
Vocalisations of Angolan birds: new descriptions and other notes

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Nouvelles descriptions et notes concernant les émissions vocales d'oiseaux angolais. Les émissions vocales des oiseaux angolais sont mal connues, mais constituent une aide importante pour inventorier les espèces, dont plusieurs sont menacées. L'auteur fournit des informations inédites concernant les vocalisations d'oiseaux angolais basées sur des enregistrements faits à l'occasion de trois visites en Angola. Des exemples de la plupart des vocalisations analysées se trouvent sur un CD produit par l'auteur (Mills 2007) qui devrait être consulté en conjonction avec cet article. De nouvelles informations sont présentées pour plusieurs espèces endémiques, rares et menacées, dont le Francolin à bandes grises *Francolinus (Pternistis) griseostriatus*, le Francolin de Swierstra *F. (P.) swierstrai*, le Coliou à dos marron *Colius castanotus*, le Bulbul à ventre roux *Phyllastrephus fulviventris*, le Rougegorge de Gabela *Sheppardia gabela*, le Cossyphé des grottes *Xenocopsychus ansorgei*, le Cossyphé à tête blanche *Cossypha heinrichi*, la Cisticole murmure *Cisticola bulliens*, le Gobemouche de l'Angola *Melaenornis (Dioptornis) brunneus*, le Souimanga d'Oustalet *Cinnyris oustaleti*, le Souimanga de l'Angola *C. ludovicensis*, le Souimanga de Bannerman *Cyanomitra bannermani*, le Gladiateur de Monteiro *Malaconotus monteiri*, le Bagadais de Gabela *Prionops gabela* et l'Amarante de Landana *Lagonosticta landanae*. Les seules espèces angolaises pour lesquelles il n'y a pas encore d'enregistrements publiés disponibles sont le Gonolek de Braun *Laniarius brauni*, la Cisticole à queue noire *Cisticola melanurus* et le Souimanga de Bocage *Nectarinia bocagei* ; certains cris de la cisticole et du souimanga ont toutefois été décrits.

Summary. Vocalisations of Angolan birds are poorly known, but are an important aid in species-specific surveys. I provide new information on the vocalisations of Angolan birds based on recordings made during three separate trips to Angola. Examples of most vocalisations discussed can be found on Mills (2007), which should be consulted in conjunction with this paper. New information is presented for several endemic, rare and threatened species, including Grey-striped Francolin (or Spurfowl) *Francolinus (Pternistis) griseostriatus*, Swierstra's Francolin *F. (P.) swierstrai*, Red-backed Mousebird *Colius castanotus*, Pale Olive Greenbul *Phyllastrephus fulviventris*, Gabela Akalat *Sheppardia gabela*, Angola Cave Chat *Xenocopsychus ansorgei*, White-headed Robin Chat *Cossypha heinrichi*, Bubbling Cisticola *Cisticola bulliens*, Angola Slaty Flycatcher *Melaenornis (Dioptornis) brunneus*, Oustalet's Sunbird *Cinnyris oustaleti*, Ludwig's Double-collared Sunbird *C. ludovicensis*, Bannerman's Sunbird *Cyanomitra bannermani*, Monteiro's Bushshrike *Malaconotus monteiri*, Gabela Helmetshrike *Prionops gabela* and Pale-billed Firefinch *Lagonosticta landanae*. Braun's Bushshrike *Laniarius brauni*, Black-tailed Cisticola *Cisticola melanurus* and Bocage's Sunbird *Nectarinia bocagei* are the only three Angolan birds for which no published recordings are available, although some calls of the cisticola and sunbird have been described.

Angola has a diverse, yet poorly known avifauna (Dean 2000). The vocalisations of several species are entirely unknown (Chappuis 2000) and the full repertoire of many others not yet described. Knowledge of bird vocalisations is an important aid in avifaunal surveys, particularly in dense habitats where detection relies heavily on aural signals (Lor & Malecki 2002). Recordings for use in playback of bird song may

increase rate and reliability of detection (Boscolo *et al.* 2006), although playback may have some undesirable side-effects (Conway & Gibbs 2005). Vocalisations also hold characters that can be used in the study of the evolutionary history of birds (McCracken & Sheldon 1997), and there are several unresolved taxonomic issues among Angola's avifauna (Mills & Dean 2007) that knowledge of vocalisations may prove useful for resolving.

Table 1. Gazetteer of localities mentioned in the text. Further details for some localities can be found in Dean (2001) and Ryan *et al.* (2004).

Tableau 1. Localités citées dans le texte. Pour des détails supplémentaires concernant certaines localités, voir Dean (2001) et Ryan *et al.* (2004).

Location	Province	Coordinates
40 km north of Calandula	Malanje	08°54'S 16°05'E
Bango	Cuanza Sul	11°21'S 14°13'E
Bimbe	Cuanza Sul	11°06'S 14°13'E
Cassongue	Cuanza Sul	11°51'S 15°03'E
Gabela	Cuanza Sul	10°51'S 14°22'E
Gungo	Cuanza Sul	11°49'S 14°08'E
Katunda	Cuanza Sul	11°44'S 14°28'E
Kissama National Park	Cuanza Sul	09°30'S 13°45'E
Kumbira Forest	Cuanza Sul	11°08'S 14°17'E
Longa River	Bengo/Cuanza Sul	10°12'S 13°31'E
Mount Moco IBA	Huambo	12°26'S 15°09'E

The aim of this paper is present new information on vocalisations of Angolan birds, based on recordings made during three separate visits to the country: in October 2003, August–October 2005 and August 2006. Most of these recordings are presented on Mills (2007), which compendium should be consulted in conjunction with the following, since regular reference is made to sounds on this volume, including to specific sections of a vocalisation (e.g. ‘part A’) for which details are presented in the accompanying guide. Original recordings will be housed with the Wildlife Section of The British Library Sound Archive (BLSA). Digital sound-recordings were made using a Sony minidisc recorder (MZ-RH910; PCM recording format) and Sennheiser unidirectional microphone (MKE300). These sounds were copied digitally to a computer for inspection and editing using Goldwave (www.goldwave.com) and production of sonograms using Raven Lite (Cornell Lab of Ornithology 2003). Vocalisations were compared, aurally and using sonograms, to recordings of closely related taxa presented on Chappuis (2000) and Gibbon (1995), and cross-referenced to descriptions of vocalisations given in the *Birds of Africa* series, Zimmerman *et al.* (1996), Borrow & Demey (2001), Stevenson & Fanshawe (2002) and Hockey *et al.* (2005). Comparisons were generally made with small sample sizes, incomplete knowledge of repertoires and lack of knowledge of analogous

vocalisations from related taxa; this should be kept in mind when interpreting differences presented.

Below I list information for 47 species, either in the form of a first description, additions to known descriptions, or other notes, following the taxonomic order of Dean (2000). Species names are followed in square parentheses by the relevant track number on Mills (2007), and the date and locality of recording (see Table 1 for locality information). Of greatest significance are first descriptions for Swierstra’s Francolin (or Spurfowl) *Francolinus (Pternistis) swierstrai* (Vulnerable), Gabela Akalat *Sheppardia gabela* (Endangered), Angola Slaty Flycatcher *Dioptrornis brunneus* and Gabela Helmetshrike *Prionops gabelae* (Endangered). Elsewhere I described the first vocalisations for Brazza’s Martin *Phedina brazzae* (Mills & Cohen 2007), also recorded in Angola. The only Angolan species remaining for which no published recordings are available are Braun’s Bushshrike *Laniarius brauni* (see Sinclair *et al.* 2007 for some information), Black-tailed Cisticola *Cisticola melanurus* and Bocage’s Sunbird *Nectarinia bocagei*, although some calls of the cisticola and sunbird were described by Irwin (1991) and Lippens & Wille (1976), respectively.

