



West African Ornithological Society
Société d'Ornithologie de l'Ouest
Africain



**Join the WAOS and support
the future availability of free
pdfs on this website.**

<http://malimbus.free.fr/member.htm>

If this link does not work, please copy it to your browser and try again.

If you want to print this pdf, we suggest you begin on the next page (2) to conserve paper.

**Devenez membre de la
SOOA et soutenez la
disponibilité future des pdfs
gratuits sur ce site.**

<http://malimbus.free.fr/adhesion.htm>

Si ce lien ne fonctionne pas, veuillez le copier pour votre navigateur et réessayer.

Si vous souhaitez imprimer ce pdf, nous vous suggérons de commencer par la page suivante
(2) pour économiser du papier.

THE SPECIES OF PARASITIC FINCHES IN WEST AFRICA

by R. E. Payne

Received 19 August 1985

Field work in recent years has added to our understanding of the biology and species limits of parasitic finches in West Africa. Although much of that work has been published (Nicolai 1968, 1972, 1977; Payne 1968, 1973, 1976, 1982; Payne & Groschupf 1984; Payne & Payne 1977), certain reports have continued to use the more readily available names from Rannerman (1953) and Mackworth-Praed & Grant (1973). Recent avifaunal reports in *Malimbus* have used the older terms with the result that even with extensive correspondence it is impossible to determine the species involved or the match between parasitic finch and their foster species. Most of the viduine species are known to be species-specific brood parasites. The present note may be useful as a summary of the current standing of these brood parasite species.

Anomalospiza imberbis

The Cuckoo Weaver or Cuckoo Finch parasitizes several warblers in the genera *Cisticola* and *Prinia*. All observations on breeding behaviour and parasitism come from East and Southern Africa (Friedmann 1960; Williams & Feith 1962; Renson & Pitman 1964). Unlike the viduine finches, the young have an unmarked mouth lining (Renson & Pitman 1964). Recent observations have somewhat extended and filled in the range outlined by Hall & Moreau (1970). The species extends through wooded grassland areas from The Gambia, Sierra Leone, Ivory Coast, Mali, Nigeria, and Cameroon (Gore 1981; Rannerman 1949; Thiollay 1985; Malzy 1962; Elgood 1982; Louette 1981). The open grassy valleys used by the birds are seemingly much more widespread than are the birds.

Vidua species

The viduine finches are sometimes split into different genera, *Steganura* for the paradise whydahs, *Hypochera* for the indigobirds or combassous, and *Vidua* for the remaining forms. I use *Vidua* for all, because they are apparently closely related and hybrids are known between most of the species groups (Friedmann 1950; Payne 1980).

Vidua paradisaea, *V. interjecta*, *V. togoensis*

The paradise whydahs of Africa include four species, three in West Africa. The details of differentiation between two of them (*interjecta* and *togoensis*) have yet to be worked out.

The widespread Paradise Whydah *V. paradisaea* mimics the song and parasitizes the nests of the Melba Finch *Pytilia melba* (only one species of Melba Finch is recognized; Wolters 1977). The male whydahs living in the sahel and neighbouring habitats from Senegal eastward to the Ethiopian plateau are shorter-tailed in breeding plumage than the whydahs of east and southern

Africa that parasitize the same species. The few specimens from areas where the two forms meet in eastern Sudan and northeastern Ethiopia appear intermediate in tail length and wing length, although comparison is problematic because the specimens are worn and details of tail shape are unclear. Other authors (Traylor 1968; Hall & Moreau 1970) have considered some of these to be hybrids of other forms of whydahs. The boundary between the short-tailed and long-tailed forms of *V. paradisaea* does not seem to coincide with the boundary between red-lored and grey-lored forms of *P. melba* (for subspecies descriptions see Walters 1963, 1977; van den Elzen & Koenig 1983). Because those two forms of whydah appear to be conspecific, the western birds occurring from Senegal to Nigeria are a subspecies (*V. p. aucupum*) as is the form occurring from northern Cameroon to the Sudan (*V. p. orientalis*). Thus *Vidua* (or *Steganura*) *orientalis* as used by Bannerman (1949) and Mackworth-Praed and Grant (1973) is thought to be conspecific with *Vidua paradisaea*, as in Payne (1971).

