

## On Geographical Variation in the Whitebrowed Sparrow-Weaver *Plocepasser mahali* Smith of Africa

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Dedicated to Professor Dr. Günther Niethammer, eminent specialist on the birds of the Palaearctic and Ethiopian Regions, on the event of his sixtieth birthday.

The Whitebrowed Sparrow-Weaver *Plocepasser mahali* Smith is a gregarious and locally abundant ploceid of the drier and mainly acacia savannas of southern and eastern Africa. It ranges from the northern districts of the Cape Province and Orange Free State, in the Republic of South Africa, north in the west to Benguela, Angola, and in the east, through East Africa to the southern Sudan, Ethiopia, and Somalia.

*P. mahali* shows quite marked variation, which until comparatively recent times dictated that it consisted of disjunct northern and southern elements with the somewhat markedly different *Plocepasser pectoralis* (Peters) interposed. Current taxonomic concepts favour the treating of *pectoralis* as a race of an enlarged species *mahali*, though it still remains to be adequately demonstrated that *pectoralis* intergrades with the dull backed and plain breasted populations of the *mahali* complex to the south-west of its range, while to the north a distributional hiatus apparently segregates it from the plain breasted north-eastern races of the species: *P. m. melanorhynchus* Bonaparte and *P. m. propinquatus* Shelley.

Skead (1967) has shown that the specific name of this bird was coined by Dr. Andrew Smith from the Tswana native name for it, *mogale*. It was not named after a person or place. In the Tswana native tongue, *mogale* actually means a warrior or fierce person.

The main purposes of this report is to describe hitherto undetected variation within the populations of the present subspecies *pectoralis* of authors, which necessitates the recognition of an additional subspecific taxon. The relationship between *mahali*-like Birds and *pectoralis*, as observed in Rhodesia, where the forms are allopatric, is discussed on the basis of a study of an adequate panel of material from that country, while consideration to the recent evolutionary history of the species is also given.

### A c k n o w l e d g e m e n t s

Some 310 specimens of the Whitebrowed Sparrow-Weaver were studied at the Durban Museum to form the basis for the present report. To augment the material in our collection, specimens were kindly lent at my request by the South African Museum, Cape Town (through Professor J. M. Winterbottom), the Museu Dr. Alvaro de Castro, Lourenço Marques (through Dr. M. Corrinta Ferreira), the Transvaal Museum, Pretoria (through Mr. O. P. M. Prozesky), and the National

Museum of Rhodesia, Bulawayo (through Mr. M. P. Stuart Irwin). Material of the Angolan form, *P. m. ansorgei* Hartert, was also received in exchange from Dr. A. A. da Rosa Pinto, of the Instituto de Investigação Científica de Angola, at Sá da Bandeira. To all those mentioned I tender my sincere thanks.

### Geographical variation

Geographical variation in *Plocepasser mahali* is highly developed, affecting general size, the colour of the back and of the underside, which latter surface may be plain white or buffy, and may be spotted or immaculate over the upper breast. Still other differences between populations exist in the breadth of the white bar over the greater-coverts in the wings, and in the extent of white tipping to the outermost rectrices. Variation in the colour of the bill seems to be a seasonal manifestation and to have little or no geographical connotation. Non-breeding birds, certainly in the southern populations, have the bill fleshy horn-colour, this changing to black with the onset of breeding activity [see also Van Someren (1932)].

The populations polarise readily into three major groupings, which seem to correspond to well-marked races of an earlier phase of evolutionary development, in which the present species *mahali* was apparently broken into three main blocks of populations, all widely separated from one another by ecologically unsuitable country. These groups, judging by the situation present in Rhodesia, were isolated sufficiently long as to have all but reached a level of specific viability. Two of these groupings of populations are now in a state of late secondary contact in Rhodesia, where they are strictly allopatric, with inhibited and all but absent intergradation. Far to the north-east, a distributional hiatus seems to segregate the northern elements of the rusty back and spotted breasted *pectoralis* from the immaculate breasted and dull back races, *melanorhynchus* and *propinquatus*, from still further north. I deliberately use the word "seems" in the previous sentence, because there is some doubt if a distributional hiatus does in fact exist. Mackworth-Praed and Grant (1955) list *pectoralis* for eastern Kenya, in which area it would be juxtaposed to *P. m. melanorhynchus* and *P. m. propinquatus*, but Jackson (1938) makes no mention of *P. m. pectoralis* as occurring in Kenya, and Moreau (1962) states quite unequivocally that in eastern Tanzania it is coastal in disposition, ranging no further north than the Central Railway line.

