

since 1938 (Sick & Teixeira 1979). In any case, the establishment of the first protected areas for the northeastern Atlantic Forests is an urgent need.

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## African Reed Warblers in northern Nigeria; morphometrics and the taxonomic debate

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African Reed Warblers *Acrocephalus baeticatus* are widely distributed over much of southern and east-central Africa, but are apparently more local in the northern tropics (Hall & Moreau 1970). The discovery on the shores of Lake Chad of a population of *A. baeticatus* (formerly believed to be *A. dumetorum*—Ash *et al.* 1967) and the suggestion that *A. baeticatus* be considered conspecific with *A. dumetorum* (Fry *et al.* 1974), together with Clancey's (1975) reclassification of *A. baeticatus* as 2 parapatric species (*A. baeticatus* and *A. cinnamomeus*) has resulted in renewed debate with regard to the taxonomy of this difficult group (Dowsett & Lemaire 1976, Fry & Ferguson-Lees 1977, Devillers & Dowsett-Lemaire 1978).

Until recently African Reed Warblers were known from only 3 localities in Nigeria; at Malamfatori (Lake Chad), at Serti in southeast Nigeria and at Ibadan in the southwest (Elgood 1982). The newly discovered population at Jekara, some 30 km ENE of Kano, Nigeria (Wilkinson & Aidley 1982) is of interest in that it lies between the Lake Chad population, previously described as *A. baeticatus hopsoni* and thought to represent a unique gene pool (Fry *et al.* 1974), and the more southerly Nigerian populations, presumably *A. c. cinnamomeus* (see Clancey 1975, and maps in Fry *et al.* 1974, and Fry & Ferguson-Lees 1977).

As part of a larger study of the avifauna of Jekara Dam (12°40'N, 8°10'E), mist netting was undertaken, normally twice monthly, from October 1981 to October 1982, in paths cut in the *Typha*-dominated waterside vegetation. African Reed Warblers were caught in every month from October 1981 until June 1982, and again in October 1982. These were distinguished from the



overwintering Palaearctic Reed Warblers *A. scirpaceus* by wing formula, *A. baeticatus* having P2 shorter than P6 rather than longer as in *A. scirpaceus* (Bannerman 1953). Numbering the primaries ascendantly from the outermost P1 inwards to P10 is followed in recording wing formulae. The shorter wing length of *A. baeticatus* also normally distinguished it from *A. scirpaceus*, but some overlap did occur and differences in wing formulae proved more reliable. A total of 37 individuals (excluding retraps) was handled and wing lengths (maximum-chord) were recorded for all of these; additionally morphometric data, including weight, tail-, tarsus- bill-lengths and wing formula were obtained for most of them. Description of colour in the field was considered to be unreliable and was not attempted for the Jekara birds.

TABLE 1

Measurements of African Reed Warblers *Acrocephalus baeticatus* from Arrigui (Niger), Malamfatori (Lake Chad), Jekara (N. Nigeria) and Darfur (Sudan). Means are given with range in parenthesis; all linear measurements are mm.

	Weight (g)	Wing	Tail	Tarsus	Bill
Arrigui 19°06'N, 12°55'E		54.7(53-57) N=11			
Malamfatori 13°37'N, 13°23'E	8.4(6.3-9.3) N=8	58.0(56.5-59) N=5	50.7(50-52) N=5	20.7(20.5-23) N=5	(16-16.5) N=5
Jekara 12°40'N, 08°10'E	8.9(7.8-12.5) N=35	56.7(54-62) N=37	47.5(44-55) N=23	22.3(21-24) N=26	15.6(14-17) N=23
Darfur Zalingei: 12°51'N, 23°29'E		53.8(50.5-55.5)	46.9(43-52)	20.4(18.5-22)	
Kulme: 12°35'N, 23°37'E		N=8	N=8	N=8	

#### Morphometric data.

Table 1 presents the data for the Jekara birds together with the published data of Fry *et al.* (1974) and Devillers & Dowsett-Lemaire (1981) for birds from neighbouring populations. In average wing-length and tail-length the Jekara birds are intermediate between the Lake Chad population of *hopsoni* and *cinnamomeus* from the Sudan. The mean tarsus measurements are larger for the Jekara birds than for any other series, but we cannot be sure whether these differences are real or reflect differences in the method of taking this measurement. Although mean values for tail and wing-lengths at Malamfatori are slightly larger than for the Jekara birds, all Lake Chad specimens fall within the range of measurements of Jekara birds with respect to tail-, wing- and bill-length, but many more birds have been measured at Jekara than elsewhere. It is possible that with bigger samples from Chad and Darfur the difference would not be significant. The range of weights suggests that the Jekara birds are somewhat heavier than their neighbours at Lake Chad. However, weights for 33 out of 35 Jekara birds fell within the range 7.8 – 9.8 g (mean=8.8), the 2 exceptions being one bird of 11.4 g on 3 May, and another weighing 12.5 g on 6 April. These 2 exceptions may have been females about to lay. Fry *et al.* (1974) suggest that African Reed Warblers at Lake Chad were ready to breed from April onwards.



