Further comments on the ageing and sexing of the Red-flanked Bluetail

Magnus Hellström and Gabriel Norevik

The recent increase in the numbers of Red-flanked Bluetails *Tarsiger cyanurus* reaching western Europe has led to discussions on published criteria for ageing and sexing of the species. Here, we present our observations of birds handled at Beidaihe Bird Observatory, in Hebei province, China, in spring 2011 and both spring and autumn 2012. This is supplemented by data from the bird observatories at Ottenby and Stora Fjäderägg (in Sweden) and by observations of Red-flanked Bluetails in the field in south-central Siberia, northeast China and Sweden.

The recent increase in Europe

The dramatic increase in sightings of Red-flanked Bluetails in western Europe matches the trend shown by the Finnish breeding population, where the number of known territories rose from single figures between the 1950s and 1980s, to tens in the 1990s, then to several hundred since 2000, peaking in 2012 when c. 570 territories were found (Rajasärkkä 2010 and *in litt.*). The actual population size is now estimated to be some 6,000 territories. It seems a reasonable assumption that many of the recent records in western Europe are of birds from the western part of the breeding range.

Moult

Adult birds (2CY+) undergo a complete post-breeding moult during late summer. Cramp (1988) raised the possibility that moult occurs after autumn migration, but the adults we handled during September and October were freshly moulted with no older feathers retained, so we agree with Svensson (1992) that the moult is completed before migration. Juveniles undergo a partial post-juvenile moult during late summer, which includes body contour feathers, lesser,

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396. Red-flanked Bluetail, adult male, autumn. Beidaihe, China, September 2012.

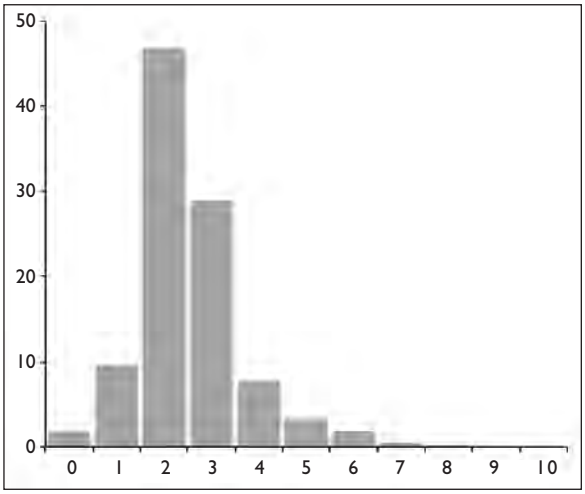


Fig. 1. Number of greater coverts included in the post-juvenile moult of Red-flanked Bluetails *Tarsiger cyanurus*, shown as a percentage of first-winter/first-summer individuals examined (n=474).