Notes on species

Finsch’s Francolin *Francolinus (Scleroptila) finschi* [03; Mount Moco IBA, August 2005]

The only previous recordings are from south-east Gabon. The advertisement call is described as a duet (Chappuis 2000), a loud *wit-u-wit* heard at dusk (Urban *et al.* 1986). While at Mount Moco IBA, advertisement calls (part A on Mills 2007) were heard on each of three evenings, at dusk, and mornings, during the early and mid morning. Sexes called simultaneously: one, presumably the female, utters a repetitive *chi* or *wit*, 3–4 times per second, whereas the male sings a more complex *ti-du-towi*, reminiscent of other taxa of the subgenus *Scleroptila* (Madge & McGowan 2002), and perhaps most similar to that of Shelley’s Francolin *F. shelleyi* (Fig. 1). The calls of the sexes appear not to be co-ordinated in any way; either bird can call alone at the start and end of a calling bout, and

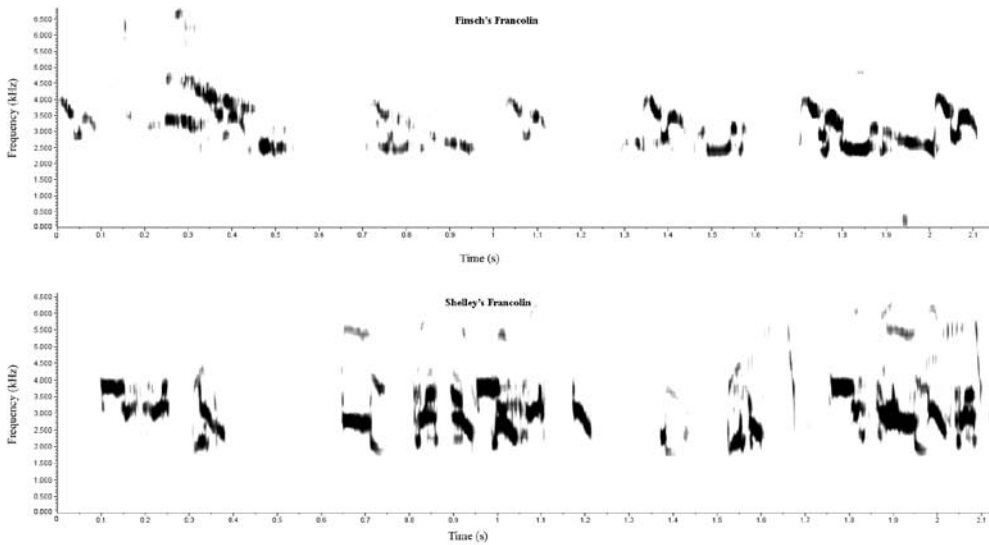


Figure 1. Sonograms of the territorial calls of Finsch's Francolin *Francolinus (Scleroptila) finschi*, alongside that of Shelley's Francolin *F. (S.) shelleyi* (Gibbon 1995), to illustrate similarities in structure.

Sonogrammes du cri territorial du Francolin de Finsch *Francolinus (Scleroptila) finschi*, avec celui du Francolin de Shelley *F. (S.) shelleyi* (Gibbon 1995), pour illustrer les similarités de leur structure.

from inspection of sonograms the calls appear not to be antiphonal. One group/pair calling would often stimulate others to call; at least three groups were heard each evening. A second call was recorded in response to playback and is presumed to be an agitation call (part B). One bird, probably the female, called a sharp, high-pitched *chwi* every *c.*1 second.

Grey-striped Francolin (Spurfowl) *Francolinus (Pternistis) griseostriatus* [04; Kumbira and Gungo, August–October 2005]

Reported to make a high-pitched rasping *kerak* similar to that of Scaly Francolin *F. (P.) squamatus* (Urban *et al.* 1986). Vaz Pinto (2002) suspected that this is an alarm-call, frequently made when flushed. He describes the territorial call as 'a very loud and crescendo blow *ff ffffffff* repeated two or three times'. The advertisement call is a duet, with one bird calling a raspy upward-inflected *shwiii* followed closely by a raucous *ke-ke-ke-ke* of the second bird (parts A–C) either at 1.0–2.5 kHz or 2.0–3.0 kHz (Fig. 2). The agitation call is a loud, sharp *ke* repeated at intervals of *c.*1 second (part D; Fig. 2). A general trend, although unquantified, was noticed for birds in areas with high human population, such as Kumbira Forest (Ryan *et al.* 2004), to call only after dusk and before dawn. In other areas with fewer people, such as Kissama National Park

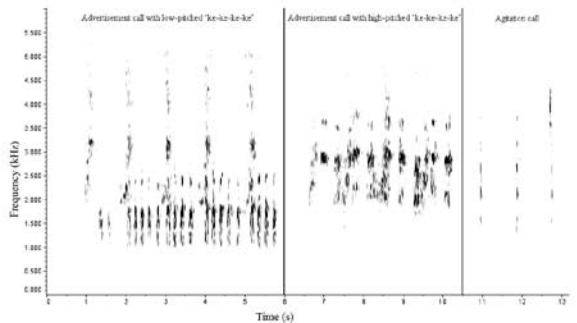


Figure 2. Sonograms of two different advertisement calls and the agitation call of Grey-striped Francolin *Francolinus (Pternistis) griseostriatus*.

Sonogrammes de deux cris d'avertissement différents et du cri d'agitation du Francolin à bandes grises *Francolinus (Pternistis) griseostriatus*.

and on the escarpment below Gungo, birds were heard calling well into the morning.

Swierstra's Francolin (Spurfowl) *Francolinus (Pternistis) swierstrai* [05; Mount Moco IBA, August 2005]

The only information on vocalisations for this species comes from Hall (1960), who described the call as 'a shrill, harsh cry, not unlike that of *Francolinus jacksoni*'. This description refers specifically to the noise made by a bird after

being flushed, and is not the advertisement call as reported in Johnsgard (1988) or Madge & McGowan (2002). The agitation call is continuous fowl-like clucking, whereas the advertisement call is a loud crowing sequence that initially grows in loudness and then fades again towards the end. Sonograms were too unclear to visualise usefully. The recording on Mills (2007) has been amplified and an echo added to prevent playback of calls, and consequently sounds reminiscent of Crested Guineafowl *Guttera pucherani*. Researchers wishing to study this species should contact the author if they wish to have an unedited recording.

Red-crested Turaco *Tauraco erythrolophus* [07; Kumbira, August 2005]

The only published recordings are from birds in captivity (Chappuis 2000) and the only vocal description, not mentioned by Fry *et al.* (1988), is by Heinrich (1958). He described the call as a very loud *krrookrruokrruokrruokrruo* and the warning call as a rough, rather loud *örrr. . . .örrr*. Calls of wild birds (Mills 2007) match exactly the calls presented on Chappuis (2000), an introductory note followed after a short pause by a series of slow, raspy notes. These are most similar to the calls of the closely related Bannerman's Turaco *T. bannermani*, although the latter's are delivered at a more rapid tempo. Other vocalisations include a single *kkrrr* (possibly the warning call referred to by Heinrich 1958) and an excited *ke-ke-ke* (beginning of part C).

Mountain Nightjar *Caprimulgus poliocephalus* [not recorded; Katunda, October 2003]

The endemic subspecies *koesteri* was heard but not recorded. The song sounded typical of the *C. poliocephalus* / *ruwenzorii* group.

Swift species *Apus* sp. [14–16; Kumbira, September 2005 and August 2006]

Three different vocalisations from large dark swifts are presented on Mills (2007), all recorded at Kumbira Forest. A recent visit in November 2008 to Kumbira revealed that all three calls are made by the same swifts, which were nesting in the cliffs on Mt Njelo. Those on track 14 sound similar to the calls of African Black Swift *Apus barbatus*. Calls on track 15 are excited calls made by a pair of birds in a flock, chasing each other. However, calls on track 16 are rather like those

made by Little Swift *A. affinis* and were made by a flock of swifts (certainly not Little Swift) circling above the forest in the late evening. These distinctive calls suggest that this is an undescribed species of swift.

Fernando Po Swift *Apus (barbatus) sladeniae*

[17; Mount Moco IBA, August 2005]

The only two specimens from the Angolan highlands of the *A. barbatus* complex, females collected at Mt Moco, were identified as *sladeniae* (Brooke 1970). Because no other taxa from the *A. barbatus* group are known from this region, the small flock of very dark birds (no pale throat seen) observed at Mount Moco IBA in the early morning, were tentatively ascribed to Fernando Po Swift (Mills & Dean 2007). Birds made a short, high-pitched scream at 4.5–6.5 kHz (Fig. 3).

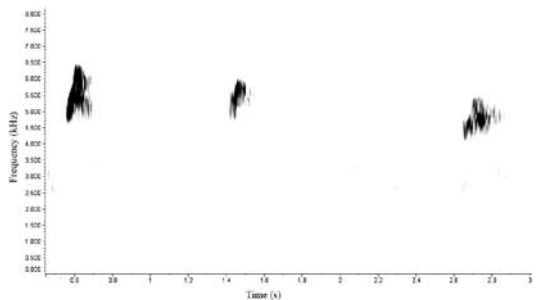


Figure 3. Sonogram of the short, high-pitched scream of Fernando Po Swift *Apus (barbatus) sladeniae*.

Sonogramme du cri court et aigu du Martinet de Fernando Po *Apus (barbatus) sladeniae*.

