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## The taxonomy of the Green Barbets (Aves: Lybiidae) of the Eastern Afrotropics

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**Abstract.** The Green Barbet group is distributed in a disrupted chain of isolated populations from coastal Kenya and north-eastern Tanzania, south to Zululand in South Africa. The phylogenetic background to the group is obscure and has resulted in the forms concerned being placed in six different genera since being introduced to science by G. E. Shelley in 1880. A re-assessment of the taxonomy of the complex based on a study of its morphological parameters, evolutionary radiation and ecological backgrounds, vocalization and unique employment of non-vocally produced sounds in response to the playing of recordings of its voice, etc., confirms that it is more satisfactory to assemble Green Barbet forms in their own genus — *Cryptolybia* — rather than merge them with the widely differing savanna barbet plexus currently arranged in the genus *Stactolaema*. It was also concluded that *Cryptolybia* is a polytypic genus comprising two allospecies (*C. olivacea* and *C. woodwardi*), both of which in turn are polytypic, this approach being preferable to according it monotypic status. The taxon *belcheri* of southern Malawi and adjacent northern Mozambique is left as a subspecies of *C. olivacea* pending further field research. **Key words.** Aves, Lybiidae\*), *Cryptolybia*, Africa, radiation, allospecies, behaviour, canopy.

The so-called Green Barbet of the genus *Cryptolybia* (vide Clancey, 1979a; Wolters, 1976 & 1980) ranges disruptedly from coastal Kenya to the eastern highlands of Tanzania, south-west to the mountains clustered round the northern end of Lake Malawi. South of this fragmented chain of three closely similar subspecies (see Jensen & Stuart, 1982), a single distinctive isolate is found in forest on the Rondo Plateau, south-west of Lindi, in the south-east of Tanzania (Clancey, 1979b), with a further group of montane forest birds present in the southern highlands of Malawi and immediately adjacent Mozambique. These last ones are sharply differentiated from the foregoing taxa in being olivaceous black along the sides of the head and on the fore-throat to the upper breast. The final isolate of the present complex occurs far to the south in the Ngoye Forest in Zululand, its closest morphological analogue being the equally small Rondo Plateau population, both of which are distinctive in having lemon yellow superciliary streaks, ear-coverts and temporal surfaces. The forms of the present barbet complex are largely olivaceous with a brownish pileum and yellowish edges to the outer vanes of the remiges, and lack white in any part of the plumage. They affect the canopy of evergreen lowland and sub-montane forest and are completely sedentary.

The generic treatment of the African Green Barbets has varied widely ever since Shelley, in 1880, described *Barbatula olivacea* from a small forest near Mombasa, in coastal Kenya, the species being placed over the years in the following genera:

\*) Lybiidae used in furtherance of the recommendation of Sibley et al., 1988 (The Auk 105: 409—423) to separate the African from New World Barbets, where use of the family Capitonidae is restricted to Central and South American taxa.

*Barbatula* Lesson, 1837 — pre-occupied

*Pogoniulus* Lafresnaye, 1844 — type-species *Bucco pusillus* Dumont, 1816

*Gymnobucco* Bonaparte, 1850 — type-species *Bucco calvus* Lafresnaye, 1841

*Buccanodon* Hartlaub, 1857 — type-species *Barbatula duchailloi* Cassin, 1855

*Stactolaema* Marshall & Marshall, 1870 — type-species *Buccanodon anchietae* Bocage, 1869

*Cryptolybia* Clancey, 1979 — type-species *Barbatula olivacea* Shelley, 1880.