Vidua obtusa, the Broad-tailed Paradise Whydah of Africa south of the Equator, is a brood-parasite of the Orange-winged Pytilia *Pytilia afra* (Nicolai 1964; Payne 1971). It is not conspecific with the West African *V. paradisaea orientalis* or *V. p. aucupum*, as suggested by the names in Bannerman (1948) and Mackworth-Praed & Grant (1973), but is a distinct species.

The other West African paradise whydahs are the Togo Paradise Whydah *V. togoensis* and the Uelle Paradise whydah *V. interjecta* (common names from Bannerman 1949). Males in breeding plumage have very long tails, >270 mm in length). Male *togoensis* have narrow tails (width of the long rectrices <30 mm), male *interjecta* have tails with the long rectrices 30-40 mm wide. Male *togoensis* are often pale buff on the nape and are more uniformly amber below; male *interjecta* are darker-naped and the maroon of the breast extends further posteriorly, giving a two-tone appearance to the underparts. No female specimens are known of either form. In their overall range occur two species of pytilia: the Red-winged Pytilia *Pytilia phoenicoptera* north in drier woodlands and the Yellow-winged Pytilia *P. hypogrammica* further south in more mesic woodlands (Hall & Moreau 1970; Louette 1981).

The two live together in the same region in some areas (Louette 1981; Elgood 1982). The map in Hall & Moreau (1970) gives the impression that the whydahs split geographically west to east, rather than south to north. The more complete distribution now available suggests overlap between the two forms of whydahs, but few specimens or identified observations are known.

The range of *togoensis* extends as far west as Kabala in Sierra Leone, at 9°35'N, 11°33'W. I observed a male in this plumage on 24 December 1973 along a road about 2 km south of the town, and noted the very long slender tail, the large straw-colored patch on the nape, and that "it looks quite golden below, not red." *Togoensis* is also known from the Karina district (BMNH; Bannerman 1949). Serle's (1949) observations of "aucupum" in Sierra Leone probably refer to *togoensis*. *P. hypogrammica* is known from Kabala (Bannerman 1949) and I saw it at Musaia (9°46'N, 11°34'W). *P. phoenicoptera* occurs further north in Guinea and The Gambia (Bannerman 1949).

Louette (1981) found no specimen records of *V. togoensis* for Cameroon, and only one (Bates's specimen from Tibati, (now in BMNH) of *interjecta*. I observed both in northern Cameroon. On 17 January 1979 I saw a male *interjecta* in breeding plumage along the railway line 8 km N of Ngaoundal (6°31'N, 13°17'E). On 8 November 1980 I saw an adult male *interjecta* at Ranyo (6°45'N, 11°49'E). On 1 November 1980 I saw both kinds of whydahs along the road from Tibati (6°28'N, 12°38'E) to Mbakaou (6°18'N, 12°48'E).

