

Systematic notes on Asian birds. 1.¹

A review of the russet bush-warbler *Bradypterus seebohmi* (Ogilvie-Grant, 1895)

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The bush-warbler *Bradypterus mandelli* (Brooks, 1875) was described from Sikkim, and numerous specimens from India were identified with it, but it was synonymised with the brown bush-warbler *Bradypterus luteoventris* (Hodgson, 1845) in 1881. In 1952, east Asian populations were grouped under the name of the Luzon form of the russet bush-warbler, *Bradypterus seebohmi* (Ogilvie-Grant, 1895). This taxonomy, however, failed to associate the Indian form and its available name *mandelli*, which received limited usage until 1919, with *seebohmi*, a matter reviewed and corrected herein. Specimens prove that *mandelli* has long been known from India, Bhutan, and Myanmar (Burma). The Thai population, previously placed in *idoneus* (Riley, 1940), belongs instead with the nominate race *mandelli*. The eastern Chinese race *melanorhynchus* (Rickett, 1898) is valid but not very distinctive. The nominate race probably occurs in Laos and northern Vietnam. Vocalisations are stereotyped, being extremely similar across Asia from north-eastern India to eastern China. The name *idoneus* is herein restricted to the southern Vietnamese population, as this race is evidently somewhat distinct vocally and morphologically. The common name 'russet bush-warbler' should continue to be used only for *Bradypterus mandelli* of mainland Asia. The Luzon form *seebohmi* was known only from the type specimen, other 20th century reports having been erroneous, until it was rediscovered in February 2000 near the type locality. Its song, while recognisably similar to that of *mandelli*, has several consistent structural differences, and we tentatively reallocate to it species rank as the 'Benguet bush-warbler' *B. seebohmi*. Both Javan and Timorese forms are morphologically distinct, and are provisionally treated as separate species, the 'Javan bush-warbler' *B. montis* (Hartert, 1896) and the 'Timor bush-warbler' *B. timorensis* (Mayr, 1944). A form on Bali for which no specimen material is available is evidently somewhat different vocally from *B. montis*. We address the issues of the synonymy of all potentially relevant names older than *mandelli*; the priority of the name *Horornis flaviventris*, Hodgson, 1845 over *B. t. thoracicus* (Blyth, 1845), of which the latter nevertheless takes precedence; and the designation of a lectotype for *Cettia russula* Slater, 1897, because the type series includes one *mandelli*. Reassessment of the range and taxonomy of *luteoventris* showed that its occurrence in Nepal, Laos, and Thailand is unproven, and that it is probably monotypic.

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Introduction

The bush-warbler genus *Bradypterus* (Aves: Sylviidae) includes 18 species, nine of which are African, and nine Asian (Watson et al., in Mayr & Cottrell, 1986). This genus was first arranged essentially as at present by Delacour (1942, 1943), who initially recognized 20 species in two subgenera. Taxa of the genus *Bradypterus* were characterised as having much smaller rictal bristles than in the rather similar bush-warblers of the genus *Cettia*, and as often having streaked or spotted underparts that *Cettia* lack (Delacour, 1942). The subgenus *Bradypterus* contained seven species, all of them African except the spotted bush-warbler *B. thoracicus* (Blyth, 1845) of Asia. The subgenus *Tribura* contained 13 species, eight of them Asian (Delacour, 1943): long-billed bush-warbler *B. major* (Brooks, 1872); Chinese bush-warbler *B. tacsanowskii* (Swinhoe, 1871); brown bush-warbler *B. luteoventris* (Hodgson, 1845); Javan bush-warbler *B. montis* (Hartert, 1896); long-tailed bush-warbler *B. caudatus* (Ogilvie-Grant, 1895); friendly bush-warbler *B. accentor* (Sharpe, 1888); chestnut-backed bush-warbler *B. castaneus* (Büttikofer, 1893); and Sri Lanka bush-warbler *B. palliseri* (Blyth, 1851). The nominate subgenus was characterised as having broad, soft rectrices, and the subgenus *Tribura* as having narrow, stiff rectrices that are prone to fraying and often faintly barred (Delacour, 1942).

Some of the insular and the continental Asian species in Delacour's (1943) subgenus *Tribura* (*major*, *tacsanowskii*, *luteoventris*, *montis*) form a group which we believe to be morphologically distinct from the exclusively insular species of the Philippines (*caudatus*), Indonesia (*accentor*, *castaneus*), and Sri Lanka (*palliseri*). The latter four species are mostly larger, with much larger feet, heavier bills, often better-developed rictal bristles, shorter and more rounded wings with very broad, usually unnotched outer primaries, and loose-textured or decomposed rectrices, often only ten in number. Not surprisingly, all these insular species had previously resided in different genera, and they will not be considered further in this review.

In Delacour's (1943) treatment, *Bradypterus luteoventris* then included four subspecies: the nominate race from western China south to Nepal and east through north-western Fujian (Fukien) and northern Vietnam (Tonkin); *melanorhynchus* (Rickett, 1898) in north-western Fujian; *idoneus* (Riley, 1940) in southern Vietnam (Annam); and *seebohmi* (Ogilvie-Grant, 1895) from Luzon, in the northern Philippines. The Javan form *montis* (colour plate 1, lower two) was described in detail by Hartert (1896), but he explicitly compared it only with other island taxa, and "with great hesitation" erected for it a new genus *Stasiasticus*. Subsequently *montis* was considered related to *luteoventris* but with "a different colour-pattern and a longer tail" (Delacour, 1943).

Several facts soon emerged that necessitated a re-evaluation of the racial composition of *luteoventris* and *montis* (Delacour, 1952). First, specimen dates showed that both *luteoventris* and *melanorhynchus* were present in Fujian in April, and Delacour (1952) concluded that they were probably sympatric species. Second, *Bradypterus* specimens collected earlier on Taiwan had been tentatively reported as "*luteoventris* subsp.?" (Hachisuka & Udagawa, 1951), with the qualification that "it is necessary to compare series of skins from Fukien and Formosa in order to determine the subspecies of the latter locality". Four Taiwanese skins sent to the U.S. by Hachisuka were slightly darker above than *melanorhynchus*, and had more clearly spotted throats

(Delacour, 1952). However, the Taiwanese birds seemed so like the holotype of *idoneus* from southern Vietnam (the only skin from that region in the U.S.) "if seasonal and individual variation and age are taken into account" that Delacour (1952) placed the Taiwanese population (and two skins from Thailand) in *idoneus*. Finally, *Bradypterus montis timorensis* Mayr, 1944 (colour plate 1, middle right) had been described from Timor, and Delacour (1952) thought that *montis* closely resembled the other forms, with which he thus combined both component taxa of *montis*. The species as newly defined (Delacour, 1952) then excluded *luteoventris*, which was treated as a monotypic species ranging from Nepal through southern China, but contained *melanorhynchus* (Fujian), *idoneus* (Vietnam, Thailand, Taiwan), *seebohmi* (Luzon), *montis* (Java), and *timorensis* (Timor). For this grouping the name *seebohmi* (Ogilvie-Grant, 1895) had priority, and it has stood to the present as the specific epithet for the russet bush-warbler *Bradypterus seebohmi* which, despite its wide range, was still known from remarkably few specimens.

With respect to the taxonomy of *seebohmi* in south-east Asia, King & Dickinson (1975) followed Delacour (1952), and their account for that species included no information on vocalisations. The vocal descriptions given for '*luteoventris*' (King & Dickinson, 1975), however, have been shown to be a composite of data for both *luteoventris* and *seebohmi* (Round, 1983, 1992; Rozendaal, 1989; Kennerley & Leader, 1993). This error occurred because the two species were not distinguished in observations from Myanmar (Burma), where *seebohmi* was thought not to occur (Smythies, 1953). This also led to recent reports of *seebohmi* as new for Myanmar (Robson, 1996a; Robson et al., 1998). Similarly, *seebohmi* does not appear in most relatively recent Indian subcontinent works (Ripley, 1961, 1982; Ali, 1962; Ali & Ripley, 1973, 1983, 1997; Inskipp & Inskipp, 1985, 1991), and in these the descriptions and in some cases the illustrations of '*luteoventris*' are composites. Thus *seebohmi* was recently reported as new for the Indian subcontinent based on a tape-recording from Bhutan (Robson, 1996b; Tymstra et al., 1997), and it was thought "probably overlooked previously" in Bhutan and West Bengal (Grimmett et al., 1998).

Since Delacour's (1952) revision, only slight adjustments have been made to the taxonomy of this group. Deignan (1963) evidently did not recognize *seebohmi*, as he treated Thai *idoneus* under *luteoventris*, and a few other recent authors continued to treat *seebohmi* as conspecific with *luteoventris* (duPont, 1971; Etchecopar & Hue, 1983). The Taiwanese population was reallocated without explanation to the geographically adjacent subspecies *melanorhynchus*, and south-eastern Tibet was added to the species' range, first under *melanorhynchus* (Li et al., 1978), and then under *idoneus* (Watson in Mayr & Cottrell, 1986).

However, in the late 1980s, PDR, FGR and P.R. Colston, and in the late 1990s, PCR and ECD studied *Bradypterus* specimens in The Natural History Museum (BMNH, Tring, U.K.), where numerous specimens from the north-eastern Indian subcontinent and Myanmar are held that conform to the morphological characters of *seebohmi* (colour plate 1, two center left). Some had originally been identified as *Dumeticola mandelli* Brooks, 1875, but had subsequently been reidentified (in most cases as *luteoventris*) to agree with the prevailing taxonomic treatment. Not only was the name *mandelli* attached to birds from the Indian subcontinent that are extremely similar to the two eastern Asian taxa (*melanorhynchus* and *idoneus*) that were treated as races of

seebohmi, but the name *mandelli* antedates *seebohmi* by 20 years (Dickinson et al., 1998). In addition, a tape-recording of Taiwanese *Bradypterus* sent by Wu Sen-Hsiung to PDR in 1989 led to the realisation that this population, which has an extremely distinctive song, was an unnamed species. Detailed morphological analyses supported this treatment, and we have elsewhere described it as *Bradypterus alishanensis* (Rasmussen et al., 2000; colour plate 1, upper left).

Thus it became clear that further study of specimens and of the history and circumstances surrounding the name *mandelli* would be vital to the correct interpretation of the taxonomy and nomenclature of this complex. As ECD and PCR were working through these matters, correspondence resulted in the availability of earlier, independently derived manuscripts with similar findings by both PDR and FGR, and we have now reached joint conclusions. The authors of the present study are listed, by mutual agreement, in alphabetical order. In this paper we review and add new data on morphological discrimination of *Bradypterus seebohmi* (sensu Delacour, 1952); we reconstruct the history of nomenclature and taxonomy as relevant to changes required in the same; and we review and present new data on the morphology, distribution, and taxonomy of closely related taxa.

Methods

Because the present paper deals with complex and confusing taxonomic issues that can only be correctly interpreted with reference to the literature and with study of the corresponding specimens, we summarise herein the relevant literature and list all known specimens (app. 1). For the sake of clarity and consistency with our conclusions, from henceforth in this paper the name *mandelli* will be used as the specific epithet for the mainland Asian taxa formerly subsumed under *seebohmi* (sensu Delacour, 1952). We restrict the name *seebohmi* to the Luzon taxon, and use *alishanensis* for the Taiwanese population; these and the taxa *montis* and *timorensis* will all be treated as separate species. Justifications for these decisions, some of which are tentative, are presented below. In contexts (other than within direct quotes) which require the use of '*luteoventris*' as defined by Seebohm (1881), we use *luteoventris* (s.l. [sensu lato]); likewise, where '*seebohmi*' and '*idoneus*' are used as defined by Delacour (1952), we use *seebohmi* (s.l.) or *idoneus* (s.l.); where these names are used without these conventions, their sensu stricto application is implied.

Specimens that we have identified as *mandelli* have been variously identified in the literature and in museum collections as *luteoventris*, *affinis* (Gray, 1846), *brunneipectus* (Blyth, 1867), *seebohmi*, *tacsanowskius*, and *thoracicus* (among others), while numerous other *mandelli* specimens have remained unidentified specifically. Due to the extensive and long-lasting confusion, we have not accepted any published records except in the cases in which they were accompanied by diagnostic descriptions, either of plumage or voice, or substantiated by identifiable skins that we have re-examined. Nearly all the specimens in existence for the taxa concerned have been examined, measured, and photographed for this study. Four *mandelli* that we have not seen, however, reside in Academia Sinica (IZAS), Beijing (Kennerley & Leader, 1993; Xu Yuan-Gong, pers. comm.), and a few unpublished (and perhaps misidentified) specimens are probably held in other museums. Most specimens were examined by all

authors, while all those listed (except as noted in app. 1) have been studied by PCR, who assembled series of Asian *Bradypterus* (including 28 *luteoventris*, 36 *mandelli*, and 11 *alishanensis*) together at the National Museum of Natural History (USNM), Washington, D.C.

Many of the characters distinguishing *mandelli* from *luteoventris* have already been elucidated (Round 1983, 1992; Kennerley & Leader, 1993). Our study of additional specimens has revealed further characters (most of which could be used only with birds in the hand), and these criteria, on which our identifications were partly based, are summarized here. PCR made final determinations in the absence of the other authors, and so assumes responsibility for any misidentifications.

Museum skins of *Bradypterus* are frequently in poor condition, as these extremely skulking birds were usually shot from close quarters. Their rectrices are often naturally frayed, and rectrix moult is (at least sometimes) simultaneous, so many specimens lack the tail characters or have the tails unmeasurable. In addition, post-accession damage is common, as the skins are quite fragile. Most skins of an important collection of 75 *Bradypterus* specimens taken in the Indian subcontinent by W.N. Koelz were badly damaged by insects before their acquisition by UMMZ. These lack measurable features, primaries, and undertail coverts, now being identifiable chiefly by colouration and pattern of the contour feathers. Many of the Koelz specimens have not previously been definitely identified or published, a fact which gave early impetus to PCR for this study, since some represented potentially significant records.

For consistency, all measurements were taken by PCR. Several non-traditional measurements were taken because the basic set of measurements failed to distinguish a high percentage of specimens of these taxa. Both sexes were combined after preliminary analyses showed an apparent lack of sexual dimorphism in the populations involved. It is, however, possible that a significant proportion of the specimens studied were missexed, and further work with fresh material is needed to ascertain definitively whether sexual dimorphism in size is in fact absent, as the present data suggest. In any case, many specimens used in this study were unsexed, and segregation by age and sex would have resulted in very low sample sizes for most groups.

Culmen lengths were taken from the skull base, as well as from the distalmost feathers; bill height and width from distal edge of nares (bill height was taken only of specimens with fully closed bills); bill tip width was taken 2 mm from tip. Nares length is distance from distalmost feather to distal edge of nares. Wing length was taken with the wing flattened and straightened; tail length was taken by positioning calipers between insertions of central rectrices; wing/tail ratio is a ratio of the two above measurements. Shortfalls of primaries were measured from the tip of each primary to the tip of the longest primary of folded wing (wingpoint), and primaries were numbered from the outermost (P1); primary notches were measured from the notch to the tip of the individual feather; length of P1 and P2 were taken from the tips of the overlying primary coverts; widths of outer primaries were taken just distal to the notch. Widths of central rectrices (R1) were taken for relatively fresh, undamaged feathers only, near the centre of the feather. Longest undertail coverts were measured from the distal tip of the pygostyle (located by palpation); coverts to tail tip is the distance from the longest undertail covert to the tip of the longest rectrix; R6 to R5 is the distance between the tips of the outermost and next outermost rectrices (when rela-

tively unworn and not moulting). Tarsus length was measured from the anterior surface of the hypotarsus (on the proximal rear side) to the distalmost undivided scute; tarsus proximal depth was taken from the hypotarsus to the front of the tarsus; tarsus distal width was taken across the widest part of the foot (where the scutes are undivided); and claw lengths were taken from the distal edge of the scutes. Summary statistics were computed using Systat Version 5.03.

To quantify colour differences between and among taxa, a Minolta CR-221 chromometer was used by PCR on selected plumage areas of the specimens assembled at the Smithsonian, and some at other museums. The values presented follow the *L a b* system (Hunter & Harold, 1987; Graves, 1998), in which higher values of *L* are lighter, higher values of *a* are redder (vs greener), and higher *b* values are yellower (vs bluer). For reproducibility, colour readings were consistently taken on the same areas of the plumage and at comparable stages of wear. Three readings were taken without repositioning the sensor; the average of these was then averaged over three such measurements between each of which the sensor was repositioned. Thus, the *ns* are population statistics performed on measurements of individual specimens each comprised of nine averaged readings. Readings were not taken from feathers that were heavily worn, dirty, or that appeared faded or foxed. Summary statistics were computed on the *L a b* values as for raw measurements.

Results and discussion

Morphological discrimination of *mandelli*

1.1. Adults

Bradypterus mandelli differs from all plumages of *B. thoracicus* — for purposes of this paper, including *B. [t.] davidi* (La Touche, 1923), which is probably specifically distinct (Round & Loskot, 1994) — in having less contrastingly pale tips to the undertail coverts, and in its much longer tail with more pointed rectrices that have stiffer shafts and become frayed in worn plumage. From *tacsanowskii*, *mandelli* differs in having narrower but better-defined pale tips to the darker-based undertail coverts, a much longer, broader outer primary, and much darker, more russet upperparts. From both the above, *mandelli* differs in having a larger bill tip, and larger, less extensively feathered nares.

The most consistent confusion has been between *mandelli* and *luteoventris* (see colour photos in Kennerley & Leader, 1993, and cover plate in Rasmussen et al., 2000). Compared to *luteoventris*, the bill of *mandelli* is larger (app. 2), more swollen-looking, with a larger, more bulbous tip on dorsal view, a less triangular appearance on side view (as the base is not obviously higher than the terminal half), and with larger, less extensively feathered nares. In *mandelli*, the bill is often entirely black (vs always pale on most of the lower mandible in *luteoventris*), and the interramal skin (that between the branches of the lower mandible) is often unfeathered and blackish (vs entirely whitish-feathered in *luteoventris*).

The face pattern of *mandelli* is stronger and darker than in *luteoventris*, and the lores are blacker; the supercilium may be whitish, buffy, or greyish (vs lores indistinctly dark and supercilium buffy in *luteoventris*). The malar and moustachial regions

of *mandelli* are dark brown (vs brighter buffy in *luteoventris*). The throat and upper breast of *mandelli* are often lightly spotted with fine dark brown speckles, which are typically heaviest at the upper edge of the breast (vs unspotted in adult *luteoventris*, or lightly mottled pale yellowish brown in juvenile *luteoventris*). The base colour of the throat in *mandelli* may be whitish, buffy, or greyish (vs a narrower whitish throat in *luteoventris*), while the upper breast of *mandelli* is either greyer or buffier than the throat (vs buffy or white centrally in *luteoventris*). In specimens of *mandelli* that have buffy areas, these are typically more rufescent (vs yellowish in *luteoventris*). The upperparts of *mandelli* are a shade richer russet (app. 3) and appear darker than in *luteoventris*. The flanks of *mandelli* are fairly dark brown (vs bright buffy in *luteoventris*). Both the under- and uppertail surfaces of *mandelli* look blacker than in *luteoventris*.

The best characters for distinguishing *mandelli* from *luteoventris* are the colour and pattern of the undertail coverts. In *mandelli*, the longest undertail coverts have definite pale tips and dark brown bases; by contrast, in *luteoventris* the brighter, tawnier-buff undertail coverts are concolorous (with the tips sometimes indistinctly paler in worn plumage). The shorter (more anterior) undertail coverts, however, are often neither very dark nor pale-tipped in *mandelli*. The longest undertail coverts of *mandelli* are also relatively shorter than in *luteoventris* (app. 2).