Red-backed Mousebird *Colius castanotus*

[18; Longa River, October 2003, and Gungo, October 2005]

The voice of this species was previously unknown (Fry *et al.* 1988) and unrecorded (Chappuis 2000). Flocks of foraging birds make a weak, high-pitched twittering, almost continuously (part A). Other calls include a harsh *chee chee chee* (part C), virtually indistinguishable from the call of Speckled Mousebird *C. striatus* (Gibbon 1995, Hockey *et al.* 2005).

Western Green Tinkerbird *Pogoniulus*

coryphaeus [22; Mount Moco IBA, August 2005]

Calls of the subspecies *angolensis* fall within the range of vocalisations made by the nominate subspecies presented on Chappuis (2000).

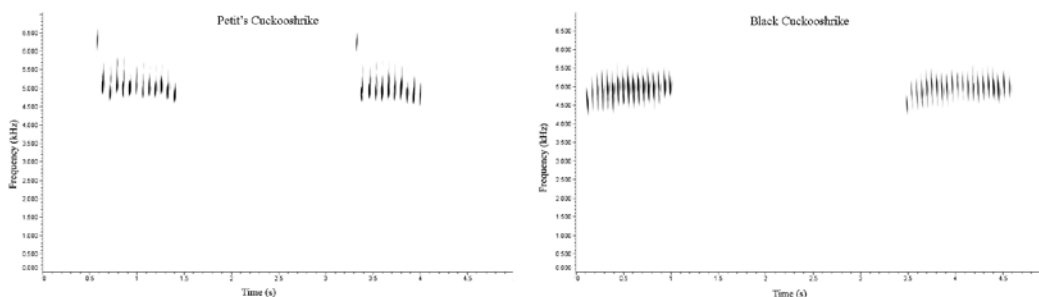


Figure 4. Sonograms of the songs of Petit's Cuckooshrike *Campephaga petiti* and Black Cuckooshrike *C. flava* (Gibbon 1995), for comparison.

Sonogrammes du chant de l'Échenilleur de Petit *Campephaga petiti* et, pour comparaison, de celui de l'Échenilleur à épaulettes jaunes *C. flava*.

Petit's Cuckooshrike *Campephaga petiti* [38; Gungo, October 2005]

No description of the vocalisations was given in Keith *et al.* (1992), although according to the authors it had been tape-recorded by R. McVicker. Stevenson & Fanshawe (2002) describe the song as 'a strong, rhythmical whistled series *sisisi-seeuu* the first notes identical, the last note falling in tone', and Zimmerman *et al.* (1996) as 'a high-pitched, scratchy warbling'. Recordings made in Angola are similar to, but distinguishable from, the song of Black Cuckooshrike *C. flava*; identification was confirmed by the presence of the distinctive female with yellow underparts. The song is a weak, high-pitched trill, consisting of an introductory note in the 6.0–6.5 kHz range followed by *c.*10 notes, with a slightly wavering quality, in the 4.5–6.0 kHz range and dropping slightly in pitch towards the end of the sequence (Fig. 4). Black Cuckooshrike songs (recording from Gibbon 1995) lack the introductory note, comprise more notes, delivered more rapidly and not dropping in pitch through

the sequence, giving the song a stronger, more even quality (Fig. 4).

Pale Olive Greenbul *Phyllastrephus fulviventris* [45; Kumbira, August–September 2005]

The only recorded vocalisation from western Congo-Kinshasa (Chappuis 2000) is a nasal whining, and is probably a contact-call (parts B–C). The most distinctive call, described as an alarm, is a loud, sharp *tsik-tschirr-tschirr* (Heinrich 1958) in the 1.5–7.0 kHz range (Fig. 5), which is most useful for finding the species. Other vocalisations include a chattier, bulbul-like song in the 1.2–3.0 kHz range (Fig. 5; part D).

Gabela Akalat *Sheppardia gabela* [47; Kumbira and near Gabela, September 2005]

The vocalisations of this Endangered endemic are unknown except for a putative song described by Ryan *et al.* (2004). This recording was inspected aurally and differs from any of the three vocalisations presented on Mills (2007); it almost

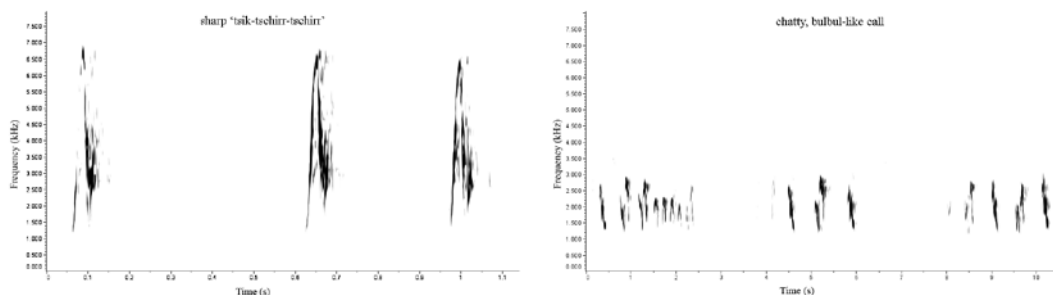


Figure 5. Sonograms of two different vocalisations of Pale Olive Greenbul *Phyllastrephus fulviventris*.

Sonogrammes de deux émissions vocales différentes du Bulbul à ventre roux *Phyllastrephus fulviventris*.

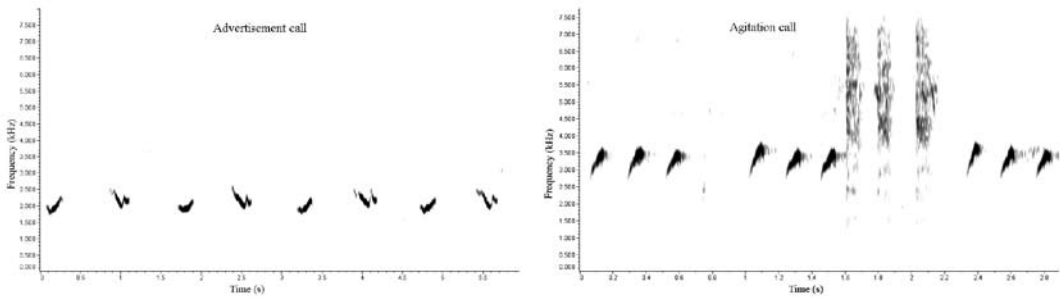


Figure 6. Sonograms of the advertisement and agitation calls of Gabela Akalat *Sheppardia gabela*.
Sonogrammes des cris d'avertissement et d'agitation du Rougegorge de Gabela *Sheppardia gabela*.

certainly belongs to Brown-chested Alethe *Alethe poliocephala*. The most common song, presumed to be the advertisement song, is made primarily from early to mid morning and during the last hour before sunset. It is a soft, regular series of two low-pitched whistles (1.7–2.7 kHz; part A), for which the rate of delivery can be varied. The one whistle has a simple upward inflection, the other is slightly more complicated, comprising two components (Fig. 6); this song may be repeated for a long period (sometimes >30 minutes). The two remaining vocalisations are presumed to be alarm/agitation calls and are often uttered in an alternating sequence (part B). According to Keith *et al.* (1992) Gabela Akalat forms a superspecies with Lowland Akalat *S. cyornithopsis*, Equatorial Akalat *S. aequatorialis*, Sharpe's Akalat *S. sharpei*, Bocage's Akalat *S. bocagei* and East Coast Akalat *S. gunningi*, although its exact position within this clade is undetermined. The whistles are most similar to those of the Lowland / Equatorial group (see sonograms in Dowsett-Lemaire 1997), although the agitation calls are similar to those recorded for Sharpe's Akalat in north-east Zambia, the only species for which comparable vocalisations were available (recordings of Sharpe's Akalat available from the author). A piercing, high-pitched call is repeated, interspersed with harsh *tche-tche-tche* calls (Fig. 6). Almost all those birds found during my visits (>50) were first located by call, making knowledge of vocalisations important for any future surveys.

Angola Cave Chat *Xenocopsychus ansorgei* [48; Mount Moco IBA and Kumbira, August 2005]
The first recordings were made in October 2003 (part D) and are described in Ryan *et al.* (2004). However, this song is not the commonest vocalisa-

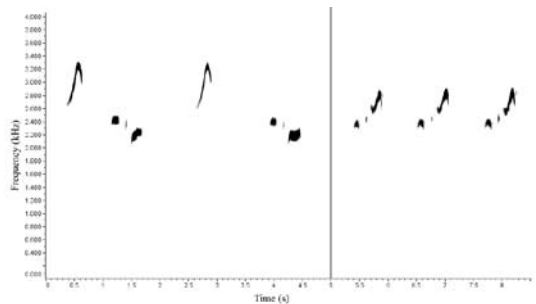


Figure 7. Sonograms of two variations of the most frequently heard call of Angola Cave Chat *Xenocopsychus ansorgei*.
Sonogrammes de deux variations du cri le plus fréquent du Cossyphé des grottes *Xenocopsychus ansorgei*.

tion and appears to be the male's territorial song. The most frequently heard vocalisation (parts A and C) is a simple series of three clear whistles, the first slower, higher pitched and with an upward inflection, followed by a pause of variable length and then two shorter, lower-pitched notes with a downward inflection (Fig. 7), not unlike some vocalisations of White-browed Robin Chat *Cossypha heuglini*. This song may be reversed as two short, similar-pitched notes followed by a more drawn-out, upward-inflected note (part B; Fig. 7). Some of these vocalisations were described by Heinrich (1958).