The most recent researched contributions on Afrotropical barbets are those of Short and Horne (1985) and their 1988 treatment of the family Lybiidae in "The Birds of Africa", volume 3, and the slightly earlier generic assessment of the family by Wolters (1976). In his contribution Wolters placed *C. olivacea* in the subgenus *Stactolaema* of the genus *Gymnobucco*, at the same time pointing out that *olivacea* was probably worthy of arrangement in a separate monotypic genus. Later, Goodwin (in Goodwin & Clancey, 1978), viewed *olivacea* as an enlarged tinkerbird or tinker barbet, placing it in *Pogoniulus*. Subsequently, disavowing this and following the comment of Wolters (1976), Clancey (1979a) erected the genus *Cryptolybia* for the Green Barbet complex, with the type-species *Barbatula olivacea* Shelley, 1880. In the "Anmerkungen, Berichtigungen und Nachträge" to his "Vogelarten", Wolters recognised *Cryptolybia* as a valid taxon, but recently Short & Horne (1985, 1988) have argued in favour of merging it with *Stactolaema*, in which genus Peters (1948) had earlier arranged *olivacea*.

The type-species of *Stactolaema* is *S. anchietae* (Bocage) described from Angola, which, with the closely allied *S. whytii* (Shelley), is one of a parapatric species pair of savanna woodland barbets, unlike *C. olivacea* which is a strict denizen of the canopy of evergreen forest. This ecological difference is manifest in the sharply patterned and variegated nature of the plumage of *Stactolaema* forms as determined on the characters of the type-species, and contrasts sharply with the duller and plainer facies of *Cryptolybia*, which is in accord with the reduction of crypsis and increase in greenness of plumage in a wide range of equatorial rain-forest woodpeckers, barbets and honeyguides. The highly vicariant distribution of the Green Barbets is traceable to the decline and fragmentation of evergreen forest in eastern and south-eastern Africa concordant with the westward retreat of the Lower Guinea Forest over the past 10 000 years. In East Africa the said forest reached its climactic stage some 18 000 years BP.

In his arrangement of 1976, Wolters treated *olivacea* as of the subgenus *Stactolaema* in a composite and disparate genus *Gymnobucco*, some members of which are largely bald. However, it is separable at generic level from all other taxa grouped in *Gymnobucco* by Wolters on the basis of the fully developed webs of the feathers of the hind head and the neck, and by having the arc of the culmen absolutely smooth and not moderately elevated proximally as in *Stactolaema* spp. and *Gymnobucco*, sens. strict. Apart from morphological characters, other parameters are not infrequently of considerable use in resolving otherwise intractable taxonomic issues. Territorial behaviour is such and may be used in conjunction with the evolutionary and environmental indicators enumerated in Table 1. Short & Horne (1980) (see also Dowsett-Lemaire & Dowsett, 1987), writing on East African birds, describe non-vocal audible response on the part of the present barbet to recordings of its distinctive "chowp chowp" vocalization in the form of the production of wing-rustling