A number of subtle shape differences exist between *luteoventris* and *mandelli* (app. 2). While the two species are similar in both length and shortfall of the outermost primary (P1) from the wingpoint, P2-P4 average significantly shorter in *mandelli*, with greater shortfalls from the wingpoint, giving it a slightly more rounded wing than for *luteoventris*. The notches on P2 and P3 are slightly more distal on *mandelli*. There is a greater mean difference between the tips of the outermost rectrix (R6) and the next outermost in *mandelli*. Finally, the tarsi of *mandelli* average slightly shorter but heavier than in *luteoventris*. Despite the above differences, and their entirely different songs, the two species are extremely similar in other measurements, wing formulae, and tail shape (although in fresh plumage *mandelli* has the tail tip more pointed). However, while *luteoventris* is remarkably uniform in all plumages, *mandelli* is highly variable, with seasonal, age, individual, geographic, and possibly sexual variation all apparently contributing to the variety of plumages.

1.2. Juvenile and first-winter plumages

Neither juvenile nor first-winter plumage has previously been adequately described for *mandelli*. Our description of the juvenile plumage of *mandelli* is based on BMNH 1914.6.12.101, previously identified both as *luteoventris* (by P. Sushkin in 1924) and *thoracicus*. This specimen is a juvenile from Ichang (Yichang), Hubei, collected on 6 August 1895. Its large bill confirms that it is *mandelli*, and it has deep russet upperparts typical of the species, a shade darker than the three adult *melanorhynchus* available for comparison. Its tail is short for *mandelli* (46.9 mm), but the rectrices are pointed and have stiff shafts, ruling out *thoracicus*. Its face is nearly unpatterned dark brown, with scarcely an indication of a supercilium and darker loreal spot, and with little contrast between the dark auriculars and the paler submalar area and chin. The breast is unspotted greyish brown, darker than in adults; the middle underparts are buffy yellowish; and the flanks and undertail coverts are dull fulvous brown, the lat-

ter with ill-marked pale tips. The basal two-thirds of the lower mandible are pale, as is the gape, while the rest of the bill is dark. Two similar juvenile specimens are BMNH 86.7.8.1882 from Shillong and BMNH 1914.6.12.104 (the individual illustrated in colour plate 1, third from top left) from Fujian. Although the short tails of juvenile *mandelli* could lead to confusion, they should be easily distinguished from all ages of *thoracicus* by their heavier bills; their darker, browner breasts; and their more pointed tails. Confusion with juvenile *luteoventris* (which resembles the adult except for its richer upperparts colouration, slightly mottled throat, and yellower underparts) seems less likely (*contra* Baker, 1997), especially given the much darker breast of *mandelli*.

Several *mandelli* specimens exhibit a distinctive colour pattern which we treat as the first-winter plumage, although some show this plumage as late as June, and morphs or sexual dimorphism may be involved. This plumage is shown by the following specimens (among others): from the Indian subcontinent, FMNH 85249 (male, West Bengal, 17 December); BMNH 1969.52.1146 (Sikkim, 16 June); BMNH 86.7.8.1903 (Bhutan duars, February); UMMZ 230773 (female, Khasi Hills, 26 December); UMMZ 230782 (male, Nagaland, 28 January); MCZ 235505 (Nagaland, May); from Myanmar, AMNH 592142 (female, 22 April); from Laos, FMNH 79846 (female, 24 April); FMNH 79847 (female, 25 April); and from Fujian, China, MCZ 129133 (male, March); and MCZ 129138 (18 May). Most of these specimens appear to have more pointed rectrices than do obvious full adults, and in the others they are either missing or too worn for determination. They are all more rufescent buff on the breast than are typical adult specimens, and are totally lacking in grey tones. Most are scarcely or not at all spotted on the throat. Some have a rufescent brown suffusion over much of the underparts, with a fairly evenly spotted buffy throat and only the centre of the abdomen paler (e.g. AMNH 592142). At the other extreme is an individual with the underparts mostly whitish, an almost unspotted white throat, and a pale buffy breast band (FMNH 85249). The rufescent plumage is that recently referred to as adult *mandelli* (Grimmett et al., 1999; Robson, 2000a), although grey-breasted individuals are clearly adults in breeding plumage. Perhaps both first-winter and fresh adult plumages are mainly russet, with adults achieving the grey breast as wear progresses. Study of fresh material is required to definitely establish the nature of this variation, as many of the specimens examined for this study were unsexed, undated, or in poor condition.

2. Nomenclature and taxonomy of populations in the Indian subcontinent: *mandelli*

2.1. The history of *Dumeticola mandelli* Brooks

Louis Mandelli (d. 1880), while managing tea estates near Darjeeling, amassed (through his employment of local collectors) by far the largest bird collection ever assembled from the Sikkim region (Pinn, 1985). He labelled two specimens taken in November 1873 and April 1874 in "Native Sikkim" (= then autonomous Sikkim) as *Dumeticola brunneipectus*, Blyth, 1867. Mandelli was evidently not entirely certain of their identity, however, as he sent these specimens to William E. Brooks (an expert on sylvine warblers). Brooks confirmed their distinctness, and at Mandelli's request he described *Dumeticola mandelli* Brooks, 1875. (Although Brooks could have used the

genitive singular '*mandellii*', he did not do so, perhaps treating it as a noun in apposition. Whatever his reason, the original spelling should stand, although the name has been subsequently published in both forms.).

In describing *mandelli*, Brooks (1875) carefully compared it with *Tribura luteoventris* and *Dumeticola affinis* (based on *Salicaria affinis* Gray, 1846, the latter now a synonym of *thoracicus*, as is *brunneipectus*; see below). Brooks (1875) considered *mandelli* "easily distinguished" from *luteoventris* "by the much larger and stronger bill; also by the grey breast, and being subject to spots on the throat ...". He mentioned that *mandelli* had the "lower tail-coverts, which reach to within an inch from end of tail, of a darker brown (non-rufous), and broadly tipped with dull white". Allan O. Hume, however, footnoted Brooks's (1875) description of *mandelli* with his own editorial opinion: "I may be in error, but I have many specimens of this species, both males and females, and it appears to me to be *brunneipectus*". In fact, Brooks (1875) had already considered this, and had asserted that *brunneipectus* "appears to me only to be unspotted *affinis*". Brian Hodgson had collected spotted *affinis* and unspotted *brunneipectus* together and implied that they were both morphs of the same species, but (unlike Brooks) Hume judged Hodgson wrong in this. The synonymy of both *affinis* and *brunneipectus* with *thoracicus* was formalised by Seebohm (1881), and re-affirmed by Oates (1889a).

Later, Hume (1878) reproduced Blyth's (1867) description of "*Dumeticola brunnectus*" [sic], and confirmed his own position, stating that *brunneipectus* "appears to me as I said at the time ... to agree perfectly, so far as it goes, with Mr. Brooks' *S. mandelli*. Of course spotting or no spotting on the breast goes for nothing in this group." While visiting Mandelli's collection in Darjeeling, Brooks re-examined one of his types and the other *mandelli* specimens there. He then responded to Hume (1878), insisting that "it is not *S.[choenicola] brunneipectus* of Blyth. His bird I take to be unspotted *S. affinis*, Hodgson" (Brooks, 1880). Although he had not examined Blyth's type of *brunneipectus*, Brooks (1880) maintained that *mandelli* could not be synonymous with it, since the former had been described (Blyth, 1867) as the same in size, form, and upperparts colour to *affinis*. Brooks (1880) observed that *mandelli* "is a larger bird, with a longer tail", and stated "in make and colour, it is closer to *Tribura luteoventris*, Hodgson, than to *D. affinis*. I again contend that it is a good species. I have not the slightest doubt about Blyth's species [*brunneipectus*] being the unspotted form of *D. affinis*." Significantly, Blyth (1867) had evidently been well aware of distinctions between *affinis* (to which he had likened *brunneipectus*) and *luteoventris* (which is similar in form to *mandelli*), having correctly noted that an illustration of the former had been mistakenly published as the latter (Gray & Mitchell, 1848).

Nevertheless, Henry Seebohm (1880, 1881) placed *mandelli* in the synonymy of *luteoventris*, stating that they "agree precisely in dimensions, relative length of wings and tail, wing-formula, and shape of bill...but the types...in Mandelli's collection, present slight variations. One skin has spots on the throat, and the other traces of slate-grey on the breast" (Seebohm, 1880). While Seebohm's comments might suggest he had seen the two syntypes of *mandelli*, he did not explicitly state this, and the types were in Darjeeling until after Mandelli's death in February 1880 (when the latter's immense collection was sold to Hume, whose own collection was then in Simla, India; Pinn, 1985). Rather, Seebohm (1880) had simply restated the differences

between the two types as described by Brooks (1875), and he even confessed his uncertainty over his own synonymy in his statement "I imagine these only to be seasonal changes; but they may prove hereafter to be specific characters".

After re-examining specimens at the BMNH, Brooks (1881a) reiterated his view: "I think that *brunneipectus* may safely be suppressed as a species, and placed as a synonym of *affinis*. This is what Mr. Seebohm has done... As *brunneipectus* was said by Blyth to have the same colour of upper surface as *affinis*, and as *mandelli* has a different one, and moreover differs also from what we know of *luteoventris*, I think, for the present at all events, *mandelli* should stand."

Brooks visited the BMNH in April 1881, while Seebohm was in Russia, and again, apparently, a month or two later when he held discussions with Seebohm. Whether they discussed *mandelli* is not on record, although at around this time Brooks (1881a) noted that *mandelli* was unrepresented in the BMNH collection. He and Seebohm did not study the material together, as indicated by Brooks's (1881b) final published statement on *mandelli* ("After a very careful comparison of the two birds, with ample material before me, which Mr. Seebohm had not, I have not the least hesitation in stating *mandelli* to be perfectly distinct."). Brooks retired in 1881 from the East Indian Railway Company, and moved to Canada, where he died in 1899 (Anon., 1899).

Seebohm's own collection held only *luteoventris* and no *mandelli* when it was accessioned at the BMNH in 1896. As late as 1881, there were apparently only 10 *luteoventris* (s.l.) from 'Nepal' (collected by Hodgson) and one from Darjeeling (collected by Fotheringham) at the BMNH (Seebohm, 1881), and none of these were *mandelli*. The first specimens ascribed to *mandelli* were only accessioned by the British Museum in 1886, as part of the Hume collection, in which were included the two syntypes of *mandelli* (BMNH 1886.7.8.1909 and 1886.7.8.1862; *contra* Warren & Harrison, 1971). Thus there can have been little or no chance after specimens of *mandelli* became available to Seebohm in 1886 for he and Brooks to have examined them together. Seebohm, therefore, must have placed *mandelli* in synonymy without having studied a series of specimens (if indeed he ever saw any), and he probably never re-examined the matter.

Incidentally, it appears that none of the above authors had actually seen Blyth's (1867) type of *brunneipectus*. Brooks (1881a) evidently expected to find it at the BMNH, probably because Blyth had retired to England prior to his 1867 description of *brunneipectus*. However, Brooks (1880, 1881a) could not distinguish Blyth's type of *brunneipectus* among the *thoracicus* at the BMNH with which specimens of both *affinis* and *brunneipectus* had been grouped following Seebohm's (1881) synonymy. Of the other new species Blyth (1866-1868) described in the series in which the description of *brunneipectus* appeared, the type of one (*Nucifraga immaculata*) is not listed as being in the BMNH type collection (Warren & Harrison, 1971), while another (*Suya gangetica*) is, but the latter seems to lack evidence linking it to Blyth. Thus, there is little reason to believe that the type of *brunneipectus* has ever been at the BMNH.

The holotype of *brunneipectus* was listed neither among the type specimens of birds in the Indian Museum, nor as one of Blyth's types missing from there that were feared lost (Sclater, 1892), but the same may be said for a number of Blyth's types. Also, in November 1996, when PCR asked to see the types of *thoracicus* and *brunneipectus* at the Zoological Survey of India (ZSI, the former Indian Museum), Calcutta, a type record card was located only for *thoracicus*. Neither type specimen could be

found (and even in 1849 the type of *thoracicus* was "in bad order"; Blyth, 1849), nor was either listed in the ZSI type catalogue (ms). It therefore seems unlikely that the type of *brunneipectus* was ever held in Calcutta. The holotype of *brunneipectus*, should it resurface, would probably be undated, and it would lack a specific locality. However, it was collected pre-1867, and it may be labelled 'Himalayas?'. The description of *brunneipectus* (Blyth, 1867), however, leaves little doubt as to its identity with *thoracicus*.

Despite Seebohm's synonymy and his own earlier scepticism, even Hume finally became convinced that *mandelli* was valid; he called it "quite distinct from *Tribura luteoventris*", and reported that he had obtained two specimens from Shillong (Hume, 1888). Oates (1889b) listed *mandelli* as a good species from Sikkim and Shillong and gave an accurate description of it, although he later omitted it (Oates, 1889a), perhaps due to a lack of information on its nest and eggs. It was listed as a species in the description and a follow-up account of the Philippine taxon that, ironically, was named *seebohmi* (Ogilvie-Grant, 1895a, b). After 1899, *mandelli* continued to receive a measure of recognition (and thus it still has the potential to displace a later name; ICZN, 2000): Baker (1907) listed *mandelli* as a species; it was reported from northern Myanmar by Rippon (Harington, 1909); and it was noted as having been compared with a specimen from southern Vietnam (Robinson & Kloss, 1919). At least two specimens were originally identified as *mandelli*: BMNH 1905.8.16.216, which was taken in Myanmar by Rippon in 1901; and AMNH 592150, which was taken in Assam by Coltart in 1905 and is identified in what must be his writing on the label.

After Hartert (1910) listed *mandelli* as a synonym of *luteoventris*, Baker (1921) stated "there can I think be no doubt that Hartert is right in uniting *luteoventris* and *mandelli*. The individual variation is great". However, Hartert (1910) was probably simply following Seebohm (1881); there is no evidence suggesting that Hartert had studied the situation himself, and the Tring (Rothschild) Museum held only two poor, atypical specimens of *mandelli*. One of these (AMNH 592150; originally identified as *mandelli*) is at least now missing the ramphotheca and podotheca, as well as most of its undertail coverts and rectrices, and the other (AMNH 592142; originally identified as *T. luteoventris?*, an emendation of *luteoventris*) is russet overall and therefore rather similar to *luteoventris*. In any case, Baker (1924, 1930) treated *mandelli* as a synonym of *luteoventris*, although inconsistently so, since he continued to refer to individuals with spotted throats as *T. mandelli*.

Thus, with no convincing rebuttal of the repeated attestations as to *mandelli*'s validity (Brooks, 1881a, 1881b; Hume, 1888; Oates, 1889b), that name was doomed to obscurity by its synonymy with *luteoventris* in influential works (Seebohm, 1881; Hartert, 1910; Baker, 1924, 1930). Only *luteoventris* (s.l.) was listed as occurring both in the Indian subcontinent, which constituted the entire previously known range of *mandelli*, and Myanmar, from where specimens of *mandelli* only began to appear in 1901 (app. 1). Baker (1933) nominally discussed only *luteoventris* (s.l.), but the data are composite, and his very large series of bush-warbler nests with cuckoo eggs in the BMNH are all now listed under this species. In most museums, existing specimens formerly identified as *mandelli* were reidentified, usually as *luteoventris*, and incoming specimens were usually labelled as *luteoventris*. Field observations of *luteoventris* (s.l.) from the Indian subcontinent must carry the strong likelihood of referring instead to

mandelli or to another similar species.

However, some 20th century workers seemed troubled by the high levels of variability shown by *luteoventris* (s.l.). At least four of Koelz's *mandelli* specimens have an unpublished name on their original labels in his writing (app. 1), while six others were identified as *luteoventris*, and four as '*Bradypterus* sp.'. Koelz left no manuscript notes that might clarify his intentions (J. Hinshaw, pers. comm. 1998), but he was evidently puzzled by his *mandelli* specimens, and probably planned to name a new form. The extensive manuscript notes on birds of the Indian subcontinent by N.B. Ticehurst and Hugh Whistler (Warr, 1996) show that they studied each BMNH specimen in an attempt to sort out the two species. While their initial identifications closely paralleled ours (listed in app. 1), they eventually treated *mandelli* as a synonym of *luteoventris*, as did Ticehurst in his manuscript on birds of Myanmar (Warr, 1996). In the report on the 1933-1934 collections from Bhutan and environs (Ludlow & Kinnear, 1937), a single *Bradypterus* specimen from Bhutan (BMNH 1935.4.5.907) was omitted. Its label was marked only '? warbler', and it proves to be a *mandelli*, which was no doubt set aside for further study.

Subsequent to the synonymy that resulted in the loss of *mandelli* from the recognised avifauna of the Indian subcontinent, related taxa began to be discovered well to the east which ought to have been compared with the considerable holdings of *mandelli* by then at the BMNH. In chronological order, these were *Lusciniola seebohmi* (1895); *Stasiasticus montis* (1896); *Lusciniola melanorhyncha* (1898); *Tribura idonea* (1940); and *Bradypterus montis timorensis* (1944). Of these, however, it is only evident from the descriptions that such comparisons were actually made for *seebohmi* by Ogilvie-Grant (1895b), who asserted that "clearly the nearest allies to this species are *L. luteoventris* and *L. mandelli*" and noted only very minor differences. Also, in reference to a southern Vietnamese specimen, Robinson & Kloss (1919) stated "It most nearly agrees with the bird described by Brooks as *Dumeticola mandelli*... in regard to the scanty throat-spots and dark mandibles; but we have followed Hartert ... in regarding this as synonymous with *L. luteoventris*." Thus, Robinson & Kloss (1919) declined to name the southern Vietnamese bird as new, and it was not until over 20 years later that *Tribura idonea* was described from an adjacent locality (Riley, 1940).

In retrospect, it is difficult to understand how all these taxa that so closely resemble *mandelli* were described, and the species limits revised, without even raising the question of *mandelli*'s specific distinctness, or the possibility that the species *seebohmi* (s.l.) occurred in the Indian region. This may be due partly to the fact that very few Indian subcontinent specimens of *mandelli* (most in poor condition and in confusing plumages) exist in the American museums in which the work by Riley, Mayr, and Delacour primarily took place. Also, comparisons have been greatly hindered by the fact that no single museum has typical representatives of all taxa. The BMNH registers evidently list only four specimens as *mandelli*: BMNH 1905.8.16.216, collected by Rippon in Myanmar; and, by an early correction in the register, 86.7.8.1908-1910 from the Hume collection, but the last, from Darjeeling, is actually a typical *luteoventris* that went as a duplicate into H. Whistler's collection. It is unclear whether this latter specimen was misidentified while in Hume's collection, or if this was a subsequent transcription or identification error.

2.2. Other potentially relevant synonyms

Besides the names *affinis* and *brunneipectus* that clearly belong in the synonymy of *Bradypterus thoracicus*, three potentially available names older than *Dumeticola mandelli* remain: *Horornis flaviventris* Hodgson, 1845; *Lusciniopsis brevipennis* Verreaux, 1871; and *Horornis erythrogenys* Hume, 1872. All these have been previously synonymised, but re-evaluation is necessary in each case in light of the erroneous synonymy of *mandelli*, in order to eliminate the possibility that any of them may be an older applicable name.