Brown-chested Alethe *Alethe poliocephala* [49; Kumbira and near Gabela, September 2005]
Songs of the endemic subspecies *hallae* differ from the descending vocalisations presented at the beginning of Chappuis (2000), which may represent a very rare call of Brown-chested Alethe, but are very similar to the simple whistles that follow.

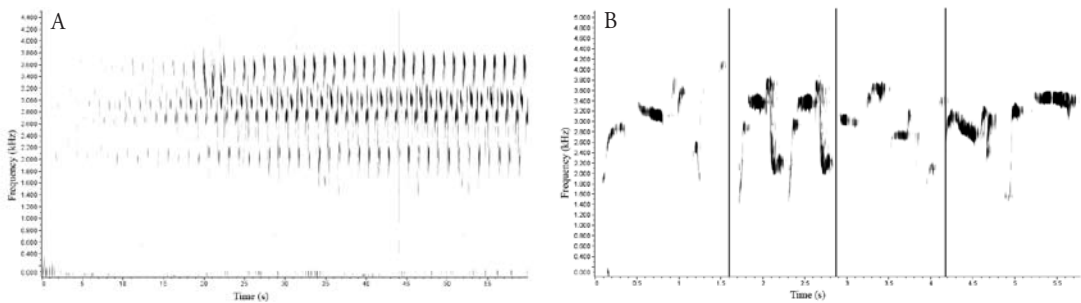


Figure 8. Sonograms of vocalisations of White-headed Robin Chat *Cossypha heinrichi*. (A) An entire song bout to illustrate the increase in intensity through the sequence. (B) Four variations of the song phrase repeated during a song bout. The second song phrase illustrated shows two rapid repeats of the same phrase.

Sonogrammes d'émissions vocales du Cossyphé à tête blanche *Cossypha heinrichi*. (A) Une séquence entière de chant pour illustrer l'augmentation en intensité pendant la séquence. (B) Quatre variations de la phrase répétée pendant une séquence de chant. La seconde phrase contient deux répétitions rapides de la même phrase.

White-headed Robin Chat *Cossypha heinrichi* [51; 40 km north of Calandula, August 2006]

The only description of the species' vocalisation is that it resembles 'White-browed Robin Chat *C. heuglini* in structure, but is much higher pitched and faster' (Sinclair *et al.* 2007). White-headed Robin Chat sings in bouts of *c.*35–70 seconds ($n=4$ song bouts) during which a song phrase, consisting of several clear, musical whistles, is repeated continuously, barely audible initially but growing greatly in intensity through the sequence (Fig. 8a). The complexity and duration, but not the pitch, of the song phrase can vary between bouts (Fig. 8b) but appears not to change within a bout, and is delivered at a mean rate of 0.6–1.7 phrases per second ($n=4$ song bouts). The pitch of all song phrases recorded was in the 1.5–4.0 kHz range; inspection of sonograms of White-browed Robin Chat produced from Gibbon (1995) show almost complete overlap in frequency (1.2–4.0 kHz) with White-headed Robin Chat. The song of White-browed Robin Chat differs primarily in that a great variety of phrases are sung in any one bout, whereas White-headed Robin Chat repeats the same phrase. Another vocalisation recorded was a single, high-pitched (3.6–3.8 kHz), upward-inflected whistle repeated about every two seconds.

Forest Scrub Robin *Cercotrichas leucosticta* [52; Kumbira, October 2005]

The song of the endemic subspecies *reichenowi* is a sweet, very musical melody of notes, as is typical for the species, but differs from recordings of the

leucosticta or *colstoni* subspecies from Côte d'Ivoire (Chappuis 2000) in several ways: in comparison to Côte d'Ivoire birds, Angolan birds sing (i) at a lower frequency (2.0–3.5 kHz compared to 2.8–4.2 kHz), (ii) fewer notes per second and (iii) shorter sequences, both in duration and number of notes (Fig. 9). Although insufficient data are available to make statistical comparisons, >50 individuals were heard during visits to Angola and none sang as quickly as the Côte d'Ivoire bird.

Evergreen Forest Warbler *Bradypterus lopezi* [55; Mount Moco IBA, August 2005]

Songs of the endemic subspecies *boultoni* are a typical sequence of similar notes increasing in intensity through the sequence (Chappuis 2000). They do not audibly differ from vocalisations of other subspecies in West or East Africa.

Red-faced Cisticola *Cisticola erythropus* [no recording]

Although not presented on Mills (2007), recordings of the near-endemic subspecies *lepe* can be heard in the background of Ludwig's Double-collared Sunbird *Cinnyris ludovicensis* (track 90), and were regularly heard throughout visits to the Angolan highlands (the only records of this subspecies outside of Angola are from the Marungu Highlands, some 1,600 km away; Dowsett & Prigogine 1974). Heinrich (1958) described the song and a potential alarm-call, but did not compare these to other subspecies, whilst Sinclair *et al.* (2007) describe the call and song as 'very different from those of Red-faced Cisticola *C. e. erythropus*,

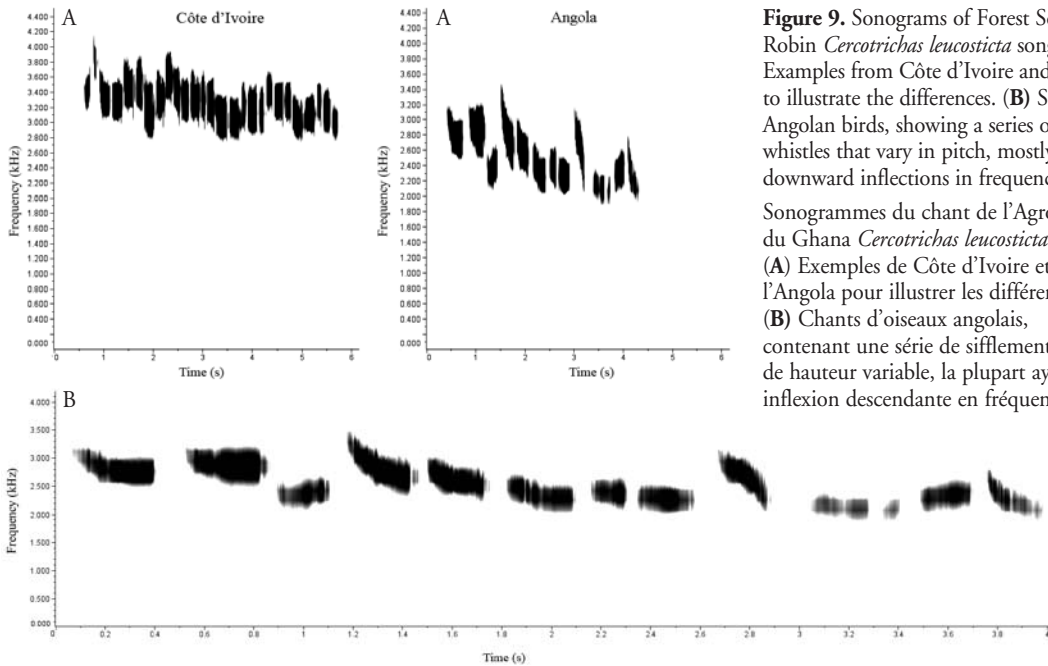


Figure 9. Sonograms of Forest Scrub Robin *Cercotrichas leucosticta* song. (A) Examples from Côte d'Ivoire and Angola to illustrate the differences. (B) Songs of Angolan birds, showing a series of clear whistles that vary in pitch, mostly with downward inflections in frequency. Sonogrammes du chant de l'Agrobate du Ghana *Cercotrichas leucosticta*. (A) Exemples de Côte d'Ivoire et de l'Angola pour illustrer les différences. (B) Chants d'oiseaux angolais, contenant une série de sifflements clairs de hauteur variable, la plupart ayant une inflexion descendante en fréquence.

the song being more melodious and liquid'. In my experience the vocalisations are very similar if not indistinguishable from this taxon in Cameroon and Gabon, although perhaps more varied than those of the southern African subspecies *nyasa*.