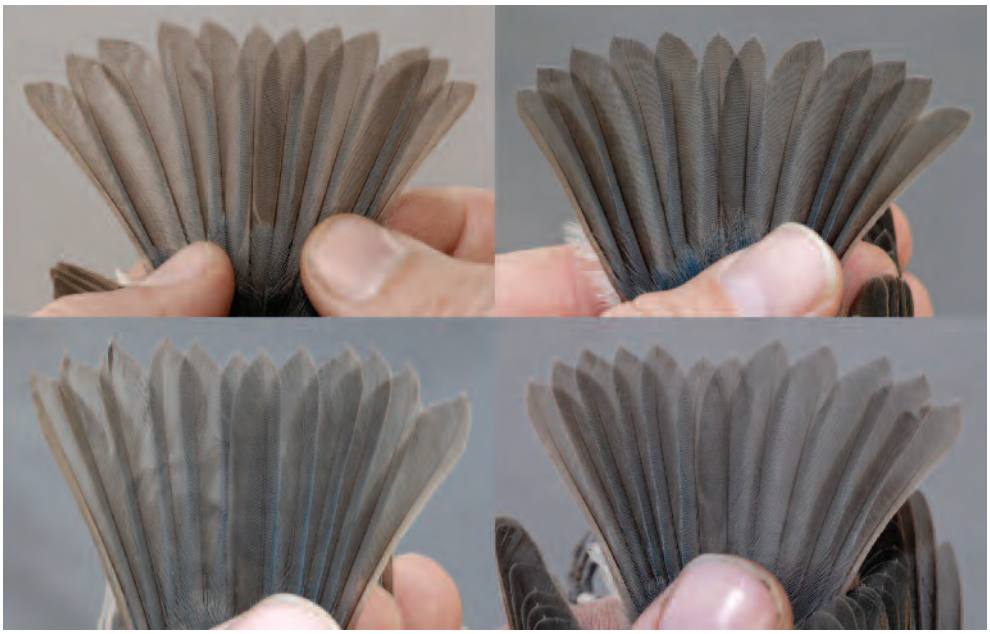
median and (generally) some greater coverts. A few individuals may also replace one or more tertials (c. 1.5% of the birds in our sample, n=266; up to three tertials replaced) or rectrices (c. 1.0%, n=397; up to nine rectrices replaced). The extent of moult in the greater coverts is shown in fig. 1. No bird of any age class has a pre-breeding moult so these feathers are retained during spring migration and throughout the breeding season.

Ageing

Ageing Red-flanked Bluetails is, with some basic knowledge and experience, quite straightforward, with critical characters found in the wing, and supporting characters often in the tail and the inside of the upper mandible. In addition, there are average differences between the age classes in iris colour (slightly warmer, more rusty brown in adults), but the results are somewhat ambiguous, and this needs further testing.

Tail feathers

The shape of the rectrices was suggested by Leader (2009) as the most reliable criterion for ageing: birds with broader and more rounded tips to the rectrices were adults,



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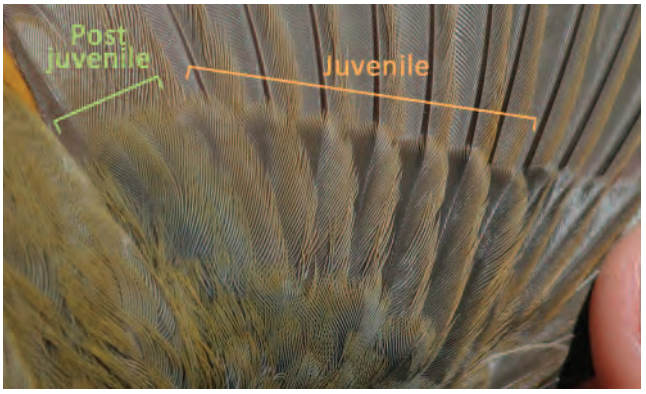
397. Comparison of the shape of the rectrices in four autumn Red-flanked Bluetails. Upper left and lower left: first-winter birds (both probable females) with unmoulted juvenile rectrices. Upper right and lower right: adult females. Although the adults have (very) slightly broader and more rounded tips to the tail feathers than the first-winters, such differences in shape are not safe to use for ageing since individual variation is large. Note also the rather protruding and slightly curved tip to the feathers of the two lower birds, which is shown by some individuals of both age classes and both sexes. Beidaihe, China, September and October 2012.

those with narrower and more pointed tips were first-years. We agree that there is an average difference as described, but we found that the shape of the rectrices is variable in both age classes with a degree of overlap that makes this feature surprisingly difficult to use for ageing. Only those individuals showing the most broad and rounded (or narrow and pointed) rectrices can be aged safely using this criterion alone. Furthermore, the possibility that a first-winter/first-summer bird may have included the tail (or part of it) in the post-juvenile moult (or replaced it after accidental loss) should be borne in mind.

More important than the shape is a general difference in feather quality and texture between the age classes in both spring and autumn. In adults, the rectrices typically appear generally darker and less worn, with more gloss and seemingly have a 'higher density' than those of first-years, which may be apparent to experienced ringers. In summary, the shape and texture of the rectrices may be useful for ageing many individuals but they are of secondary importance compared with the information found in the wing.

