A case for one, two or three species

Egretta egrets within the *garzetta*, *schistacea* and *dimorpha* complex that occur in East Africa have presented identification and taxonomic problems for decades, and continue to do so. The relationship between what are referred to as Little Egret (comprising races *garzetta*, *nigriceps* and *immaculata*), the Dimorphic Heron (*dimorpha*) and Western Reef Heron (*gularis* and *schistacea*) has been a matter of great controversy (Hancock & Kushlan 1984; see a related article in this *Scopus* issue). Here, I review both the earlier treatment of these closely related birds, and the forms occurring in East Africa today, hoping that this will move us closer to the point where a consensus concerning the taxonomic status of all can be reached.

The following four forms comprise the *Egretta garzetta* complex:

i. *E. g. garzetta* is white plumaged with black bill and legs, yellow feet and blue-grey lores. When breeding, feet and lores become bright pink,

orange or red.

ii. *E. g. gularis* is dimorphic, but most individuals are blackish or slate-grey with a white chin and variable yellow to dark brown legs. The bill and legs turn black when breeding.
   - White plumaged *gularis* often have some dark feathers in the plumage. Bill always relatively thick and long.

iii. *E. gularis schistacea* is highly variable in bill size and colouration of soft parts. The bill tends to be thicker than in *garzetta*, particularly at the base.
   - Dark *schistacea* are blue-grey with a white throat and occasionally white wing patches, a greenish-yellow bill, olive-green legs, yellow feet and lores.

iv. *E. dimorpha* is also dimorphic with dark blackish birds often outnumbering white ones. Many dark-phase birds are lighter in colouration than *gularis*, while white and intermediate phases also occur, as well as individuals that are bluish-grey sometimes speckled with white.
   - Dark individuals usually have white throats and white wing patches, but again the amount of white present is variable. Bill and legs are black with feet yellow or olive sometimes extending to the tarsi. Lores generally bright yellow turning deep pink when breeding, as do the feet.
   - White phase individuals in both breeding and non-breeding plumage are extremely difficult to separate from nominate *garzetta*, though the seemingly longer and thicker-based bill can be a diagnostic feature.

All forms utilise a wide variety of habitats, including riverbanks, shallow lakes, pools, lagoons, irrigation canals, flooded grasslands and marshes, as well as coastal habitats such as mudflats, sandy beaches, rocky coastlines, coral reefs and mangroves. The typically coastal forms, *gularis, schistacea* and *dimorpha*, generally favour marine shorelines, but all have also been recorded inland: *dimorpha* in Madagascar; *schistacea* on several Rift Valley lakes; and *gularis* in mangrove-lined rivers well inland in several West African countries (Kushlan & Hafner 2000).

Taxonomic treatment has varied considerably over the years: while Chapin (1932) appeared to support the recognition of three species (*E. garzetta, E. gularis* and *E. schistacea*), Steinbacher (1936) argued that the multi-phased egret occurring on the East Coast of Africa and showing mixed traits of *gularis* and *dimorpha*, was a different race and even species to the typical white *garzetta*, and should be named *Egretta cineracea*. Grant & Mackworth-Praed (1938) reiterated their earlier views in support of *E. garzetta* (including *dimorpha*), *E. gularis* and *E. schistacea*, and considered *dimorpha* synonymous with *schistacea*. Later White (1965) lumped all of them into the one *garzetta*, a view that had been suggested earlier by Berlioz (1959). Payne & Risley (1976) and Payne (1979) nevertheless opted for three species, while Cramp & Simmons (1977) and Hancock & Elliott (1978) preferred just two (*E. garzetta*. and *E. gularis*). Britton (1980), recognising the complexities surrounding the southern Kenya coastal birds that appeared intermediate in size between the smaller *garzetta*

and the larger *dimorpha*, similarly preferred to list them under *garzetta* (*pro tem*). Meanwhile Brown *et al.* (1982) recognising only the nominate form of *E. garzetta* (Little Egret) in Africa, considered both *asha* (now *schistacea*) and *dimorpha* as races of *gularis* (Western Reef Heron). More recently however both Zimmerman *et al.* (1996) and Dickinson (2003) have supported the recognition of three species: Little Egret (*E. garzetta*), Dimorphic Egret (*E .dimorpha*) and the Western Reef Heron (*E. gularis schistacea*).

