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Vaurie, C. 1953. A generic revision of flycatchers of the tribe Muscicapini. *Bull. Am. Mus. nat. Hist.* 100: 453–538.
— 1954. Systematic notes on Palearctic birds. No. 9 Sylviinae: the genus *Phylloscopus*. *Amer. Mus. Novit.* 1685: 1–23.
— 1965. *The Birds of the Palearctic Fauna. Non-Passeriformes*. London: H. F. & G. Witherby.
Vaurie, C. & Amadon, D. 1962. Notes on the Honey Buzzards of eastern Asia. *Am. Mus. Novit.* 2111: 1–11.
Wells, D. R. 1972. Bird Report: 1969. *Malay Nat. J.* 25: 43–61.
— 1975. Bird Report: 1972 and 1973. *Malay. Nat. J.* 28: 186–213.
Wells, D. R. & Becking, J. H. 1975. Vocalizations and status of Little and Himalayan Cuckoos, *Cuculus poliocephalus* and *C. saturatus*, in Southeast Asia. *Ibis* 117: 366–371.

The subspecific status of the southern African populations of *Streptopelia semitorquata* (Rüppell)

by P. A. Clancey

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The large collared dove, the Red-eyed Dove *Streptopelia semitorquata* (Rüppell), of the Ethiopian Region ranges widely from Senegal in West Africa, east to Ethiopia, Eritrea and Somalia, as well as Yemen in the southwest of the Arabian Peninsula, and south through Africa to the Cape. It was first shown as exhibiting geographical variation by von Erlanger (1905) and later by Grant (1915), who was the first worker to review the species as a whole. Among later authors who dealt with the geographical variation of this dove in depth were Gyldenstolpe (1924), Friedmann (1930), Roberts (1935) and Chapin (1939). Friedmann believed only two subspecies warranted recognition: *S. s. semitorquata* (Rüppell) 1837: Taranta Mts, Acchele Guzai, Eritrea, and *S. s. minor* (Erlanger) 1905: Fanole and Kismayu, Somalia. His findings were in the main endorsed by Chapin, and both authors found little justification for the continued maintenance of a West African form, *S. s. erythrophrys* (Swainson) 1837: Senegal, as initially advocated by Grant and some later workers. Recent authors, notably White (1965) and very recently Nowak (1975), have gone so far as to maintain that, despite the readily demonstrable variation, races are not admissible. In turn, I do not find this latter view acceptable in the light of some recent work of my own.

Examination of a large body of material from southern, central and eastern Africa effected in the Durban Museum indicates that individual variation in this dove is not inordinately high and has been seriously overstated by many workers. Characters assessed as of importance in arranging the populations in subspecific taxa are often quite well marked and geographically correlated. Variation in *S. semitorquata* affects general size, the level of saturation of both the upper- and under-parts and the extent of grey over the distal wing surfaces, but only the latter two constitute subspecifically significant parameters. Wear and insolation result in a general browning and darkening of the plumage with the loss of the waxy greyish patina of the newly moulted feathering. Most marked is the loss of the bluish grey over the rump and upper tail-coverts. Many museum skins are now both foxed and affected by subtle grease staining.

Roberts (1935) arranged the South African populations of the Red-eyed Dove in two subspecies on mensural characters, recognising a widely

distributed race, *S. s. australis* Roberts 1932: Sekororo, Leydsdorp, eastern Transvaal, and a far western representative based on a singleton with a wing of 212 mm (*S. s. maxima* Roberts 1932: Toten-Maun road, northwestern Botswana). In proposing *maxima* Roberts appears to have been unduly influenced by incorrect wing-length data provided by Bocage in the case of the Angolan population (see Traylor 1960). Peters (1937) merged *australis* with the nominate subspecies, but recognised *maxima* as "known only from the type locality". Both *australis* and *maxima* were treated as synonymous with *S. s. semitorquata* in my *Catalogue* (Clancey 1965) and in the *S.A.O.S. Check List of the Birds of South Africa* (1969) pending a reappraisal of their status.