The three groupings of populations (and races) mentioned in the previous paragraph may be differentiated as follows:

1. Back earthen or greyish buffy brown; underside pale buff, the breast faintly streaked with brown . . . . *mahali* group
2. Back cinnamon-brown or rusty; underside white or pale buff, the upper breast distinctly spotted with dark brown . . . . *pectoralis* group
3. Back earthen brown; underside plain white . . . . *melanorhynchus* group



Whitebrowed Sparrow-Weaver *Plocepasser mahali*

Ventral views of five races of *P. mahali* to show variation in ground colour and the presence or absence of breast spotting.

Upper row :

left: *P. m. stridens*

right: *P. m. pectoralis*

Note lighter breast spotting in *pectoralis*.

Lower row :

left: *P. m. stentor*

centre: *P. m. ansorgei*

right: *P. m. melanorhynchus*

Note broad white tipping to tail in *ansorgei*, and stark white of underside in *melanorhynchus*. The fact that birds in this row have the breast unspotted should also be noted.

(Photo: Dennis Cleaver)

*Mahali* group: The species was first discovered by Dr. Andrew Smith in what is today the western Orange Free State during the course of the Expedition for Exploring Central Africa from the Cape of Good Hope, in 1834, and was described in the report of the expedition in the year 1836. The topotypical populations of nominate *P. mahali* are characterised by large size and dark dorsal colouration. In fifteen skins (of ♂♂♀♀) in the Durban Museum from the upper Orange River at Aliwal North, the lower Vaal River at Riverton and Kimberley, and the middle Modder River, near Bloemfontein, all more or less topotypical of *P.m. mahali*, the wings range 101–108, and the tails 60–66 mm. In freshly moulted condition the mantle and scapulars are Olive-Brown [Ridgway (1912)]. There is virtually no difference in size between the sexes. In assessing the size variable care must be exercised in seeing that the specimens are adult, as the juvenal remiges and rectrices are moulted later than the contour plumage. The species is also subject to serious and rapid abrasion, largely owing to its habit of roosting, and in the season breeding, in globular nests of coarse white or straw-coloured grass-stalks, the sharp ends of which are projected outwards at the entrances to deter predators. Most birds of the *mahali* group are in fresh dress by April/May, following the breeding season, though this is often delayed or extended by climatic factors, especially in the more xeric race *stentor*, so that it is difficult to lay down a definite calendar for moult. Birds agreeing exactly with the topotypical populations extend from the western half of the Orange Free State to the north-eastern Cape, Griqualand West, the eastern parts of Botswana (Bechuanaland Protectorate) from Lobatsi north to about Serowe, and the highveld of the Transvaal. It occurs irregularly in Upper Natal.

Immediately to the west of the populations of *P. m. mahali* lies an assemblage in which the upper-parts are paler and more buffy or sandy in tone. The sharp step in the mantle and scapular colour gradient towards this more buffy brown dorsal facies is amply illustrated by the good samples from Kimberley, Riverton and Kuruman, in the northern Cape, and in others from immediately to the west of Kanye and Serowe, in Botswana, in the Durban and Bulawayo collections. The more buffy backed birds represent the race *P. m. stentor* Clancey, 1957, described from Kenhardt, in the north-western Cape. *P. m. stentor* is centred mainly on South-West Africa and Botswana, extending to the northern and north-western Cape in the south, and to western and south-western Rhodesia, in the north-east.

The third discrete assemblage of populations in the *mahali* group is to be found in western and southern Angola. Such populations differ rather significantly from both *stentor* and nominate *mahali* in the marked increase in white in the enlarged supercilia, and on the wings and outermost rectrices. The underside is also whiter, not so distinctly buffy or vinaceous tinged as in *stentor* and *mahali*; the brownish streaking is

vestigial or absent. The size also tends to be greater, if our single adult male with a wing-length of 111 mm. be typical. The well-marked Angola race was named *P. m. ansorgei* Hartert, in 1907, the paratypical series from Wawayella, in Benguela. *Ansorgei* is like *stentor* on the back.