Wing

The juvenile wing has a rather rusty overall hue, not only in the edges of the remiges (as some adult birds show), but also in the edges of the juvenile greater and primary coverts. In the post-juvenile moult, the lesser, median and a number of greater coverts are replaced by adult-type feathers, creating a moult contrast with the retained juvenile feathers. This contrast may be subtle (roughly comparable with that shown by first-winter female Common Redstarts *Phoenicurus phoenicurus*), but with practice it is extremely useful for ageing since adults (after their complete post-breeding moult) lack this contrast. Adult-type greater coverts show brownish-olive edges, concolorous with the scapulars, lesser and median coverts, whereas the edges of any remaining juvenile greater and primary coverts have a more vivid rusty hue (see plates 398 & 400). In some first-years (probably most often males), the new adult-type coverts may show a pale bluish-grey hue, which makes the contrast easier to see. Since there is no winter moult, this moult-contrast char-



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398. A typical first-winter Red-flanked Bluetail showing moult contrast, with seven retained juvenile outer greater coverts and three adult-type innermost greater coverts that were replaced during the post-juvenile moult (the innermost is hidden under the scapulars). Note the rusty edges of the juvenile greater and primary coverts, compared with the adult-type olive lesser, median and innermost greater coverts and scapulars. Beidaihe, China, September 2012.

Magnus Hellström

399. A typical adult female Red-flanked Bluetail in autumn, showing a freshly moulted and homogenous wing lacking moult contrast. Note the brownish-olive edges to all greater and primary coverts, concolorous with the lesser and median coverts, and the scapulars. Note also that the tips to the greater coverts are somewhat paler and more rusty, commonly seen in adults (and is often more distinct than shown by this individual). Beidaihe, China, September 2012.

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400. First-winter Red-flanked Bluetail (logged as probable male based upon the colour of tail, uppertail-coverts and intensity of the flank colour). Note the rusty panel created by the edges of the retained juvenile greater and primary coverts, which contrasts with the more olive colour seen in the replaced, post-juvenile lesser and median coverts, scapulars and mantle. Beidaihe, China, September 2012.

acter remains valid in spring, when heavily worn juvenile feathers may further emphasise the contrast. The extent of this moult is variable and the contrast often occurs on the inner part of the arm; sometimes it is necessary to lift the scapulars to find it (in other words it is not always evident in the field). Duivendijk (2011) stated that most juveniles do not replace any greater coverts in the post-juvenile moult; this is not the case, but may appear so from field views alone. In our sample, c. 76% of the birds examined had replaced two or three greater coverts; just 1.7% of the birds examined had not replaced any greater coverts, but in such cases the panel of rusty juvenile greater and primary coverts still showed contrast with the moulted brownish-olive median and lesser coverts and

Magnus Hellström

401. Adult female Red-flanked Bluetail in autumn. Note the lack of colour contrast in the wing, the olive edges of the adult-type greater and primary coverts being concolorous with the surrounding feather groups. The perception of colours in feathers of the Red-flanked Bluetail is greatly affected by lighting conditions, and assessment should be made only under favourable light conditions. Beidaihe, China, September 2012.

Table 1. The colour and pattern of the inside of the upper mandible in Red-flanked Bluetails *Tarsiger cyanurus* at Beidaihe, China, autumn 2012.

category colour/pattern	sample size	number first-winter	number adult	percentage first-winter	percentage adult
A	143	142 (99.3%)	1 (0.7%)	46.9%	3.7%
B	86	85 (98.8%)	1 (1.2%)	28.1%	3.7%
C	18	14 (77.8%)	4 (22.2%)	4.6%	14.8%
D	61	51 (83.6%)	10 (16.4%)	16.8%	37.0%
E	22	11 (50.0%)	11 (50.0%)	3.6%	40.8%
total	**330**	**303**	**27**	**100.0%**	**100.0%**