Roberts stated in 1932 that eastern southern African birds were sufficiently larger than topotypical *semitorquata* from Ethiopia as to warrant segregation under the name *S. s. australis*. In his later exposé (Roberts 1935) he gives the wings of southern African birds (both ♂♂ and ♀♀) as ranging from 183–204 mm. My own measurements for southern African specimens (from Rhodesia and Moçambique, south to the Cape) are: ♂♂ 185–201, ♀♀ 181·5–203 mm. Ethiopian birds are not subspecifically different in size from those of southern Africa, averaging only slightly smaller, the wings of ♂♂ being 180–195·5, ♀♀ 176–186·5 mm (Table 1). On the basis of the criterion laid down in the original diagnosis, *australis* cannot be maintained by wing-length as discrete from *semitorquata*. However, my series shows that the relatively stable populations present over the plateau of Rhodesia and in extreme eastern Botswana, the Transvaal, Moçambique south of the Limpopo R. (with single examples of *S. s. semitorquata* cropping up in the littoral populations present as far south as Durban and the Transkei), Swaziland, the Orange Free State, the lowlands of Lesotho, Natal and Zululand, and the Cape (mainly in the east and south, locally west to the Berg R.) differ sufficiently in various colour characters to justify their recognition as a subspecies, for which Roberts' *S. s. australis* can be employed.

S. s. australis as here defined is seen as being paler than *S. s. semitorquata*, in this respect resembling *S. s. minor* of southern Somalia and the coast lands of Kenya and northeastern Tanzania. Compared with *semitorquata*, *australis* is whiter over the forehead and face, the hind and lateral surfaces of the head and neck are paler vinaceous, the rest of the dorsum is distinctly lighter and greyer in newly moulted condition (about the greyish Drab of Ridgway (1912) (pl. xlvi), as against Olive-Brown (pl. xl)), and the rump and upper tail-coverts are lighter and bluer, less leaden, grey. Ventrally, the chin and throat are whiter, and the lower fore-throat, breast and sides are more lavender, less markedly vinaceous or vinous pink (close to Light Vinaceous Drab (pl. xlv), as against Brownish Drab), while the grey of the abdomen, flanks, crissum and under tail-coverts is again markedly paler. In the wings, the general facies is paler with more extensively distributed and lighter blue-grey over the lesser, median and secondary coverts and tertials, while the axillars and under wing-coverts are less blackish slate.

Viewed in series, paler general colouration, whiter chin and upper fore-throat, paler grey under tail-coverts, and more extensively distributed grey in the wings differentiate *australis* from *semitorquata*. Its range is as defined above.

Nominate *S. semitorquata* replaces *australis* in Moçambique from north of the Limpopo R. and from the Zambesi R. valley of Rhodesia, northern

Botswana in the Okavango Swamp region and the Caprivi Strip northwards. As noted above, the influence of this dark race is evident as far south as Durban, Natal, and the humid coastal region of the Transkei (Pondoland).

In placing the Botswana and Caprivi element with nominate *semitorquata* I have given careful consideration to the probable validity of *S. s. maxima*, named on a single skin procured during the course of the Vernay-Lang Kalahari Expedition of 1930. Table 1 shows that this population ranges much longer in wing-length than any other, as first demonstrated by Roberts and confirmed in the main by Irwin & Benson (1967). While the wing-lengths of 196–210 for ♂♂ and 193–203 mm for ♀♀ of the "*maxima*" population

TABLE 1

The wing-length (mm) in selected populations of the Red-eyed Dove *Streptopelia semitorquata* arranged in a south-north sequence.