Variation in the *mahali* group is therefore seen as quite sharply stepped, and is not clinal in form.

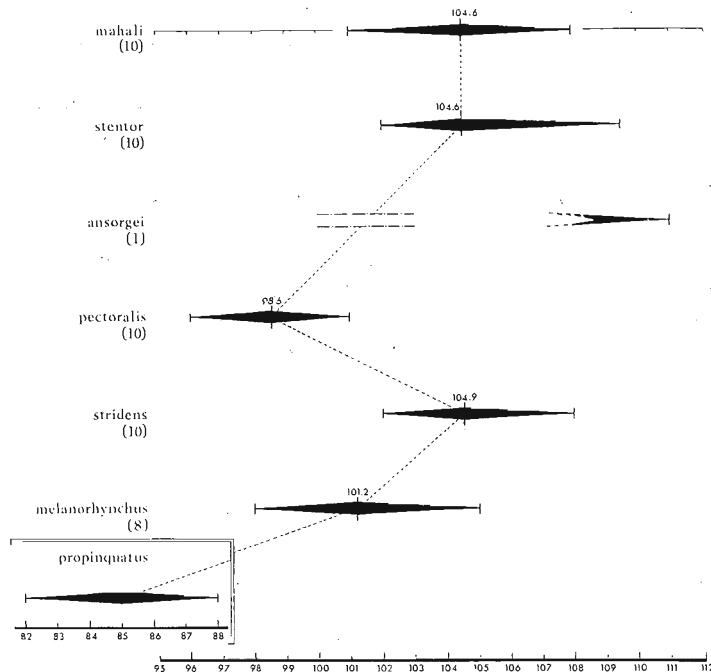
*Pectoralis* group: The populations of this assemblage differ abruptly from those of the representative of the *mahali* group with which they are in contact in Rhodesia, namely, *P. m. stentor*, on the basis of a redder, more rusty or ochraceous, colour to the back, and the fact that the upper breast is boldly marked with dark buff-brown sub-apical sagittate markings. *Stentor* also differs quite markedly from the Rhodesian and Zambesi populations of the *pectoralis* of authors in its larger size, though this distinction falls away on comparison with the northern populations of the present *pectoralis*. These same northern *pectoralis* are also clearer white, less buff or vinaceous below, than those of Rhodesia and the Zambesi valley, but ventral ground colour, as size, is not diagnostic of the group.

*P. m. pectoralis* (Peters), 1868, was described in the first instance from the Inhambane district of southern Moçambique, in which locality it has not been taken or observed since Peters' time. Pinto and Lamm (1961) have argued more or less convincingly on the basis of our present knowledge of the form's distribution that a mistake must have occurred in the original or subsequent labelling of the paratypical material, which they aver almost certainly came from the Tete district, and not Inhambane. The species is abundant along the Zambesi at Tete, and at the same time unknown in the Inhambane district, of Moçambique, and Pinto and Lamm are almost certainly correct. Of the topotypical populations of *P. m. pectoralis*, I have examined a good series from Msussa, Messenguese, Tete, Chicoo, and elsewhere on the middle Zambesi River valley. Such populations differ in no way from those of the northern half of Rhodesia, and the Zambesi River valley as far west as Sesheke, in south-western Zambia.

*P. m. pectoralis* and *P. m. stentor* are clearly in a state of late secondary contact in Rhodesia. Judging from the fairly adequate panel of material available from Matabeleland existing in general museum collections, intergradation is nonexistent. All specimens examined have been quite clearly *stentor* or *pectoralis*; at the same time they are completely allopatric forms. This does not, of course, confirm that these two forms do not meet and intergrade at any point where their ranges converge. All the collecting of this species in Rhodesia in the past has been executed on a general and random basis, as part of programmes of collection building, and detailed sampling of colonies with the present exercise in mind, in the Gwaai, Wankie, and Matetsi areas, of north-western Matabeleland, still requires to be carried out in order to test the validity of any belief in a complete lack

of gene-flow between *pectoralis* and *stentor*. In so far as an absence of known intergradation or introgression between closely allied allopatric forms dictates that they are not to be considered as conspecific, I would caution against treating the *mahali* and *pectoralis* complexes as discrete semi-species in a superspecies until the matter has been more fully studied, especially by first hand investigation in the field in north-western Rhodesia.

