

The taxonomic status of the Madagascar Cuckoo *Cuculus (poliocephalus) rochii* and its occurrence on the African mainland, including southern Africa

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Cunningham-van Someren (1988) records the occurrence of the Shy Albatross *Diomedea cauta* in Kenya on the basis of a specimen obtained at sea near Mombasa in November 1986, and mentions that the same severe weather conditions prevailing at that time probably accounted for a first record of the Lesser Cuckoo *Cuculus poliocephalus rochii* in Natal, South Africa. I would like here to draw attention to the fact that the Madagascar Cuckoo is not a subspecies of the Lesser Cuckoo *Cuculus poliocephalus*, but deserves specific status as *Cuculus rochii*, a conclusion I reached a considerable time ago, discussing it as early as 1973 with the late Dr C. W. Benson, who agreed with my conclusion. In addition, the above-cited record is not, in fact, the *first* record of the Madagascar Cuckoo in Natal.

Taxonomic status of the Madagascar Cuckoo

Peters (1940) regarded the Madagascar Cuckoo as a subspecies ('*rochii*') of the Lesser Cuckoo *Cuculus poliocephalus*, and at that time nothing was known of the occurrence of the latter ('nominate') species anywhere in Africa (Peters 1940: 20). Although in the last decades there have been a number of occurrences in Africa, it seems appropriate to review the available material of the *poliocephalus/rochii* taxa.

The main criterion for separating the Madagascar Cuckoo '*Cuculus rochii*' from the Lesser Cuckoo 'nominate *Cuculus poliocephalus*' and for raising it to specific status, I consider to be the difference in vocalization. *C. rochii* produces phrases of 4 evenly spaced notes, ranging in frequency between 0.7 and 1.2 KHz, in which each note starts high, but proceeds with a rapid slur downwards. In contrast to this, *C. poliocephalus* produces repetitive phrases of 6, or occasionally 5, notes, much more high-pitched, having a frequency between 1.5 and 2.5 KHz. Moreover, in *poliocephalus*, each note rises and falls in pitch, audible to the human ear as "kýoh" (Fig. 1).

Verbalized, the call of *rochii* can be represented by the syllables "ka-ka-ká-ko", and that of *poliocephalus* by "kyo-kyoh-kýoh-kýoh-kýoh-kyoh" in the case of the 6-note form. In addition, the individual sounds that *poliocephalus* makes in its call-phrase are much shorter, the 6-note phrase taking about the same time (1.0 sec) as *C. rochii* takes for its 4-note phrase (see Fig. 1).

I have been able to make adequate and accurate comparisons between the calls of all other Asiatic and African cuckoo species, from my own tape

recordings and those of colleagues. From all of these, sonograms have been made and were used to allocate the former "Lesser Cuckoo" in SE Asia *Cuculus poliocephalus lepidus* and its associated subspecies *C.p. insulindae* to the Himalayan Cuckoo *Cuculus saturatus* (Wells & Becking 1975, Becking 1975). The last note of *C. rochii*'s call is not always distinctly lower than the preceding ones; there exists a considerable amount of variation in the vocalizations. More details on the differences in vocalization of various individuals or populations of *rochii* and the specific female call will be published elsewhere.

It is safe to conclude from these data that the only cuckoo vocalization reminiscent of the call of *C. rochii* is superficially that of the Indian Cuckoo *Cuculus micropterus*, which also produces phrases of 4 elements, with a different phonetic timbre and melody obvious to the human ear and apparent in sonograms (Fig. 1). A measure of the degree of resemblance of the call of *rochii* to that of *micropterus*, as observed by the human ear, can be found in their native names. The Malagasy name (current in Tananariva) for *rochii* is *Taon-taon-kafa*, an onomatopoeic interpretation of the call. In translation *taon(a)* = year and *kafa* or *hafa* = next (suggesting the meaning "I will make my nest next year"). Cowan (1881) gives the following local native names for the Madagascar Cuckoo: *Kakafotra* (locality: Hova), *Kankafotsa* (Betsileo), *Kankafo* (Bara), *Kakafatra*, *Kakafo* (Tanala), *Taotaonkafa* (N. Sakalava), *Kankafotsa* (N Betsimisaraka), *Boto-kong'kong* (N Antakarana), all of them onomatopoeic interpretations. The onomatopoeic interpretations of the call of *micropterus* on Java are: "*Ka-kang-ká-to*" (*kakang* = brother and *káto* or *gátok* = the beating on wood, Javanese) or more illustratively "*Opat-pátok*" (=the 4 sticks, Sundanese) and "*Belánda mábok*" (*Belanda* = Dutchman and *mabok* = drunk, Indonesian/Malayan, saying literally "The Dutchmen are drunk").

Apart from its vocalization, *rochii* can be separated from *poliocephalus* by a number of biometrical and morphological characteristics. Specimens of *rochii* are relatively larger and males especially have greater wing (160–179 mm) and tail (135–155 mm) measurements compared with 149–161 mm and 124–142 mm in *poliocephalus* (see Appendix 1). The larger size of the Madagascar Cuckoo is also reflected in the weights, which range between c.60–65 g in *rochii* (Benson *et al.* 1976) and c.46–56 g in adult *poliocephalus* (see Appendix 2).