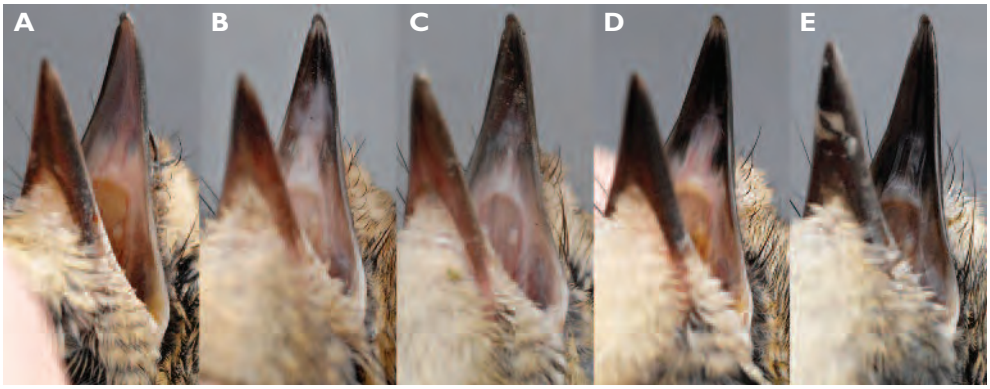
scapulars. As with the rectrices, the adult wing shows a better feather quality and texture compared with that of the juvenile wing (both coverts and remiges), which may be a useful character for ageing birds in the hand.

Many fresh individuals show variably distinct pale spots at the tips of the greater coverts (and sometimes also the tertials). Although indicative of juvenile feathers, the presence of pale spots is not straightforward as a tool for ageing as they may also occur in adult feathers (though less commonly). Adults with pale spots often have the entire feather tip slightly more rusty than usual, but still show a brownish-olive edge to the feather. Truly pale and distinct spots to the greater coverts and tertials are not particularly common in either of the age classes, and may perhaps be found in juvenile feathers only.

Upper mandible

In several chats, the inside of the upper mandible darkens with age. Most of the Red-flanked Bluetails in our sample were examined for differences in the colour of the inside of the upper mandible. Individual variation is quite pronounced and this character requires further study. In addition, as suggested originally by Roni Väisänen *in litt.*, we found a slight difference between the sexes, with a somewhat darker pattern in males. We classified autumn birds (n=330) according to the scale shown in plate 402 (categories A–E), and then aged each bird independently, in terms of the criteria for the wing and tail described above. The findings are shown in table 1. In short, there is complete overlap, since both age classes were found in all five categories, but the following points are worth noting:

- Virtually all birds with pattern A or B (a pale interior to the upper mandible or a pale interior with diffuse darker edges) were first-winters.
- Proportionately, very few first-winters showed pattern E (a dark inside to the upper mandible). However, owing to the much higher numbers of first-winter birds



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402. The five categories (A–E) used to classify the colour and pattern of the inside of the upper mandible in Red-flanked Bluetails in autumn. A = entirely pale, B = pale with diffusely darker edges, C = intermediate, D = dark with pale centre, E = entirely dark. All birds photographed in Beidaihe, China, during early autumn migration 2012.

trapped at Beidaihe (which is probably analogous to the situation for vagrants to western Europe in autumn), we caught just as many category E first-winter birds as adults (11 each).