Two interesting points emerge from a study of the populations of the *mahali* and *pectoralis* groups. Generally speaking, the birds of these two major groupings of populations are alike in size. However, as the populations of *pectoralis* range south and south-west to meet those of the *mahali* group in Rhodesia, size drops sharply (Rhodesian ♂♀ wings 92—101, as against 100—109.5 in ♂♀ of *P. m. stentor* (see knot-diagram), and the underside loses its whiteness and becomes suffused with vinaceous or pale buff and the breast spotting lightens from Mummy Brown to pale Buffy Brown. The evolutionary significance of these interesting developments is not immediately apparent. The northern Rhodesian and Zambesi R. valley populations of the *pectoralis* group are in a sense intermediate between the



Wing-length in adult ♂♂ (in mm.) of the Whitebrowed Sparrow-Weaver *Plocepasser mahali*, shown by racial taxa in a strict south-north geographical arrangement. The marked drop in size in *P. m. pectoralis* in the sequence of subspecies *P. m. mahali* — *P. m. stridens* is particularly noteworthy.

balance of its populations and *P. m. stentor* in having the underside buffy white and the breast spotting light brown, but there the partial shifts in character gradients cease, the discreteness of these two major groupings being heightened by a lack of any further merging of characters and the presence of a marked size difference in the contiguous populations of *mahali*.

Apropos the findings enumerated in the previous paragraph, it would appear that until comparatively recent times, the populations of the *pectoralis* group were not only spatially segregated from those of the *mahali* and *melanorhynchus* complexes but were themselves effectively sundered by ecological and other factors into two subgroupings. One assemblage was probably centred on the East African littoral and the other on the Zambesi R. valley. These had clearly attained the level of reasonably well-marked subspecies at the time of their secondary contact. Intergradation observed in the Luangwa R. valley and southern Malawi is of a type normal between reasonably well-defined races and is somewhat sharply stepped. It seems desirable to take cognisance of this well defined variation within the *pectoralis* complex of populations by recognising two subspecies in place of the present one. In so doing, the range of *P. m. pectoralis* will be confined to the middle and lower Zambesi R. valley and the valleys of some of that river's major affluents, and the northern half of Rhodesia, while the populations of East Africa from the littoral of Tanzania south to northern Mocambique, the southern end of Lake Nyasa (L. Malawi), and extreme eastern Zambia require to be recognised as a new race, for which the name *P. m. stridens* is formally introduced below. *P. m. stridens* differs both on ventral and dorsal colour characters and size, as described earlier in this discussion on the populations constituting the *pectoralis* group.

*Melanorhynchus* group: The populations constituting this northern assemblage range from the interior of Kenya and Somalia, north to the southern Sudan and southern and central Ethiopia. In the west they extend as far as western Uganda. Compared with the northern race of the *pectoralis* group (*P. m. stridens*), they differ abruptly in that the back is greyish earthen brown, much as in the races of the *mahali* group in the southern part of the African continent. Below, they differ absolutely in lacking the dark brown sub-apical sagittate spotting to the upper breast, though in some, dark streaking is present over its lateral surfaces. The ventral ground colour is white as in *stridens*.

As indicated earlier in the present paper, the forms of the *pectoralis* and *melanorhynchus* assemblages seem not to be in contact. Within the latter complex of populations, as in the case of the others, quite well-marked variation is present, the populations of the arid, low-lying south-eastern parts of the group's range being markedly smaller than those of the more mesic and elevated regions to the west and north-west. In the south-eastern populations, resident in southern and south-western Somalia,

an area characterised by small and often pale races, the wings of ♂♀ range from 82—88, whereas in the western birds the wings in both sexes measure 96—105 mm. The small sized birds bear the name *P. m. propinquatus*, the larger ones constituting the taxon *P. m. melanorhynchus*.