Nestlings, fledglings still being fed by foster-parents, and immatures of *rochii* normally have plumages with hepatic features (that is to say, reddish brown feathers with dark brown to black transverse bands); yet a characteristic distinguishing *rochii* from *poliocephalus* is the apparently complete absence of a wholly-hepatic female plumage in *rochii*, while hepatic *poliocephalus* females occur very frequently. In all the females which I have seen of the Madagascar Cuckoo in various collections, only a few partially-hepatic specimens occur. One of these is an old, formerly mounted, specimen from October 1880, obtained in Imerina, Central Madagascar (leg. J.M. Hildebrandt), in the Senckenberg Museum, Frankfurt (SM) (reg. no. 27781). Although it shows many hepatic features, it has, however, some blue on the throat, a bluish back, and slate-blue upper tail-coverts. Its plumage is certainly not fully adult, and it



Figure 2. Differences in the black-grey patterning on the small feathers covering the carpo-metacarpal joint of *Cuculus rochii* (the 3 left feathers) and *Cuculus poliocephalus* (right feather). 2 × life-size.

might even be wrongly sexed, as the wing (174 mm, left) and tail (144 mm) measurements are within the male range. Two females in the Paris (MNHN) museum are in intermediate plumage, changing from hepatic to blue, i.e. one specimen from Andapa (leg. A. L. Rand, 15. viii. 1930), the other from Tuléar (leg. Ph. Milon, 18. xi. 1947). The dates suggest that they are 2nd-year birds and probably ready to breed in this plumage.

To my knowledge, none of the plumages of *rochii* ever exhibits any rusty or buffy in the grey areas on the throat and the sides of the neck, whereas this is quite common in *poliocephalus*. Furthermore, in adult *rochii*, the small feathers over the upper edge of the carpo-metacarpal joint on the upperside of the wing have a spotted or banded pattern, whereas in adult *poliocephalus*, these small feathers normally have a grey/black inner vane and a completely white or whitish outer vane (see Fig. 2). The latter feature is especially prominent in adult specimens of the blue phase of *poliocephalus*, but in immatures and hepatic females this feature is more obscure.

Finally, there are some minor morphological differences between both species. In adult specimens of *rochii*, the angle between the left and right lower mandible bones (namely the dentary and surangular bones) is wider and the arch of the symphysis connecting them more rounded; in *poliocephalus*, the angle between these 2 lower mandible bones is somewhat more acute and the arch connecting them rostrally is more pointed (see Fig. 3).

Occurrence of *Cuculus rochii* on the African mainland

Cunningham-van Someren's (1988) record of *Cuculus (poliocephalus) rochii*, obtained in November 1986, is incorrectly reported as the first from Natal. There is, however, in the British Museum (Natural History) (BMNH) at Tring a previously unrecognized *Cuculus rochii* specimen from Natal. It is an immature bird, unsexed and undated (BMNH reg. no. 89.6.25.94), obtained in Durban (29°53'S, 31°00'E), Natal, collected by Henry Gordge during last century, and formerly in the Shelley Museum collection.

From recoveries of *C. rochii* elsewhere on the mainland of Africa, it is clear that this cuckoo migrates from Madagascar (Malagasy) in the off-season. Its principal migration into Africa is northwestward or westward, and only occasionally or accidentally is it more southwestwards (see Fig. 4). The main breeding season in Madagascar falls in November and December. The first birds returning from their winter quarters on the African mainland arrive in SW Madagascar at the end of August and

increase in numbers during September (as is apparent from their calls), with a distinct peak about the middle of October (O. Appert). The latest post-breeding birds observed or collected in Madagascar are from the end of March or the beginning of April. Accordingly, most of the extensive skin material of *C. rochii* in the major museums, i.e. BMNH (Tring), Cambridge Univ. Museum (UK), RMNH (Leiden), MNHN (Paris), Natur-Museum Senckenberg (SM, Frankfurt), Museum Koenig (Bonn), Naturhistoriska Riksmuseet (NR, Stockholm), and AMNH (New York), as examined by me, was collected in Madagascar between October and December, with some collected in August and September or between January and March. The sole exception is an immature (juvenile ?) specimen collected on 4. v. 1881 (BMNH reg. no. 89.6.25.93, leg. Rev. W. D. Cowan) in Madagascar (locality not given). (William Deans Cowan was a missionary in Antananarivo (= Tananarive), Central Madagascar and the author of a remarkable booklet (see references on Madagascar birds and their native names).

Most *rochii* from the African mainland have been obtained in the eastern Congo basin (see Fig. 4), between the beginning of June and the middle of August, i.e. outside the breeding season. I have seen the greater portion of all extant material of *rochii* from the African mainland, but some specimens could not be traced or could not be obtained on loan, and I was, in fact, involved in the identification of some of these specimens (e.g. those obtained by Dr C. W. Benson and the mist-netting records of Mrs D. B. Hanmer).