TABLE 2

Wing formulae of African Reed Warblers *Acrocephalus baeticatus* from Arrigui (Niger), Malamfatori (Lake Chad), Jekara (N. Nigeria) and Darfur (Sudan)

	2nd primary falls	10th pry. shortfall	Wing point
		Mean range	
Arrigui 19°06'N, 12°55'E	between 7th & 8th N=11	9.5(8-11) N=11	
Malamfatori 13°37'N, 13°23'E	equals 6th-7th N=5	(9-11) N=5	P <sub>3</sub> N=1
Jekara 12°40'N, 08°10'E	between 6th & 10th (mean 8, median 8) N=29	8.4(6-10) N=24	P <sub>3-4/5</sub> N=29
Darfur Zalingei: 12°51'N, 23°29'E Kulme: 12°35'N, 23°37'E	between 6th & 8th	(5-8)	4?*

Note. \*From Fig. 2 in Fry *et al.* (1974).

Of 29 Jekara birds examined for wing formula (Table 2), the second primary fell between the 6th and 7th or equalled the 7th in 9 birds, between the 7th and 8th or equalled the 8th in 15 birds, and exceeded the 8th in 5 birds. In the 5 specimens from Lake Chad examined by Fry *et al.* (1974), the second primary equalled the 6th - 7th. Thus in this respect the Jekara birds more closely approach those from Arrigui and Darfur than those from Lake Chad. A further difference in wing formulae between the Lake Chad skins and the Jekara birds is suggested by the type specimen of *A. b. hopsoni*, which has the wing point at the 3rd primary (Fry *et al.* 1974), rather than, as normally in the Jekara birds, at the 4th primary (22 of 29 birds examined), and only once at the 3rd primary. In the latter case the bird was also aberrant for some reason in having P<sub>4</sub> shorter than both P<sub>3</sub> and P<sub>5</sub>, perhaps indicating a failure of this feather to grow normally. With regard to the 10th primary shortfall (*sensu* Fry *et al.* 1974), the range for the Jekara birds bridges that between the Arrigui and Lake Chad specimens and those from Darfur.

### Discussion

We have no skins of the Jekara birds, but in defining the Lake Chad population as *Acrocephalus baeticatus hopsoni*, Fry *et al.* (1974) state that the race is less rusty and lacks the rufous wash of *cinnamomeus*. In contrast, Devillers & Dowsett-Lemaire (1978) failed to find any difference in colouration between skins from Lake Chad, Arrigui (Niger) and *cinnamomeus* from Darfur (Sudan). *A. b. hopsoni* was secondly differentiated by Fry *et al.* (1974) in having a longer wing and a greater 10th primary shortfall than *cinnamomeus*. However, since the Lake Chad specimens fall within the range established for Jekara birds with respect to tail-, wing- and bill-lengths it could be argued that the Jekara population is *hopsoni*. On the other hand, the average wing- and tail-lengths of the Jekara birds were intermediate between those of *hopsoni* and *cinnamomeus*. Fry & Ferguson-Lees (1977) comment on a cline in wing-length in *cinnamomeus*, with the more northerly populations approaching *hopsoni* in this respect. We suggest that *hopsoni* continues this cline and question the ecological isolation of this race. In agreement with this suggestion we note that in the measurements of the 10th primary shortfall, the range in the Jekara birds bridges those of the Chad and Arrigui series and the *cinnamomeus* specimens from Darfur. Although we remain cautious of the above comparisons of wing formulae (these may differ



between live birds and museum specimens—Mead 1977), when considered together with the other data we must concur with Devillers & Dowsett-Lemaire (1978) in questioning the validity of *hopsoni*.

The Jekara population, although some 550 km from Malamfatori, Lake Chad, must cast doubt on the ecological isolation of the Lake Chad population. Jekara dam is a man-made, construction, which was completed in October 1976. The presumably recent invasion of this habitat attests to the mobility of these small warblers, a view supported by their apparent seasonal occurrence at Lake Chad (Fry *et al.* 1974). Similar waterside habitats that may hold *A. baeticatus* occur in other areas of Northern Nigeria between Kano and Lake Chad but to our knowledge none has been systematically worked.

Finally we suggest that the apparent similarity between the most northerly populations in the northern tropics and those from southern Africa may represent convergent evolution of these populations. Contrary to Fry & Ferguson-Lees (1977), we consider this the most probable of the 4 explanations they offer for this similarity. If Clancey's (1975) reclassification of *A. baeticatus* as 2 species is adopted, we would place '*hopsoni*' and similar populations with the northerly *A. cinnamomeus* and not, as previously suggested by Fry & Ferguson-Lees (1977), with the southerly *A. baeticatus*. However, in the absence of more certain data we concur with the latter authors that all African Reed Warblers may presently be best represented as a single polytypic species.

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