Bubbling Cisticola *Cisticola bulliens* [57; Longa River, October 2003, and Bimbe, August 2005] Although not previously recorded, the song of this species is described as 'fairly musical, rippling and bubbling, preceded by 3 short introductory notes' (Urban *et al.* 1997), and is supposedly distinctive. The repertoire recorded for Bubbling Cisticola (Mills 2007) is very similar to that of Chattering Cisticola *C. anonymus* from Gabon and Cameroon, and Rattling Cisticola *C. chini-ana* from Kenya and Tanzania, and may not be distinguishable from either species, especially considering the variability they all display. The latter two species are known to respond to each other's songs (Chappuis 2000). Furthermore, morphology is very similar between this trio, suggesting that these three species may form a superspecies at least, rather than Bubbling Cisticola, Chattering Cisticola and Trilling Cisticola *C. woosnami* (Urban *et al.* 1997), the latter having a rather different song and morphology. Molecular techniques should be used to investigate relationships between these taxa.

Wailing Cisticola *Cisticola lais* [58; Mount Moco IBA and Kumbira, August 2005]

Wailing Cisticola has a varied vocabulary that differs geographically (Urban *et al.* 1997) and the endemic *namba* subspecies appears to be no exception, although vocalisations are not dissimilar to those from other regions. Three vocalisations were witnessed in Angola: (i) a typical, loud *peeee*, (ii) the song, commencing with an upward-inflected note and followed by one or more even-toned, lower-pitched notes, (iii) and a buzzy scold made immediately after the song.

Miombo Wren Warbler *Calamonastes undosus* [67; Mount Moco IBA, August 2005]

Songs of the endemic subspecies *huilae* match those made by the morphologically similar subspecies *undosus* and *cinereus*, and not those of the morphologically different *stierlingi* group (Urban *et al.* 1997, Chappuis 2000), which may be regarded as a separate species (Gill *et al.* 2009).

Grey Apalis *Apalis cinerea* [63; Mount Moco IBA, August 2005]

Songs of the endemic subspecies *grandis* were described by Heinrich (1958) but not compared to other subspecies; the recordings on Mills (2007) do not audibly differ from recordings of subspecies from Kenya and Cameroon (Chappuis

2000), although the sample presented does not include vocalisations from the female and may be insufficient to detect subtle differences.

Hartert's Camaroptera *Camaroptera brachyura harterti* [66; Kumbira and Bango, September–October 2005]

Vocalisations of this endemic taxon, sometimes treated as a full species (Gill *et al.* 2009), do not audibly differ from vocalisations made by other taxa in the *C. brachyura* / *brevicauda* complex.

Pulitzer's Longbill *Macrosphenus pulitzeri* [68]

The first description of vocalisations is by Ryan *et al.* (2004); no additional vocalisations were heard during three months of observation along the Angolan scarp, although the simplest song described as *chew-it* (Ryan *et al.* 2004) can be seen (but not heard) to comprise three, not two, discreet sounds with a general decrease in tone through the sequence (Fig. 10).

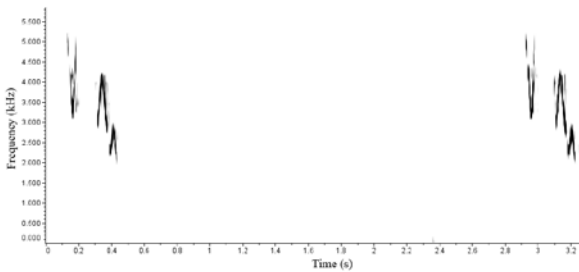


Figure 10. Sonogram of the *chew-it* call of Pulitzer's Longbill *Macrosphenus pulitzeri*, showing three separate notes, although only two can be heard.

Sonogramme du cri *tchiou-it* du Nasique de Pulitzer *Macrosphenus pulitzeri*, contenant trois notes séparées, dont seulement deux sont audibles.

Long-billed Crombec *Sylvietta rufescens* [69; Longa River, August 2006]

Vocalisations of the endemic subspecies *ansorgei* presented on Mills (2007) sound very similar to those of the race presented on Gibbon (1995). However, other vocalisations heard and recorded subsequent to the publication of Mills (2007) differ subtly from vocalisations in the south of the species' range. Its distinctness from southern subspecies should be investigated using molecular techniques, as the morphology is fairly distinct. It

has a white eyebrow, white underparts with rich rufous flanks, and a relatively short bill.

Southern Hyliota *Hyliota australis* [73; Kumbira, September 2005, and Bango, October 2005]

Some confusion exists over the identity of hyliotics along the Angolan escarpment (Mills & Dean 2007). Birds were highly vocal, usually being detected by an almost continuous dry chipping, especially in flight. These calls are presented on recordings by Bob Stjernstedt of Southern Hyliota from Zambia. The author had not previously heard Southern Hyliota give these calls, and hence declined to assign the calls on Mills (2007) to any given species. It appears there is little doubt that they are of Southern Hyliota (F. Dowsett-Lemaire *in litt.* 2008), although the habitat differs from that favoured in other parts of the range (Urban *et al.* 1997) and further investigation, especially using molecular techniques, would be of interest.

Angola Slaty Flycatcher *Melaenornis (Dioptornis) brunneus* [74; Kumbira, October 2003]

The voice of this endemic species was previously undescribed (Urban *et al.* 1997). Calls are a short, high-pitched (5.0–8.0 kHz) buzz, *zzzit-zit* repeated one to three times (Mills 2007; Fig. 11). No song or other vocalisations were heard. These calls are structurally similar to those of White-eyed Slaty Flycatcher *M. (D.) fischeri* presented on Chappuis (2000)—both, when listened to at a playback rate of 0.25 times the recording rate, can be heard to have an upward inflection—but differ in being higher pitched (dominant pitch 5.5 kHz in *fischeri* and 6.5 kHz in *brunneus*), less harsh and weaker, giving them distinctly different sounds. Vocal evidence suggests they should be treated as separate species, as is usually the case.

White-fronted Wattle-eye *Platysteira albifrons* [78; Gungo and Bango, October 2005]

Calls first described by Ryan *et al.* (2004); no additional vocalisations were noted during three months of observations along the Angolan scarp, although not all vocalisations are presented on Mills (2007), including the four whistles most similar to Common Wattle-eye *P. cyanaea* for which a sonogram is presented by Ryan *et al.* (2004).

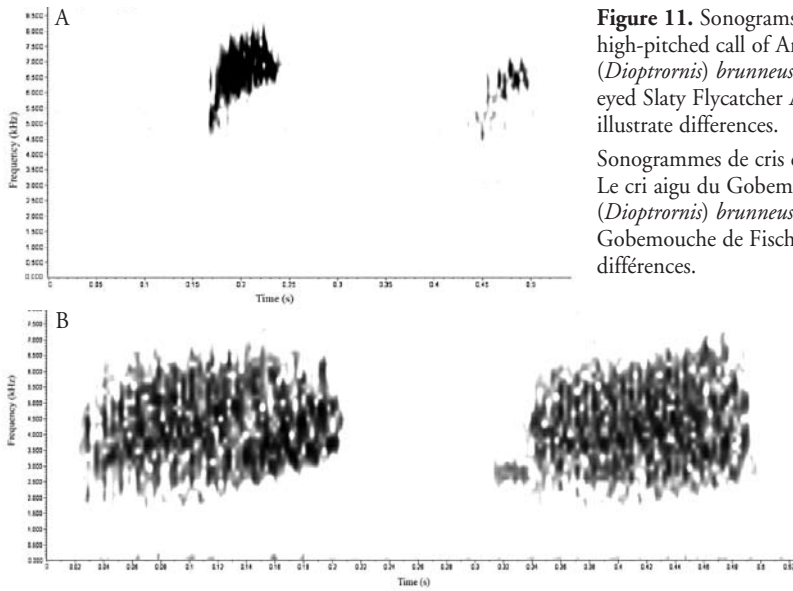


Figure 11. Sonograms of Slaty Flycatcher calls. (A) The high-pitched call of Angola Slaty Flycatcher *Melaenornis (Dioptornis) brunneus* compared with that of (B) White-eyed Slaty Flycatcher *M. (D.) fischeri* (Chappuis 2000), to illustrate differences.

Sonogrammes de cris de gobemouches *Melaenornis*. (A) Le cri aigu du Gobemouche de l'Angola *Melaenornis (Dioptornis) brunneus* comparé avec (B) celui du Gobemouche de Fischer *M. (D.) fischeri*, pour illustrer les différences.