The taxon *L. brevipennis* was based on two specimens from Moupin (= Baoxing Xian, Sichuan: 30°23'N., 102°50'E.), China, in the Museum National d'Histoire Naturelle (MNHN), Paris. The mounted syntypes were examined by La Touche (1926), who then placed the taxon in the synonymy of *luteoventris*. Because by then La Touche (1926) also recognised *melanorhynchus*, he presumably would have compared *brevipennis* with true *luteoventris*. In any case, PCR re-examined both now-dismounted syntypes in 1997, and confirmed that this synonymy is correct.

The May-collected holotype of *Horornis erythrogenys* Hume, 1872, from Darjeeling, was examined by Oates (1889b), who considered it *luteoventris* in fresh spring plumage, and it has consistently been listed since then as a synonym of *luteoventris*. We have examined the holotype of *erythrogenys* (BMNH 1886.7.8.2194), and it is indeed an unusually brightly coloured, but otherwise typical, individual of *luteoventris*.

Horornis flaviventris Hodgson, 1845, was listed as a good species "from the Cachar region of the hills of Nepal" (Jerdon, 1863), and then as a valid taxon based on three syntypes by Seebohm (1881), and its identity has never properly been established. Subsequently Brooks (1881b) noted that Mandelli's specimens in Hume's collection labelled as *flaviventris* were actually the aberrant bush-warbler *Cettia flavolivacea*. After examining the syntypes of *flaviventris*, Brooks (1881b) wrote:

"Above they are much about the same tone of colour as *Dumeticola affinis* [*thoracicus*]; below they are much like a yellowish *Horornis fortipes*. There is no spotting on the breast, but one is very slightly mottled on the chin and upper throat. The breast is browner than the throat and abdomen. The tone of the bird below by no means warrants the name of *flaviventris*. One of the three has the lower tail-coverts tolerably perfect. These are brown, with broad, pale brownish white margins in the true *Dumeticola*, *Tribura* and *Locustella* fashion. The wing is also that of a *Dumeticola*, and so is the very rounded tail, with the outer feathers a good half inch short of central tail feathers.... To me the species looks much like unspotted *Tribura affinis* (*Dumeticola affinis*, Hodgs.), and may be the young of that species or the bird in a yellowish plumage; but I am not sure about its being *affinis*, for the latter has, as a rule, a longer wing, and the third feather is proportionately longer, there being a greater distance or step between second and third than in *flaviventris*".

Subsequent to its description, *flaviventris* was reported only once, as having been collected in the Khasi Hills by Lt. Godwin-Austen (Hume, 1888). Oates (1889b) synonymised *flaviventris* with *thoracicus*, but it was later synonymised with *luteoventris*

(s.l.; Hartert, 1910). Although Warren & Harrison (1971) stated that only the selected type (BMNH 1845.1.9.828) remains, according to the BMNH accession register, the syntypes of *flavoventris* are BMNH 1845.1.9.828, 829 and 830, all of which we have now located.

The syntypes of *flavoventris* have whitish-tipped undertail coverts, and are thus incompatible with *luteoventris*; they have fine bill tips, so they cannot be *mandelli*. They do not resemble juvenile specimens of *mandelli*, which have a more solidly dark grey-brown breast and flanks, and a larger, mainly dark bill; nor those of *luteoventris*, which are very like the adults but yellow-tinged below. Rather, they closely match juvenile *thoracicus* (e.g., BMNH 1938.12.13.74) in colour and bill size and shape. The tails of the two syntypes of *flavoventris* that have measurable tails are 37.6 and 41.5 mm long; shorter than juveniles of *mandelli* or *luteoventris*. Thus, although Brooks (1881b) was not quite certain, much more comparative material is now available than in his time, and all evidence indicates that *Horornis flavoventris* is a synonym of *Bradypterus thoracicus*.

As long as *Horornis flavoventris* Hodgson, 1845, remained in the synonymy of *luteoventris*, the latter clearly had page priority over the former. However, the necessity of associating it with *thoracicus* means that the name *flavoventris*, which was published in August (Duncan, 1937), probably antedates *Dumeticola thoracica* Blyth, 1845 by a few weeks. Baker (1930) dated the latter as "after August 1845"; no doubt he arrived at this from the fact that the description of *thoracica* appeared in the journal issue (no. 164) which covered the Asiatic Society's August meeting. Given the potential for the little-used *flavoventris* to displace the well-established name *thoracicus*, we have applied for conservation of the latter (Case 3102; see *Bull. Zool. Nomen.* 57(1), p. 9, March 2000). However, Article 23.9 of the newest Code (ICZN, 1999) stipulates that names in disuse since 1899 could not in any case displace those now in use, so *thoracicus* automatically takes precedence and *Horornis flavoventris* becomes a nomen oblitum, which will not appear on an Official List of Rejected Names (P. Tubbs, in litt.). Also of relevance to the preservation of *thoracicus* is that, while *affinis* has been listed as authored by Hodgson, 1844, this was a nomen nudum that formed the basis for the valid description of Gray (1846).

Thus, no available, applicable names with priority over *mandelli* exist. This name is explicitly associated with extant syntypes of unambiguous identification and a thorough description; it figures extensively in the older literature; and it received limited usage until 1919. It was synonymised by an author who had not studied series and was not even certain that his own action was correct, and later it was displaced by an author who overlooked it entirely despite the good series available and the extensive references to it in the older literature. The name *mandelli* must therefore be used for the Himalayan population associated with those forms previously grouped under the younger name *seebohmi* (s.l.) and thus for the continental species, as redefined herein. Were priority to be set aside for some reason, we note further that *seebohmi* is different enough in vocalisations and morphology that we tentatively treat it as a separate species. If *seebohmi* were, however, considered conspecific with *mandelli*, the continued use of the name *seebohmi* (s.l.) for the entire species would not only defy priority, but would also invite further taxonomic confusion, as this outlying population presents a borderline case of speciation and is therefore liable to changing treat-

ments. The next available name for the continental populations would be *melanorhynchus* (La Touche, 1898), but no benefits would be gained by its use for the species over the older available name *mandelli*.

Although the common name 'russet bush-warbler' has also been used for island populations which we herein consider non-conspecific, this name is more familiar in the context of the continental Asian forms, which we now group under the oldest name, *mandelli*. Suitable alternative common names already exist for most of the other taxa (which see). We therefore formally propose the usage of the pair of names 'russet bush-warbler *Bradypterus mandelli*'. This has already been adopted elsewhere (though without the hyphen; Kazmierczak & Singh, 1998; Kazmierczak & van Perlo, 2000; Robson, 2000a; Round, 2000) on the basis of our work in progress (Dickinson et al., 1998).

2.3. Evidence for *mandelli* in the Indian subcontinent

At least 45 specimens of *mandelli* were collected in the north-eastern Indian subcontinent between 1873 and 1953 (app. 1; fig. 1a). Their localities range from West Bengal and Sikkim east (one of which is from inside the present-day borders of Bhutan) to the hills south of the Brahmaputra including those in Meghalaya. The specimen from Bhutan (BMNH 1935.4.5.907, collectors' no. 2972) is that omitted from the published trip report (Ludlow & Kinnear, 1937), in which both *thoracicus* and *luteoventris* (s.l.) were discussed.

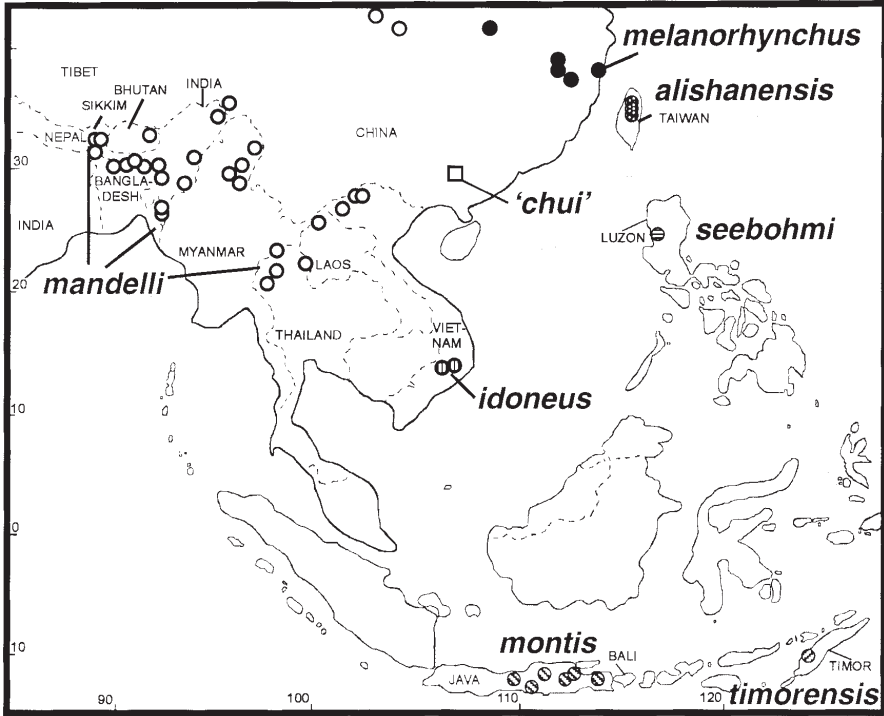
The number of specimens (16) from the hills of Meghalaya would seem to indicate that *mandelli* was particularly common there, and due to its habitat preferences, it is likely to have increased, if anything, with forest destruction. It was found common in the Shillong area in spring 2000 (C.R. Robson, pers. comm.). The lack of specimens from neighbouring Bangladesh, or from the Indian hills north of the Brahmaputra and east of Bhutan, must be due to the fact that very few collectors have ever worked in these hills. In fact, *mandelli* has recently been tape-recorded at several sites in Arunachal Pradesh (fig. 1b; P. Singh, in litt.). In addition, the non-forest habitat of *mandelli* has often received little attention from collectors, and the region in question has been almost entirely off-limits to foreigners until very recently.

Recently published information on *mandelli* from the Indian subcontinent seems to have been based solely on aural records. In this species, the song is quite unmistakable to experienced observers. On 13 May 1989, the song was:

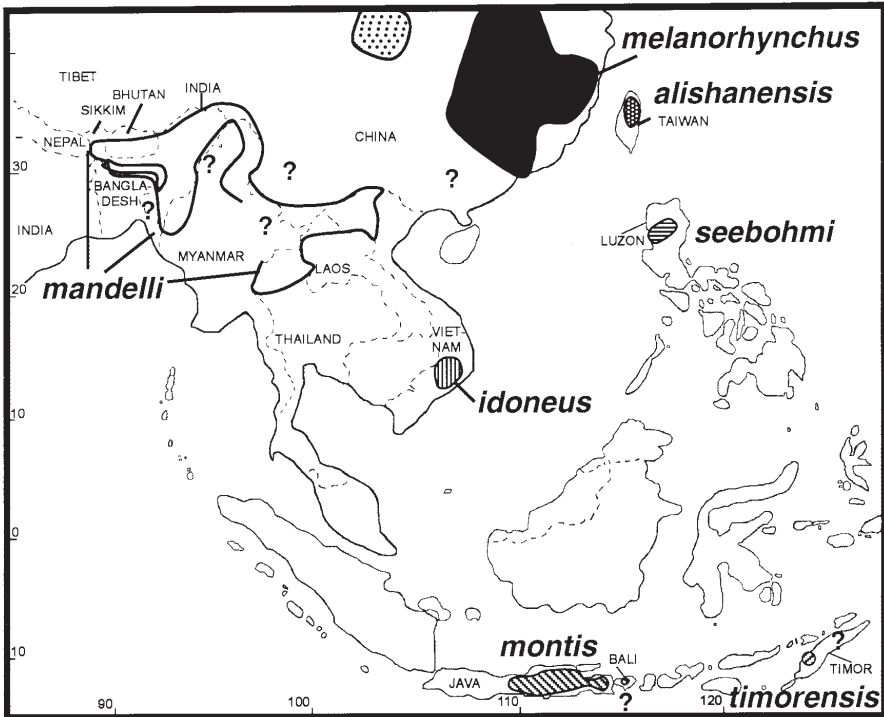
"...frequently heard in tea plantations below Darjeeling and along Tenzing Road to Ghoom (2000-2200 m), not heard at higher elevations. According to F.G. Rozen-daal the diagnostic *crree-ut, creeut* ... (which I tape recorded) belongs to the taxon *sebohmi* and not to *luteoventris* (as stated in the handbooks and field guides!!)." (Scharringa & Schrijver, n.d.).

On "10 November 1994, Sikkim, one calling bird was seen at Pemayangtse Monastery (2080 m) in Sikkim, India. It was seen in tall grass at edge of lawn, surrounded by patches of primary oak-chestnut forest, along path next to the monastery" (J. Scharringa, in litt.). The first of these reports accounts for the West Bengal record in Grimmett et al. (1999), and other recent observers have also found

a



b



this species near Darjeeling (e.g., P. Alström, P. Singh, in litt.). Several reports, supported by tape-recordings, originate from Arunachal Pradesh (fig. 1b): Jengging (28°40'N., 94°58'E.), at 850 m on 25-26 March 1998; Chimpu, near Itanagar (ca. 27°06'N., 93°37'E.), 300 m, on 13 March 1998; Jang (27°34'N., 91°59'E.), 2100 m, 19 July 1998; along the Bomdilla (27°20'N., 92°20'E.) to Dirang (27°25'N., 92°17'E.) road, 2450 m, on 10 July; and near Tenga at 1940-1980 m along the Tenga-Bomdilla road (Singh, 1999).

For Nepal, none of the Hodgson 'Nepal' specimens of *luteoventris* (s.l.) have proven to be *mandelli* instead, and there are no other valid reports of *luteoventris* (s.l.) from the country (Inskipp & Inskipp, 1991). However, *mandelli* evidently breeds just to the east, in Darjeeling, and so may be expected in easternmost Nepal. For Bhutan, only *luteoventris* (s.l.) had been reported previously (Inskipp & Inskipp, 1994; Ali et al., 1996). However, two recent separate reports of *mandelli* (Robson, 1996b; Tymstra et al., 1997) are based on a tape-recording made on 23 May 1994 by S. Connop at 2200 m in south-west Gasa, west Bhutan (ca. 27°55'N., 89°41'E.). This record of singing *mandelli* strongly suggests it breeds there, and is the first report for west Bhutan. The species is also listed but unsourced for central Bhutan (Grimmett et al., 1999), and the country's sole specimen (BMNH 1935.4.5.907) is from east Bhutan (app. 1). For Bangladesh, records exist of *luteoventris* (s.l.) from the hill sectors (er Rashid, 1967), but the correctness of all these is uncertain. No definite records of either species are known from Bangladesh (P. Thompson, in litt.).

As there are no records of *mandelli* far away from the hills in the Indian subcontinent, it is presumably mostly an altitudinal migrant. The only nesting records for the region are a Mangpu, West Bengal specimen (BMNH 1886.7.8.1877) said to have been taken on the nest on 15 June, and breeding records for Shillong (Baker, 1907). Three clutches of four eggs each taken in late May 1908 by Coltart in the Khasi Hills, and from the Baker collection, were originally labelled *Tribura mandelli* (BMNH 1961.1.776) but were later relabelled *luteoventris*. However, the fact that Coltart correctly identified his 1905 specimen (app. 1) suggests that these eggs are likely to be *mandelli* as well.

Not all the problems surrounding *mandelli* within the Indian subcontinent involve its confusion with *luteoventris* - many *mandelli* specimens have been identified as *thoracicus* (app. 1). While his description of *luteoventris* appears to refer exclusively to that species, Inglis (1957), who (with H.V. O'Donel) was one of the few 20th century collectors operating within the range of *mandelli*, probably included *mandelli* with *thoracicus*.

Within the range defined by the specimen records (see app. 1, fig. 1) it appears that *mandelli* may be reasonably common, but more field work is clearly required to establish how its habitat requirements and altitudinal range in the breeding season differ from those of *luteoventris*, with which it is otherwise widely sympatric. Field work might also demonstrate species-specific differences in eggs that would allow existing collections to be re-identified. There may even be differences in nest struc-

Figure 1. Map of verified localities for taxa of the *Bradypterus seebohmi* (s.l.) superspecies: a) specimens only (listed in app. 1), with symbols centered over localities; b) ranges reconstructed from other sources discussed in text. Areas filled with dots are of uncertain taxonomic allocation.

ture, as suggested in a composite account of *luteoventris* (s.l.) by the observation that the 'species' builds two kinds of nests — domed and cup nests (Baker, 1933).

3. Populations in Myanmar: *mandelli*

3.1. Evidence for *mandelli* in northern Myanmar

Despite recent reports of *mandelli* as new for Myanmar, there is ample evidence for its presence within that country dating to 1901 (app. 1, fig. 1). The first published record of *mandelli* (and the only specimen under that name) from Myanmar was provided without supporting data in a list of birds that Col. Rippon had evidently encountered in northern Myanmar (Harington, 1909). Fortunately, a specimen (BMNH 1905.8.16.216) substantiates Rippon's record from the Kauri-Kachin tract (approx. 25°45'N., 96°52'E.); its correct identification as *mandelli* may have been due to Oates's assistance (Rippon, 1901). The details of this record have not previously been published and this, along with the disuse of the name *mandelli*, no doubt explains why Rippon's record has been overlooked or disregarded in subsequent works on Myanmar, most influentially Smythies (1953 and other editions). In Ticehurst's MS on birds of Myanmar (Warr, 1996), Rippon's *mandelli* specimen was listed as *luteoventris*, as Seeböhm's synonymy was followed therein.

Harington (1909) collected a specimen and found a nest under construction that he thought was of *luteoventris* (s.l.), and a similar nest with eggs was later brought in by a Kachin. The birds kept "to belts of thick grass and rushes" and had a "very grasshopper-like note", the latter suggesting *luteoventris* (although of course grasshopper calls also vary by species). However, Harington's 1908 specimen (AMNH 592142), collected at Sinlum-Kaba (24°16'N., 97°31'E.), Bhamo District, was labelled '*luteoventris*' but is *mandelli*. Thus it seems probable that Harington's (1909) account is a composite of the two species.

Stanford found both species at Kambaiti (25°24'N., 98°09'E.) "at about 7000 ft. where it was undoubtedly breeding in sallow, bramble and rough grass outside the tree-jungle on the edge of pea cultivation. I shot a male singing in May, a thin song rather like the noise of a fishing reel. The alarm note is a harsh grating 'churr'" (Stanford & Ticehurst, 1938). The description of this song broadly fits that of *luteoventris* (Kennerley & Leader, 1993), and six of Stanford's seven Kambaiti specimens are *luteoventris*, but one (BMNH 1941.12.1.167) is *mandelli*. Two specimens of *luteoventris* from Stanford's collection (his collecting number 2507, and no. 2434 collected by W. Stubbs) are in the Swedish Museum of Natural History (NRM); the others are at the BMNH. Stanford also apparently found *luteoventris* near Hpare (probably 25°50'N., 98°25'E.) in "poplar and bramble scrub...at 6000-7000 ft." in March 1939, this time writing of "a faint grasshopper-like song" (Stanford & Mayr, 1941). Although Stanford & Mayr (1941) listed it as "*Tribura thoracica*?", Stanford was confident that this was the same bird he had found breeding at Kambaiti, where he had evidently heard *luteoventris* but collected both species.