Samples of *P. m. melanorhynchus* in the Durban Museum suggest that in these northern representatives of *P. mahali* the females range markedly smaller than the males, in contradistinction to the similarity of the sexes obtaining further south. Whether this finding is equally valid for *propinquatus* I am unable to say, as this form is unrepresented in our collection, and such data as I have on it have been acquired from the literature, though there is no reason to doubt the presence of a demonstrable sexual size-difference in the race concerned as well.

From the above survey of geographical variation in the present species *Plocepasser mahali*, it will be appreciated the three groups into which the populations so readily polarise have now all but attained specific viability. While I believe it convenient to continue to recognise the populations of the *mahali*, *pectoralis* and *melanorhynchus* groups as conspecific, it would be just as accurate and acceptable to consider them semi-species in a superspecies, all three being coteries of minor races. As mentioned earlier, a critical study and adequate sampling of colonies in the field in the north-western parts of Matabeleland, and perhaps those of the Luangwa R. valley as well, are needed preparatory to a final decision either way being effected. We are clearly dealing with a borderline case which can only be resolved by work in the field and a critical evaluation of such additional data as accrue from such a source.

### Geographical Races

#### Southern plain breasted races

##### The *Mahali* group.

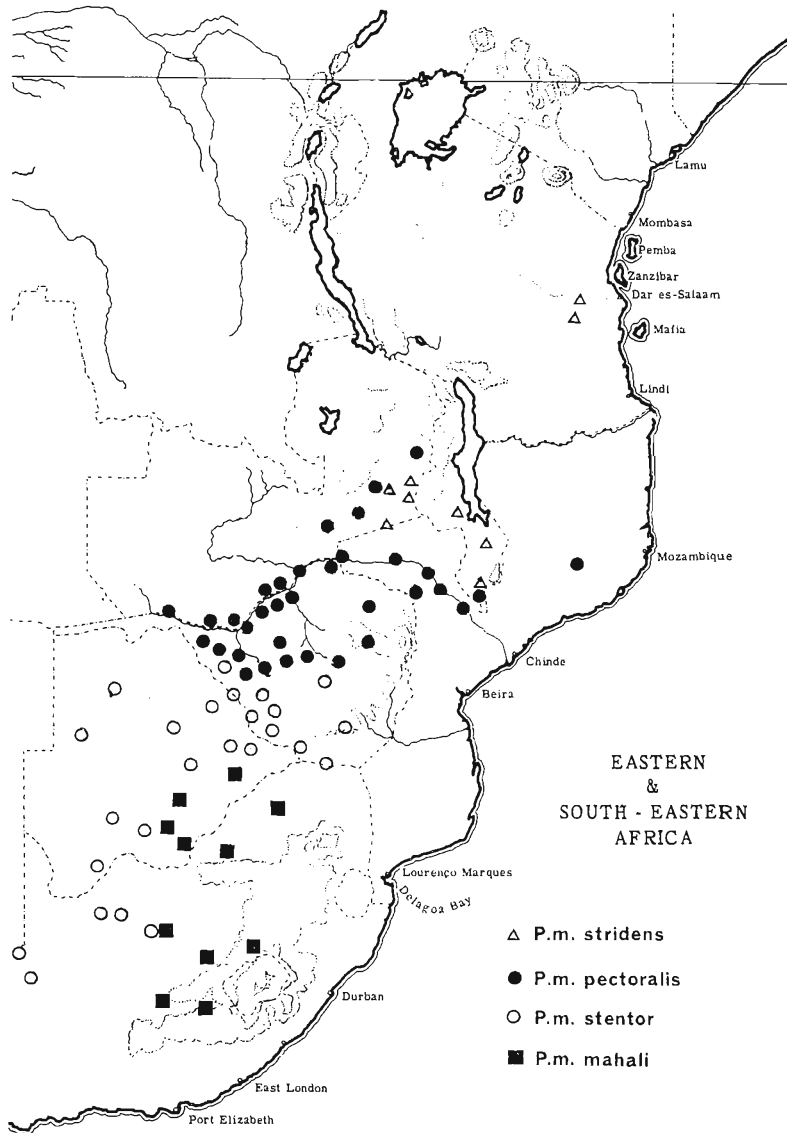
##### a) *Plocepasser mahali mahali* Smith

*Plocepasser Mahali* A. Smith. Rep. Exped. Expl. Centr. Afr., 1836, p. 51: between the Orange R. and the Tropic, restricted to confluence of Modder and Riet Rivers, western Orange Free State, by Clancey, Durban Mus. Novit., vol. vi, 4, 1957, p. 48.