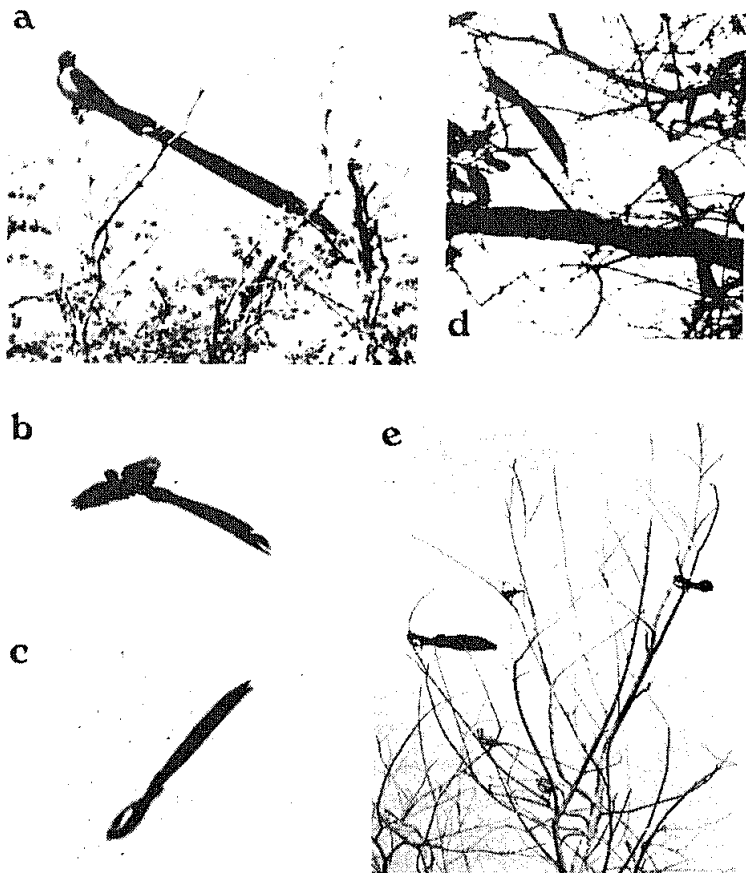


Figure 1. Uelle Paradise Whydah *Vidua interjecta*. (a) on song perch, (b) in flight display, (c) diving to song perch (Mole Nat. Park, Ghana); (d) males in Yankari Nat. Park, Nigeria, in (e) showing apparently short tails due to angle of view (left) and to loss of the second pair of rectrices and retention of short central pair (right).

Interjecta were seen near each town; narrow-tailed birds apparently *togoensis* were seen in the more densely wooded country about halfway between. This appears to be the first known site where *interjecta* and *togoensis* live together, and suggests that two species are indeed involved. Both *P. phoenicoptera* and *P. hypogrammica* occur in northern Cameroon in the Adamawa region (Louette 1981).

Nicolai (1977) studied *Pytilia hypogrammica* and found nests parasitized by *V. togoensis* near Enugu, southeastern Nigeria. Adult male whydahs mimicked the songs of *P. hypogrammica* and the young nestlings mimicked the begging calls of this foster species. In an earlier note, Serle (1957) found a nest of *P. hypogrammica* near Enugu that was parasitized by the local whydah. Serle's specimens (AMNH 765522, RMNH 66.164231) appear to be dark-naped, dark-breasted, and broad-tailed *interjecta* not *togoensis*. More observations are needed, as are specimens of known song and parasitic behaviour.

Specimens of *togoensis* are known from Sierra Leone (Karina), "Liberia" (no locality, tail missing, see Louette 1978), Ivory Coast (Bandama), Ghana (Gambaga, Kete Kratschi the type locality, Kete), Togo (Mangu, Paio), and Chad (Gore); the last is rather worn but has a slender tail (23 mm).

Vidua interjecta is widespread throughout the range of *Pytilia phoenicoptera*, its apparent foster species. I saw males with very long tails that appeared broader-vented than the width of the head in Mole National Park, Ghana, in October 1985, near Zaria, Nigeria, from July to September 1968, and in Yankari National Park, Nigeria, in November 1980. In all of these localities the common pytilia is *P. phoenicoptera* (Greig-Smith 1976, Fry 1975, Crick & Marshall 1981). Specimens are known for Mole and Zaria and photographs for Yankari (Fig. 1). A male photographed at the motel dam at Mole appears narrow-tailed quite yellow across most of the underparts without the deep russet breast of most specimens of *interjecta* including the one skin specimen seen at the Mole National Park headquarters. *P. hypogrammica* has been observed at Mole (Greig-Smith 1976).