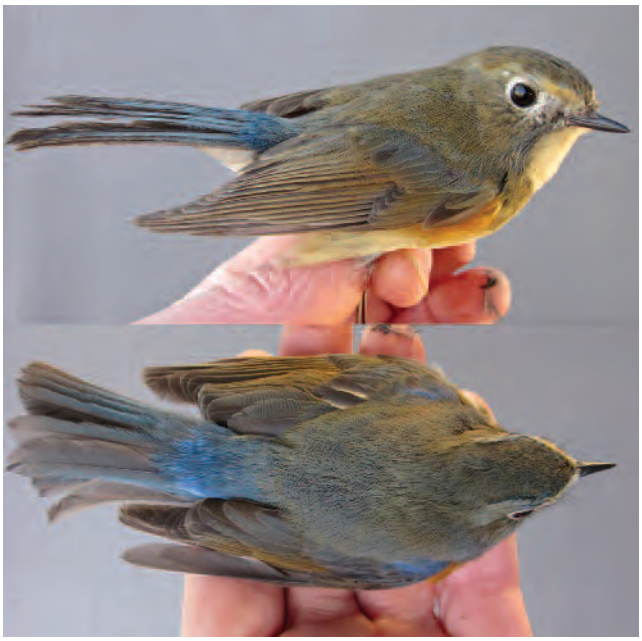
These data should be interpreted with care since the number of birds (especially adults) is rather low, and this character should be used with caution and as a supporting feature only.

Do 'dull-morph' males exist?

Adult male Red-flanked Bluetails show considerable variation in the extent of blue in the body contour feathering and remiges. In terms of the remiges, individuals vary without any discernible geographical pattern since adult males with blue or olive (or a mixture of both) outer vanes to primaries and secondaries seem to be found all over the breeding range. Variation in the colour of the body feathers is less well understood.

Cramp (1988) states that: 'In some areas, many adult males are dull morph, apparently retaining female-like plumage throughout life, and bright morph adult males are rare', a statement attributed to Ali & Ripley (1973). The latter contained remarks on males displaying a female-type plumage under the headings of 'Kashmir Redflanked Bush Robin *Erithacus cyanurus pallidor*' and 'Eastern Redflanked Bush Robin *Erithacus cyanurus rufilatus*'.

Following taxonomic review, the southern group of bluetails breeding in the Himalayas and western China is now treated as a distinct species, the Himalayan Bluetail *Tarsiger rufilatus*, with the taxa *rufilatus* and *pallidor* becoming races of that species. This leaves northern, migratory Red-flanked Bluetail as a monotypic species. The effect of this revision may be to temper or invalidate some statements made by authors writing prior to the general acceptance of that taxonomic revision. Regarding *pallidor*, Ali & Ripley comment that: 'In Kashmir blue males [are] noted as being the exception', which in turn is directly based on the statement by Davidson (1898) after his visit in Kashmir: 'In most of the pairs of *Ianthia* [= *Tarsiger*] we saw, both sexes were in the brown plumage, and it was decidedly the exception to find a male in the handsome blue plumage.' In the case of *rufilatus*, Ali & Ripley stated that: 'Only a small percentage of breeding males are in blue plumage, most of them being in brown plumage.' Ali & Ripley made no mention of male Red-flanked Bluetails (*sensu stricto*) in female-type plumage. Consequently, the above statement from Cramp (1988) is in fact valid for the Himalayan Bluetail, and we have found no reference claiming male dimorphism in the Red-flanked Bluetail.



Bo Petersson

403. Adult (3CY+) Red-flanked Bluetail. Most likely a dull male owing to the extensive bright blue lesser coverts (not fully visible here), a faint blue wash in the greater coverts, a few bright blue feathers in the side of the crown, slight bluish-grey cast in the sides of the neck and in the lower mantle, and bright blue uppertail-coverts. Beidaihe, China, April 2012.

The existence of a dull-morph male in the Red-flanked Bluetail was questioned by Leader (2009), who suggested that it may relate to confusion with first-year males that breed in a female-type plumage. Although this may be true in part, we believe that the situation is more complicated, with intriguing variation still to be

explained. During spring migration at Beidaihe, we have handled some interesting individuals including an adult (3CY+), most probably male, showing a dull plumage except for bright blue in the lesser coverts (see plate 403). This individual had a mixture of olive feathers and olive feathers with a (very) slight bluish-grey hue in the sides of the throat, neck and in the lower mantle. The feather bases were olive-grey, and this bird would not turn blue with wear. Furthermore, the suggestion of a dull-morph male in the Red-flanked Bluetail could be a plausible explanation for the situation in the area around the southern parts of Lake Baikal, where blue males are rarely seen during the breeding period (local ornithologists Sergey Pysjanov and Igor Fefelov pers. comm.; pers. obs.).