Upper-parts on mantle and scapulars dark earthen brown [Olive Brown, Ridgway (1912), pl. xl]. Underside vinaceous or buffy white, the breast feathering faintly streaked with pale brown.

Wings of 10 ♂♂ 101—108 (104.6), of 10 ♀♀ 101—106 (103.1) mm.

Range: North-eastern Cape and Griqualand West to the western half of the Orange Free State, Upper Natal (irregularly), the Transvaal highveld,



Sketch-map of eastern and south-eastern Africa showing the ranges by localities of specimens critically determined as to subspecies of four races (one shown in part only) of the Whitebrowed Sparrow-Weaver *Plocepasser mahali*.

and eastern Botswana (Bechuanaland Protectorate) from Lobatsi north to Serowe and Palapye.

b) *Plocepasser mahali stentor* Clancey

*Plocepasser mahali stentor* Clancey, Durban Mus. Novit. vol. v, 4, 1957, p. 47: Kenhardt, north-western Cape Province.

Mantle and scapulars paler and more sandy or ochraceous than in *P. m. mahali* [Buffy Brown (pl. xl)]. Ground colour of ventral surface about the same.

Wings of 10 ♂♂ 102—109.5 (104.6), of 10 ♀♀ 100—108 (102.9) mm.

Range: North-western Cape Province north from the district of Kenhardt, South West Africa, and northern Cape in districts of Gordonia and Kuruman to Botswana (Bechuanaland Protectorate), except in south-east, and western Rhodesia (mainly Matabeleland, extending east locally to Selukwe and the Nuanetsi R.). Intergrades with nominate *mahali* to the south-east of its range, and with *ansorgei* to the north-west.

c) *Plocepasser mahali ansorgei* Hartert

*Plocepasser mahali ansorgei* Hartert, Novit. Zool., vol. xiv, 1907, p. 487: Wawayella, Benguela, Angola.

Rather similar to *P. m. stentor* on the upper-parts, but white supercilia broader, and black coronal patch more laterally constricted. Below paler and whiter, and breast without adumbrated brown markings. In wings, with a broader white bar over the apices of the greater-coverts, and outer margins to the secondaries whiter. Tail with broader white tipping to outer rectrices, this often equalling the apical quarter. Ranging a little larger in size.

Wing of 1 ♂ 111, of 1 ♀ 101.5 mm.

Range: Western Angola from inner edge of the coastal plain of Benguela and the adjacent escarpment south to Moçamedes and Huila (east to at least Cassinga, but probably reaching the Cubango R.) [after Traylor (1963)].

### Spotted breasted races

#### The *Pectoralis* group

d) *Plocepasser mahali pectoralis* (Peters)

*Philagrus pectoralis* Peters, Journ. f. Ornith., vol. xiv, 1868, p. 133: Inhambane, Sul do Save, Moçambique, but Type probably from Tete, Zambezi R. (vide Pinto and Lamm, Ostrich, vol. xxxii, 1, 1961, pp. 50, 51).

In fresh dress, mantle and scapulars Saccardo's Umber (pl. xxix), with ochraceous-rust overlay. Underside Pale Pinkish Buff (pl. xxix), the upper breast with bold sub-apical sagittate spots of Buffy Brown (pl. xl).

Wings of 10 adult ♂♂ 96—101 + (98.6), of 10 ♀♀ 92—100 (96.1) mm. (Rhodesian and Moçambique specimens).

**Material examined:** 131 (Rhodesia, 74 (mainly L. Kariba, Chirundu, Feira, Darwin and Que Que); Zambia, 26 (mainly Livingstone, and western Luangwa R. valley); Mocambique, 25 (Chicoa, Tete, Messenguese, Msussa, R. Mazoe, and Lalaua); Malawi, 6 [Chiromo, Tangadzi (intergrades)]).