Commenting on the above, Smythies (1949) wrote "Stanford found it breeding round Kambaiti (this species, not *thoracica* as stated in *Ibis*, 1941: 238)". Although this compounds the confusion as it does not mention Hpare, Smythies was seemingly trying to correct the record, and Stanford (*in* Stanford & Ticehurst, 1938) had indeed list-

ed the Kambaiti birds as *luteoventris*. Both Smythies and Stanford apparently thought that both songs belonged to a single species. However, Stanford only noted hearing *luteoventris* and most of his specimens were this, while Smythies had heard only *mandelli* (see next paragraph). No specimen was collected at Hpare, so we can only assume, as did Smythies (1949), that the listing of *thoracicus* by Stanford & Mayr (1941) was a simple error.

Smythies (1949) did not note having heard singing *Bradypterus* in February 1948 along the N'Mai Hka drainage, but soon after turning back on 31 March he heard what he believed to be *luteoventris*. He termed it "a common breeding bird on the Htagaw hillsides in early April and others were heard at Langyang [25°57'N., 98°18'E.] and above Laukkaung [25°54'N., 98°11'E.]", and he rendered the song as "a rapid repetition of two notes, a sort of screech followed by a sharp short note, at a rate of 2-3 pairs of notes per second, *creee-ut-creee-ut ...*". This vocal description clearly pertains to *mandelli*, and the only *Bradypterus* specimen that we know Smythies collected on this trip was in fact a *mandelli* (BMNH 1948.34.47).

3.2 Evidence for *mandelli* in Western Myanmar

Bradypterus luteoventris (s.l.) has been listed from two localities in the Chin Hills (Smythies, 1953). Breeding records from Haka (north Chin Hills) in April 1910 are substantiated by a typical *luteoventris* (AMNH 592141) netted on the nest (Venning, 1912). The other published Chin Hills report of *luteoventris* (s.l.) was from Natma Taung (= Mt. Victoria, south Chin Hills). Measurements were published of 15 *luteoventris* (s.l.) specimens that G. Heinrich had collected between 2600 and 3000 m (Stresemann & Heinrich, 1940), but the exact number taken was not reported. Heinrich's specimens were divided between the AMNH, ANSP (Academy of Natural Sciences, Philadelphia), MCZ (Museum of Comparative Zoology, Harvard), and ZMB (Museum für Naturkunde, Berlin), and we have located and re-examined 20 from this expedition, all of which are clearly *luteoventris*. Previously, in 1904 Rippon had collected ten unpublished specimens between ca. 2300 and 2900 m on Natma Taung that also are all *luteoventris*. Curiously, although both these expeditions collected extensively at a variety of elevations and habitats on Natma Taung, and took good series of *luteoventris* there, neither happened to take *mandelli*. Although specimens of *mandelli* have not been obtained nearer to Natma Taung than Blue Mountain in Mizoram (app. 1, fig. 1a), its distinctive vocalisations have recently been reported from both the northern and southern Chin Hills, including at Natma Taung (fig. 1b; Robson et al., 1998). The massive deforestation of the Chin Hills (PCR pers. obs.) might have resulted in an increase in the range and abundance of *mandelli* there.

Records of *mandelli* are lacking from the Northern and Southern Shan States and Kayah State (= Karenni), but this is no doubt due to the rudimentary state of ornithology in these regions. Certainly in the Southern Shan States (PCR pers. obs.), at least, there is abundant suitable habitat, and numerous records exist from adjacent Thailand.

4. Populations in Thailand: *mandelli*

The only two *mandelli* specimens known from Thailand before the 1980s had both

been assigned to the race *idoneus* (Delacour, 1952), but Round (1992) questioned this assignment because the Chinese race *melanorhynchus* seemed equally plausible; *mandelli* was then in synonymy.

As there has been a great deal of confusion surrounding the identification of the few *Bradypterus* specimens known from northern Thailand, we review the matter here. A moulting, tail-less *mandelli* specimen (USNM 350293) from Doi Phu Kha in April 1936 has been reported as *B. thoracicus przewalskii* (Deignan, 1945), *B. seebohmi idoneus* (Delacour, 1952), and *B. luteoventris idoneus* (Deignan, 1963). A good specimen of *mandelli* with an exceptionally heavily spotted throat (MCZ 196866) from Doi Angka (= Doi Inthanon) on March 1937 was earlier listed as *B. t. thoracicus* (Peters, 1940; Deignan, 1945), but was reidentified by Delacour (1952) as *idoneus*. Incidentally, since the reassignment of both the above, there have been no acceptable Thai records of *B. t. thoracicus*, although that taxon was still listed by Deignan (1963) and consequently appeared in later regional lists.

Of two *Bradypterus* specimens collected at Doi Suthep in March 1937 and preserved as mummies (Deignan, 1945), one was published as *B. thoracicus shanensis* (Ticehurst, 1941), now *B. [t.] davidi* (Round & Loskot, 1994). The other (USNM 344431) was identified as *Bradypterus luteoventris ticehursti* but is *mandelli*. This means there is no record of *B. luteoventris ticehursti* from Thailand (see section on that species).

In 1983, a significant breeding population of *mandelli* was discovered and substantiated by a specimen (Thai National Reference Collection, TNRC ACW 40) on Doi Ang Khang, Chiang Mai Province, Thailand. The species is now known to be a locally common resident between 1300 and 1900 m in the hills of northern Thailand, at least at Doi Pha Hom Pok (20°04'N., 99°10'E.); Doi Chiang Dao (Doi Luang Chiang Dae, 19°23'N., 98°50'E.); Huai Nam Dang (Ban Huai Nam Dang, 19°17'N., 98°37'E.) and Doi Inthanon (Round, 1983, 1992; Lekagul & Round, 1991). All four Thai *mandelli* specimens (see app. 1) are best placed with nominate *mandelli*, for reasons explained below.

5. Populations in China: *melanorhynchus*

The original stimulus for the recognition of *seebohmi* (s.l.) as a species separate from *luteoventris* (Delacour, 1952) was the presence of both in Fujian in April. However, an earlier description (La Touche, 1899) of the habitat of *luteoventris* (s.l.; grasslands with ferns at 1370 to 1520 m at Kuatun), and of the presumed song (rendered as "chee-chuckee-chuckee-chuckee-chuckee"; La Touche, 1899) carried the implication that two species were involved; at least the song as described fits *melanorhynchus* and not *luteoventris*. La Touche (1913) mentioned an April record of *melanorhynchus*, and then (1926) treated the two respectively as *Tribura luteoventris* and *Tribura thoracica melanorhyncha*.

In passing, La Touche (1923) had commented that Hartert (1910) had previously synonymised *melanorhynchus* under nominate *thoracicus*, but qualified this by saying that "I believe that he is now inclined to consider the Chinese bird distinct" (La Touche, 1923), and later "I understand that he now agrees with me that it is different" (La Touche, 1926). However, even after that, Hartert & Steinbacher (1932-1938) retained *melanorhynchus* in the synonymy of *thoracicus*, dismissing it with the state-

ment "keine sicheren Unterschiede erkennen" [no clear distinction is apparent]. La Touche's trinomial treatment of *melanorhynchus* as a race of *thoracica* was, however, followed by Baker (1930), Caldwell & Caldwell (1931), and Yen (1933), and as a result of the considerable confusion in the literature on China, *melanorhynchus* was listed as a synonym of *thoracicus* by Warren & Harrison (1973).

The three syntypes of *Cettia russula* Slater, 1897, previously synonymised with *luteoventris* (La Touche, 1926), were reported to be at the BMNH (Warren & Harrison, 1971); the selected syntype, and the other two, were collected at Kuantun, northwestern Fujian by Rickett and La Touche. However, only two (both *luteoventris*) are in the BMNH, while the syntype (taken on 18 May 1896) is not there, nor is any other collected on that date (M.P. Adams, in litt.). Instead, this syntype, which is actually a specimen of *melanorhynchus* rather than of *luteoventris*, was retained by La Touche and is now MCZ 129138 (although it was not listed as a type by Bangs, 1930). This creates a situation in which the name *Cettia russula*, long a synonym of *Bradypterus luteoventris*, requires the designation of an appropriate lectotype if it is to be assured of continued treatment as such. We therefore designate the selected type (Warren & Harrison, 1971) of *Cettia russula* Slater, 1897, BMNH 1898.1.28.65, collected 27 May 1896, and which is a true *luteoventris*, as the lectotype for that taxon.

The area in Kuantun where La Touche, Rickett and Styan all collected is now within the Wu Yi Shan Reserve, and both *luteoventris* and *mandelli* breed there. They also both breed at Ba Bao Shan, Guangdong, where *luteoventris* occurs in the dwarf bamboo on the windblown summit whereas *mandelli* prefers lightly wooded or scrubby hillsides on the upper and mid-slopes; the latter's habitat must have expanded significantly due to deforestation in China this century. Outside the breeding season both occur at lower elevations, and they have then been found in identical habitat, as at Hong Kong, where *mandelli* is more common and sings even in winter, a habit not noted for *luteoventris* (P. Kennerley, pers. comm.). From south-eastern China, specimens of *melanorhynchus* appear to exist only for Fujian and Hubei, however, and thus far it can only be assumed that the birds from Guangdong and those wintering in Hong Kong (Kennerley & Leader, 1993) also belong to the race *melanorhynchus*. If the variation between southern and northern populations in eastern China is clinal, it may not be possible to racially assign specimens from intermediate localities.

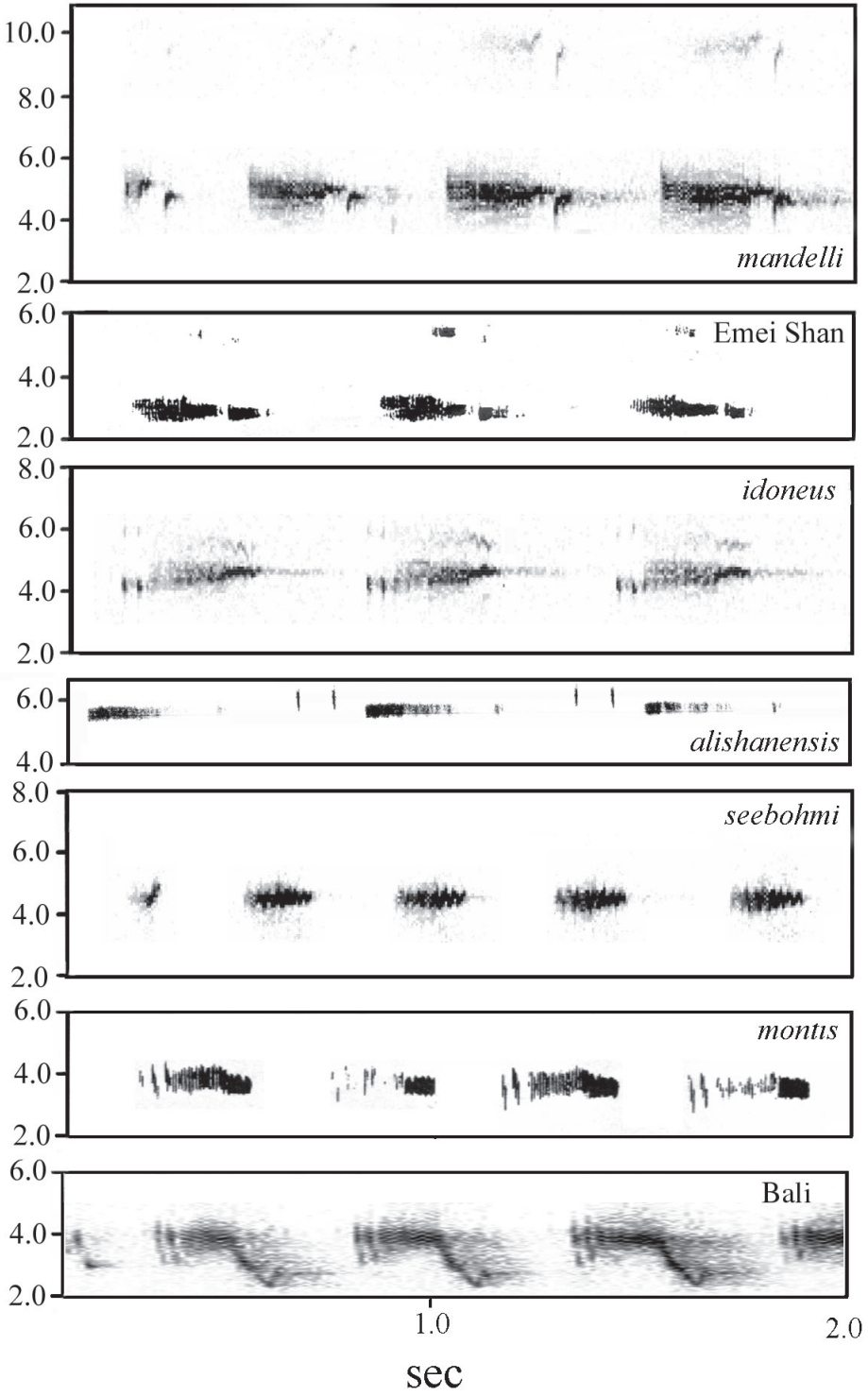
For two enigmatic taxa that are evidently only known from the type specimens, the type locality for both *Bradypterus tacsanowskii chui* (Yen, 1933) and *B. thoracicus saturatus* (Yen, 1933) in the Dayao Shan (fig. 1a; ca. 24°00'N., 110°06'E.), Guangxi, would form an outlying breeding population at least for the first species and probably both (Cheng, 1958, 1987). It remains unclear where the type specimens are, and there seems to be no record of their having been re-examined; unfortunately, neither is described in adequate detail to allow confident determination of its identity. However, as noted by Kennerley & Leader (1993), the description of *chui* mentions its smaller size, darker upperparts, and more reddish flanks than in *tacsanowskii* (Yen, 1933), and thus it is a much better match for *mandelli*. The description of *B. thoracicus saturatus* must be taken in the light that Yen (1933) had followed La Touche's (1923, 1926) trinomial treatment of *melanorhynchus* under *thoracicus*. Yen stated that *saturatus* was very similar to *melanorhynchus* but with browner rather than grey sides of breast and body. However, *mandelli* (including *melanorhynchus*) varies considerably in this

character, a fact not recognised by Yen (1933), and the browner sides and shorter tail (48 mm.) of *saturatus* actually are consistent with the possibility of its being a juvenile *mandelli*. Both *chui* and *saturatus* had short wings (50 and 51 mm for the former; 49 for the latter), which is also consistent with *mandelli*. Hopefully, the type specimens of *chui* and *saturatus* are extant (but we have failed to locate them), and their identity can still be resolved. It seems most unlikely that a breeding population of *tacsanowskius*, differing from the nominate in characters that make it very similar to *mandelli*, would exist in south-eastern China, and the same could be said of *thoracicus*. In any case, Dayao Shan is not far north of known populations of *mandelli* in northern Vietnam (fig. 1a). Given that *mandelli* is common in winter in Hong Kong, and has been heard in various places in Guangdong Province (Round, 1992), it seems likely that it will prove to be more or less continuously distributed in eastern China (as postulated by Round, 1992). A visit to near the type locality of *chui* and *saturatus* with the specific goal of relocating these taxa failed to find birds vocalising like *tacsanowskius*, and the area was largely deforested (P. Kennerley, pers. comm.).

From farther north, and possibly representing an isolated population, there are two known specimens from Yichang, Hubei Province and two from Sichuan: one (USNM 306276) from Washan (= Ebian Xian, 29°20'N., 103°05'E.), the other a single poorly prepared specimen (MNHN 1896) from Tat-sien-lou (= K'ang-ting, 30°03'N., 102°02'E.). Both of these localities are near Emei Shan (29°32'N., 103°21'E.) where both *mandelli* and *luteoventris* were tape-recorded in 1986 (C. Robson, pers. comm., 1999), and where FGR heard both in 1987 (at about 1840 m. near First Hall temple below Huayan Peak).

The eastern Chinese (Fujian) subspecies *B. mandelli melanorhynchus*, while quite similar to nominate *mandelli*, usually has paler upperparts, this being especially apparent in comparisons among BMNH specimens, and differs mensurally in several characters from nominate *mandelli* (appendices 2, 3), including in its shorter bill and tail. Also, none of the specimens we have seen shows more than slight speckling on the throat. Clearly, *melanorhynchus* represents a valid taxon, which we believe on morphological and vocal evidence to be conspecific with *mandelli* from north-eastern India. Except for the paler upperparts colouration than in *mandelli*, *melanorhynchus* does not seem to form a morphological link between nominate *mandelli* and the Taiwanese *alishanensis* (Rasmussen et al., 2000), despite its intermediate geographical situation. Songs of birds from near the type locality of *melanorhynchus* in Fujian, and from neighbouring Guangdong and Hong Kong sound extremely similar to those from Thailand (fig. 2; Round, 1992), Bhutan and West Bengal (J. Scharringa tape-recording), and Arunachal Pradesh (P. Singh tape-recording). Incidentally, a song of *mandelli* tape-recorded at Emei Shan differs in a few details from eastern Chinese and

Figure 2. Sonagrams of primary songs of all taxa of *Bradypterus seebohmi* (s.l.) except *timorensis*: from top to bottom, *B. mandelli melanorhynchus* taped by P.R. Kennerley at Ba Bao Shan, China, 15 June 1988; *B. mandelli* from Emei Shan taped in 1986 by C.R. Robson (previously reproduced in Round, 1992); *B. mandelli idoneus* taped by C.R. Robson, Cong Troi, 11 January 1990; *B. alishanensis* taped in Taiwan by Liu Yi-Hua (previously reproduced in Fig. 2 of Rasmussen et al., 2000, published here with permission from The Auk); *B. seebohmi* (s.s.) taped by N. Dymond near Mt. Polis, Luzon, early spring 2000; *B. montis* from Java, taped by FGR (previously reproduced in Rozendaal, 1989); and *B. ?montis*, taped by P. Morris at Bedugul Botanic Gardens, Bali, (probably on) 27 August 1999.



Thai recordings, most notably in its considerably lower pitch (Round, 1992). Further investigation is required to determine whether this may be yet another subspecies, which seems not unlikely given that this area supports numerous endemics and is evidently somewhat isolated from the rest of the range of *mandelli*. The attachment here of all eastern Chinese specimens and records to *melanorhynchus* is provisional, and it seems very likely that the Sichuan population may not belong in this race (fig. 1a, grey circles). Additional Chinese localities for which reliable field observations (Round, 1992) indicated the presence of *mandelli* include Ba Bao Shan (24°55'N., 113°01'E.); Wu Yi Shan (27°43'N., 117°40'E.); Nan Gong Shan (21°20'N., 101°30'E.) and nearby Xishuangbanna; and Nan Kwun Shan (23°38'N., 114°38'E.).

A south-eastern Tibet record (app. 1) for July from Zayu (Xu Yan-Gong, in litt.), very near the junction between India, Myanmar, and China (28°24'N., 97°00'E.), was first published (Li et al., 1978) as *B. seebohmi melanorhynchus* but this record does not seem to have been acknowledged in Cheng (1987). It was reallocated to *B. s. idoneus* (s.l.; Watson in Mayr & Cottrell, 1986), as the sole basis for the Tibet record listed therein, almost certainly because of the relative geographic proximity of Tibet to the nearest known population assigned to that race in northern Thailand. This was of course done without knowledge of the existence of *mandelli* in north-eastern India, and the specimen requires re-examination but, if correctly identified to species, it will surely prove to be *mandelli*.