Population	n		Range	mean	S.D.	S.E.
			S. s. australis			
E. Cape & Natal	10	♂♂	186·5–201	192·6	4·22	1·34
	12	♀♀	181·5–195	185·6	4·39	1·27
S. Moçambique &	7	♂♂	191–199	193·2	2·98	1·12
E. Transvaal	4	♀♀	187–191	189·2	2·06	0·52
Transvaal (except E. lowlands)	16	♂♂	185–200	193·1	4·54	1·14
	12	♀♀	187·5–203	192·0	4·15	1·20
Rhodesia	9	♂♂	186–199	190·6	3·77	1·26
	6	♀♀	184–197	189·1	4·52	1·84
			S. s. semitorquata			
N.W. Rhodesia, Caprivi,	11	♂♂	196–210	202·0	3·93	1·18
N. Botswana, etc.	8	♀♀	193–203	195·5	3·13	1·11
"*maxima*"						
Zambia	5	♂♂	189–199	192·0	4·06	1·81
	3	♀♀	186–195	191·5	—	—
S.E. Zaire (mainly *ex*	20	♂♂	182–198	190·9	4·07	0·91
Verheyen 1953)	10	♀♀	180–196	186·1	4·86	1·54
Angola (*ex* Traylor)	17	♂♂	180–200	192·0	—	—
	8	♀♀	177–194	186·0	—	—
Malawi (*ex* Irwin & Benson)	10	♂♂	179–192	183·0	—	—
	6	♀♀	173–193	182·7	—	—
Tanzania & Kenya	14	♂♂	178–191	182·2	3·86	1·03
	12	♀♀	172–186	176·6	4·23	1·22
Ethiopia (mainly *ex*	11	♂♂	180–195·5	188·7	4·52	1·36
Friedmann)	11	♀♀	176–186·5	181·4	3·29	0·99

show a considerable overlap with many neighbouring and even with distant populations, especially those of *S. s. australis*, the means are significantly greater than those of any other population of the species (♂♂ 202·0, ♀♀ 195·5 mm). Skins with wings in excess of 198 mm from beyond what appear to be the limits of *maxima* are all from immediately contiguous regions such as central Angola, Zambia and southeastern Zaire. The geographical sector occupied by *maxima* contains other large-sized avian subspecies, and the Red-eyed Dove appears simply to be following a similar trend for reasons not yet obvious.

It is worthy of note that the population named *maxima* in the first instance is deeply coloured, resembling in this regard nominate *semitorquata*, in contradistinction to the populations occurring further south.

Statistically, *maxima* just fails to attain the critical (75 %) limit for the recognition of mensural subspecies (Amadon 1949). Compared with Ethiopian specimens (topotypical of *S. s. semitorquata*), using a student's t-test, males of *maxima* have a value of 7·38 and females 9·14, in both instances P being far below ·001: showing that males do not meet Amadon's requirements for formal subspecific recognition, whereas females do, though their standard ranges indicate too much overlap to justify recognition of "*maxima*" on the basis of large size in the female alone. The prudent course of action in the present case appears to be to merge *S. s. maxima* with *S. s. semitorquata*, in so doing recognising only *semitorquata* and *australis* from the South African Sub-Region.

With the recognition of a southern African race of the Red-eyed Dove, the species is now comprised of three subspecies: *S. s. semitorquata*, *S. s. minor* and *S. s. australis*. The present nominate subspecies may be divisible into western and eastern elements along the lines originally laid down by Grant, as it is noted that *S. s. erythrophrys* is admitted by Mackworth-Praed & Grant (1952). The races and their synonyms will now stand as follows:

(a) *Streptopelia semitorquata semitorquata* (Rüppell), 1837. *Synonyms: Turtur erythrophrys* Swainson, 1837, *Turtur shelleyi* Salvadori, 1893, *Turtur semitorquatus intermedius* Erlanger, 1905, *Streptopelia semitorquata elgonensis* Granvik, 1923, *Streptopelia semitorquata maxima* Roberts, 1932;

(b) *Streptopelia semitorquata minor* (Erlanger), 1905;

(c) *Streptopelia semitorquata australis* Roberts, 1932.

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References:

Amadon, D. 1949. The seventy five per cent rule for subspecies. *Condor* 51 (6): 250–258.
Chapin, J. P. 1939. The Birds of the Belgian Congo, part II. *Bull. Amer. Mus. Nat. Hist.* 75: 162–164.
Clancey, P. A. 1965. A Catalogue of Birds of the South African Sub-Region, part II. *Durban Mus. Novit.* 7 (10): 321.
Erlanger, C. F. von. 1905. *Journ. f. Ornith.* 53: 124, 125.
Friedmann, H. 1930. Birds collected by the Childs Frick Expedition to Ethiopia and Kenya Colony, Part I. *Bull. U.S. Nat. Mus.* 153: 216–219.
Grant, C. H. B. 1915. On a collection of Birds from British East Africa and Uganda presented to the British Museum by Capt. G. S. Cozens. *Ibis*. 10th ser. 3 (1): 41, 42.
Gyldenstolpe, N. 1924. Zoological results of the Swedish Expedition to central Africa 1921. *Kungl. Svensk. Vetenskap. Handlingar*, Tredje ser. 1 (3): 308–310.
Irwin, M. P. S. & Benson, C. W. 1967. Notes on the Birds of Zambia, part IV. *Arnoldia Rhod.* 3 (8): 5, 6.
Mackworth-Praed, C. W. & Grant, C. H. B. 1952. *Birds of Eastern and North Eastern Africa*, 1: 471, 472. London.
Nowak, E. 1975. Zur Systematik der Gattung *Streptopelia* (Columbiformes, Aves). *Bonner zool. Beitr.* heft 1–3, 26: 135–154.
Peters, J. L. 1937. *Check-List of Birds of the World*, 3: 93. Cambridge, Mass.
Ridgway, R. 1912. *Color Standards and Color Nomenclature*. Washington.
Roberts, A. 1932. Preliminary descriptions of sixty-six new forms of South African Birds. *Ann. Transv. Mus.* 15 (1): 24, 25.
— 1935. Scientific results of the Vernay–Lang Kalahari Expedition, March to September, 1930. *Ann. Transv. Mus.* 16 (1): 82, 83.

S.A.O.S. List Committee. 1969. *Check list of the Birds of South Africa*: 103. Cape Town.
Traylor, M. A. 1960. Notes on the birds of Angola, non-passeres, *Pub. cult. Co. Diam. Ang. Lisboa*, 51: 149.
Verheyen, R. 1953. Exploration du Parc National de l'Upemba, Mission G. F. de Witte, fasc. 19: 298–300.
White, C. M. N. 1965. *A Revised Check List of African Non-Passerine Birds:* 156, 157. Lusaka.

Sympatric *Cisticola* spp. and the competition exclusion principle

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Although the grassland warblers of Africa, *Cisticola* spp. are morphologically very similar, they differ in choice of habitat in most cases. However, in the Transvaal, South Africa, five species of *Cisticola* occur in open grassland (Bankenveld, or *Cymbopogon-Themeda Veld*—Acocks 1953). Although they can be found together, three of the species have distinct habitat preferences; *Cisticola juncidis* occurs in moist grassland, *C. brunnescens* in short moist grassland, and *C. aridula* in dry grassland. The remaining two, *C. ayresii* and *C. textrix* occur in short dry grassland, and do not have obvious differences in habitat preference. Further, apart from distinctive displays of the breeding males, they are virtually impossible to distinguish in the field. These two species possibly represent an exception to the ecological principle of competitive exclusion.

Measurements of culmen, wing and tarsus of museum specimens of *C. ayresii* and *C. textrix* were obtained for birds from the area of sympatry in the Transvaal and from areas of allopatry. The measurements were tested with a Students "t" test to show whether differences between the species and between sub-species were statistically significant, with the following results:

(a) Males of *C. textrix* are larger than males of *C. ayresii* in an area of sympatry (Table 1). The differences are consistent but never more than 12%.

TABLE 1

Differences in culmen, wing and tarsus measurements (mm) of *C. textrix major* and *C. ayresii*.

		C. t. major mean		S.D.	n	*C. ayresii* mean		S.D.	n	Difference
Males	Culmen	12·6	±	0·58	24	11·1	±	0·47	15	P<·001
	Wing	54·0	±	1·49	26	49·1	±	1·46	15	P<·001
	Tarsus	20·6	±	0·97	22	18·1	±	1·0	15	P<·001
Females	Culmen	12·2	±	0·65	22	11·4	±	0·67	16	P<·001
	Wing	49·6	±	1·18	21	46·5	±	2·1	16	P<·001
	Tarsus	18·9	±	0·98	18	17·1	±	0·8	16	P<·001

Male *C. ayresii* tested against female *C. textrix major:* Culmen P<·001, Wing not significant, Tarsus P<·02.

(b) *C. textrix major* of the Transvaal is generally larger, statistically so in the case of wing measurements, than *C. t. textrix* of the Cape province (Table 2), but there is no significant difference in the culmen and wing sizes of *C. ayresii* from different parts of Southern Africa (Table 3).