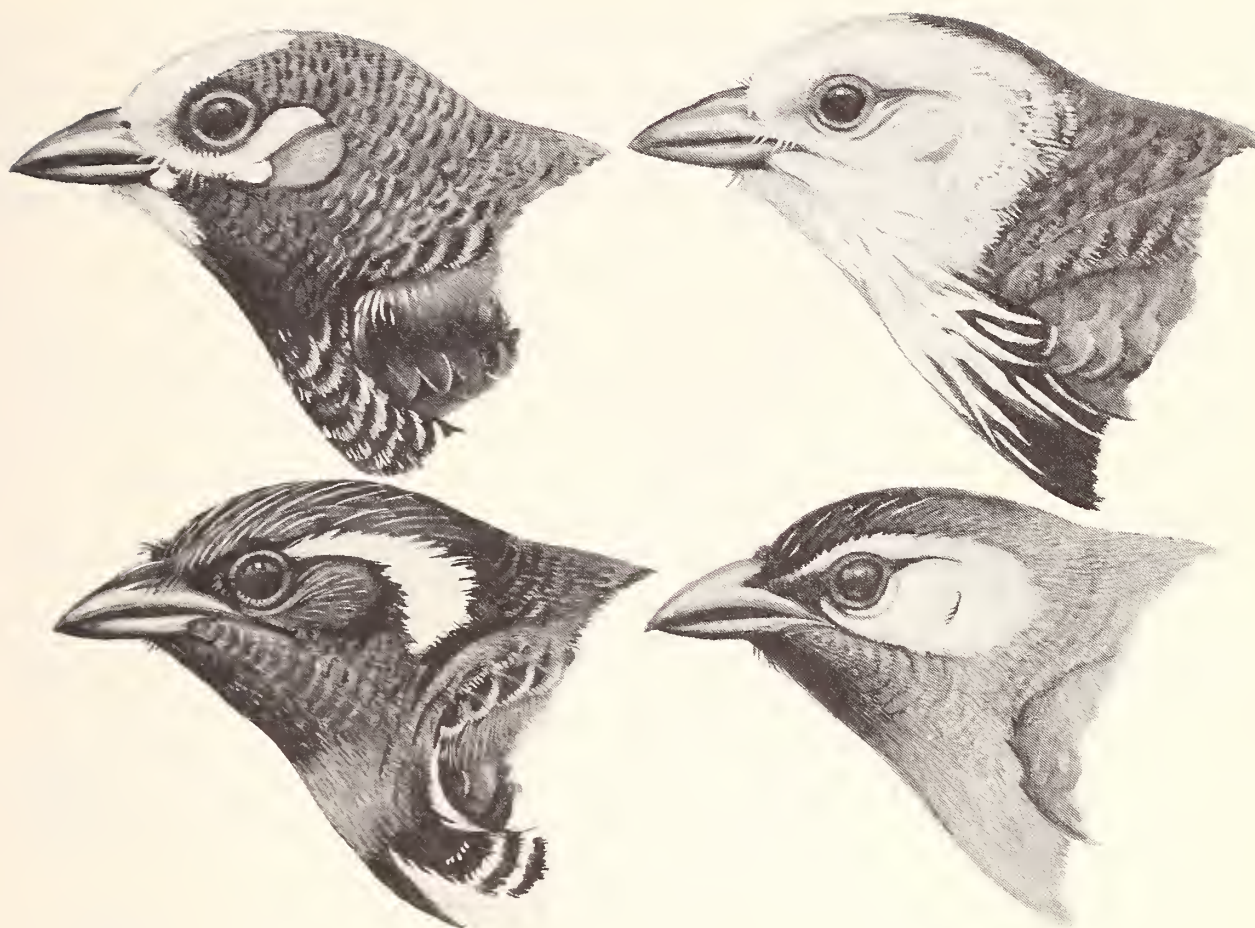


Fig. 1: Heads of four Afrotropical barbets discussed in the present contribution to show marked variation in head pattern.

Upper left: *Stactolaema whytii sowerbyi* Sharpe

Upper right: *Stactolaema anchietae anchietae* (Bocage)

Lower left: *Stactolaema leucotis leucotis* (Sundevall)

Lower right: *Cryptolybia woodwardi woodwardi* (Shelley)

Note lighter body colouration of *C. woodwardi* and smooth arc of the culmen, which is basally slightly elevated in *Stactolaema* spp.

sounds. During a visit to the Ngoye Forest, Zululand, on 3 May, 1986, I was able to confirm similar territorial response to taped recordings of the normal call from a pair of this remote austral isolate attracted to the canopy above my head. As far as determined, comparable behaviour has not been noted in other African barbets, which additional territorial behavioural response may be viewed as a supplementary indicator of valid generic status.

Examination of the remiges of *C. olivacea* and *C. woodwardi*, as well as of *Stactolaema anchietae*, *S. whytii* and *S. leucotis*, reveals no remigial peculiarity which could be construed as functional in the creation of a non-vocal territorial response to taped calls. *C. olivacea* and *C. woodwardi* have the short first primary much broader and usually longer than in *Stactolaema* spp. (25–27, versus 18–23 mm), but about the same or somewhat less than in the cases of *Gymnobucco bonapartei*, *G. calvus*, *G. peli* and *G. sladeni*. These latter barbets differ conspicuously in having the nasal bristles denser and longer, vertical in arrangement and rusty buff, tipped with blackish brown in colour. In the wing-formulae of *Cryptolybia* spp., p 5 is the longest remex.