6. Populations in Laos and Vietnam

6.1. Evidence from Laos and northern Vietnam: *mandelli*

In Indochina, there appear to be two separate populations, one in southern Vietnam where *idoneus* was described from near Da Lat, and another in northern Vietnam and northern Laos. Specimens exist from northernmost Laos at Phong Saly, and from northern Vietnam at Bao Ha (22°11'N., 104°21'E.), Ngai-Tio (22°32'N., 104°12'E.), and Pakha or Pho-lu (22°19'N., 104°12'E.; fig. 1). All these sites are based on specimens that were previously labelled *luteoventris* and reported as such (Kinnear, 1929; Delacour, 1930; Bangs & Van Tyne, 1931; Delacour & Jabouille, 1931), so Laos and northern Vietnam were not included in the range of *mandelli* in King & Dickinson (1975) or Vo Quy & Nguyen Cu (1995), although this has been amended in Robson (2000a). Delacour's (1930) record, which was initially given as from Pakha, was corrected the next year to Pho-lu, which agrees with the specimen label (see app. 1; a Pa Kha or Bac Ha is located at 22°33'N., 104°16'E.).

Recent records from Laos of *mandelli* are from Nam Ha (20°51'N., 100°58'E.), Louang Namtha Province, north-western Laos, seen or heard in tall grass between 1200-1650 m., and Phou Louey (20°15'N., 103°11'E.), Houaphanh Province, north-eastern Laos, in scrub and grass from 1900-2050 m (Duckworth et al., 1999). There is also a recent aural record by J.C. Eames from Tam Dao (21°29'N., 105°38'E.; Round, 1992), and sight or aural records from Cuc Phuong (20°17'N., 105°41'E.; 20°19'N., 105°38'E.; or 20°56'N., 106°22'E.; as low as 450 m. in early February) and Sa Pa/Lo-Quy Ho (22°21'N., 103°52'E.; C.R. Robson pers. comm. 1999). FGR recorded both *mandelli* and *luteoventris* in apparently adjoining territories at Lo-Quy Ho Pass, Hoang Lien Son Province. The population of northern Indochina is darker above than

melanorhynchus, and for this reason and on geographical grounds it probably pertains to *mandelli*.

6.2. Evidence from southern Vietnam: *idoneus*

For the taxon described from a single southern Vietnamese specimen, *B. m. idoneus*, and since extrapolated to include Thai, Taiwanese, and south-eastern Tibetan populations (Delacour, 1952; Watson in Mayr & Cottrell, 1986), no distinguishing characters could be found to justify the racial division on the basis of this range. Neither plumage nor mensural characters (app. 4) have been found for non-Vietnamese specimens attributed to the race *idoneus* (s.l.) that differ in any discernible pattern from Indian subcontinent and Burmese *mandelli*. Subspecific identities had not previously been bestowed on Burmese *mandelli*, these all having been either treated monotypically or misidentified. Delacour's (1952) assignment of Thai specimens to the race *idoneus* (s.l.) cannot be upheld on the basis of characters provided therein.

However, in direct comparison with two specimens from northern Laos, three from Thailand, and one from Myanmar, the type of *idoneus* is very dark and slightly less russet above; it is paler below and lacking either strongly buffy or greyish tones on the breast, being plain pale cold brownish; and it has duller flanks with little fulvous tint. Quantitative colour data for the type of *idoneus* are presented in Rasmussen et al. (2000) with emphasis on comparisons with *alishanensis* of Taiwan.

The two Da Lat specimens (*idoneus* s.s.) from southern Vietnam are similar in most measurements (app. 4) to *idoneus* (s.l.) as well as to nominate *mandelli*, but appear to differ from both in shortfalls of the inner primaries (P6-10), which show that their inner 'hand' is broader. Both are also unusually pale below, with drab breasts and no buffy wash. The earlier of the two Da Lat specimens (BMNH 1912.20.376) was said to be in moult (Kinnear, 1929), and in Whistler & Ticehurst's MS on Indian birds (Warr, 1996) the annotations "This specimen probably (like *idonea*) like *mandelli*/Yes, like 86.7.8.1862 although nothing like so rufescent but 45 yrs diff. in age of skin" refer to the same specimen. However, in this connection it should be noted that colouration of all taxa in this group does not appear to be much (if at all) affected by age of the specimen, and so the observed difference mentioned by Whistler & Ticehurst in upperparts colour is thus probably genuine. In comparisons between this Da Lat specimen and three *mandelli* collected by H. Stevens in northern Vietnam (app. 1), M.P. Adams (pers. comm.) stated "By comparison, 1912.20.376 is a brighter, cleaner white on the chin, throat and belly and has an extremely weak 'dirty'-looking breast patch ... (overall – 1912.20.376 is whiter)". It is slightly darker and less reddish above, with a white rather than buffy supercilium.

This sample of two Da Lat specimens is far from statistically significant, but, as they were measured at different times and places without comparison until much later, and as they are similar to one another in these characters while differing from other populations, this is likely to be a manifestation of geographic variation. Without more specimens, this alone would probably be insufficient to justify subspecific recognition. However, it has been known for several years that a tape-recording made on 11 January 1990 by C.R. Robson from Cong Troi, near Da Lat (and close to the type locality of *idoneus*) is noticeably different (although being broadly similar) to those from China, north Vietnam, and Thailand (Round, 1992).

Thus, southern Vietnamese *idoneus* is evidently recognisably distinct both in mor-

phology and vocally, and we therefore restrict the race *idoneus* to the mountains of southern Vietnam (an area of very high endemism), recognising that further work is needed, in particular to establish the degree to which it is isolated. The other continental populations (except *melanorhynchus* in eastern China), to our knowledge, do not differ either morphologically or in vocal patterns from *mandelli* (app. 4; fig. 2), within which they should be subsumed. A possible exception involves the population of Emei Shan, but although the tape-recording from Emei Shan is at a lower pitch than for other *mandelli* populations, the overall pattern is extremely similar.

In southern Vietnam, recent sight or aural records (fig. 1b) exist from Mt. Lang Bian (12°02'N., 108°23'E.), Cong Troi (12°09'N., 108°23'E.; Robson et al., 1993a); Mt. Bi Doup (12°05'N., 108°40'E.), Long Lanh (12°08'N., 108°39'E.), Cong Troi South (12°06'N., 108°23'E.), and Tuyen Lam (11°52'N., 108°25'E.; Robson et al., 1993b) and the species is also known from Deo Nui San (ca. 11°35'N., 108°04'E.; C.R. Robson, pers. comm., 1999). The earliest of these records is from 1990, by which time Robson was aware of the distinctive song of *B. mandelli* (C.R. Robson, pers. comm. 1999).

7. The population in the Philippines: *seebohmi*

This form was for many years known only from the description of the unique type specimen (Ogilvie-Grant, 1895a, b; Whitehead, 1899; McGregor, 1910). This specimen (AMNH 592174; colour plate 1, top right; app. 1; fig. 1) was taken in the mountains of Lepanto in northern Luzon at ca. 1800m. in a thick patch of coarse grass on 28 December 1894 by John Whitehead.

Recently, Dickinson et al. (1991) noted that E. Mearns had collected two juveniles in July 1907 that are now in the USNM, and therefore presumed that the species must be a rare resident in Luzon. However, of five specimens accessioned at the USNM as *Tribura seebohmi*, at least one had been re-examined and deemed to be a Luzon bush-warbler *Cettia seebohmi* Ogilvie-Grant, 1894 rather than *Bradypterus seebohmi*. However, a second search for, and re-examination of, the putative Luzon *B. seebohmi* specimens was done by PCR, and notes that K.C. Parkes had sent ECD were reviewed. These showed that, of the five Mearns specimens identified as *Tribura seebohmi* (USNM 202626-202628, 208498-208499), two (USNM 202627 and 208498) had been re-identified as *Cettia seebohmi* in August 1986 by Parkes for Dickinson et al. (1991). A third specimen (USNM 202628) listed as juvenile *Bradypterus* in Dickinson et al. (1991) is instead *Cettia seebohmi*. A fourth (USNM 202626) listed by Parkes as juvenile *Bradypterus* cannot now be located, and the fifth (USNM 208499) had been exchanged with the Academia Sinica. It seems unlikely that the two which seem not to have been re-examined will prove to be *Bradypterus seebohmi*, given the originally mistaken identifications of the other three, so we must conclude that the only specimen of *seebohmi* is the holotype.

Until this year, the only other report of *seebohmi* on Luzon, and from the Philippines, was that of J. Scharringa (Dickinson et al., 1991), who reported having tape-recorded the species on Mt. Polis, where he thought it common. The unpublished trip report (Scharringa & Schrijver, n.d.) reads "...it must be mentioned that *B. seebohmi* of Luzon has a different song" than *mandelli*. However, Scharringa's field notes indicate that the birds he recorded are instead *Bradypterus caudatus*, a conclusion with which

he has concurred (J. Scharringa, pers. comm.), and which was independently reached by Harrap (1994) on the basis of Scharringa's tapes.

Thus, for more than a century the taxon group that forms the subject of this paper was still represented in the Philippines by the unique December-collected type specimen from northern Luzon (although this fact has gone unrecognised until now), and no information existed on its vocalisations. We had concluded that the specimen could not have been a vagrant or migrant from some other known population, as it does not agree closely with any of them. For the same reason, the specimen could hardly have been mislabelled, or have had the label switched, and since the skin was prepared in J. Whitehead's distinctive style, it must have been taken on one of his expeditions. Thus we had concluded that an overlooked population of *Bradypterus* warblers must await rediscovery in the mountains of northern Luzon.

Fortuitously, just prior to this paper going to press, *seebohmi* was rediscovered nearly simultaneously by S. Harrap, T. Fisher, D. Allen and N. Dymond, at Bay-yo, near Mt. Polis (16°58'N., 121°02'E.), on 24 February 2000, and also by P. Heath. The birds were in steep grassy valleys between ca. 850-1300 m, and as many as five were heard singing (D. Allen, in litt.). Tape-recordings were made by Harrap, Allen, and Dymond, and the latter also had good views of a singing bird as well. He recorded that it showed a brownish face, greyish-brown flanks, greyish upper breast and sides of breast, lightly mottled across the upper breast, all features that accord well with the specimen. However, Dymond noted that the "undertail coverts were uniform dark brown with no apparent marking at all", a seeming incongruity that may be related to viewing conditions or heavily worn feathers in which the whitish tips were mostly lost.

The unique *seebohmi* specimen has dark russet upperparts, similar to or slightly darker than those of *montis*, a short whitish supercilium (vs typically grey in *montis*), a browner (vs. greyer) face, the throat and upper breast have short vague greyish striations, rather than the heavy dark brown flecks and blotches typical of *montis* (or the nearly unmarked throat and breast of putative first-year plumage in *montis*); the undertail coverts are as in *montis*; and its flanks are dark with very little of the ochraceous tinge that is typically strongest in *montis*. The *seebohmi* specimen is more similar mensurally to *montis* than to any other taxon (app. 2), but it has a lower wing/tail ratio, and slightly smaller feet, although with relatively long claws. The type of *seebohmi* resembles *timorensis*, but differs from the latter (which is almost equally poorly known) in its much darker overall colouration, its darker-based, conspicuously pale-tipped undertail coverts, and its shorter and broader central rectrices. It differs from all three races of *mandelli* in numerous measurements (app. 2), its striated throat and breast, and its duller flanks. The individual and temporal variation in plumage and soft part colouration that characterises some members of this superspecies (e.g., *mandelli* and *montis*; variation greatly reduced in *alishanensis*) make it probable that *seebohmi* will be found to exhibit at least some variability.

When *seebohmi* was first heard by the above observers, its song was immediately recognised as that of a *Bradypterus* warbler due to its similarity with *mandelli* and *montis*. However, it differs consistently in a number of respects (fig. 2). The song of *seebohmi* is comprised of shorter, more rapidly repeated, more monosyllabic and less structured notes than are those of any other taxon. While each song phrase possesses the

initial short note that characterises most if not all of the other taxa, the song strophe of *seebohmi* is otherwise very simple, and is comprised of repetitions of only one basic element, a metallic zipping sound. There is no hint of a bisyllabic nature to the notes, or of intranote frequency shifts. There are also ca. five iterations of the song strophe per two sec, rather than ca. three as is usual for the other taxa. At least three tapes that were made are all consistent in this characteristic rate of delivery; a bird heard singing in the background was performing at the same rate (S. Harrap, in litt.); and the singing birds that were being taped had not been incited by tape playback (N. Dymond, pers. comm.).

The quality of the song of *seebohmi* is closest to that of *idoneus* of southern Vietnam, and both share a less nasal, more metallic quality than for nominate *mandelli* and *melanorhynchus*, however, the above-mentioned differences are entirely consistent between *seebohmi* and *idoneus*. In a series of ten blind trials, PCR was readily able to distinguish between taped songs of *seebohmi* and *idoneus* each time. Comparing *seebohmi* to *montis*, S. Harrap (in litt.) stated that the former has a flat note, while that of Bali *?montis* is a "klip-dziu-dziu-dziu", starting out at 4 kHz and descending after ca. 0.2 sec to 2 kHz (however, the sonagram shown in fig. 2 has somewhat flatter notes). Furthermore, the song on Bali is slower, mellower, and less rasping than that of *seebohmi* (S. Harrap, in litt.). Despite their geographical proximity, the song of *alishanensis* (fig. 2) is so different in a number of characters from that of *seebohmi* that comparisons are difficult; in the former the main notes are much clearer (entirely lacking buzziness), and are interspersed with pronounced clicks that are totally lacking in the song of *seebohmi*.

Until more material of *seebohmi* becomes available, we can only state that it does not clearly fit within any of the other groups. While its song sounds remarkably similar in particular to that of the southern Vietnamese form *idoneus*, it is consistently recognisably different, and sonagrams show structural distinctions in several characters in which *idoneus* is more similar to *mandelli* than to *seebohmi*. The geographical position of *seebohmi* might suggest relatedness with *alishanensis* of Taiwan and/or *melanorhynchus* of the adjacent Chinese mainland rather than the much more distant Sundan populations, but as is well known, the affinities of the montane avifaunas of these areas typically belie their geographical proximity. None of these taxa is known to be a long-distance migrant, and the low wing-tail ratio of *seebohmi* makes it especially unlikely to be a good disperser. In other words, it may be presumed that each of these island populations are completely isolated and have been for some time. Given the isolation of *seebohmi* in a separate biogeographic sub-region, it seems unlikely that it really is conspecific with any other population, and rather than arbitrarily placing it in another species without any firm basis for doing so, we tentatively reallocate to it specific status, and as such we suggest for it the common name 'Benguet bush-warbler'. Placing *seebohmi* with *montis* would upset the nomenclatural situation without just cause, as the former name would have year priority, and the song is quite different from that of *montis* (S. Harrap, pers. comm.). DNA studies are planned by P. Alström and others that should provide further evidence on this matter.

7. Populations in Indonesia: *montis* and *timorensis*

7.1. Java

Despite the relatively early ornithological exploration of Java, the population of *Bradypterus* warblers remained undiscovered until January 1896, when two specimens were obtained on Mt. Arjuno (= Gng. Arjuna; app. 1). A few months later, Hartert (1896) reluctantly erected for it a new genus, naming it *Stasiasticus montis* (colour plate 1, lower two). He noted that its nares are "rather open in front", the "Plumage [is] rich and soft; the upper and under tail-coverts full, broad, soft, and long, nearly or quite half as long as the tail.... Tail graduated; rectrices broad, soft, and somewhat pointed at the tips.... Feathers of chin and upper throat white with blackish bases and tips, those of fore-neck blackish with whitish fringes; ... Sides of neck grey; ... Under tail-coverts brown with white borders, the basal ones slightly tinged with rufous olive." Hartert (1896) did not mention having compared *montis* with the continental Asian taxa now in *Bradypterus*, although he did imply that he had done so by stating "its structure does not agree with that of any other form known to me." *Stasiasticus* was later placed in the synonymy of *Bradypterus* (Kuroda, 1933), a genus then otherwise known only from Africa, so Kuroda's (1933) treatment implies that he saw greater affinities between *montis* and the African species than to the Asian genera *Tribura* and *Dumeticola*, although he stated that the forms allied to *montis* were "not recognizable". Chasen (1935) presumably followed Kuroda in treating it as *Bradypterus montis*. It was subsequently considered related to *B. luteoventris* (s.l.) but with "a different colour-pattern and a longer tail" (Delacour, 1943), but it was then placed under *seebohmi* (s.l.) on the basis of general similarities (Delacour, 1952), and Rozendaal (1989) considered the song of *montis* similar enough to that of *mandelli* to support Delacour's (1952) treatment. A recent statement that "there is no published justification for treating *montis* as a separate species" (Inskipp et al., 1996) must therefore refer to Delacour's (1952) revision, rather than to his and Hartert's earlier descriptions.

Bradypterus montis is larger than *mandelli* (app. 2), with a large bill and feet; its nares have less feathering than do any of the other taxa considered here; its feet and toes are at least sometimes very dark; its tail is particularly long and broad, with less pointed tips to the fresh rectrices; and its wings are relatively short. It is very richly coloured and dark above (app. 3), its underparts are much more heavily marked, usually with a blotchy, streaked appearance from the throat through the flanks; the flanks are brighter cinnamon; and the face pattern is distinct, as the entire auriculars are quite grey and more or less concolorous with the supercilium and breast. As with *mandelli*, presumed first-winter *montis* are plainer below, lacking strong grey tones or streaking, and with partly pale lower mandibles and legs. Also as with *mandelli*, confirmation is needed of the exact attribution of this unstreaked plumage.

Juveniles of *montis* are similar in colour of upperparts to the adults, but below are browner, with a strong yellow tinge (unlike juvenile *mandelli*). Some differ from *mandelli* as do the adults in having strongly and extensively dark-streaked underparts. The soft-part colours (lower mandible and legs) that are dark in many adult *montis* are pale in juveniles.

A sonagram (fig. 2) has already been published showing the considerable similar-

ity in pattern of the song of *montis* to the population of northern Thailand (Rozendaal, 1989) here treated as nominate *mandelli*. Playback of the song of *mandelli* from China elicited response from several *montis* (Rozendaal, 1989), and this was taken at the time as support for Delacour's (1952) treatment of *montis* as conspecific with *seebohmi* (s.l.), but the significance of reaction to playback is obscure unless controlled experiments are conducted. The sonagrams differ more from that of *idoneus* than do those of *mandelli* (P. Alström, pers. comm.). These acoustic differences, not yet based on a reasonable sample of individuals, require further study. However, taken with the several morphological differences from *mandelli*, the vocal distinctions show that *montis* is best treated as a separate species, for which the previously used common name Javan bush-warbler seems most appropriate.

Bradypterus montis is clearly more widespread on Java than Kuroda (1933) indicated (app. 1, fig. 1). Although previously thought rare, the high elevations frequented by *montis*, its preference for grass, low scrub, and small trees in open deforested areas (Rozendaal, 1989), and its relatively wide range within Java suggest that its conservation risk is low.

7.2. Bali

No *Bradypterus* specimens or prior reports exist from Bali, but multiple individuals were seen and heard on 21 June 1989 on a tree-covered hillside, just above Lake Bratan (8°16'S., 115°11'E.) at about 1200 m. in central Bali (Kennerley, 1989; fig. 1b). One individual was seen carrying a beakful of insects and gathering others, strongly suggesting it was feeding young in a nest nearby. Both its appearance and vocalisations were broadly similar to Chinese *mandelli* with which the observer was familiar, but it was not compared to *montis* of adjacent eastern Java (Kennerley, 1989). The description provided of the birds seen in Bali (Kennerley, 1989) resembles *montis* more closely than it does *mandelli*, especially in the grey ear coverts, but is like neither in that no pale fringes (assuming that 'dark terminal fringes' is a lapsus for 'pale') to the undertail coverts were visible. However, breeding birds would likely be in worn plumage so that pale tips might not be visible (P. Alström, pers. comm.).