Angola Batis *Batis minulla* [79; Kumbira, September 2005]

The first descriptions of vocalisations are provided by Dowsett-Lemaire (1997) and Chappuis (2000) based on recordings from Congo-Brazzaville: a series of 4–50 pure notes with a progressively descending tone. Recordings from Angola match these by descending in tone through the sequence and consistently lacking any buzzy notes made by some *Batis* species.

Brown Illadopsis *Illadopsis fulvescens* [80; Kumbira, September 2005]

Vocalisations of the endemic subspecies *dilutior* do not audibly differ from recordings presented on Chappuis (2000) made at various other Central African localities. Vocalisations include the characteristic *dict'-a-fown* phrase (Chapin 1953) made by birds from Central Africa but not West Africa (Fry *et al.* 2000).

Dusky Tit *Parus fumereus* [82; Kumbira, September 2005, and Bango, October 2005]

Calls of the endemic subspecies *gabala* fall within the range typical for the species (Chappuis 2000). Mimicry recorded in Angola (Mills 2007) includes African Paradise Flycatcher *Terpsiphone viridis*, Black-headed Oriole *Oriolus larvatus* and Dark-backed Weaver *Ploceus bicolor*.

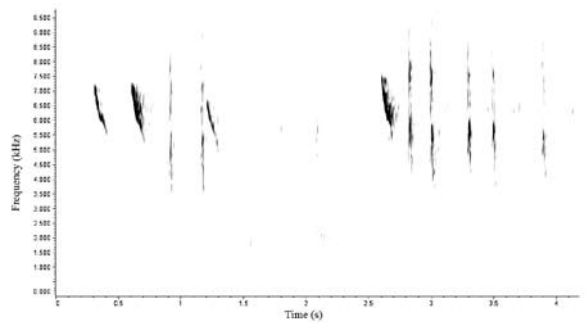


Figure 12. Sonogram illustrating two calls of Little Green Sunbird *Anthreptes seimundi*: spitted dry notes, with a smaller range in frequency, and a high-pitched call.

Sonogramme illustrant deux cris du Souimanga de Seimund *Anthreptes seimundi* : petites notes sèches, contenant peu de variation en fréquence, et un cri aigu.

Little Green Sunbird *Anthreptes seimundi* [86; Gungo, October 2005, and Bimbe, August 2006] Fry *et al.* (2000) describe the song as a 'very thin, high-pitched, insect-like *pssss* or *psssssup*', which corresponds to the recording presented on Chappuis (2000), thought to be a call of two young individuals. Borrow & Demey (2001), too, describe only this call. However, these do not represent songs or calls of adults, and the first recordings of adult calls are presented on Mills (2007). Stevenson & Fanshawe (2002) describe the call as 'a fairly loud, spitted, dry series of identical notes', which may match one of the calls recorded in Angola (Mills 2007). The second

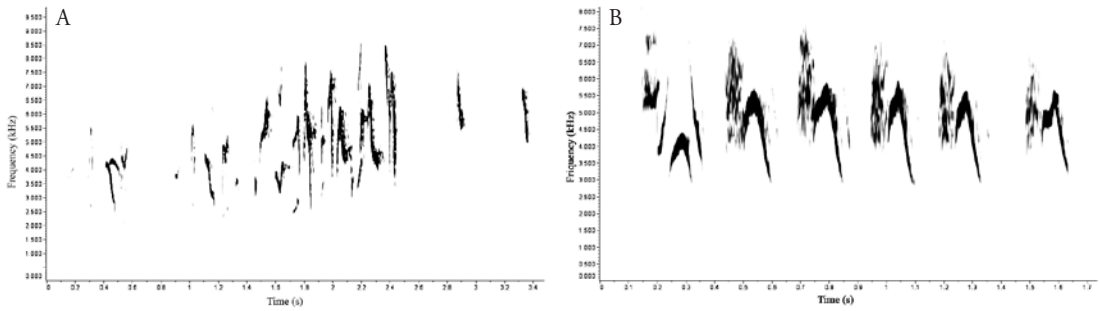


Figure 13. Sonograms of vocalisations of Oustalet's Sunbird *Cinnyris oustaleti*. (A) Jumbled song. (B) Harsher calls. Sonogrammes d'émissions vocales du Souimanga d'Oustalet *Cinnyris oustaleti*. (A) Chant désordonné. (B) Cris râpeux.

call is a very thin, high-pitched note, not nearly as drawn-out as the call presented on Chappuis (2000) (Fig. 12).

Bronzy Sunbird *Nectarinia kilimensis* [88; Mount Moco IBA, August 2005]
Vocalisations of the endemic subspecies *gadowi* do not audibly fall outside the range of the characteristic 'loud, nasal' vocalisations typical of the species (Fry *et al.* 2000).

Oustalet's Sunbird *Cinnyris oustaleti* [89; Kumbira, August 2005]
The only recordings are of the subspecies *rhodesiense*, with descriptions only of the soft *tzip* foraging call and harder ticking (Fry *et al.* 2000). Several vocalisations of the nominate subspecies, endemic to Angola, are presented on Mills (2007): a rapidly jumbled song in the 2.5–8.5 kHz range and high-pitched *tzip* notes in the 5.0–7.5 kHz range (Fig. 13a), harsher notes and *tchk tchik* flight-calls (end of track), the latter two similar to those of White-

bellied Sunbird *C. talatala*. The harsher notes consist of two different sounds: a buzz, followed immediately by a clear note that rises and then falls in pitch (Fig. 13b).

Ludwig's Double-collared Sunbird *Cinnyris ludovicensis* [90; Mount Moco IBA, August 2005]
The taxonomy of the *afra* superspecies is poorly resolved (Fry *et al.* 2000), and all taxa may represent a single species (Dowsett & Forbes-Watson 1993). The only descriptions of vocalisations for this species, as treated by Fry *et al.* (2000), are of the subspecies *whytei* in Malaŵi (Dowsett-Lemaire 1988, Dowsett-Lemaire & Dowsett 2006). Chappuis (2000) erroneously lists a bird recorded from Kakamega Forest in western Kenya as this species. The first recordings of calls and song of the subspecies *ludovicensis*, endemic to Angola, are presented on Mills (2007). Calls are a series of repeated harsh, nasal notes in the frequency range 2.5–6.5 kHz (Fig. 14a); the song is a very

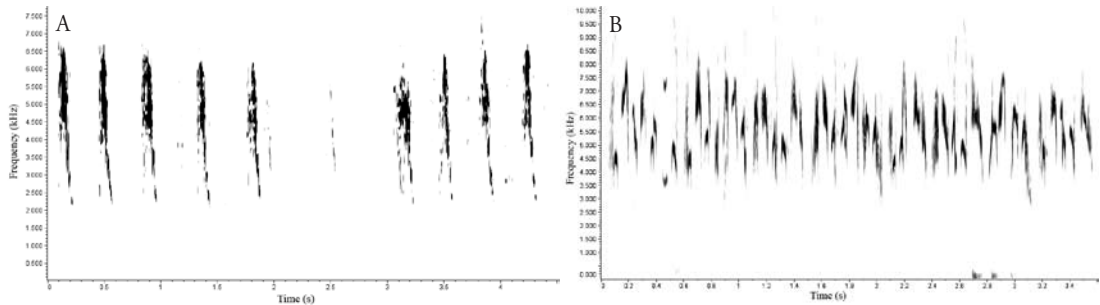


Figure 14. Sonograms of vocalisations of Ludwig's Double-collared Sunbird *Cinnyris ludovicensis*. (A) Repeated harsh, nasal calls. (B) Rapid, jumbled song. Sonogrammes d'émissions vocales du Souimanga de l'Angola *Cinnyris ludovicensis*. (A) Cris râpeux et nasillards répétés. (B) Chant rapide et désordonné.

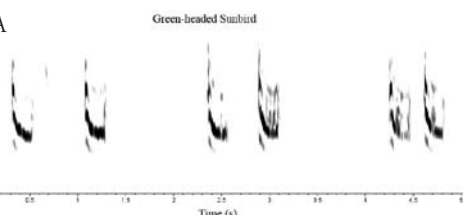
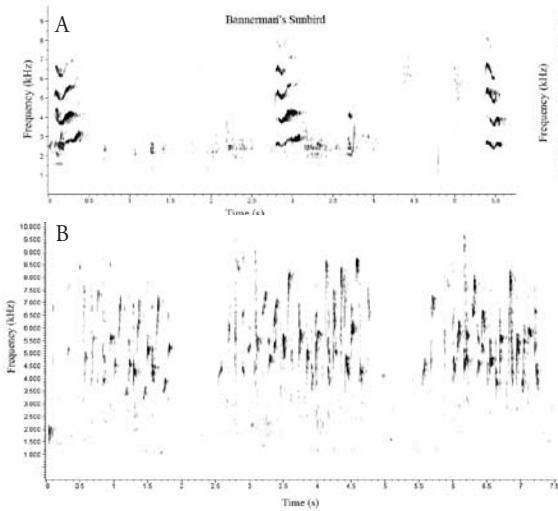


Figure 15. Sonograms of vocalisations of Bannerman's Sunbird *Cyanomitra bannermani*. (A) Calls compared to those of Green-headed Sunbird *C. verticalis*. (B) Song, a rapid, undulating jumble of high-pitched notes.