The following material I have actually examined: At NR, Stockholm, there is one specimen of *rochii* obtained at Kasindi (0°03'N, 29°43'E), E. Congo (leg. E. Arrhenius) in August 1913 (NR reg. no. 177). The Koninklijk Museum voor Midden-Afrika (KMMA, Tervuren, Belgium), has a number of *rochii* specimens: from Kamituga (3°04'S, 28°11'E), Itombwe, E. Zaire (Congo), collected on 6.vi.1958 (leg. A. Prigogine); from Bulaimu (0°37'N, 29°50'E), Kivu district, E. Zaire, collected on 30.vi.1912 (leg. M. Pilette); from Idjwi Island in Lake Kivu (1°56'S–2°17'S, 28°58'E–29°07'E), Itombwe, 2 specimens, one collected at 1860 m on 11.vii.1965, the other collected on 14.viii.1969 (both leg. A. Prigogine) (see Schouteden 1950, 1968, Prigogine 1971). Two other *rochii* specimens from the Congo territory are in AMNH (New York). One specimen was collected at Tshibati (2°14'S, 28°47'E) at 1970 m on the southwestern side of Lake Kivu in the eastern highlands of Zaire on 15.vi.1953 (leg. J. P. and R. T. Chapin, AMNH reg. no. 764020), in a mixed habitat of fire-affected montane bamboo, dry evergreen forest and scrub woodland (see Chapin *et al.* 1987). The other specimen was collected at Avakubi (1°20'N, 27°55'E), Haut-Zaire, on 4.vii.1914 (leg. J. P. Chapin, Congo Expedition, AMNH reg. no. 159064).

I have examined only 2 specimens, apart from the South African record mentioned above, which were *not* obtained in the Congo basin, but somewhere in between the Congo and the east coast. Of these, one was collected in Gombe (0°30'N, 32°28'E), 30 km NW of Kampala, close to Lake Victoria, Uganda on 9.viii.1905 (leg. F. J. Jackson, AMNH reg. no. 265295). The other, obtained in Kasama (10°10'S, 37°10'E), Zambia, on 16.xi.1954 (leg. C. W. Benson), is preserved in the Natural History