Specimens of male *interjecta* in breeding plumage are known from Guinea (Cercle de Faranah), Mali (Bamako, Kaulikoro), Ghana (Mole N.P.), Nigeria (Karu, Enugu - see above, Yola 157 km NW, Zaria 8 km NW), Cameroon (Tibati 40 mi NE), Chad (Banda, Bahr Keela - this form?), Central African Republic (Gaza, Nola-Mbaiki - type locality, Fort Sibut; Bozoum), Zaire (Garamba P.N., Gangala-na-Bodio, Faradje), Sudan (Roma, Logoforok), and Ethiopia (Rimb, Borrage Kokolate, Baro-Bonga Fork).

Field identification of male whydahs is tricky because the apparent width of the tail varies with the angle of view and with flattening by the wind. Field estimates of tail length (distinguishing *orientalis* and *aucupum* from *interjecta* and *togoensis*) are risky, as early in the breeding season many birds are in breeding plumage except for the long rectrices which are the last to complete growth: some apparently short-tailed birds may be growing longer tails. In addition, males sometimes lose their long second rectrices while retaining the shorter, more pointed and broader first rectrices, making them appear shorter-tailed than when in complete plumage. The same is true in museum specimens: Bates (1933) distinguished *togoensis* as having display rectrices no wider than 25 mm and *interjecta* as wider than 25 mm; are based on the tail of its natural shape; my corresponding measurement of 30 mm is based on a flattened tail.

Questions remain about the whydah species. Are the females distinct

in plumage? Is there geographic variation within a species? Does the type specimen of *interjecta* in fact apply to a population that parasitizes *Pytilia phoenicoptera*? The type locality of *interjecta* is only vaguely known (between Nola and Mbaiki in the Central African Republic), and in this general area the more widespread pytilia is *P. hypogrammica*, according to the few records available. Do the two whydahs have different songs and different host species in the areas where they live in sympatry? To add to our understanding of the whydahs it would be helpful to distinguish the long-tailed forms by noting the nape colour, breast colour, and the shape of the tail. Photographs, specimens (skin, or even a long tail feather) and tape recordings would be useful. Current information indicates that two species are involved and that there is considerable geographic overlap between them (especially in Guinea and Sierra Leone, in Ghana and in Cameroon) from east to west, though they may in large part sort out north and south as do their foster species.

Vidua chalybeata, *V. wilsoni*, *V. raricola*, *V. larvata*, *V. funerea*

The indigobirds or combassous include several species. Most published field observations of indigobirds do not give sufficient detail to allow identification. The species indicated above differ from the species recognized in earlier standard works; details are available in a review (Payne 1982).

Vidua chalybeata, the Village Indigobird, extends cross the sahel and neighbouring vegetation zones from Mauritania and Senegal to Sudan and Ethiopia and through east and southern Africa. In West Africa it is distinguished by its black wings and tail and by orangish feet in the breeding males. It parasitizes the widespread Senegal or Red-billed Firefinch *Lagonosticta senegala*, and its range extends through most of that of the foster species. The young mimic the begging calls of their foster species and the adult males mimic the calls and songs of the young and adults of the foster species, as well as other indigobirds of its species (Nicolai 1964, Payne 1973). Male *V. chalybeata* vary in breeding plumage from greenish (Senegal and neighbouring areas) to bluish (Senegal to Sudan); males in most Ethiopian populations are purplish. The females can scarcely be distinguished from females of other indigobird species in West Africa. On average they may have brighter orange feet when alive, and they average smaller (wing length) than other forms except for *V. wilsoni* (Payne 1982).

V. wilsoni, Wilson's Indigobird, extends through most of the range of its foster species, the Bar-breasted Firefinch *L. rufopicta*. Males in breeding plumage are purplish-glossed and have light brownish edges and darker brown vanes to the flight feathers. They are distinguished from other species known in West Africa by the purplish plumage, and from *V. c. ultramarina* in eastern Sudan and Ethiopia by the lack of a glossy sheen as well as by the brown not black wings. Females shot or captured from males at their courting and singing sites, at present cannot be distinguished from other indigobirds. *V. wilsoni* is a species-specific brood parasite of *L. rufopicta*; the adult males mimic their songs and calls. The songs are characterized by a jingle of often several notes per second, each note differing in pitch from the one before. The alarm calls are distinctive as well. Audiospectrograms of foster species and indigobirds are in Payne (1982). These indigobirds and the three remaining species are best identified by song, through knowing the songs and calls of the firefinch species. The range of *V. wilsoni* extends from Senegal and The Gambia through Guinea-Bissau, Ghana, Togo, Nigeria, Cameroon, Central African Republic, northeastern Zaire, and Sudan (Payne 1982); one specimen is known from western Ethiopia (Gambela) as well (USNM 568295).