Further reports of *Bradypterus* on Bali have come from Bedugul Botanic Garden (8°17'S., 115°10'E.), at ca. 1500 m. (P. Morris, B.F. King, F.R. Lambert, pers. comm.). Birds seen and tape-recorded by P. Morris "were singing from rank vegetation at the forest edge. Very good views [were obtained] of a pair in response to playback, particularly of the alarm call. Largish, long-tailed *Bradypterus*. Dark earthy-brown upperparts, greyish ear-coverts, paler supercilium, grey streaking on the throat-upperbreast, rufous-brown wash on flanks, darker rufescent brown undertail coverts with narrow paler fringes. Bill appeared all dark, legs pinkish, typical mouse-like behaviour." These observation accord very closely with characters of *montis* (some of them exclusively so), except for the "rufescent brown" undertail coverts, which are blackish-brown in *montis*, but this may have been affected by lighting.

The song heard but not taped by P.R. Kennerley was "a very distinctive and monotonous 'zeeurt zeeurt' repeated at intervals of approximately 0.5 seconds" and was "slightly more buzzing and did not have quite such an obvious break in the two parts of the song" as in *mandelli*, but the "differences were minor and did not detract from the similarity of the two" (Kennerley, 1989). The tape-recording made by P. Morris confirms the above-noted differences from *mandelli* (fig. 2), as there is no break

between the buzzy main note and the sharply descending clearer, secondary note, which drops from a frequency centred around 4.0 kHz to nearly 2.0 kHz. In this tape, a second bird was singing near the main one, and its voice was identical. The available sonagram of *montis* lacks the sharp descent, but resembles the Bali bird in lacking any suggestion of a break between the main element and the terminal portion. Both this character and the two distinct short chips at the beginning of each phrase seem to distinguish both *montis* and the Bali bird from *mandelli* (except of the southern Vietnamese race *idoneus*, which however has a somewhat ascending strophe). The concordance between all the vocalisations from Bali strongly suggests that these differences are consistent, and the bird on Bali may be an undescribed subspecies of *montis*. Collection and study of specimens from Bali, and further documentation of vocal differences, will be necessary to ascertain the validity of this possibility.

7.3. Timor

The population of Timor was discovered at 1800 m. on Mt. Mutis in 1932 (app. 1, fig. 1, colour plate 1), but was not described until 1944, after Delacour's first review of *Bradypterus*. It was perceived as sufficiently close to the Javan form to be called *Bradypterus montis timorensis* (Mayr, 1944). In his description, Mayr (1944) explicitly compared *timorensis* only with *montis*, of which three specimens were available at the AMNH. The only two specimens known of *timorensis* (app. 1) differ from *montis* in being slightly smaller (app. 2, 3); in having a long pale grey supercilium, which is prominent well behind the eye; in lacking a definite dark loreal spot; in showing little dark spotting on the throat, but instead having grey and white striations on throat and breast as in *seebohmi*; in being much paler and redder above, and paler and much more uniform below; in having pale brown undertail coverts with very inconspicuous pale tips; in having paler brown flanks; and in having a narrower tail, with a paler and browner undertail surface. The lower mandible and legs are pale (like some *montis*). *Bradypterus timorensis* likewise differs from the other taxa discussed herein (*seebohmi*, *mandelli* and *alishanensis*) in its paler overall colouration and its longer tail.

Murray D. Bruce (in White & Bruce, 1986) reported an August sight record from about 1800 m. near Same (8°59'S., 125°40'E.), eastern Timor (fig. 1b), on which he (M.D. Bruce, pers. comm.) has now provided further details: the sighting was in 1972, during an intensive survey of many forest patches at a variety of altitudes, in "old secondary forest with areas of dense undergrowth". He noted "the lack of a supercilium", and that the call was "buzzing notes [not] heard elsewhere on Timor" which led him to the bird, which was on the ground in the undergrowth. Bruce's elimination of the other resident sylviines to be expected in August, and his 1975 examination of the syntypes of *timorensis*, convinced him that he had seen *timorensis*. Nevertheless, we consider the occurrence of *timorensis* in east Timor in need of substantiation, not least because of the discrepancy in the description regarding the supercilium.

Despite spending three days at 1800 m. at the top of Mt. Mutis from 26-28 March 1985, in Stein's field site and thus presumably near where *timorensis* was collected, and although he was using mist nets and found every other montane Timorese endemic common, P. Andrew (in litt.) was unable to locate *timorensis*. On Mt. Mutis in 1989, FGR could not locate *timorensis* (Rozendaal, 1989), nor, in a brief visit there in late October without this specific objective, could F.R. Lambert, who (pers. comm.) noted that "much of the understorey there has been seriously degraded by overgraz-

ing". In the spring of 1999, Lambert again tried for several days to locate *timorensis* both in dense and disturbed open forest on Mt. Mutis, but failed to see it or hear unrecognized songs that could belong to it (F.R. Lambert, in litt.).

With its almost unmarked undertail coverts, pale reddish upperparts, and long narrow tail, *timorensis* is essentially as different in structure and plumage from Javan *montis* as from the holotype of *seebohmi* and, given its isolation and the general concordance of morphological and vocal differentiation with geographic factors in this group, we consider it more likely than not that *timorensis* will prove specifically distinct. We therefore provisionally raise *timorensis* to specific rank, and suggest for it the common name 'Timor bush-warbler'. Hopefully this will spur field research on this almost unknown bird, and we await information on vocalisations, habitat, and ecology, and further morphological and genetic data for confirmation or otherwise.

8. Populations in Taiwan: *alishanensis*

The population from the mountains of northern and central Taiwan (*B. alishanensis*; colour plate 1, top left; fig. 1) is clearly best treated as a separate species (Rasmussen et al., 2000), which long remained an undescribed taxon, even though specimens have been known since 1917. This oversight was due first to the synonymy of *mandelli* with *luteoventris* and the resultant artificially expanded variation within *luteoventris* (s.l.); and then to the superficial similarity of *alishanensis* with the type of *idoneus* (Delacour, 1952). Even later *alishanensis* was grouped under the geographically proximate *melanorhynchus* (Watson in Mayr & Cottrell, 1986). However, *Bradypterus alishanensis* differs substantially and obviously in primary song (fig. 2) from all races of *mandelli* (the differences being a great deal more striking when actually heard than in sonagrams), and in addition *alishanensis* has numerous subtle plumage and structural differences (app. 2, 3) which hold up well in series, including paler brown undertail coverts with inconspicuously paler tips, a smaller bill, a slightly different wing shape, and drabber overall colouration with much less variation. It lacks both the grey and russet plumage tones so characteristic of *mandelli*. Its song differs much more from all the other taxa for which song is known (that is, all except *timorensis*) than these do from each other, and the vocal differences are of such magnitude that it seems scarcely conceivable that they would recognise each other as conspecifics. Good examples of the song of *mandelli* and *alishanensis* may be heard on Scharringa (2000). Even if (under a very broad biological species concept) *seebohmi*, *montis*, and *timorensis* were all treated as subspecies of *mandelli*, such a treatment could not be justified in the case of *alishanensis*. All known specimens of *alishanensis* are listed and their associated data are presented, along with a colour cover illustration and sonagrams comparing *alishanensis* to *mandelli* and *luteoventris* in Rasmussen et al. (2000), although unfortunately the reproduction of the illustration was much too pale. We therein proposed the common name 'Taiwan bush-warbler'.

9. Revisions to the distribution and taxonomy of *luteoventris*

Knowledge of the distribution, breeding biology, and ecology of *Bradypterus luteoventris* requires reassessment in light of its long-term confusion with *mandelli* and *alishanensis*. While a full study is beyond the scope of the present paper, a few remarks

are presented here. The only records of *luteoventris* (s.l.) from Nepal are early 19th century specimens from Hodgson's collection, supposedly from the northern hills (Inskipp & Inskipp, 1991). Given that the species has not been recorded there since, despite the large number of observers and the abundance of high-altitude, non-forest habitat, this should be reviewed. Although Hodgson was a careful observer and discovered many species in Nepal, a number of other species have also not been reported from that country since being included in his collections, which were largely assembled by unsupervised hired help. Thus Hodgson would have had only the word of his assistants for the provenance of many of his specimens, especially those originating from outside the Nepal Valley (Cocker & Inskipp, 1988). The *luteoventris* specimen or specimens that formed the basis for the description (Hodgson, 1845), which clearly fits this species rather than *mandelli*, was said to inhabit "the Cachar, among brushwood; manners unknown". Compounding the uncertainty, after incorporation in the BMNH, many of Hodgson's original labels were recopied and the originals destroyed by G.R. Gray, who is known to have mixed up localities on some of Hodgson's material (Sharpe, 1906). Reports from west of Nepal (e.g., Jones, 1919) and specimens in BMNH identified as *luteoventris* have previously been rejected by Ticehurst and Whistler in their MS (Warr, 1996). The most westerly unquestioned records of *luteoventris* in the Indian subcontinent are thus from the Darjeeling area of West Bengal.

It now appears that there are no unassailable records of *Bradypterus luteoventris* in Thailand, since the lone specimen considered *B. l. ticehursti* from Doi Suthep has proven to be *mandelli*. The species is now known from the country only from unverifiable sight records (Round, 1983, 2000). A record of *luteoventris* (s.l.) from Mao Xao Ping (Mao Xao Phing, 22°19'N., 103°15'E.), northern Vietnam, collected on 3 April 1929, is based on a true *luteoventris*, unlike the others from there (Bangs & Van Tyne, 1931). Although Wildash (1968) continued to follow older sources (e.g., Delacour & Jabouille, 1940) in listing only *luteoventris* (s.l.) for South Vietnam, subsequent to the recognition that two species were involved, true *luteoventris* has not been documented from southern Vietnam, where *idoneus* appears to be the only form. The same appears to be true for Laos, where true *luteoventris* remains on the country list only on the basis of a sight (not an aural) report (P. Davidson, pers. comm.; Duckworth et al., 1999).

In Taiwan, listings of *luteoventris* were in fact the then-undescribed *alishanensis*. However, a recent report by K.-C. Huang of seven *luteoventris* banded at Kao-ping-hsi, Kaosiung (centred at 23°00'N., 120°35'E.) (Robson, 2000b) on 21 November must represent either a range extension southward of *alishanensis*, or the first record of *luteoventris* from the country.

The known distribution of *luteoventris* is thus remarkably coincident with that of *mandelli*: the definitely known western limit for both species is in the Darjeeling sector of West Bengal, India; both seem to occur in the same areas of south-eastern Tibet, north-eastern India, western and northern Myanmar, much of southern and south-eastern China, Hong Kong, and northern Vietnam. However, only *mandelli* is definitely known for northern Thailand, northern Laos, and southern Vietnam. It appears likely that over their entire ranges, *luteoventris* breeds at higher elevations (P. Kennerley, in litt.; Robson, 2000a), but extensive and rigorously documented field work is needed to confirm this. If *luteoventris* (unlike *mandelli*) truly does not sing in winter, as suspected by P.R. Kennerley (in litt.), that would make documentation of its winter

range even more problematic. The listing of southern Myanmar in the range of *luteoventris* (King & Dickinson, 1975; Robson, 2000a) is evidently based solely on the type specimen of *ticehursti* (which nevertheless indicates local breeding in the Arakan Yomas), which we deal with below.

Two taxa of *luteoventris* were recognised by Watson in Mayr & Cottrell (1986): nominate *luteoventris*, from most of the species's range; and *ticehursti* Deignan, 1943 (a replacement name for the preoccupied *Tribura luteoventris saturatus*, Ticehurst, 1941), from southern Myanmar and northern Thailand. The latter, however, was known only from a single specimen labelled as a juvenile (BMNH 1948.80.1138) from the Arakan Yomas, Myanmar (which is a *luteoventris* with the tail still growing), and a single Thai specimen which is actually *mandelli*. The supposed race *ticehursti* has also been reported from south-western Yunnan (western part Cangyuan, ca. 22°N., 100°E.; June; Cheng, 1987; Meyer de Schauensee, 1984; and Watson in Mayr & Cottrell, 1986), but the basis for this needs re-evaluation, and it seems likely to represent the nominate race instead. Delacour (1943) had not recognized *ticehursti*, believing the colour differences due to foxing, but this is untenable as the specimen of *ticehursti* is darker, not paler, than the nominate. Almost certainly, the unusually dark plumage of the type specimen of *ticehursti* is instead largely due to its being a juvenile (possibly somewhat stained or aberrant). We therefore return *ticehursti* to the synonymy of *luteoventris*, as was Delacour's judgment, although for a different reason. Incidentally, northern Vietnamese skins of *luteoventris* seem darker than specimens from other parts of the range of the species, increasing the potential for confusion with *mandelli* there, and indicating the need for a critical reappraisal of racial variation in *luteoventris*, which should be considered monotypic until otherwise demonstrated.

10. Conclusions

The taxon group formerly treated as *Bradypterus seebohmi* (s.l.), with the addition of the overlooked Himalayan *mandelli*, seems to form a superspecies group. This group is united by morphological characters including slightly to markedly paler tips to the undertail coverts, a black bill at least in breeding adults (with the possible exception of *seebohmi* and *timorensis*), and often a somewhat speckled or streaked throat and/or upper breast. All, so far as known, have songs for which the main element is a buzzy, metallic, or clear note of moderate duration with or without much shorter, sharper ancillary notes. Although they are oscine passerines, the songs of each taxon appear to be extremely stereotyped, with little variation between recordings and intra-taxon localities. *Bradypterus luteoventris*, which for many years was thought conspecific with all the above, has entirely different vocalisations. Within the *seebohmi* (s.l.) group, the Taiwanese *Bradypterus alishanensis* has by far the most distinctive vocalisations documented, recognising that the song of *B. timorensis* remains unknown. The variability in morphology and song of *seebohmi* (s.l.) far exceeds that

Colour Plate 1. Taxa of the *Bradypterus seebohmi* (sensu lato) superspecies: 1, Taiwan bush-warbler *B. alishanensis* adult; 2, Benguet bush-warbler *B. seebohmi* sensu stricto, adult; 3, Timor bush-warbler *B. timorensis* adult; 4, Javan bush-warbler *B. montis* adult; 5, id., juvenile; 6, russet bush-warbler *B. mandelli* juvenile; 7, id., adult. Original painting by Ian Lewington.



shown by species within other groups of sylvine warblers that have been thoroughly studied recently and confirmed as single species.

The assumed relationships of all the above must be tempered by the fact that none of the morphological or vocal characters exclude the possibility that at least one other species (*Bradypterus tacsanowskius*) may be a sister species to some or all of the above. This taxon combines characters of all those dealt with herein, differing only slightly in plumage and in having a smaller outer primary. Clearly DNA studies, coupled with further field and museum data, will be required to better understand the systematics of this complex group.

Key to the recognised forms of the *Bradypterus mandelli* superspecies

- 1a. Tail short (usually under 50 mm), tip soft and rounded, not frayed *thoracicus* (including *davidi*)
- 1b Tail moderately long (usually over 50 mm), tip stiff and pointed, often frayed 2
- 2a Upperparts olive-brown, outermost primary short and narrow *tacsanowskius*
- 2b. Upperparts drab brown to russet-brown, outermost primary longer and broader 3
- 3a. Longest undertail coverts essentially unicoloured *luteoventris*
- 3b. Longest undertail coverts with pale tips and darker bases 4
- 4a. Undertail coverts medium brown, inconspicuously pale-tipped; upperparts not dark russet 5
- 4b. Undertail coverts dark brown, upperparts dark russet 6
- 5a. Upperparts dull brown, no grey on face *alishanensis*
- 5b. Upperparts bright rufous-brown, face partly grey *timorensis*
- 6a. Lower breast unmarked, washed grey or russet 7
- 6b. Lower breast somewhat streaked darker 8
- 7a. Tail broad-based, structure of distal rectrices looser *montis* (unstreaked)
- 7b. Tail base narrower, structure of distal rectrices more compact *mandelli*
- 8a. Breast with definite, short streaks *montis* (typical)
- 8b. Breast with vague striations *seebohmi*

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Appendix 1. Specimens of *Bradypterus sechoumi* (s.l.) and their label data (arranged in geographical order first by country, then from west to east, north to south, then alphabetically by museum acronym, and then numerically by specimen number). Museum acronyms are explained in the Acknowledgements.

Specimen No.	Sex	Age	Locality and coordinates	Date	Collector; Collection (Coll.)	Altitude (m)	Remarks on label and citation if any
India: <i>mandelli</i>							
BMNH 1886.7.8.1877	♀	ad.	Mangpu, West Bengal; 26°58'N, 88°22'E	15/6/1875	Hume Coll.	—	Earlier IDs <i>affinis</i> , <i>thoracia</i> ; 'female snared on nest', less russet above than others
FMNH 85249	♂	ad.	Mangpu	17/12/1930	Stevens	—	Earlier ID <i>luteoventris</i> ?
BMNH 1886.7.8.1870	—	ad.	Sikkim	5/1874	Hume Coll.	—	Original ID <i>affinis</i>
BMNH 1969.52.1146	—	ad./imm.	Sikkim	16/6/1875	Hewitt Coll.	—	Earlier ID <i>luteoventris</i>
CUVC 14925 (previously BMNH 86.7.8.1864)	♂	ad.	Sikkim	—	Mandelli; Wright Coll.	—	Earlier ID <i>thoracia</i>
NRM 568372	—	—?	Sikkim	—	Hume Coll.	—	Earlier ID <i>luteoventris</i>
BMNH 1886.7.8.1857	—	ad.	Native Sikkim; ca. 27°30'N, 88°30'E	4/1874	Mandelli; Hume Coll.	—	Earlier IDs <i>affinis</i> , <i>thoracia</i>
BMNH 1886.7.8.1862	—	ad.	Native Sikkim	11/1873	Mandelli; Hume Coll.	—	Syntype of <i>mandelli</i> . In register as <i>Luscinola thoracia</i> .
BMNH 1886.7.8.1908	—	ad.	Native Sikkim	3/1876	Mandelli; Hume Coll.	—	Earlier ID <i>luteoventris</i> , but corrected in register to <i>mandelli</i> ; one label annotation (now crossed out) reads 'Type of <i>D. mandelli</i> Brooks', and in pencil, 'No. 1909', also 'Described in 1876!' so cannot be a syntype. Register states 'Type of <i>L. mandelli</i> , Brooks', but an arrow points to the following entry
BMNH 1886.7.8.1909	—	ad.	Native Sikkim	4/1874	Mandelli; Hume Coll.	—	Syntype of <i>mandelli</i> ; in register originally as <i>luteoventris</i> but corrected to <i>mandelli</i>
BMNH 1886.7.8.2124	—	ad.	Native Sikkim	3/1876	Mandelli; Hume Coll.	—	Earlier ID <i>brunneipectus</i>