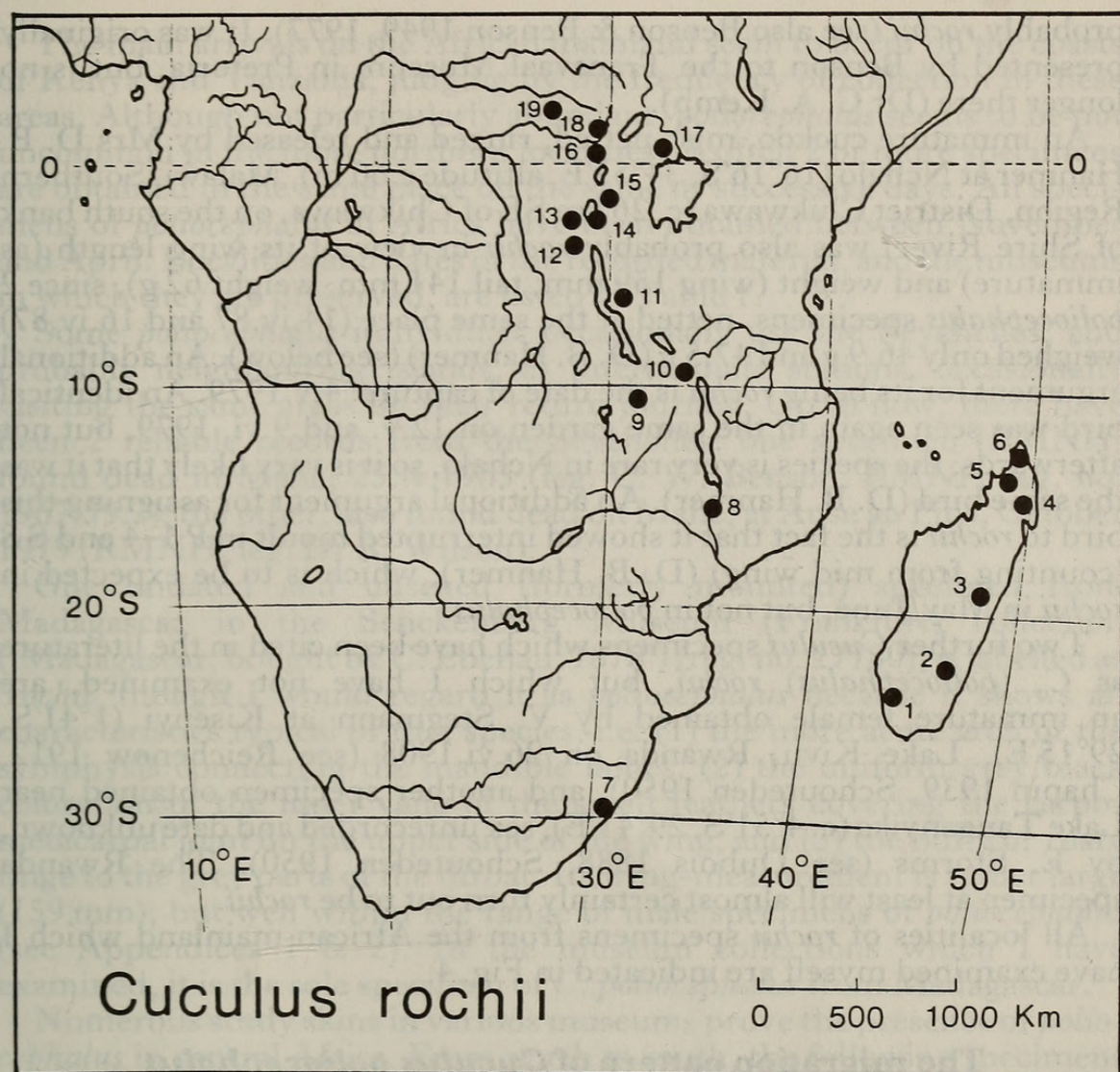


Figure 4. Map of southern Africa, with localities from which *Cuculus rochii* is known. Some localities in Madagascar, where *C. rochii* occurs throughout the island in the wooded (wetter) regions are given. Only well-known localities are indicated, from south to north. **Madagascar:** (1) Tuléar (23°20'S, 43°41'E), (2) Ivohibe (22°28'S, 46°53'E), (3) Périnet (18°56'S, 48°26'E), (4) Andapa (14°53'S, 50°16'E), (5) Coast opposite Nossi Bé Isl. (13°22'S, 48°25'E) and (6) Mt d'Ambre (11°58'S, 49°14'E). **Mainland Africa.** Localities of collected specimens (one mist-netted) from south to north: (7) Durban, Natal, S. Africa (29°53'S, 31°00'E), (8) Nchalo, Southern Region Malawi, Chikwawa Distr. (16°16'S, 34°55'E), (9) Kasama, Zambia (10°10'S, 37°10'E), (10) Isoko, Rungwe Distr., S. Tanzania (9°25'S, 33°31'E), (11) Lake Tanganyika, Tanzania/E. Zaire (c.4°51'S, 29°41'E), (12) Kamituga, Itombwe, E. Zaire (Congo) (3°04'S, 28°11'E), (13) Tshibati, SW. side of Lake Kivu, E. Zaire (2°14'S, 28°47'E), (14) Idjwi Isl. in Lake Kivu, Itombwe, E. Zaire (1°56'S–2°17'S, 28°58'E–29°07'E), (15) Kisenyi (or Gisenye), Lake Kivu, Rwanda (1°41'S, 29°15'E), (16) Kasindi, E. Zaire (0°03'N, 29°43'E), (17) Gombe, Lake Victoria, Uganda (0°30'N, 32°28'E), (18) Bulaimu, Kivu Distr. E. Zaire (0°37'N, 29°50'E) and (19) Avakubi, E. Zaire (1°20'N, 27°55'E).

Museum of Zimbabwe (NHMZ), Bulawayo (see Benson 1956 and Benson *et al.* 1971) and was identified as *C. (poliocephalus) rochii*. A third specimen collected by C. W. Benson and sexed as a male, was obtained on 13.ix.1947 at Isoko (9°25'S, 33°31'E), Rungwe District, southern Tanzania. On the basis of its wing length (163 mm) and weight, it is very

probably *rochii* (see also Benson & Benson 1949, 1977). It was originally presented by Benson to the Transvaal Museum in Pretoria, but is no longer there (Dr C. A. Kemp).

An immature cuckoo, mist-netted, ringed and released by Mrs D. B. Hanmer at Nchalo (16°16'S, 34°55'E, altitude c.60 m), Malaŵi, Southern Region, District Chikwawa (c. 26 km SE of Chikwawa, on the south bank of Shiré River) was also probably *rochii* in view of its wing length (as immature) and weight (wing 159 mm, tail 141 mm, weight 62 g), since 2 *poliocephalus* specimens, netted at the same place (14.iv.87 and 16.iv.87) weighed only 46.9 g and 47.5 g (D. B. Hanmer) (see below). An additional argument for its being *rochii* is the date of capture: 4.v.1979. An identical bird was seen again in the same garden on 12.v. and 9.vi. 1979, but not afterwards; the species is very rare in Nchalo, so it is very likely that it was the same bird (D. B. Hanmer). An additional argument for assigning this bird to *rochii* is the fact that it showed interrupted moult in P 1–4 and S 8 (counting from mid wing) (D. B. Hanmer), which is to be expected in *rochii* in May/June, but not in *poliocephalus*.