Table 1: The morphological, behavioural and other parameters in support of the recognition of the genera *Stactolaema* and *Cryptolybia* as valid, natural assemblages of Afrotropical barbets. — The reduction in the webbing to the feathering over the hind and lateral head surfaces alluded to under *Stactolaema* (Morphology [b]) is viewed as a thermoregulatory adaptation, which sees its culmination via *Gymnobucco bonapartei* in the almost completely bald state of such equatorial species as *G. calvus*, *G. peli* and *G. sladeni*

	<i>Stactolaema</i>	<i>Cryptolybia</i>
Immediate evolutionary horizon:	Recent; southern savanna woodland radiation	Pleistocene at height of glaciation. In climax forest. Two radiations, both relict.
Habitat:	Savanna woodland facies	Evergreen forest canopy.
Behaviour:	(a) Not strictly sedentary (b) No non-vocal territorial behaviour (c) Vocally undistinguished	Highly sedentary Wing-rustling aggressive territorial response. Distinctive vocalization.
Morphology:	(a) Pattern complex and with much visible white. No green in plumage (b) Feathers of hind and sides of head downy with poorly developed metallic blue-black webs. (Derived). (c) Arc of culmen basally slightly elevated and tending to the horizontal.	Plumage pattern simple, either bronzy or dull greenish olivaceous. No visible white. Feathers of said surfaces comparable with rest of contour feathering. (Ancestral).  Arc of culmen completely smooth.
Component species:	<i>S. anchietae</i> , subspp. <i>S. whytii</i> , subspp. <i>S. leucotis</i> , subspp.	<i>C. olivacea</i> , subspp. <i>C. (o.) belcheri</i> <i>C. woodwardi</i> , subspp.

Short & Horne have already advocated removal from *Gymnobucco* of those species grouped in the subgenus *Stactolaema* by Wolters, these being *anchietae*, *whytii* and *leucotis*, and, of course, *olivacea*. It is now submitted that this partitioning of *Gymnobucco*, with its current composition of disparate species, should be taken a stage further by recognising — notwithstanding the views of Short & Horne — *Cryptolybia* as a discrete monotypic genus, the differentiating criteria by which this may be sustained as laid out above in Table 1. Dr H. E. Wolters (15 December, 1988) intimates that he is now prepared to accept *Stactolaema* as a full genus in line with Short & Horne, with its subgenera *Phalacrobuco* Boetticher, 1951, and *Heliobucco* Shelley, 1889, and reaffirms his earlier acceptance, in 1980, of *Cryptolybia*.

As demonstrated earlier, the present barbet complex consists of highly disjunct populations, which form, on the basis of marked morphological characters, three groups with no established intergradation or contact between them. Only in the chain of montane isolates from the north-east to the south-west of Tanzania and northern Malawi is there a possibility of gene-interchange, yet there is no confirmation of this occurring between the three moderately differentiated subspecies involved in this sequence of populations. While the present distribution of these barbets indicates that they are capable of colonizing spread, they are singularly unadventurous