**Range:** Centred on the middle and lower Zambesi R. valley. Extends west to about Sesheke in Zambia and the northern Wankie district in Rhodesia. In the latter territory south to an irregular line Gwaai R. — Que Que — Hartley — Beatrice, but in Zambia mainly along the Zambesi, extending north into the Luangwa R. valley (where intergrading with the following race). In Moçambique along the Zambesi R. and its major affluents in the districts of Tete and Manica e Sofala, extending north to Zambezia (Lalaua) and southern Malawi.

e) *Plocepasser mahali stridens*, **subsp. nov.**

**Type:** ♀, adult. Mkata R., Morogoro — Kilosa, eastern Tanzania. 15 June, 1963. Collected by T. E. Irwin. In the collection of the Durban Museum. D. M. Reg. No. 15731. Wing 104 mm.

Mantle and scapulars darker than in *P. m. pectoralis* [Cinnamon-Brown (pl. xv)]. Underside clearer white, less pinkish or buffy white, this most marked over the throat and medio-ventral plane; upper breast usually more densely spotted, the sagittate spots larger and blacker brown [Mummy Brown (pl. xv)]. Size larger, and as *stentor* in this regard.

Wings of 10 ♂♂ 102—108 (104.9), of 8 ♀♀ 102—106 (103.6) mm.

**Material examined:** 36. [Tanzania, 3 (Mkata R.); Malawi 2 (Liwonde); Zambia, 31 (Kakumbi, Luangwa R. valley)].

**Range:** Eastern Tanzania, south to Niassa and Cabo del Gado, northern Moçambique, and Malawi immediately south and west of Lake Nyasa (L. Malawi), and extreme eastern Zambia, south-west of which it intergrades with the foregoing, mainly in the Luangwa R. valley. Mackworth-Praed and Grant (1954) list this form (as *pectoralis*) from eastern Kenya, but Moreau (1962) does not acknowledge „*pectoralis*“ as present in Kenya.

#### Northern plain breasted races

##### The *Melanorhynchus* group

f) *Plocepasser mahali melanorhynchus* Bonaparte

*Plocepasser melanorhynchus* Bonaparte, Consp. Gen. Av., vol. i, 1851, p. 444: Shoa, central Ethiopia (ex Rüppell).

Rather similar to *P. m. mahali* but not quite so dark on the back. Below white as in *P. m. stridens*, but black sub-apical sagittate spotting over upper

breast restricted to the lateral surfaces and often absent. In wings, white bar over greater-coverts broader. Sexes somewhat dissimilar in size. Smaller than *P. m. mahali*, especially the female. Differs from *stridens* in having a duller, less rusty, brown back, and plain white upper breast. Ranging smaller, the female markedly so.

Wings of 8 ♂♂ 98—105 (101.2), of 7 ♀♀ 96—98.5 (97.3) mm. Friedmann (1937) gives wings of ♂♂ as 93—104, ♀♀ 90—101.5 mm.

Range: Nguruman, northern Tanzania, Kenya back from the littoral, western and northern Uganda, the Sudan south of about 6° N. lat., and southern Ethiopia west of the Rift.

Note: Friedmann (1937) discusses minor variation in this taxon, which is not considered of sufficient merit as to warrant its sub-division.

g) *Plocepasser mahali propinquatus* Shelley

*Plocepasser propinquatus* Shelley, Ibis, 1887, p. 6: Somali = Bardera, Juba R., southern Somalia, vide Mackworth-Praed and Grant, Birds Eastern and North Eastern Africa, vol. ii, 1955, p. 864.

*Plocepasser melanorhynchus erlangeri* Reichenow, Journ. f. Ornith., vol. lv, 1907, p. 4: Kismayu, Somalia.

Similar to *P. m. melanorhynchus* but slightly paler on the back. Differs sharply in its much smaller size.

Wings of ♂ ♀ 82—88 mm. Van Someren (1932) gives 80—87 mm.

Range: Southern Somalia, and, perhaps, adjacent eastern Kenya to about the Tana R. mouth.

### Summary

Variation in the southern and eastern African populations of the Whitebrowed Sparrow-Weaver *Plocepasser mahali* is discussed. Arising from this new study, it is considered advisable to recognise a further race in this population complex, this described as *P. m. stridens*. Seven races are admitted for the species as a whole, as against the six acknowledged by Moreau (1962).

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