Two further *Cuculus* specimens which have been cited in the literature as *C. (poliocephalus) rochii*, but which I have not examined, are an immature female obtained by V. Stegmann at Kisenyi (1°41'S, 29°15'E), Lake Kivu, Rwanda on 26.vi.1908 (see Reichenow 1912, Chapin 1939, Schouteden 1950), and another specimen obtained near Lake Tanganyika (c. 4°51'S, 29°41'E), sex unrecorded and date unknown, by E. Storms (see Dubois 1888, Schouteden 1950). The Rwanda specimen at least will almost certainly turn out to be *rochii*.

All localities of *rochii* specimens from the African mainland which I have examined myself are indicated in Fig. 4.

The migration pattern of *Cuculus poliocephalus*

Cuculus poliocephalus has a completely different migration pattern from that of *C. rochii*, for it is a long-distance migrant, covering large expanses of open sea. Breeding in Japan and China and along the Himalayas from Pakistan through Kashmir, Nepal, Bhutan and Assam to the mountain regions of Burma, it migrates at the beginning of the northern winter to southern India and Sri Lanka (Ceylon); the northeastern populations, from Japan and China especially, follow an eastern route, passing the Andaman Islands (from where the species has been recorded) on the way to Sri Lanka (or *vice versa*). In winter the species is relatively common in southern India, and particularly in Sri Lanka, in the period before departure to the African continent and, occasionally, on some of the adjacent islands. In spring, Sri Lanka is also the main landfall and staging-post for populations from further east. The BMNH possesses 10 *poliocephalus* skins from Sri Lanka collected, according to the ones dated, in 2 separate periods—September to early February and April–May, mainly from the west and southwest: Bogawantawa, 30.ix.1913 (leg. W. Phillips); Ceylon 26.xii.1870 (Hume collection); Galapitakande, Namunukula, 7.ii.1948 (leg. W. W. A. Phillips); a number of specimens from Dehiwala, 4 km S of Colombo, on the coast of the Western Provinces, dated 18.iv.1950, 12.iv.1953, 27.iv.1953 and 11.v.1953, all collected by W. W. A. Phillips.

The main arrivals on the African mainland seem to occur on the coasts of Kenya and Tanzania, judging by the frequency of collection in these areas. Although not particularly abundant, *poliocephalus* seems to be not uncommon in the more northern localities, as often 2 or more specimens are obtained in the same place on the same or successive days. All specimens of *poliocephalus* in Africa have been obtained between November and April. Localities and dates of the recorded material, and the museums in which they are preserved, are listed in Table 1.

Some *poliocephalus* individuals occasionally use the Seychelles, and probably neighbouring islands, as intermediate stations, occasionally visiting the same areas on their return journey. Up to now, there have been 2 reliable records from the Seychelles: one specimen (BMNH) found dead in Mahé, 25.iv.1965 (leg. C. W. Benson, BMNH reg. no. 1967.39.2); the other, also found dead on Mahé, at Anse au Pins, October 1979 (RMNH, leg. Dr R. Wilson).

One undated and unsexed (formerly mounted) specimen from Madagascar in the Senckenberg Museum (Frankfurt) collection ('Madagascar, bought by C. Ebenau, 1878') (reg. no. 27780), is labelled as '*rochii*' though I would regard it as *poliocephalus* because it shows all characteristics typical of that species, i.e. (1) the more acute arch of the symphysis connecting the mandible bones, (2) the uniform grey/black coloration of the inner vane of the small feathers covering the carpo-metacarpal joint on the upper side of the wing, and (3) the buffy or rusty tinge to the grey parts of the throat. Its wing-measurement is rather large (159 mm), but well within the range of male specimens of *poliocephalus* (see Appendices 1 & 2). In the museum collections which I have examined, it is the sole specimen of *C. poliocephalus* from Madagascar.

Numerous study skins in various museums prove the presence of *poliocephalus* in central Africa. From north to south, the following specimens have been obtained: Kenya (4), Tanzania (10), Malaŵi (2), Zambia (1), Zimbabwe (2) and Mozambique (1). Some of these records have been published by Moreau & Moreau (1937), Benson (1951, 1953, 1956), Benson *et al.* (1970, 1971, 1976), Benson & Benson (1977) and Clancey (1960, 1964).

The 2 specimens, mentioned above, which were mist-netted and released by Mrs D. B. Hanmer in Nchalo, Malaŵi, on 14 and 16 April 1987, were considered also to be *poliocephalus* on the basis of their measurements and weights: wing 159 mm, tail 126 mm, 46.9 g, and wing 160 mm, tail 128 mm, 47.5 g, respectively. Both specimens were of the blue phase, apparently immatures which had recently moulted into adult dark-grey plumage. One bird (16.iv.1987) was in completely new plumage, the other (14.iv.1987) was also in new dress, except S 4. These new plumages are in agreement with the moulting pattern of *C. poliocephalus*, at the beginning of its breeding season, but certainly not in agreement with the moult of *C. rochii* at this time of year. Moreover, both specimens showed typical *poliocephalus* plumage-features, having a deep reddish (tending to crimson-red) plumage on the nape and the side of the neck, and the grey throat area faintly buffy (D. B. Hanmer), shown in a colour-slide of the 14.iv.1987 specimen, provided by Mrs Hanmer.