BMNH 1886.7.8.2125 ROM 54174	— —	ad. ad.	Native Sikkim Native Sikkim	2/1876 7/4/1876	Mandelli; Hume Coll. Fleming Coll.	— —	Earlier ID <i>brunneipectus</i> Earlier IDs <i>brunneipectus</i> , <i>thoracicus</i>
BMNH 1949.Whi.1.13147	♂	ad./imm.	Huldibari T. [ea] E. [state], Duars, West Bengal; ca. 26°55'N, 88°30'E	12/05/1927 or 12/06	O'Donel; Whistler Coll.	100	Earlier IDs <i>thoracica</i> , <i>taczanowskia</i> , <i>luteoventris</i> , <i>seebohmi</i> (by the time of Whistler and Ticehurst's examination). Label annotation 'certainly not <i>taczanowskia</i> '. Detailed reasons for this comment also annotated faintly in pencil. Earlier ID <i>luteoventris</i>
BMNH 1886.7.8.1903	—	ad./imm.	Lower hills, Bhutan Duars, West Bengal; ca. 26°40'N, 89-92°E Bhutan Duars	2/1874	Mandelli; Hume Coll.	—	Earlier ID <i>brunneipectus</i> , <i>luteoventris</i>
BMNH 1886.7.8.2126	—	ad.	Bhutan Duars	1/1877	Hume Coll.	—	Earlier ID <i>brunneipectus</i> , <i>luteoventris</i>
BMNH 1886.7.8.2127 UMMZ 230777	— ♀	ad. ad./imm.	Bhutan Duars Menoka, Assam-Bhutan border; ca. 26°40'N, 89- 92°E	2/1876 19/2/1952	Hume Coll. Koelz Coll.	— —	Earlier ID <i>brunneipectus</i> Earlier ID <i>luteoventris</i> *
UMMZ 230796	♀	ad.	Phulbari, Garo Hills, Meghalaya; 25°54'N, 90°02'E	12/4/1950	Koelz Coll.	—	Earlier ID <i>Bradypterus</i> sp.
UMMZ 230812	♀	?	Bamanigaon, west side of Khasi Hills; ca. 25°30'N, 91°E	28/11/1949	Koelz Coll.	—	Earlier ID (an MS name)*
BMNH 1898.9.1.1627	—	ad.	N. Khasi Hills, Meghalaya; ca. 25°30'N, 91°30'E	1/1876	Chennell [label], Godwin-Austen [register]; Tweeddale Coll.	—	Earlier ID <i>luteoventris</i>
UMMZ 230776	♂	ad.	Cherrapunji, Meghalaya; 25°18'N, 91°42'E	21/4/1952	Koelz Coll.	—	Earlier ID <i>luteoventris</i> ; 'Testes 4 mm. Singing'*
UMMZ 230886	♂	ad.	Cherrapunji	21/4/1952	Koelz Coll.	—	Earlier ID <i>luteoventris</i> ; 'Testes 4 mm. Singing'*
BMNH 1886.7.8.1880	—	ad.	Shillong, Meghalaya; 25°34'N, 91°53'E	10/1877	Cockburn; Hume Coll.	—	Earlier IDs <i>affinis</i> , <i>thoracicus</i>

BMNH 1886.7.8.1881	♀	ad.	Shillong	18/7/1877	Cockburn; Hume Coll.	Earlier IDs <i>affinis</i> , <i>thoracica</i>
BMNH 1886.7.8.1882	♂	juv.	Shillong	30/8/1877	Cockburn; Hume Coll.	Earlier ID <i>affinis</i> ; tail short
BMNH 1886.7.8.1907	—	ad.	Shillong	7/1877	[Cockburn]; Hume Coll.	Earlier IDs <i>luteoventris</i> and <i>affinis</i> ; extremely heavily brown-spotted upper breast
BMNH 1895.7.14.1012	—	ad./imm.	Shillong	27/5/—	Godwin-Austen	Earlier ID <i>luteoventris</i>
specimen not located	—	—	Shillong	pre-1907	Baker	Baker (1907): 'I have procured two specimens both trapped on their nests.'
specimen not located	—	—	Shillong	pre-1907	Baker	Baker (1907): 'I have procured two specimens both trapped on their nests.'
UMMZ 230768	♀	juv.?	Pynursla, Khasi Hills, Meghalaya; 25°19'N, 91°54'E	12/8/1949	Rupchand; Koelz Coll.	Earlier ID <i>luteoventris</i> *
UMMZ 230769	♀	juv.?	Pynursla	13/8/1949	Koelz Coll.	Earlier ID <i>luteoventris</i> *
UMMZ 230807	—	juv.	Pynursla	13/8/1949	Koelz Coll.	Earlier ID <i>Bradypterus</i> sp.*
UMMZ 230773	♀	imm.	Mawryngkneng, Khasi Hills, south-east of Shillong; ca. 25°30'N, 92°E	26/10/1951	Koelz Coll.	Earlier ID <i>luteoventris</i> ; 'Cran. gran. inc.*'
UMMZ 230813	♀	ad.	Blue Mt., Lushai Hills, Mizoram; 22°38'N, 93°03'E	12/4/1953	Koelz Coll.	'Not <i>intermedia</i> . Only critical char. that agrees = undert. c.';
UMMZ 230814	♀	ad.	Sangau, Lushai Hills; 22°44'N, 93°04'E	7/2/1953	Koelz Coll.	(an MS name)*
UMMZ 230815	—	ad./imm.	Sangau	11/2/1953	Koelz Coll.	Earlier ID <i>Bradypterus</i> sp. (an MS name)*
UMMZ 230816	♂	ad./imm.	Sangau	15/2/1953	Koelz Coll.	Earlier ID <i>Bradypterus</i> sp.*
UMMZ 230817	♀	ad.	Sangau	23/2/1953	Koelz Coll.	Earlier ID <i>Bradypterus</i> sp.*
UMMZ 230782	♂	ad./imm.	Nichuguard, Nagaland; 25°49'N, 93°47'E	28/1/1951	Koelz Coll.	Earlier ID <i>luteoventris</i> *
UMMZ 185935	♀	—	Karong, Manipur; 26°18'N, 94°03'E	27/9/1950	Koelz Coll.	Earlier ID <i>Homochlamys fortipes</i> ; bill broken, no tail.
MCZ 235505	—	ad./imm.	Mokokchung, Nagaland; 26°15'N, 94°15'E	5/1918	—	Original ID erased, then <i>Tribuna</i> sp.?: <i>Bradypterus</i> ?

BMNH 1895.7.14.1011	—	ad.	(for the district) 'E. Naga' [probably Nagaland]; ca. 26°N, 95°E	—	Godwin-Austen	—	Earlier IDs <i>affinis</i> , <i>luteoventris</i>
AMNH 592150	♂	ad.	Margherita, Lakhimpur District, Assam; 27°17'N, 95°49'E	13/1/1905	Coltart; Rothschild Coll.	—	Original ID <i>mandelli</i> ; later ID <i>thoracica</i> ; label notation 'much like <i>thoracica</i> but tail longer, ?'
Bhutan: <i>mandelli</i>							
BMNH 1935.4.5.907	♂	ad.	Sana, Trashiyangsi (=Tashigang), E. Bhutan; 27°35'N, 91°23'E	4/10/1934	Ludlow ♀ Sherriff	2400	Earlier ID '? warbler'
Myanmar: <i>mandelli</i>							
BMNH 1905.8.16.216	—	ad.	Kauri, Kachin State; 25°45'N, 96°52'E	May 1901	Rippon	—	Earlier ID <i>mandelli</i> ; published as such in Harington (1909) on Rippon's word
AMNH 592142	♀	ad./imm.	Sinlum-Kaba, Bhamo, Kachin State; 24°16'N, 97°31'E	22/4/1908	Harington; Rothschild Coll.	ca. 1700	Earlier ID <i>luteoventris</i> ; published as probably such in Harington (1909)
BMNH 1941.12.1.167	♂	ad.	Kambaiti, Kachin State; 25°24'N, 98°09'E	23/5/1935	Stanford	2000	Original ID <i>Tribuna</i> ?; <i>luteoventris</i> erased; 'single male singing in swallow bushes on a hillside'
BMNH 1948.34.47	♂	ad.	Htaungaw, Kachin State; 25°57'N, 98°23'E	5/4/1948	Smythies	1500	Earlier ID <i>luteoventris</i>
Thailand: <i>mandelli</i>							
MCZ 196866	♀	ad.	Mt. Angka (= Doi Inthanon); 18°35'N, 98°29'	3/3/1937	Griswold	1300	Earlier ID ('Delacour ident.'): <i>T. seebohmi idoneus</i> ; very heavily spotted on lower throat but lower mandible 'flesh color'; published as <i>B. t. thoracicus</i> by Greenway (1940) and Deignan (1945).
USNM 344431	—	ad./imm.	Doi Suthep; 18°48'N, 98°55'E	23/3/1937	Deignan	1000	Badly damaged specimen; earlier ID <i>B. luteoventris ticehursti</i> , but is <i>mandelli</i>

TNRC** ACW 40	♀	ad.	Doi Angkhang, Chiengmai; 19°48'N, 98°59'	17/7/1983	Round	ca.1500- 1600	'Ovary inactive'
USNM 350293	♀	ad.	Doi Phu Kha; ca. 19°20'N, 101°E	5/4/1936	Deignan	—	Earlier IDs ? <i>B. seebolimi idoneus</i> ; <i>luteoventris</i> ; <i>tacsanowskii</i> (last erased)
Laos: <i>mandelli</i>?							
FMNH 79846	♀	ad.	Phong-Saly; 21°41'N, 102°06'E	24/4/1929	Van Tyne	1330	Earlier ID <i>luteoventris</i>
FMNH 79847	♀	ad./imm.	Phong-Saly	25/4/1929	Van Tyne	1330	Earlier ID <i>luteoventris</i>
N. Vietnam: <i>mandelli</i>?							
BMNH 1924.12.21.266	♂	ad.	Ngai-Tio, Tonkin; ca. 22°32'N, 103°43'E	22/5/1924	Stevens	ca. 1700	Earlier ID <i>luteoventris</i> ; 'breeding'
MNH 1944.110	♂	ad.	Pho-lu, Laokay (= Lao Cai); 22°19'N, 104°12'E	19/12/1929	Delacour & Jabouille	—	Earlier ID <i>luteoventris</i>
BMNH 1924.12.21.263	♀	ad./imm.	Bao-Ha, Tonkin; 22°11'N, 104°21'E	18/11/1923	Stevens	—	Earlier ID <i>luteoventris</i>
BMNH 1924.12.21.264	♀	ad./imm.	Bao-Ha	3/12/1923	Stevens	—	Earlier ID <i>luteoventris</i> ; 'dense reeds'
S. Vietnam: <i>idoneus</i>							
USNM 359220	♂	ad.	Cam-ly, W. of Da Lat; 11°44'N, 108°15'E	1/6/1939	Rock	500	Type of <i>idoneus</i> ; earlier ID 'Tribuna near <i>luteoventris</i> '
BMNH 1919.12.20.376	♀	ad.	Da Lat, Annam; 11°56'N, 108°25'E	3/5/1918	Boden Kloss	1500	Earlier IDs <i>tacsanowskii</i> , <i>luteoventris</i>
China: <i>mandelli</i>?							
?	♂	—	Zayu, Tibet; 28°24'N, 97°00'E	—/7/1973	—	—	Not seen; first ID <i>melanorhyncha</i> (Li Dehao et al. 1978), then <i>idoneus</i> (Watson in Mayr & Cottrell, 1986); new record for Xizang; 68 g
MNH 1896	—	ad.	Tat-sien-lou (= K'ang- ting), Szechuan; 30°03'N, 102°02'E	—	Dejean	—	Earlier ID ? <i>luteoventris</i>

USNM 306276	♀	juv.	near Wa Shan, Szechuan; ca. 29°20'N, 103°05'E	31/7/1925	Graham	1800?	Earlier ID <i>luteoventris</i> ; probably <i>mandelli</i>
China: <i>melanorhynchus</i>							
BMNH 1914.6.12.101	♂	juv.	Ichang (=Yichang), Hubei; 30°42'N, 111°17'E	6/8/1895	Styan	—	Earlier ID <i>thoracia</i> , later (P. Sushkin 1924) <i>luteoventris</i>
BMNH 1914.6.12.102	♂	ad.	Ichang	10/8/1895	Styan	—	Earlier ID <i>thoracia</i>
IZAS 53014			Guangze County, Fujian; 27°32'N, 117°21'E	4/6/1939		—	Earlier ID <i>melanorhyncha</i> . Not seen.
BMNH 1914.6.12.104	♂	juv.	Kuatun, N.W. Fujian; ca. 27°45'N, 117°50'E	16/10/1896	Styan	—	Earlier ID <i>russula</i>
BMNH 1900.3.10.13	♂	ad.	Kuatun	4/5/1897	Rickett	—	Type of <i>melanorhynchus</i>
BMNH 1900.3.10.14	♂	juv.	Kuatun	16/10/1896	Styan	—	Earlier ID <i>russula</i>
IZAS 53012			Kuatun	31/3/1939		—	Earlier ID <i>melanorhyncha</i> . Not seen.
IZAS 53013			Kuatun	24/4/1940		—	Earlier ID <i>melanorhyncha</i> . Not seen.
IZAS 53015			Kuatun	13/3/1940		—	Earlier ID <i>melanorhyncha</i> . Not seen.
MCZ 129134	♂	ad.	W. Fujian	12/1915	La Touche	—	ID <i>melanorhynchus</i>
MCZ 129135	—	ad.	Kuatun	Winter 1914	La Touche	—	ID <i>melanorhyncha</i>
MCZ 129136	♂	ad.	Kuatun	4/1914	La Touche	—	Earlier ID <i>melanorhyncha</i>
MCZ 129138	—	ad./imm.	Kuatun	18/5/1896	La Touche	—	Earlier IDs T. <i>russula</i> , T. <i>luteoventris</i> ; syntype of <i>Cettia</i> <i>russula</i> Slater, 1897
NEWHM 13086.79	—	imm?	S. China	—	[Styan-type preparation]	—	Earlier ID <i>thoracicus</i>
ZMB 39.10	—	ad./imm.	Kuatun	29/3/1938	Klappenich	600	Earlier IDs <i>luteoventris</i> , <i>russula</i>
MCZ 129133	♂	ad./imm.	C. Fujian; ca. 26°N, 118°E	3/1901	La Touche	—	Earlier IDs <i>melanorhyncha</i> ; <i>luteoventris</i> ; not not <i>lut.</i> ; see large bill and wing formula'
ZMH 40746	♂	ad./imm.	Futschau (=Fuzhou), Fujian, 26°05'N, 119°18'E	October	Siemssen	—	Earlier ID <i>luteoventris</i>
ZMH 40887	♂	ad.	Fuzhou	April	Siemssen	—	Earlier ID <i>luteoventris</i>

RMNH 51348	♂	ad.	Sikatok	9/9/1913	Bartels		
RMNH 51349	♂	ad./imm.	Sikatok	9/9/1913	Bartels		
RMNH 51350	♀	ad./imm.	Sikatok	17/5/1914	Bartels		
RMNH 51351	♀	juv.	Sikatok	9/3/1915	Bartels		
RMNH 51352	♂	ad.	Sikatok	11/3/1915	Bartels		
RMNH 51353	♀	ad./imm.	Sikatok	13/3/1915	Bartels		
RMNH 51354	♂	ad.	Sikatok	13/3/1915	Bartels		
Jawa Timur (East Java): <i>montis</i>							
RMNH (no number)	—		Dlogodringo, Gunung Lawu (= Lawoe), 7°38'S, 111°11'E	4/6/1956	Van Balgooy	3000	
ZMA 4911	♂		Dlogodringo	25/10/1934	Mr. & Mrs. J. P. Rosier	1800	Voous (1948)
AMNH 592175	♂	ad.	Gunung Arjuna (Ardjuno); 7°45'S, 112°34'E	1/1896	Doherty; Rothschild Coll.	2700-3000	Holotype
AMNH 592176	♂	ad.	Gng. Arjuna	1/1896	Doherty; Rothschild Coll.	2700-3000	
AMNH 592177	♀	ad./imm.	Gng Arjuna	7/12/1924	Rothschild Coll.		
RMNH 51355	♂	ad.	Gunung Raung (Raoeng); 8°08'S, 114°03'E	24/10/1917			
MZB 12443	♀	ad./imm.	Klosot; ca. 7°50'S, 114°23'E or Tengger Geb.***, ca. 7°55'S, 112°55'E	10/7/1939	Soeparma	2400	
Timor: <i>timorensis</i>							
AMNH 308007	♂	ad.	Gunung Mutis; ca. 9°30'S, 124°10'E	1/3/1932	Stein	1800	Holotype; Mayr (1944)
AMNH 345901	♀	ad.	Gng. Mutis	1/3/1932	Stein	1800	Paratype; Mayr (1944)

*All insect-damaged; most lack the ramphotheca, podotheca, remiges, and rectrices.

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*** Assumed to be the correct coordinates, but those for Klosot could be correct

Appendix 2. Mean measurements (in mm) \pm standard deviations, with *n* in parentheses for the principal taxa discussed in this paper. Significance levels under Column 2 (*Bradypterus mandelli*, 3 races lumped) refer to *t*-tests vs. *Bradypterus luteoventris*; under Column 5 (*B. mandelli melanorhynchus*) comparisons were between *B. m. mandelli* and *B. m. melanorhynchus*; under Column 6 (*B. montis*) to *mandelli* (3 races lumped) vs. *montis*. * = $P \leq 0.05$; ** = $P \leq 0.01$; *** = $P \leq 0.001$. L = length, w = width, d = depth, h = height; P1 = outer primary, P10 inner primary, etc. In this table, *idonetus* refers to the subspecies *sensu* Delacour (1952; Vietnam, Thailand, and Laos). For explanation of measurement protocols, see Methods.