V. wilsoni includes as a synonym "*Hypochera lorenzi*" (Nicolai 1972).

The description of *V. wilsoni* applies to both, in plumage and in behaviour (Payne 1982).

V. funerea, the Variable Indigobird, extends through the range of its foster species, the African Firefinch *L. rubricata*. (Neither it nor any other form of indigobird is known to be associated with the firefinch *L. virata*, which may be a distinct species or a race of *L. rhodopareia* or *L. rubricata*, see Nicolai 1982, Payne 1982, Payne & Louette 1983). Males have light brownish edges and darker brown vanes of the flight feathers. Males in breeding plumage in Sierra Leone and in Cameroon are glossy blue; males in northern Nigeria are green. Further east and south the populations of this species vary from green to blue to purplish in a complex pattern (Payne 1973, 1982). Males mimic the songs and calls of their foster species, *L. rubricata*. Females are indistinguishable in size and plumage from other species in West Africa although they are distinguishable in southern Africa.

V. raricola, the Jambandu Indigobird, lives within the range of its foster species, the Black-bellied Firefinch *L. rara*. Males have light brownish edges of the brown flight feathers. The glossy plumage varies from greenish in northern Cameroon (Banyo) and in Sierra Leone (Kabala) to bluish-green in Ghana (Mole National Park), the only localities where individual birds have been saved as specimens after their songs were tape recorded. Females are indistinguishable in size and plumage from other indigobirds in West Africa. Males mimic the songs and calls of *L. rara*.

V. larvaticola, the Bako Indigobird, lives within the range of its foster species, the Black-faced Firefinch *L. larvata* (including *L. l. vinacea*). Males tape-recorded as they mimicked the songs of this firefinch and then collected at Zaria and Panshanu, northern Nigeria, ranged from bluish-green to blue in the gloss of the breeding plumage. The range as pieced together from museum specimens extends from The Gambia and Guinea to Ethiopia. Because the last three species of indigobirds all have variable plumage colour (blue to green) it is not known whether the bluish-glossed birds of the Ivory Coast and Ghana are this species; I have tentatively regarded them so (Payne 1982). Females are not morphologically distinguishable in any obvious way from the other indigobirds.

"Bako" in Hausa refers to guest or visitor, an appropriate name for a brood parasite. The name is phonetically similar to "baki" (f. "baka"), indicating "black, very dark blue, or very dark green" - also appropriate for the male breeding plumage.

Because the indigobird song is learned from the bird's social experiences with its foster parents, and the adults cannot consistently be distinguished in all sexes and localities from other species, it was not possible to test the idea that the indigobird formed a set of distinct species until after some genetically-determined traits were known. With recent field work it has been determined that the nestlings mimic the colours and patterns of the mouths of their foster species (Table 1). In two species in southern Africa the young birds have been raised from nestlings to adult male breeding plumage to verify that the young with different mouth colours grow up to be different adults (Payne 1977, 1982). Because the eggs and young found in most nests are taken by predators, nestlings of the other indigobirds found in the field could be raised in captivity, to determine whether they develop into the kinds of adults that mimic the songs of the same foster species.