Sonogrammes d'émissions vocales du Souimanga de Bannerman *Cyanomitra bannermani*. (A) Cris comparés à ceux du Souimanga à tête verte *C. verticalis*. (B) Chant : un gazouillis ondulé rapide de notes aiguës.

rapid, jumbled series of high-pitched notes in the 3.5–8.5 kHz range (Fig. 14b). These vocalisations are similar to those of other double-collared sunbirds and probably indistinguishable from those described for *whytei* in Malawi (Dowsett-Lemaire 1988) or for *graueri* in Rwanda (Dowsett-Lemaire 1990).

Bannerman's Sunbird *Cyanomitra bannermani* [92; 40 km north of Calandula, August 2006]

The only previous recordings are from north-west Zambia (Chappuis 2000); the call is a 'nasal, up-slurred *djoow?*' (Fry *et al.* 2000) from which recordings of Angolan birds do not audibly differ (Mills 2007). This call is tonally similar to that of Green-headed Sunbird *C. verticalis*, with which it forms a superspecies (Fry *et al.* 2000), although

inspection of recordings of *C. verticalis* from Chad (Chappuis 2000) suggests that the call made by Bannerman's Sunbird is more complex, with an additional upslurred ending (Fig. 15a). The first song recordings are presented on Mills (2007) and comprise a rapid, undulating jumble of high-pitched notes (3–9 kHz) (Fig. 15b), overall not dissimilar to the song of Green-headed Sunbird.

Gabela Bushshrike *Laniarius gabela* [94; Kumbira, August 2005]

The full repertoire was first described by Ryan *et al.* (2004); no additional vocalisations were heard during three months along the Angolan scarp. Three of the most typical vocalisations are presented on Mills (2007): a deep, guttural *worrrk*, a harsh *tsik ksh-ksh-ksh-kshk* and a boubou-like

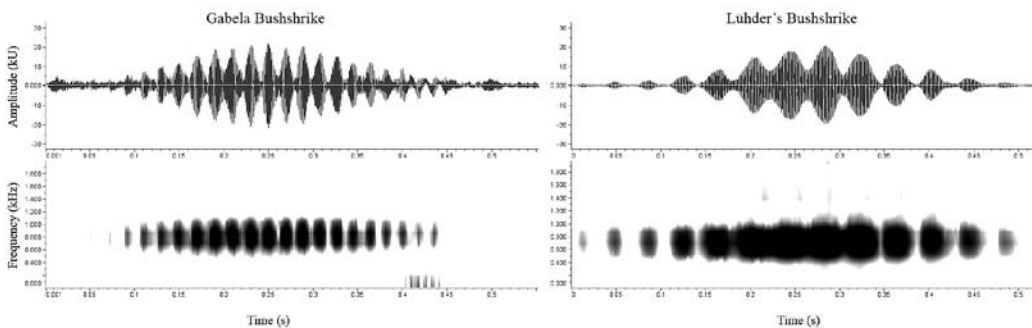


Figure 16. Waveforms (above) and sonograms comparing the *worrrk* call of Gabela Bushshrike *Laniarius gabela* and Lühder's Bushshrike *L. luehderi*.

Formes des ondes (en haut) et sonogrammes comparant le cri *ouorrrk* du Gonolek de l'Angola *Laniarius gabela* avec celui du Gonolek de Lühder *L. luehderi*.

whioo whioo (Ryan *et al.* 2004). Comparing the *worrrrk* call to the analogous vocalisation of Lühder's Bushshrike *L. luehderi* from Makokou, Gabon (Chappuis 2000), with which Gabela Bushshrike is often lumped (see Fry *et al.* 2000 for discussion), some differences can be detected. Vocalisations of Gabela Bushshrike are marginally higher pitched (0.5–1.2 kHz vs. 0.4–1.1 kHz) and comprise more components, visualised on a waveform as the number of oscillations (Fig. 16). However, the differences in pitch are so small as to be potentially meaningless, especially considering the range of frequencies any single bird can produce (see Dowsett-Lemaire 1990) and the variation of calls made by any *Laniarius* species. Proper comparisons of vocalisations should be made using recordings from several individuals and statistical analysis, in conjunction with playback of calls in the field to judge which differences are biologically meaningful.

Monteiro's Bushshrike *Malaconotus monteiri* [97; Kumbira, August–September 2005, and Gungo, October 2005]

The only described calls are from Cameroon: Andrews (1994) describes it as a mournful whistle repeated five, not three, times, whereas Williams (1998) shows that songs of presumed *M. monteiri* are indistinguishable from Green-breasted Bushshrike *M. gladiator*. However, identification of *M. monteiri* in Cameroon is controversial and the vocalisations should be considered undescribed (Chappuis 2000). Vocalisations of 14 different individuals were heard along the Angolan scarp during August–October 2005, and some of these were recorded and are presented on Mills (2007). The song is a mournful, low-pitched whistle (1.0–1.2 kHz) typical of and overlapping in frequency with all songs of Grey-headed Bushshrike *M. blanchoti* presented on Chappuis (2000), but slightly lower pitched than the songs of Green-breasted Bushshrike *M. gladiator* (1.1–1.4 kHz) presented on the same volume. However, these minute differences should be investigated properly, using recordings from multiple individuals of each taxon, before they can be regarded as diagnostic. Similarity of vocalisations between Green-breasted, Grey-headed and Monteiro's Bushshrikes suggests that vocalisations are not a useful tool for separating them, and argues for a proper investigation of genetic differences.

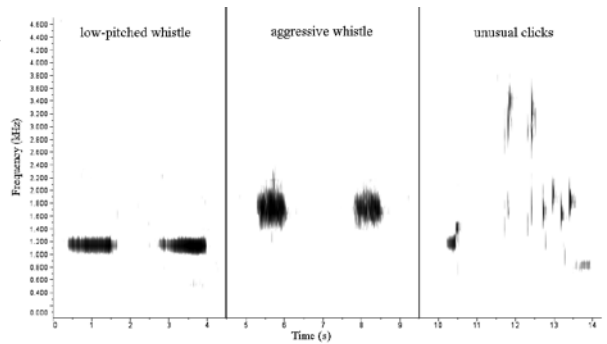


Figure 17. Sonograms of Monteiro's Bushshrike *Malaconotus monteiri* vocalisations.

Sonogrammes d'émissions vocales du Gladiateur de Monteiro *Malaconotus monteiri*.

In Angola, Monteiro's Bushshrike whistles were repeated 1–14 times before a pause, with 77% of 245 bouts noted consisting of 1–3 whistles; some whistles had a falsetto ending. Other calls included a harsher, more aggressive whistle in the 1.4–2.0 kHz range, a call made by both Grey-headed Bushshrike and Green-breasted Bushshrike, and some unusual clicks that I have never heard made by other *Malaconotus* species (Fig. 17; part D).

Gabela Helmetshrike *Prionops gabela* [100; Kissama National Park and Bimbe, September 2005]

The vocalisations of this endemic were previously unknown (Fry *et al.* 2000). It has a broad vocal repertoire, with songs consisting of combinations of various clear whistles, clicks, buzzes and more grating sounds (Fig. 18), similar to the vocalisations made by Retz's Helmetshrike *P. retzi*. Juveniles made a continuous churring call (part F).

Bocage's Weaver *Ploceus temporalis* [103; Cassongue, August 2005]

The only known recordings are from north-western Zambia (Fry & Keith 2004; BLSA); recordings from Angola are of a male making the 'loud *cha*' call at a colony along a river (Fry & Keith 2004).