Variables	(3 races combined)									
	<i>luteoventris</i>	<i>mandelli</i>	<i>mandelli</i>	<i>mandelli</i>	<i>idonetus</i>	<i>melanorhynchus</i>	<i>montis</i>	<i>timorensis</i>	<i>seebolmi</i>	<i>alishanensis</i>
Culmen (skull)	13.7 \pm 0.6 (116)	14.0 \pm 0.6 (47)**	14.3 \pm 0.5 (28)	13.8 \pm 0.5 (9)	13.4 \pm 0.7 (10)**	15.0 \pm 0.9 (26)**	14.6 \pm 0.3 (2)	14.2	14.2 \pm 0.8 (11)	
Culmen (feathers)	10.0 \pm 0.6 (117)	10.4 \pm 0.6 (46)**	10.6 \pm 0.5 (27)	10.1 \pm 0.4 (9)	10.1 \pm 0.6 (10)**	11.1 \pm 0.6 (26)**	10.7 \pm 0.1 (2)	11.0	10.2 \pm 0.6 (11)	
Bill h (nares)	2.8 \pm 0.2 (108)	3.1 \pm 0.1 (50)**	3.1 \pm 0.1 (28)	3.0 \pm 0.2 (10)	3.1 \pm 0.1 (12)	3.3 \pm 0.2 (26)**	3.2 \pm 0 (2)	3.2	3.1 \pm 0.2 (12)	
Bill w (nares)	2.4 \pm 0.2 (121)	2.8 \pm 0.2 (51)**	2.8 \pm 0.2 (29)	2.8 \pm 0.3 (10)	2.8 \pm 0.2 (12)	2.7 \pm 0.6 (27)	2.6 \pm 0.3 (2)	2.9	2.9 \pm 0.5 (12)	
Bill tip w	1.0 \pm 0.1 (85)	1.3 \pm 0.1 (47)**	1.2 \pm 0.1 (28)	1.3 \pm 0.1 (9)	1.3 \pm 0.1 (10)	1.3 \pm 0.1 (25)	1.2 \pm 0.1 (2)	1.2	1.2 \pm 0.1 (11)	
Nares length	1.9 \pm 0.3 (88)	1.4 \pm 0.6 (51)**	1.4 \pm 0.2 (30)	1.4 \pm 0.3 (10)	1.5 \pm 0.4 (11)	1.9 \pm 0.4 (27)**	1.3 \pm 0 (2)	1.2	1.1 \pm 0.3 (12)	
Wing I	52.3 \pm 1.6 (130)	51.7 \pm 2.3 (50)	51.9 \pm 2.2 (29)	51.6 \pm 2.8 (9)	51.3 \pm 2.1 (12)	53.3 \pm 1.1 (27)**	53.5 \pm 0.7 (2)	52.0	54.1 \pm 1.5 (12)	
Tail I	57.1 \pm 3.1 (104)	58.1 \pm 3.3 (41)	59.8 \pm 2.8 (24)	55.5 \pm 2.1 (7)	56.0 \pm 3.1 (10)**	60.1 \pm 2.9 (23)*	64.3 \pm 2.0 (2)	62.1	60.3 \pm 1.9 (8)	
Wing/tail ratio	0.9 \pm 0.1 (103)	0.9 \pm 0.6 (39)	0.9 \pm 0.1 (22)	0.9 \pm 0.1 (7)	0.9 \pm 0.1 (10)*	0.9 \pm 0.4 (23)	0.8 \pm 0 (2)	0.8	0.9 \pm 0 (8)	
P1 shortfall	23.2 \pm 1.4 (116)	23.3 \pm 1.5 (46)	23.5 \pm 1.4 (26)	23.2 \pm 2.2 (9)	22.9 \pm 1.4 (11)	24.4 \pm 1.2 (19)**	24.9 \pm 0.5 (2)	24.3	24.3 \pm 1.4 (11)	
P2 shortfall	7.6 \pm 0.9 (120)	9.1 \pm 1.1 (44)**	9.1 \pm 1.1 (24)	8.7 \pm 1.1 (9)	9.3 \pm 1.0 (11)	10.2 \pm 1.3 (19)**	10.6 \pm 1.5 (2)	9.5	9.4 \pm 1.0 (12)	
P3 shortfall	1.2 \pm 0.5 (105)	2.2 \pm 0.7 (44)**	2.3 \pm 0.7 (24)	1.8 \pm 0.9 (9)	2.2 \pm 0.6 (11)	2.5 \pm 0.8 (19)	1.7 \pm 1.1 (2)	2.5	2.3 \pm 0.7 (10)	
P4 shortfall	0.2 \pm 0.3 (93)	0.5 \pm 0.5 (42)**	0.7 \pm 0.6 (22)	0.2 \pm 0.4 (9)	0.3 \pm 0.4 (11)*	0.7 \pm 0.7 (18)	0.4 \pm 0.2 (2)	1.0	0.7 \pm 0.8 (11)	
P5 shortfall	0.2 \pm 0.4 (81)	0.1 \pm 0.2 (42)*	0.0 \pm 0.1 (23)	0.2 \pm 0.4 (9)	0.1 \pm 0.2 (10)	0.0 \pm 0 (18)	0.0 \pm 0 (2)	0.0	0.1 \pm 0.2 (11)	
P6 shortfall	1.4 \pm 0.8 (72)	1.3 \pm 0.6 (42)	1.2 \pm 0.6 (23)	1.7 \pm 0.9 (9)	1.2 \pm 0.2 (10)	0.9 \pm 0.5 (7)	0.7 \pm 1.1 (2)	0.8	0.5 \pm 0.7 (9)	
P7 shortfall	2.6 \pm 0.9 (54)	2.5 \pm 0.7 (40)	2.5 \pm 0.7 (21)	2.8 \pm 0.9 (9)	2.4 \pm 0.4 (10)	2.0 \pm 0.4 (5)	1.0	2.0	1.9 \pm 0.4 (9)	
P8 shortfall	3.7 \pm 0.9 (50)	3.9 \pm 0.8 (37)	3.9 \pm 0.9 (20)	4.5 \pm 0.8 (8)	3.5 \pm 0.5 (9)	3.0 \pm 0.7 (6)*	3.0	3.1	3.4 \pm 0.4 (10)	
P9 shortfall	4.9 \pm 1.0 (44)	5.0 \pm 0.9 (37)	5.0 \pm 0.9 (19)	5.7 \pm 0.7 (9)	4.5 \pm 0.3 (9)	4.2 \pm 0.7 (5)*	—	4.2	4.5 \pm 0.4 (10)	
P10 shortfall	6.2 \pm 1.3 (40)	6.2 \pm 0.9 (37)	6.0 \pm 0.9 (19)	7.2 \pm 0.6 (9)	5.8 \pm 0.3 (9)	5.1 \pm 0.8 (4)*	—	5.2	5.5 \pm 0.6 (9)	
P1 notch	7.0 \pm 0.7 (112)	7.0 \pm 0.9 (47)	7.1 \pm 1.0 (27)	6.9 \pm 0.7 (8)	6.9 \pm 0.9 (12)	7.7 \pm 0.9 (9)*	7.4 \pm 1.3 (2)	6.4	6.5 \pm 0.8 (9)	
P2 notch	11.2 \pm 0.7 (113)	10.4 \pm 0.9 (46)**	10.9 \pm 0.6 (26)	9.7 \pm 0.7 (8)	9.8 \pm 1.0 (12)**	11.4 \pm 1.0 (21)**	10.6 \pm 0.2 (2)	10.7	10.9 \pm 0.6 (10)	
P3 notch	11.1 \pm 0.8 (88)	10.7 \pm 0.8 (46)*	11.0 \pm 0.6 (26)	10.2 \pm 0.8 (9)	10.3 \pm 0.8 (11)**	11.7 \pm 0.9 (14)**	11.6	11.5	11.0 \pm 0.8 (10)	
P11	13.9 \pm 1.3 (114)	13.8 \pm 1.0 (47)	13.6 \pm 1.0 (26)	14.2 \pm 1.1 (9)	13.8 \pm 0.9 (12)	15.3 \pm 1.0 (26)**	13.9 \pm 1.3 (2)	13.4	14.4 \pm 1.3 (11)	
P21	29.4 \pm 1.5 (97)	27.8 \pm 1.6 (47)**	27.7 \pm 1.3 (26)	28.1 \pm 2.5 (9)	27.5 \pm 1.5 (12)	29.0 \pm 1.1 (26)**	27.9 \pm 1.0 (2)	27.8	28.7 \pm 1.3 (12)	

P1 distal w	3.0±0.3 (114)	3.0±0.3 (48)	3.0±0.3 (27)	2.9±0.3 (9)	3.2±0.3 (12)*	3.7±0.3 (20)***	3.2±0.1 (2)	3.3	3.2±0.4 (10)
P2 distal w	5.0±0.4 (116)	5.1±0.4 (49)	5.1±0.4 (27)	4.9±0.5 (10)	5.1±0.5 (12)	5.6±0.4 (21)***	5.9±0.7 (2)	6.5	5.4±0.4 (10)
P3 distal w	5.7±0.4 (88)	5.8±0.5 (46)	5.8±0.5 (27)	5.4±0.2 (8)	6.0±0.4 (11)	6.4±0.3 (17)***	5.9±0.8 (2)	6.2	6.0±0.3 (10)
Central rectrix w	10.6±1.2 (91)	10.3±0.8 (41)	10.3±0.9 (24)	10.0±0.6 (7)	10.4±0.9 (10)	11.2±1.0 (21)***	10.4±0.1 (2)	13.1	10.6±0.8 (8)
Undertail coverts l	32.6±4.2 (86)	28.8±5.2 (44)***	30.8±4.9 (26)	25.9±5.0 (7)	25.9±3.8 (11)**	29.2±2.3 (19)	29.9	31.6	28.7±2.1 (8)
Coverts to tail tip	28.1±4.5 (60)	32.3±4.2 (38)***	32.4±4.7 (21)	33.2±4.7 (8)	31.3±2.8 (9)	34.3±4.0 (15)	—	—	34.7±3.8 (7)
R6 to R5	10.6±2.4 (59)	13.4±3.6 (31)***	14.0±3.7 (16)	12.6±5.2 (7)	13.0±1.0 (8)	13.5±1.5 (12)	—	—	12.7±1.2 (5)
Tarsus l	19.8±0.9 (122)	18.8±0.8 (52)***	19.0±0.8 (32)	18.9±0.9 (9)	18.4±0.7 (11)	20.7±0.7 (27)***	19.5±0.1 (2)	19.7	19.8±0.8 (12)
Tarsus prox. d	2.3±0.2 (123)	2.4±0.2 (53)*	2.5±0.2 (32)	2.3±0.3 (9)	2.3±0.3 (12)*	2.8±0.2 (24)***	2.7±0 (2)	2.6	2.5±0.2 (12)
Tarsus distal w	2.4±0.1 (124)	2.5±0.1 (52)**	2.6±0.1 (31)	2.4±0.1 (9)	2.4±0.2 (12)**	2.9±0.2 (27)***	2.8±0.1 (2)	2.7	2.7±0.1 (11)
Middle claw l	3.9±0.3 (117)	3.9±0.3 (52)	3.9±0.3 (31)	3.9±0.3 (9)	3.8±0.3 (12)	4.2±0.3 (27)***	4.0±0.1 (2)	4.6	4.2±0.2 (12)
Hindclaw l	6.1±0.4 (92)	6.0±0.5 (47)	6.0±0.6 (29)	6.2±0.2 (7)	5.9±0.2 (11)	6.4±0.4 (27)**	6.4±0.6 (2)	6.4	6.8±0.3 (12)

Appendix 3. Summary statistics (means \pm standard deviations, with n in parentheses) for *L. a b* colour values for the principal taxa discussed in this paper. Significance levels under Column 2 (*Bradypterus mandelli*, 3 races lumped) refer to *t*-tests vs. *Bradypterus luteoventris*; under Column 5 (*B. mandelli melanorhynchus*) to *B. m. mandelli* vs. *B. m. melanorhynchus*; under Column 6 (*B. montis*) to *B. mandelli* (3 races lumped) vs. *B. montis*. * = $P \leq 0.05$; ** = $P \leq 0.01$; *** = $P \leq 0.001$. *Bradypterus mandelli idoneus* refers to this taxon *sensu* Delacour (1952). Additional colour measurements are presented in Rasmussen et al. (2000).

Variables	(races separate)								
	<i>luteoventris</i>	<i>mandelli</i>	<i>mandelli</i>	<i>mandelli</i>	<i>idoneus</i>	<i>melanorhynchus montis</i>	<i>timorensis</i>	<i>seebohmi</i>	<i>alishanensis</i>
Crown									
<i>L</i>	29.6 \pm 1.4 (25)	29.4 \pm 1.8 (30)	29.6 \pm 1.4 (22)	26.3 \pm 1.9 (3)	30.2 \pm 1.4 (5)	25.8 \pm 2.4 (3)**	29.0 \pm 1.2 (2)	26.3	29.3 \pm 2.5 (5)
<i>a</i>	4.7 \pm 0.5 (25)	5.9 \pm 0.7 (30)***	6.1 \pm 0.6 (22)	5.4 \pm 0.2 (3)	5.3 \pm 0.8 (5)*	5.0 \pm 0.7 (3)*	5.7 \pm 0.2 (2)	5.2	5.4 \pm 0.4 (5)
<i>b</i>	14.7 \pm 1.2 (25)	15.0 \pm 1.4 (30)	15.2 \pm 1.4 (22)	13.7 \pm 0.7 (3)	14.6 \pm 1.3 (5)	12.1 \pm 1.2 (3)**	15.6 \pm 1.1 (2)	15.1	14.9 \pm 0.7 (5)
Auriculars									
<i>L</i>	47.2 \pm 3.3 (26)	41.6 \pm 4.8 (20)***	42.5 \pm 5.1 (13)	35.2 \pm 0.9 (2)	41.8 \pm 3.0 (5)	36.1 \pm 1.8 (3)**	43.6 \pm 3.2 (2)	35.9	41.0 \pm 2.2 (5)
<i>a</i>	3.7 \pm 1.0 (26)	4.6 \pm 1.1 (20)**	4.8 \pm 1.2 (13)	4.1 \pm 0.2 (2)	4.2 \pm 1.1 (5)	4.0 \pm 0.2 (3)	4.6 \pm 0.8 (2)	3.0	4.1 \pm 0.6 (5)
<i>b</i>	17.7 \pm 2.4 (26)	16.7 \pm 2.8 (20)	17.5 \pm 2.8 (13)	14.5 \pm 0.1 (2)	15.5 \pm 2.6 (5)	13.6 \pm 1.5 (3)	18.5 \pm 3.0 (2)	12.0	16.8 \pm 1.3 (5)
Rump									
<i>L</i>	30.9 \pm 1.3 (27)	30.5 \pm 1.3 (21)	30.7 \pm 1.2 (15)	28.4 \pm 0.5 (2)	30.9 \pm 0.9 (4)	27.3 \pm 0.9 (3)	30.4 \pm 1.3 (2)	29.3	31.5 \pm 1.7 (5)
<i>a</i>	5.1 \pm 0.7 (27)	5.8 \pm 0.7 (22)**	5.9 \pm 0.6 (16)	4.3 \pm 0.7 (2)	6.0 \pm 0.2 (4)	5.1 \pm 1.4 (3)	5.2 \pm 0.2 (2)	5.5	5.8 \pm 0.3 (5)
<i>b</i>	16.6 \pm 1.6 (27)	16.8 \pm 1.5 (22)	17.1 \pm 1.2 (16)	13.7 \pm 2.5 (2)	17.2 \pm 0.7 (4)	13.8 \pm 2.4 (3)**	16.3 \pm 0.4 (2)	16.1	17.5 \pm 0.8 (5)
Uppertail surface									
<i>L</i>	29.2 \pm 2.2 (27)	29.5 \pm 1.5 (21)	29.6 \pm 1.4 (15)	27.4 \pm 0.1 (2)	30.2 \pm 1.5 (4)	26.4 \pm 2.7 (2)*	28.5 \pm 0.3 (2)	29.0	32.3 \pm 1.5 (5)
<i>a</i>	5.1 \pm 0.6 (27)	5.0 \pm 0.4 (21)	5.0 \pm 0.4 (15)	4.4 \pm 0.1 (2)	5.2 \pm 0.3 (4)	4.7 \pm 0.4 (2)	5.2 \pm 0.7 (2)	5.2	5.0 \pm 0.4 (5)
<i>b</i>	12.6 \pm 2.0 (27)	11.4 \pm 1.3 (21)*	11.3 \pm 1.1 (15)	9.3 \pm 0.8 (2)	12.7 \pm 1.0 (4)*	9.8 \pm 0.1 (2)	11.7 \pm 1.4 (2)	11.8	12.8 \pm 1.2 (5)

Central breast									
<i>L</i>	61.6±5.3 (29)	58.7±5.0 (36)*	59.8±4.3 (29)	51.3±6.9 (3)	56.5±3.7 (4)	48.5±3.4 (3)**	53.3±2.7 (2)	57.4	55.5±6.1 (5)
<i>a</i>	0.9±1.2 (29)	1.9±1.0 (36)**	2.0±1.1 (29)	1.3±0.3 (3)	1.8±1.0 (4)	1.8±0.8 (3)	1.5±0.3 (2)	1.3	1.5±0.6 (5)
<i>b</i>	16.8±5.1 (29)	14.5±4.6 (36)	15.1±4.5 (29)	10.7±3.5 (3)	13.4±5.4 (4)	10.3±1.3 (3)	10.4±1.6 (2)	13.8	11.7±2.8 (5)
Upper flanks									
<i>L</i>	54.6±3.8 (29)	44.2±5.1 (33)***	44.8±5.3 (25)	43.8±5.2 (3)	41.6±3.9 (5)	37.2±4.2 (3)*	37.0±0.2 (2)	33.8	42.6±4.4 (5)
<i>a</i>	4.2±1.5 (29)	5.3±1.2 (33)**	5.6±1.1 (25)	4.1±1.6 (3)	4.5±1.0 (5)*	5.1±0.9 (3)	3.9±0.4 (2)	3.7	5.2±0.8 (5)
<i>b</i>	24.5±2.6 (29)	20.8±2.8 (33)***	21.3±2.6 (25)	19.1±4.1 (3)	19.0±2.8 (5)	18.5±2.6 (3)	17.0±2.0 (2)	16.3	20.5±1.6 (5)
Undertail coverts									
<i>L</i>	47.0±4.7 (24)	40.4±2.2 (20)***	40.0±2.3 (14)	40.0±1.9 (2)	42.1±1.7 (4)	32.9±1.2 (2)***	38.1±2.8 (2)	38.7	46.5±3.3 (5)
<i>a</i>	5.0±0.8 (24)	3.9±0.6 (20)***	4.0±0.5 (14)	3.0±0.2 (2)	3.9±0.3 (4)	3.4±0.4 (2)	3.8±0.7 (2)	4.0	4.8±0.8 (5)
<i>b</i>	21.7±2.6 (24)	14.6±1.7 (20)***	14.5±1.6 (14)	13.2±3.2 (2)	15.3±1.3 (4)	10.3±0.3 (2)**	14.3±0.4 (2)	14.7	19.3±2.0 (5)

Appendix 4. Mean measurements (in mm) \pm standard deviations, with n in parentheses for *Bradypterus mandelli mandelli* (India, Bhutan, and Burma), *B. m. idoneus* (s.l., minus south Vietnamese specimens), and *B. m. idoneus* (s.s., south Vietnamese specimens only).

Variables	<i>mandelli</i>	<i>idoneus</i> (s.l.)	<i>idoneus</i> (s.s.)
Culmen (skull)	14.3 \pm 0.5 (28)	13.9 \pm 0.5 (8)	13.3
Culmen (feathers)	10.6 \pm 0.5 (27)	10.1 \pm 0.4 (8)	9.8
Bill h (nares)	3.1 \pm 0.1 (28)	3.0 \pm 0.2 (9)	3.2
Bill w (nares)	2.8 \pm 0.2 (29)	2.7 \pm 0.3 (9)	2.9
Wing l	51.9 \pm 2.2 (29)	51.6 \pm 3.0 (8)	51.0 \pm 1.4 (2)
P1 shortfall	23.5 \pm 1.4 (26)	23.2 \pm 2.3 (8)	22.7 \pm 0.7 (2)
P2 shortfall	9.1 \pm 1.1 (24)	8.7 \pm 1.2 (8)	8.9 \pm 0.3 (2)
P3 shortfall	2.3 \pm 0.7 (24)	1.6 \pm 0.8 (8)	2.4 \pm 0.9 (2)
P4 shortfall	0.7 \pm 0.6 (22)	0.3 \pm 0.4 (8)	0.2 \pm 0.3 (2)
P5 shortfall	0.0 \pm 0.1 (23)	0.2 \pm 0.4 (8)	0.0 \pm 0 (2)
P6 shortfall	1.2 \pm 0.6 (23)	1.8 \pm 0.9 (8)	0.4 \pm 0.6 (2)
P7 shortfall	2.5 \pm 0.7 (21)	2.9 \pm 0.9 (8)	1.4 \pm 0.2 (2)
P8 shortfall	3.9 \pm 0.9 (20)	4.5 \pm 0.8 (8)	2.4
P9 shortfall	5.0 \pm 1.0 (19)	5.8 \pm 0.6 (8)	4.0 \pm 0.8 (2)
P10 shortfall	6.0 \pm 0.9 (19)	7.3 \pm 0.6 (8)	5.1 \pm 1.5 (2)
Tarsus l	19.0 \pm 0.8 (32)	19.0 \pm 0.9 (8)	18.7 \pm 0.9 (2)
Tail l	59.8 \pm 2.8 (24)	55.5 \pm 2.1 (7)	58.1