Table 1 Mouth patterns of nestling indigobirds and firefinches in West Africa^a

Indigobird	Firefinch	Colours of mouth lining and gape			
		tubercles tip/base	gape	horny palate	buccal cavity
<i>V. chalybeata</i>	<i>L. senegala</i>	white/blue	blue	pastel yellow	orange
<i>V. wilsoni</i>	<i>L. rufopicta</i>	white flange, no tubercles	white to dark blue	reddish lilac	reddish lilac
<i>V. funerea</i>	<i>L. rubricata</i>	blue	blue-black	pale yellow	pink
<i>V. raricola</i>	<i>L. rara</i>	pale blue/dark blue	violet red to bluish grey	purplish-white to purplish grey	purplish white to reddish lilac, lateral spots
<i>V. larvaticola</i>	<i>L. larvata</i>	pale blue/dark blue	dark blue to pale yellow	pale yellow	violet red orange

^a Summarized from Payne 1982. All species have a ring of five black spots on the roof of the mouth (sometimes the two posterior spots are missing, especially in *L. senegala* and *L. rufopicta*). For illustrations see Nicolai (1964, 1972), Morel (1973), Payne (1973, 1982).

All five species are known to live in immediate sympatry with distinctive behaviour and morphology with at least one other species, and to maintain their local identity. For example at Banyo, Cameroon, all blue males mimicked the songs of *L. rubricata*, all green males mimicked the songs of *L. rara*, and all purplish males mimicked *L. rufopicta* (Payne 1982, Payne & Groschupf 1984). At Panshanu, Nigeria, all blue males mimicked *L. larvata* and all green males mimicked *L. rubricata*. The combination of different male plumages in coexisting populations of indigobirds with different foster-species song mimicry, and of the mouth colour differences in the young indigobirds, together were necessary to show that they were distinct species.

The earlier names "*camerunensis*" and "*nigeriae*" were dropped because of doubt to which kinds of indigobirds the type specimens applied. The type of "*camerunensis*" was collected between Nola and Mbaiki in the southern Central African Republic. The firefinches *L. rubricata*, *L. rara*, and *L. larvata* all live in this general area, and any might have been the foster species of the type specimen. Because West African populations indigobirds with blue plumage (like "*camerunensis*") are known that mimic each of these firefinch species, it is doubtful that "*camerunensis*" can be applied critically to any one of them. The name *camerunensis* is a *nomen dubium* and it was considered desirable to drop its use and necessary to describe two new species (*V. raricola*, *V. larvaticola*) (Payne 1982). A similar argument applies to the use of the name "*nigeriae*", because some green indigobirds in Nigeria and neighbouring Cameroon mimic *L. rubricata*, others mimic *L. rara*, and still others *L. larvata*. The type specimen is intermediate in size between the larger *L. rubricata* mimics and the smaller mimics of *L. rara* and *L. larvata*, so it is impossible to determine that it goes with one or another kind of indigobird.

Vidua macroura

Pin-tailed Whydahs *Vidua macroura* are widespread in West Africa from Senegal eastwards to Sudan and also are common in eastern and southern Africa in grassy habitats. The males differ from the other West African viduines in song, which appears not to mimic the foster species (Nicolai 1964). They are not restricted to a single species of fosterer in their parasitism. On distributional grounds it is likely they parasitize several waxbills of the genus *Estrilda* in West Africa, including the Common Waxbill *E. astrild*, Black-rumped Waxbill *E. troglodytes* and Orange-cheeked Waxbill *E. melpodia*. All these waxbills have young with nearly identical mouth patterns and colours, and the juvenile *V. macroura* that I have seen all have the same appearance. *V. macroura* may also parasitize other species, but the evidence is not definite. They feed with Orange-breasted Waxbill *E. subflava*, but the young of this waxbill have a cream-coloured mouth and lack the colours of the other known waxbills. Young have also been seen feeding with family groups of Bronze Mannikins *Lonchura cucullata* but young mannikins have a horseshoe-pattern in the mouth and not the spots characteristic of the waxbills. I know of no nestling whydahs in the nest of a mannikin. The association of young viduines with family groups of finches is not definitive evidence of parasitism as the young viduines may join any small group of finches. These records (e.g. Macdonald 1980) are questionable, as are records based on unidentified viduine eggs or other white eggs in the nests of other estrildids and even other kinds of birds (Friedmann 1950, critique in Nicolai 1964).