Thus, the current taxonomic options for East African birds are as follows:

i. A single polymorphic species: *Egretta garzetta*, comprising *garzetta, gularis, schistacea* and *dimorpha* (e.g., Hancock & Kushlan 1984, Dowsett & Dowsett-Lemaire 1993)

ii. Two species: *Egretta garzetta* (nominate form only) and *Egretta gularis* (including *schistacea* and *dimorpha*) (e.g., Brown *et al.* 1982)

iii. Three species: *Egretta garzetta, Egretta gularis* and *Egretta dimorpha* (e.g., Dickinson 2003)

While all forms (*garzetta, schistacea* and *dimorpha*) largely behave as separate species in Kenya and are generally easy to identify, a situation occurred at Lake Turkana, northern Kenya during the 1970s, whereby breeding was observed among individuals that appeared to be dark phase *schistacea* with those that appeared identical with the all-white *garzetta*. More recently, a mixed colony of egrets breeding on Sumuka Island, Lake Victoria, appeared to contain birds resembling white phase *dimorpha* alongside normal white phase *garzetta* (Byaruhanga & Ostergaard 2008). Elsewhere, observations of egrets in a coastal area of southern Tanzania suggested a mix of both *garzetta* and *dimorpha*, with possible hybrid birds present (Londei 2010). Since it is well known that *schistacea* and *garzetta* freely interbreed with one another in Israel (Ashkenazi 1993) and in India (Parasharya & Naik 1984), there would appear to be convincing evidence for considering all three forms as being members of one polymorphic species.

A particularly close relationship between *dimorpha* and *gularis* would in some way ease the identification problems that surround so many grey or light bluish-grey individuals that are periodically seen in coastal areas of southern Kenya from Mombasa south to Dar-es-Salaam and Zanzibar, and occasionally on some Rift Valley lakes. Pakenham (1979) clearly recognised a taxonomic problem surrounding the black-billed egrets occurring on Pemba and Zanzibar, and felt that consideration of the island's birds being *E. gularis dimorpha* a distinct possibility. The principal diagnostic characteristic of reef herons—a thicker bill—although highly variable, does suggest adaptation of these races to marine habitats and hard-bodied food (Hancock & Kushlan 1984). Whether this is sufficient to claim specific recognition remains questionable. Indeed, Little Egrets (*garzetta*) may occur alongside reef herons in many coastal areas from southern Somalia south to Dar-es-Salaam and beyond (e.g., see Londei 2010). Similarly, birds that look like typical *dimorpha* mix freely along the East African coast with a few individuals that appear to be *schistacea* as well as with those that look like typical *garzetta* (Hancock & Kushlan 1984).

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Quailfinches *Ortygospiza* spp. in East Africa

Quailfinches are characterised by their exclusively grass-dwelling habits, they are always difficult to see well, and equally difficult to catch and examine closely. They are widely distributed throughout sub-Saharan Africa and may be considered true grassland endemics. Gregarious in habits and exceedingly cryptically plumaged, they spend much of their lives on the ground, and are easily disturbed when approached. A single superspecies, the quailfinch comprises no less than eleven forms together with a complex and often confusing taxonomy. Traylor (1963) and Dickinson (2003) recognised two species, *Ortygospiza atricollis* and *O. gabonensis*, while White (1963) preferred *O. atricollis* and *O. fuscocrissa*.

Following the DNA sequencing of several taxa, which appeared to show that the forms *atricollis* and *ansorgei* were as closely allied to each other as were *fuscata* and *gabonensis*, yet *atricollis-ansorgei* and *fuscata-gabonensis-muelleri* were as distant from each other as were several other pairs of African waxbills. As a result Fry (2004) felt it best to separate *gabonensis* and to divide *atricollis* into two species (*O. atricollis* and *O. fuscocrissa*), thus recognising **three** species within the single superspecies of eleven forms.

East African populations can be defined as follows:

(a) The atricollis group: *ugandae* Van Someren 1921. Type locality Mumias, western Kenya. It was considered synonymous with *O. fuscocrissa muelleri* by White (1963), recognised by Paynter *et al.* (1968), but not by Britton (1980), Nikolaus (1987, 1989) or Zimmerman *et al.* (1996). Traylor (1963) felt that West African *atricollis* and East African *ugandae* 'composed a natural group', while more recently, *ugandae* was treated as a race of *atricollis* by Dickinson (2003). The atricollis group ranges from southern Sudan and northwestern Uganda down the Nile to Murchison Falls National Park. In addition, there are old specimen records from Entebbe (Grauer 1907) and Mumias, western Kenya (Van Someren 1917). Recent sight records close to Mumias (B. Finch, *pers. comm.*), together with sight records from the Kibinda Rice Scheme in eastern Uganda (attributed to *O. g. dorsostriata* by Carswell *et al.* 2005) may also refer to *ugandae*.

(b) The 'black-chinned' gabonensis group: *dorsostriata* Van Someren 1921. Type locality Ankole, southwest Uganda. It was considered as a