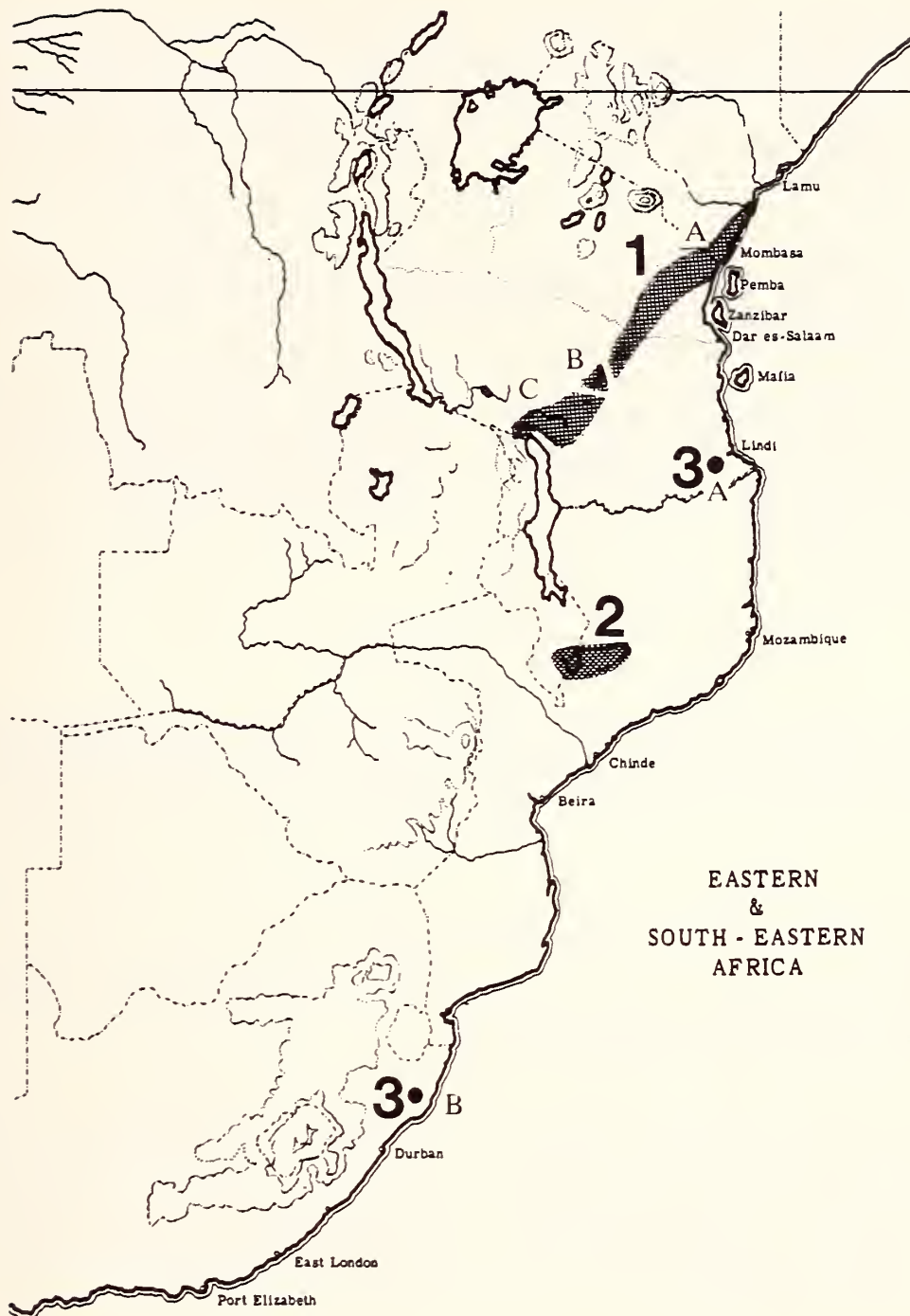


Fig. 2: Sketch-map showing the disposition of Green Barbet taxa in eastern and south-eastern Africa.

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|--------------------------------|---|
| 1. <i>Cryptolybia olivacea</i> | 2. <i>Cryptolybia (olivacea) belcheri</i> |
| A. <i>C. o. olivacea</i>       | 3. <i>Cryptolybia woodwardi</i>           |
| B. <i>C. o. howelli</i>        | A. <i>C. w. hylophona</i>                 |
| C. <i>C. o. rungweensis</i>    | B. <i>C. w. woodwardi</i>                 |

and sedentary today. Study of the pattern presented by contemporary *Cryptolybia* forms supports the contention that they derive from two chronologically staggered evolutionary radiations, the remnants of the earlier of the two now reduced to tiny populations occupying single and widely separated forests. Why this should be so is unclear, as the Ngoye Forest differs little from similar low altitude forests present along the entire interior verge of the south-eastern African lowlands, and supports no other comparable avian isolates. Interestingly, no competition from a barbet

species of like proportions and affecting evergreen forest canopy can be invoked as the underlying cause of the massive die-back of this particular group, which has resulted in it being now represented by northern and southern terminal isolated populations. Only a few hundred pairs of both isolates can now exist at the same time.