Dark-backed Weaver *Ploceus bicolor* [104; Longa River, October 2003]

The song of the endemic subspecies *amaurocephalus* is a series of sweet, pure whistles (Fry & Keith 2004), which does not audibly differ from

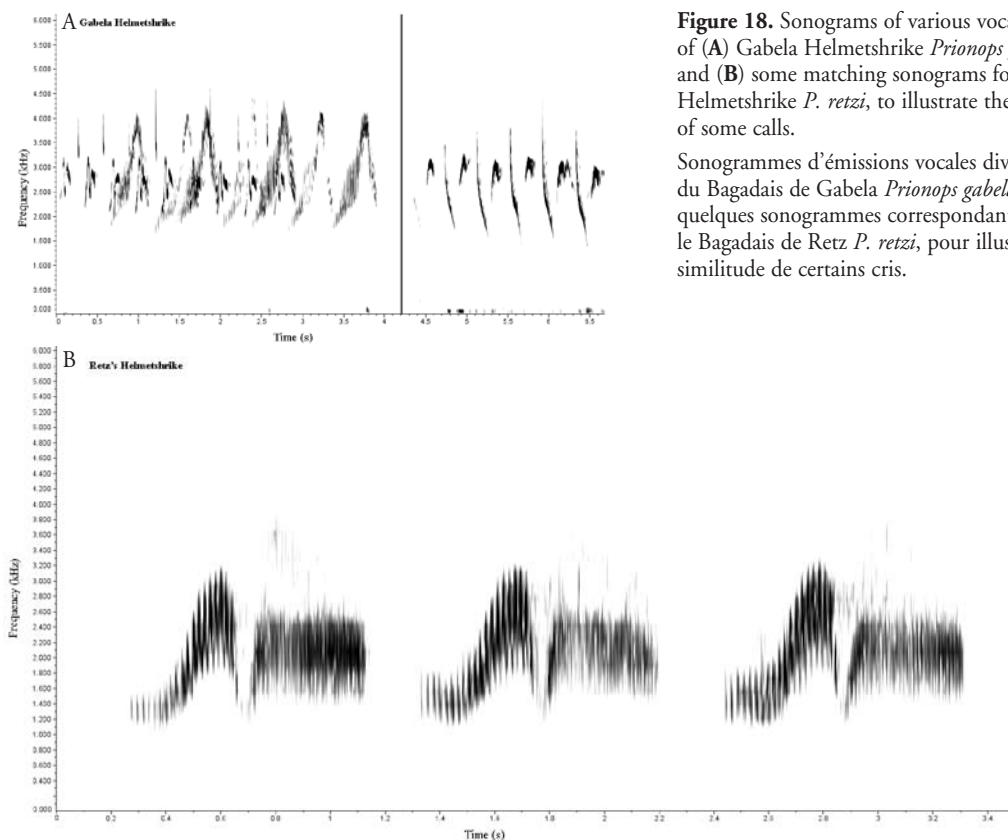


Figure 18. Sonograms of various vocalisations of (A) Gabela Helmetshrike *Prionops gabela*, and (B) some matching sonograms for Retz's Helmetshrike *P. retzi*, to illustrate the similarity of some calls.

Sonogrammes d'émissions vocales diverses (A) du Bagadai de Gabela *Prionops gabela*, et (B) quelques sonogrammes correspondants pour le Bagadai de Retz *P. retzi*, pour illustrer la similitude de certains cris.

the range of songs displayed by other races of the species.

Golden-backed Bishop *Euplectes aureus* [105; Longa River, October 2003]

Recordings of calls from a single bird in non-breeding plumage are the first of birds from Angola (Mills 2007). Calls are the typical sharp *tzip* (Fry & Keith 2004) and do not audibly differ from calls of birds on São Tomé (Chappuis 2000), where the species is thought to have been introduced (Christy & Clarke 1998).

Red-faced Crimsonwing *Cryptospiza reichenovii* [106; Kumbira, August 2005]

Recordings of the nominate subspecies, which also occurs on Bioko and in Cameroon, are presented on Mills (2007). Vocalisations consist of typical, repeated, high-pitched notes and trills (Hockey *et al.* 2005) that cannot be heard to differ consistently from recordings of the subspecies *australis* from Zimbabwe (Gibbon 1995, Chappuis 2000).

Dusky Twinspot *Euschistospiza cinereovinacea* [107; Mount Moco IBA, August 2005]

Recordings represent the call described as *tsyip-tsyip* by Goodwin (1982), a repeated short, dry, high-pitched note. Each individual note rises and falls rapidly in pitch from *c.*4–8 kHz and lasts *c.*0.2 seconds (Fig. 19). The note was repeated on average every 0.67 seconds (range = 0.5–1.3; *n*=30 inter-note intervals from two individuals). Because birds flocked (often *c.*20 individuals per flock) and called simultaneously it was often difficult to identify individual callers in the flock with any certainty, resulting in a small sample size. Calling within a flock was continuous while birds were active, although how regularly any individual bird called is unknown.

Pale-billed Firefinch *Lagonosticta landanae* [108; Kumbira, August 2005, and Bimbe, September 2005]

Three different vocalisations are presented on Mills (2007): song (part A–C), high-pitched contact calls (part D) and a buzzy trill (part E). Due to

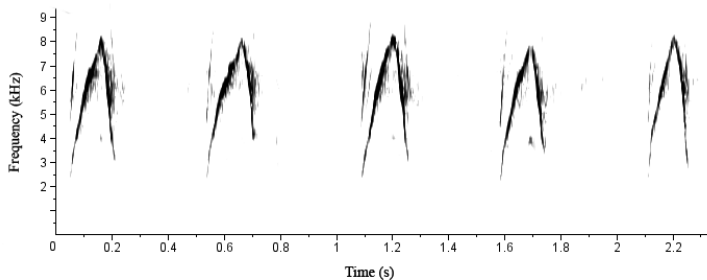


Figure 19. Sonogram of the repeated *tsyip-tyip* contact call of Dusky Twinspot *Euschistospiza cinereovinacea*.

Sonogramme du cri de contact *tsièp-tsièp* répété du Sénégalais sombre *Euschistospiza cinereovinacea*.

the complexity of firefinch vocalisations, it is difficult to find analogous vocalisations for comparison of African Firefinch *L. rubricata* and Jameson's Firefinch *L. rhodopareia* (Gibbon 1995). The song (Fig. 20) comprises various whistles and trills. Based on a much larger sample of recordings, Payne (2004) considers the vocalisations of *landanae* to be very similar to those of African Firefinch *L. rubricata* and treats *landanae* as a subspecies of African Firefinch.

Yellow-crowned Canary *Serinus flavivertex* [109; Mount Moco IBA, August 2005]

Song and flight-calls of the endemic subspecies *huillensis* consist of the typical 'tinkling jumble of sweet notes and trills' and 'rising *sweet*' (Fry & Keith 2004) respectively.

Black-faced Canary *Serinus capistratus* [110; Mount Moco IBA, August 2005]

The song of the endemic subspecies *hildegardae* is a series of clear, high-pitched whistles, not dissimilar to those recorded for the nominate subspecies at Ndola, Zambia (Chappuis 2000), although neither this individual nor any of the 50+ individuals heard during August–October 2005

in the Angolan highlands or along the Angolan scarp were heard to make the rattles or buzzy notes described by Fry & Keith (2004) and audible on Chappuis (2000).

Thick-billed Seedeater *Serinus burtoni* [111; Mount Moco IBA, August 2005]

The song of the isolated Angolan population of the subspecies *tanganjicae* is fairly typical of the species, although Fry & Keith (2004) do not mention the inclusion of mimicry in the song. The recorded individual mimics Red-faced Cisticola, Dusky Twinspot, Bronze Sunbird, Ludwig's Double-collared Sunbird and, possibly, Black-faced Canary among the typical complex of trills, churrs and twitters.

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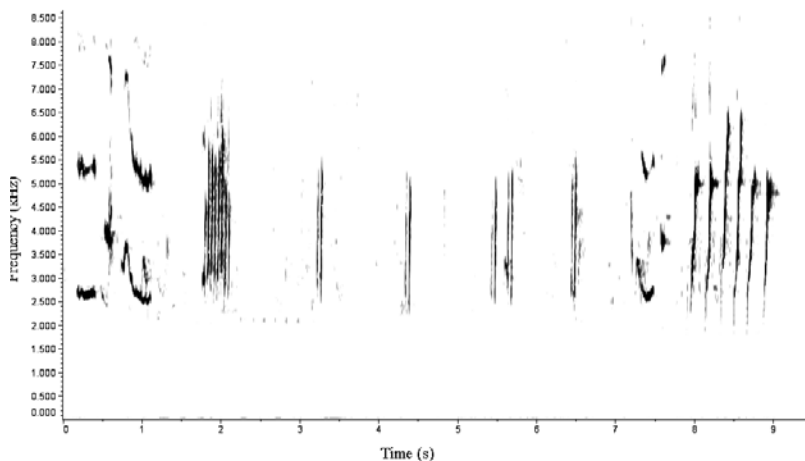


Figure 20. Sonogram of Pale-billed Firefinch *Lagonosticta landanae* song, consisting of various whistles and trills.

Sonogramme du chant de l'Amarante de Landana *Lagonosticta landanae*, consistant de sifflements et trilles variés.

provided valuable comments on the manuscript, which vastly improved its contents.

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