TABLE 1

List of specimens of *Cuculus poliocephalus* collected on the African mainland, arranged from North to South

NUMBERS and LOCALITY		
Kenya	(4)	Coastal region near Kilifi (Sokoke Forest) (3°37'S, 39°50'E), 10. iv.–18. iv. 1958 (leg. P. A. Clancey), Durban Museum.
Tanzania	(2)	32 km and 48 km NW of Tanga (c. 4°54'S, 38°44'E), 31. iii. 1934 (leg. R. E. Moreau), BMNH.
	(2)	Amani (5°09'S, 38°36'E), 26. xi.–4. xii. 1931 (leg. R. E. Moreau), BMNH.
	(3)	Nkumbi (5°11'S, 38°54'E), 8 km E of Muheza, 11 & 12. iv. 1934 (leg. R. E. Moreau), BMNH.
	(1)	Uluguru Mts., Morogoro Distr. (7°2'S, 37°40'E), 1. iii. 1962 (leg. Th. Andersen), RMNH.
	(2)	Mikindani, Mtwara Distr. (10°16'S, 40°05'E), 4 & 5. iii. 1965 (leg. Th. Andersen), RMNH.
Zambia	(1)	Jumbe, Luangwa Valley, near Chipata (= Fort Jameson) (13°16'S, 32°07'E), 20. iii. 1953 (leg. C. W. Benson), NHMZ.
Malawi	(1)	Dedza Distr. (14°20'S, 34°24'E), southern Malaŵi, 6. iii. 1951 (leg. C. W. Benson), BMNH.
	(1)	Mitongwe, Ncheu Distr. (14°50'S, 34°45'E), 16. ii. 1951 (leg. C. W. Benson), BMNH.
	(2)	Nchalo (16°16'S, 34°55'E), southern Malaŵi, 14. iv. 1987 and 16. iv. 1987 (mist-netted by Mrs D. B. Hanmer, see text).
Zimbabwe	(2)	Haroni/Lusitu confluence, 360 m (20°02'S, 33°01'E), 19. i. 1966 and 17. iv. 1964 (leg. H. D. Jackson and a collector given only as P. A. 1518, respectively), NHMZ.
Mozambique	(1)	6.2 km W of Mocuba (16°52'S, 36°57'E), 29. i. 1932 (leg. J. Vincent), BMNH.

Again, I would like to emphasize that I have not seen all material extant in museum collections. Of these, one specimen in the NHMZ, Bulawayo, collected at Danger Hill II, near Mpika (11°30'S, 31°35'E), sex unrecorded, by W. E. Poles on 11. iii. 1952 (see also Benson & White 1957, Benson *et al.* 1973) was on loan and not available. It had been recognized by Benson, on the basis of its wing-length, as a true *C. poliocephalus*. Another specimen, an adult male with a wing-measurement of 149.5 mm, collected on Mt. Selinda (20°24'S, 32°43'E), Melsetter District, eastern Zimbabwe by Sandground, on 29. iii. 1930 (now in the Museum of Comparative Zoology (MCZ), Cambridge, Massachusetts, USA), surely must be *poliocephalus*. A third specimen, mentioned by Verheyen (1935: 309)

for Shinkulu in the Upemba National Park (c. 8°40'S, 27°00'E), in Zaire, collected 26.xi.1947, has also not been seen. Other specimens may be present in the smaller regional museums, but probably not in southern Africa, as this species is not mentioned in handbooks of regions south of 30°S (Clancey 1960, 1964, Mackworth-Praed & Grant, Ser.2, 1962).

Conclusions

On the basis of vocalization, some biometrical and some minor morphological plumage and mandible characteristics (in adult specimens), *C. rochii* is a good species. Moreover, adult females of *rochii* lack the rufous hepatic phase common in *C. poliocephalus*. Clearly *C. rochii* is not related to *C. poliocephalus* and cannot therefore be united in a superspecies with *C. poliocephalus*.

The main migration route of *C. rochii* is in a northwest direction from Madagascar towards the Congo basin, apparently following a rather narrow 'corridor' on the African mainland (see Fig. 4).

C. poliocephalus has been recorded from numerous places on the African mainland. It is now shown that it occurs also on the Seychelles (2 records) and in Madagascar (1 record) at a time when *rochii* is also present.

These 2 cuckoo species are probably much more common in their winter quarters than collecting and sight records indicate, being rather shy and extremely elusive. Moreover, on their winter grounds, they are completely silent.