The occurrence of a single *Estrilda* species in an area where *V. macroura*

occurs would be reasonable indirect evidence of the local parasitism of the *Estrilda* species. In most areas more than one kind of *Estrilda* is known, however. *E. astrild* is parasitized as the only foster species in parts of southern and eastern Africa, and the occurrence of this species with *V. macroura* on Bioko (Fernando Po) suggests local parasitism, though *E. nonnula* occurs there as well. *E. melpoda* is the common waxbill at Mole National Park and its habitat matches that of the local *V. macroura* (Greig-Smith 1976), and it is probably the local foster species. In the other West African localities where I found *V. macroura* I saw both the Orange-cheeked Waxbill *E. melpoda* and either *E. troglodytes* or *E. astrild*, so cannot say for certain whether one or all are used as foster species. The Anambra Waxbill *E. poliopareia* is another probable foster species; it is closely related to the Fawn-breasted Waxbill *E. paludicola* which is the only local foster species in parts of northwestern Zambia. Local studies are needed to determine the brood parasitism of the whydahs in West Africa. The breeding displays of *V. macroura* have been described in northern Ghana (Shaw 1984).

ACKNOWLEDGEMENTS

I am grateful to Mary Gartshore Dyer for making available her photographs of the young of *Lagonosticta rara*, *L. larvata*, and *V. larvaticola*. In my field work I was assisted by Christopher Risley, Randy Breitwisch, and Kathy Groschupf. The curators of several museums, especially the American Museum of Natural History, U.S. National Museum, Muséum National d'Histoire Naturelle (Paris), and British Museum (Natural History), allowed me repeatedly to examine specimens in their care. Field work was supported by the National Science Foundation and the National Geographic Society.

REFERENCES

- BATES, G.L. (1933) Northern races of *Steganura paradisaea*. *Bull. Br. Orn. Cl.* 53: 179-181
- BENSON, C.W. & PITMAN, C.R.S. (1964) Further breeding records from Northern Rhodesia (no. 4). *Bull. Brit. Orn. Cl.* 84: 54-60
- CRICK, H.Q.P. & MARSHALL, P.J. (1981) The birds of Yankari Game Reserve, Nigeria: their abundance and seasonal occurrence. *Malimbus* 3: 103-114
- FRIEDMANN, H. (1960) The parasitic weaverbirds. *U.S. Nat. Museum Bull.* 223
- FRY, C.H. (1975) The birds of Zaria, IV - residents, vagrants, and check-list (passerines). *Nigerian Orn. Soc. Bull.* 4: 91-101
- GORE, M.E.J. (1981) Birds of The Gambia. *B.O.U. Check-list No.* 3.
- GREIG-SMITH, P.W. (1976) The composition and habitat preferences of the avifauna of Mole National Park, Ghana. *Nigerian Orn. Soc. Bull.* 12: 49-66
- LOUETTE, M. (1978) Contribution to the ornithology of Liberia (part 4). *Rev. Zool. Afr.* 92: 639-643
- LOUETTE, M. (1981) The birds of Cameroon, an annotated check-list. *Verh. Konink. Acad. Wetensch. Lett. schone Kunst. Belgie* 43, no. 163