The three population groups of Green Barbets are identifiable on the basis of the criteria presented hereunder:

- |  |  |
|--|--|
| 1. Superciliary stripes and temporal surfaces dull olivaceous. Fore-throat largely light blackish olivaceous | Coastal Kenya and north-eastern to south-western Tanzania and northern Malawi highlands. |
|--|--|

*Cryptolybia olivacea*

with subspecies *C. o. olivacea* (Shelley)

*C. o. howelli* (Jensen & Stuart)

*C. o. rungweensis* (Benson)

For comments on subspecies see Jensen & Stuart (1982), the authors treating *C. o. uluguruensis* of Ripley & Heinrich of the Uluguru Range as synonymous with *C. o. olivacea*.

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|--|---|
| 2. As 1 above but with the lateral head, fore-throat and upper breast olivaceous black | Confined to southern Malawi on Cholo Mtn and adjacent northern Mozambique on Mt Namuli. |
|--|---|

*Cryptolybia (olivacea) belcheri* (Sclater)

- |   |  |
|---|--|
| 3. Differs from 1 above in having the superciliary streaks, ear-coverts and temporal surfaces of the head lemon yellow, which character may be viewed as plesiomorphic. | South-eastern Tanzania in the Nchin-gidi Forest, Rondo Plateau, SW of Lindi, and in the Ngoye Forest, Zululand, some 2150 km to the south. |
|---|--|

*Cryptolybia woodwardi*

with subspecies *C. w. hylophona* Clancey

*C. w. woodwardi* (Shelley)

For arrangement of subspecies see Clancey (1985).

The geographical variation exhibited by the populations dealt with in 1 above is given in the Jensen & Stuart publication cited. In the case of 3, this can also be found in the reference given. Short & Horne (1985, 1988) treat the Rondo Plateau and Zululand isolates as of the same subspecific taxon, yet ambivalently recognise three minor contiguous differentiates clustered on ranges from the Ulugurus to mountains round the northern end of Lake Malawi as valid subspecies, thus creating an indefensible arrangement, even for those favouring broad groupings of populations. The differences exhibited by the two *woodwardi* populations meet the requirement for differentiation at subspecies level, these being as follows:



*C. w. woodwardi*

Ngoye Forest  
Zululand

Wings of ♂ ♀ >90

Tails of ♂ ♀ >49

Culmens of ♂ ♀ >20.5

*C. w. hylophona*

Rondo Plateau,  
SE Tanzania

wings <88

tails <48

culmens <20

*C. w. hylophona* also differs from nominate *C. woodwardi* in having less distally extended lemon yellow superciliary streaks and in having both the streaks and the ear-coverts and temporal regions of the head a greener yellow. Other, more subtle differences are that it has the pileum somewhat browner, less olivaceous, and is paler and yellower ventrally, the lower fore-throat and entire breast less overlaid or washed with dusky olive. The upper mandible is usually longer, the tip of the maxilla extending beyond that of the mandible. In effect, *hylophona* has eight distinguishing features.

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### Zusammenfassung

Der Olivbartvogel, ein Bewohner der Waldgebiete Ost- und Südostafrikas, von Shelley 1880 als *Barbatula olivacea* beschrieben, ist in der Vergangenheit sehr verschiedenen Bartvogelgattungen zugeteilt worden. In neuester Zeit wird er meist entweder zum Genus *Stactolaema* gerechnet oder als Vertreter einer eigenen Gattung, *Cryptolybia* Clancey, 1979, angesehen. Für die letztere Auffassung sprechen ökologische, ethologische, Struktur- und Gefiederfärbungsmerkmale. Die z. T. relikthaft verbreiteten geographischen Formen des Olivbartvogels werden gewöhnlich als Subspezies einer einzigen Art, *C. olivacea*, angesehen, sind aber wohl richtiger zu zwei Allospezies innerhalb einer Superspezies zusammenzufassen, nämlich zu *C. olivacea* (mit den Subspezies *olivacea*, *howelli*, *rungeensis* und der stärker verschiedenen, vielleicht eine dritte Allospezies darstellenden *belcheri*) und *C. woodwardi* (mit *woodwardi* und *hylophona*).

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