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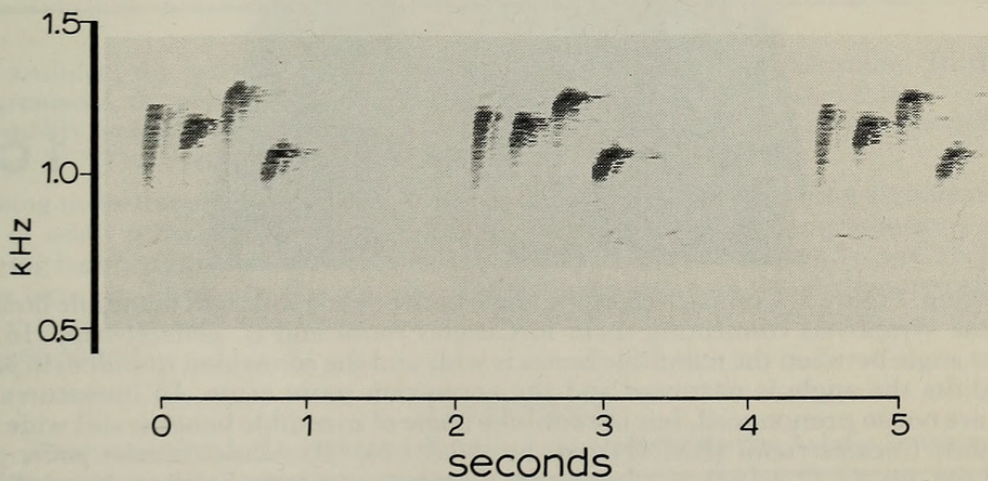
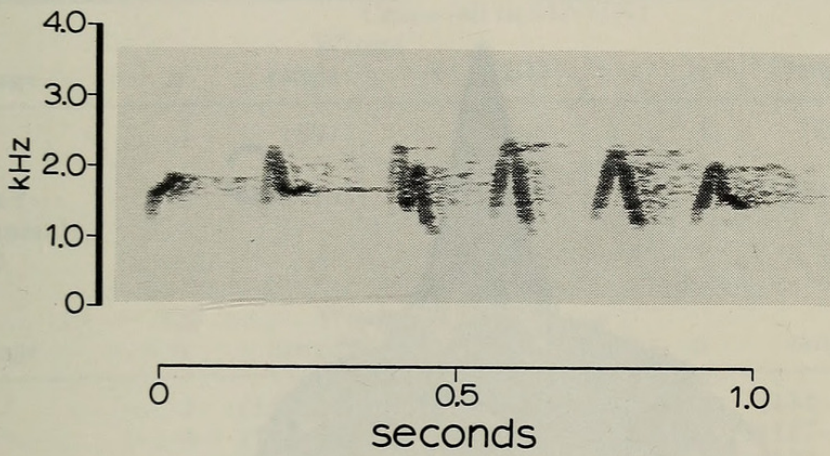
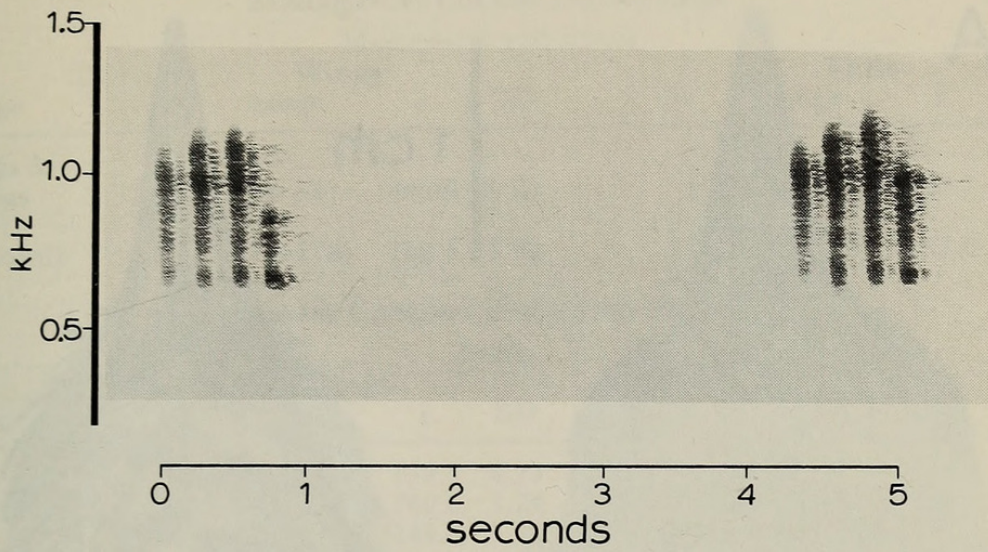
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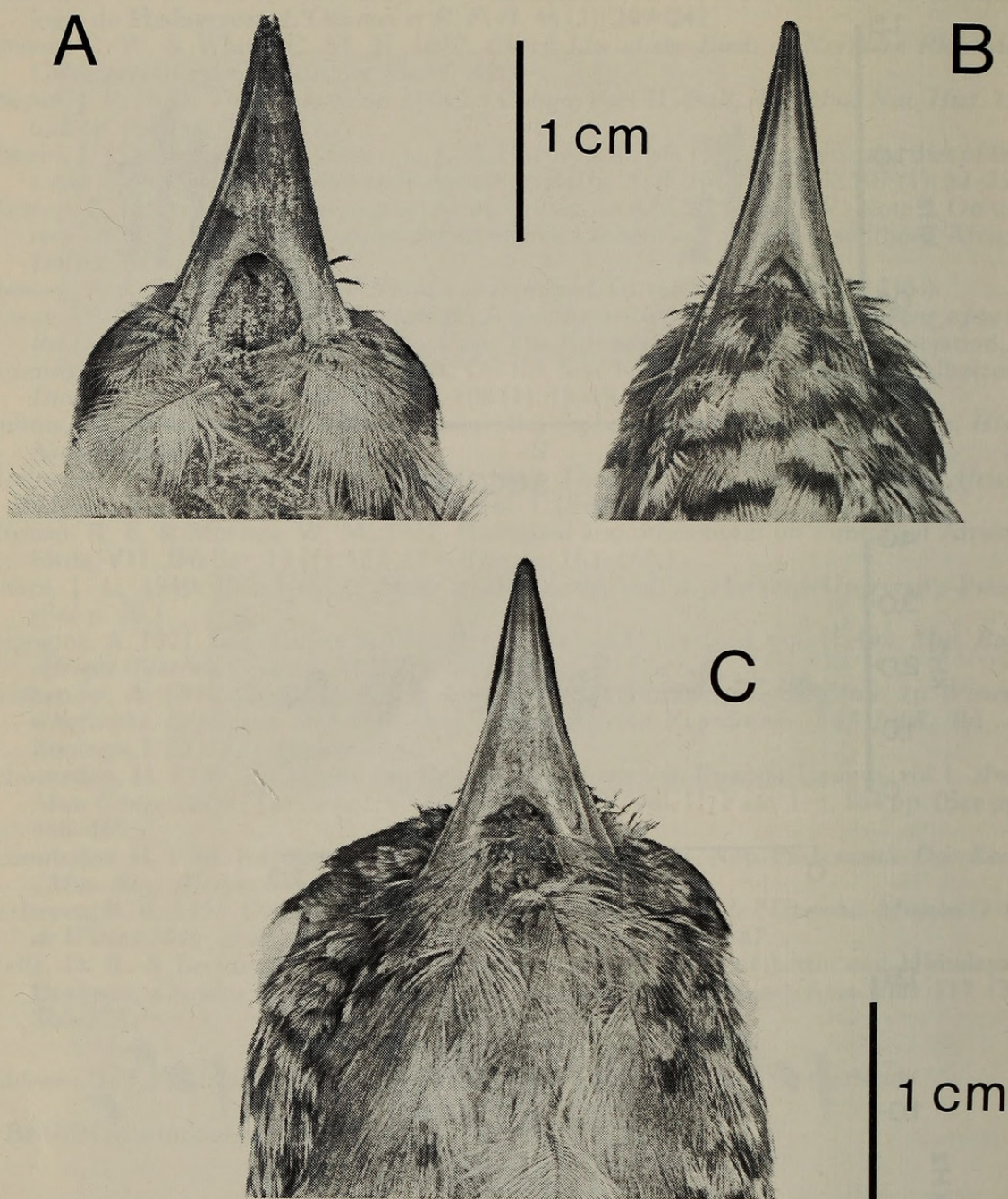
APPENDIX 1