- MACDONALD, M.A. (1980) Observations on Wilson's Widowfinch and the Pintailed Whydah in southern Ghana, with notes on their hosts. *Ostrich* 51: 21-24
- MALZY, P. (1962) La faune avienne du Mali (Bassin du Niger). *L'Oiseau et Rev Fr. Orn.* 32: no. special
- MOREL, M.-Y. (1973) Contribution à l'étude dynamique de la population de *Lagonosticta senegala* L. (estrilidides) à Richard-Toll (Sénégal). Interrelations avec le parasite *Hypochera chalybeata* (Müller) (viduinés). *Mém. Muséum National d'Histoire Naturelle, Paris, Sér. A. Zool.* 78: 1-156
- NICOLAI, J. (1964) Der Brutparasitismus der Viduinae als ethologisches Problem. *Z. Tierpsychol.* 21: 129-204
- NICOLAI, J. (1968) Wirtsvogelbeziehungen der *Hypochera*-Formen *camerunensis* und *nigeriae*. *Naturwiss* 55: 654
- NICOLAI, J. (1972) Zwei neue *Hypochera*-Arten aus West Afrika (Ploceidae, Viduinae). *J. Orn.* 113: 229-240
- NICOLAI, J. (1977) Der Rotmaskenstrild (*Pytilia hypogrammica*) als Wirt der Togo-Paradieswitwe (*Steganura cogoensis*). *J. Orn.* 118: 175-188
- NICOLAI, J. (1982) Comportement, voix et relations de parents de l'Amaranthe du Mali (*Lagonosticta virata*). *Malimbus* 4: 9-14
- PAYNE, R.B. (1968) Mimicry and relationships in the indigobirds or combassous of Nigeria. *Nigerian Orn. Soc. Bull.* 5: 57-60
- PAYNE, R.B. (1971) Paradise whydas *Vidua paradisaea* and *V. obtusa* of southern and eastern Africa, with notes on differentiation of the females. *Bull. Br. Orn. Cl.* 91: 66-76
- PAYNE, R.B. (1973) Behavior, mimetic songs and song dialects, and relationships of the parasitic indigobirds (*Vidua*) of Africa. *Orn. Monogr.* 11.
- PAYNE, R.B. (1976) Song mimicry and species relationships among the West African pale-winged indigobirds. *Auk* 93: 25-38
- PAYNE, R.B. (1977) Clutch size, egg size, and the consequences of single vs. multiple parasitism in parasitic finches. *Ecology* 58: 500-513
- PAYNE, R.B. (1980) Behavior and songs in hybrid parasitic finches. *Auk* 97: 118-134
- PAYNE, R.B. (1982) Species limits in the indigobirds (Ploceidae, *Vidua*) of West Africa: mouth mimicry, song mimicry, and description of new species. *Misc. Publ. Univ. Mich. Museum of Zoology* 162.
- PAYNE, R.B. & GROSCHUPF, K.D. (1984) Sexual selection and interspecific competition: a field experiment on territorial behavior of nonparental finches (*Vidua* spp.). *Auk* 101: 140-145
- PAYNE, R.B. & LOUETTE, M. (1983) What is *Lagonosticta umbrinodorsalis* Reichenow 1910? *Mitt. Zool. Museum Berlin* 59, *Ann. Orn.* 7: 157-161

- PAYNE, R.B. & PAYNE, K. (1977) Social organization and mating success in local song population of Village Indigobirds, *Vidua chalybeata*. *Z. Tierpsychol.* 45: 113-173
- SERLE, W. (1949) Birds of Sierra Leone (part IV). *Ostrich* 20: 114-126
- SHAW, P. (1984) The social behaviour of the Pin-tailed Whydah *Vidua macroura* in northern Ghana. *Ibis* 126: 463-473
- THIOLLAY, J.-M. (1985) The birds of Ivory Coast: status and distribution. *Malimbus* 7: 1-59
- TRAYLOR, M.A. (1968) Family ploceidae, subfamily viduinae. In: *Checklist of Birds of the World*, vol. 14, ed. R.A. Paynter, Jr. Harvard University Press, Cambridge, Mass.
- VAN DEN ELZEN, R. & KONIG, C. (1983) Vögel des (Sud-) Sudan: taxonomische und tiergeographische Bemerkungen. *Bonn. Zool. Beitr.* 34: 149-196
- WILLIAMS, J.G. & KEITH, G.S. (1962) A contribution to our knowledge of the Parasitic Weaver, *Anomalospiza imberbis*. *Bull. Br. Orn. Cl.* 82: 141-142
- WOLTERS, H. (1963) Zur Rassengliederung von *Pytilia melba* (L.). *J. Orn.* 104: 185-190
- WOLTERS, H.E. (1977) Über die westafrikanischen Rassen des Buntastrilds, *Pytilia melba* (L.) (Aves, Estrildidae). *Bonn. Zool. Beitr.* 28: 324-330