Wing- and tail-length measurements (in mm) of material examined of *Cuculus rochii* and *Cuculus poliocephalus*

Madagascar Cuckoo <i>Cuculus rochii</i>								
Madagascar and Africa								
sex & age	n	Wings ¹			n	Tails		
		range	\bar{x}	SD		range	\bar{x}	SD
ad. ♂	28	(160–179)	167.0	4.96	28	(135–155)	144.3	5.70
ad. ♀ ²	4	(158–163)	160.5	2.08	4	(134–141)	138.1	3.01
imm.	19	(149–166)	157.0	4.96	18	(132–156)	141.2	7.33



J. H. Becking. Figure 1. Sonograms comparing the calls of 3 cuckoo species. **A.** *Cuculus rochii* (recorded in Madagascar). **B.** *Cuculus poliocephalus* (recorded in Japan). **C.** *Cuculus micropterus* (recorded in India).



J. H. Becking. Figure 3. Comparison of the angle between left and right mandible bones and arch of the symphysis connecting them in *Cuculus rochii* and *C. poliocephalus*. In *rochii* adults the angle between the mandible bones is wide and the connexion rounded, in *poliocephalus* adults the angle is narrower and the connexion more acute. In immatures these features are not so pronounced, but in *rochii* the angle of mandible bones is still wide.

(A) Adult *Cuculus rochii* (BMNH reg. no. 80.5.1.3), (B) Adult *Cuculus poliocephalus* (BMNH reg. no. 87.12.2.143), (C) Immature *Cuculus rochii* from Durban, Natal (BMNH reg. no. 89.6.25.94).



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