Sexing

Sexing adult (2CY+ autumn and 3CY+ spring) Red-flanked Bluetails is more or less straightforward. Difficulties often arise when attempting to sex first-year birds, however, so establishing the correct age is an essential first step.

Adults

From 2CY autumn onwards, the sexes are generally distinguishable since males will have developed their brightly coloured plumage (see plate 396), although the blue may be partly and variably concealed by brownish-olive fringes while fresh. Note that adult females may, exceptionally, show bright blue pigmentation in the lesser coverts (and according to Leader (2009) also in the scapulars). But in the case of the only such female we have handled, this blue pigmentation was confined to a single lesser covert.

If we acknowledge that dull adult males do exist (whether as a morph or just individual variation), sexing of adult birds obviously becomes more complicated. As in the younger age classes (see below), the colour of the tail and uppertail-coverts combined with flank colour and wing length should provide guidance for most (but note that the colour scales shown below are not designed for adults).

Of the 41 adults measured in autumn, the wing length of 44% fell within the overlap range of 78–80 mm, while the remaining 56% were measured as 75–77 mm (females) or 81–85 mm (males; table 2).

First-years

In first-winter and first-summer plumage, males and females are very similar, and many individuals should be left unsexed. However, like Leader (2009) and Cramp (1988), we found that, on average, males show a more intense and deeper blue in the rectrices and uppertail-coverts than females. Combined with wing length, blue in the plumage (away from the tail/rump) and flank colour (on average brighter orange in males) allows many individuals to be sexed correctly. Our classification of the colour intensity of the tail, uppertail-coverts and the flanks was established with reference to the examples in images plates 405 & 406.

If present at all, blue feathering (away from tail/rump) in first-year birds is confined to post-juvenile coverts and the scapulars. In its weakest form, it is visible as a pale bluish-grey

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404. A typical Red-flanked Bluetail showing bright blue pigmentation in a lesser covert. Left: single feathers showing blue pigmentation can easily be overlooked, and may need to be searched for. In this photo the feather is visible close to the centre of the image. In addition, note the typical gloss in the feather centre of most of the coverts, which sometimes (especially in photographs) appears confusingly bluish. Right: a closer look at the feather reveals several very small bright blue pigmentation elements. Beidaihe, China, September and October 2012.

Table 2. Wing length of adult Red-flanked Bluetails *Tarsiger cyanurus*, Beidaihe, China, autumn 2012.

Sex	sample size	mean wing length (mm)	SD	minimum	maximum
male	22	81.3	1.9	78	85
female	19	77.9	1.5	75	80

Table 3. Wing lengths in three categories of first-winter Red-flanked Bluetails *Tarsiger cyanurus* at Beidaihe, China, autumn 2012.

Tail, uppertail-covert and flanks	sample size	mean wing length	SD	minimum	maximum
male	95	79.5	1.6	76	83
indeterminate	101	78.7	2.1	75	83
female	47	77.2	1.3	74	79

hue covering most of the feathers involved. If present on the adult-type greater coverts, it often appears as weak parallel bands crossing the feathers. This faint hue is seen regularly in both sexes (more uncommonly in females) but should not be mistaken for the normal gloss that occurs in all Red-flanked Bluetails in the feather centre of the wing-coverts (see plate 404). In many individuals, the blue pigmentation is a notably brighter, clear and almost luminescent blue. In such cases it is often confined to single feathers. A close look at such feathers often reveals that the blue is deposited irregularly on the feather, often appearing as tiny bright blue granules of varying size. In our sample, such bright blue feathers were present in c. 30% (n=131) of the first-winter males (some individuals showing several blue lesser coverts, creating small patches of blue), but in only c. 1% (n=97) of the first-winter females (just one individual, showing bright blue pigmentation in a single lesser covert).

Assessment of the flanks is sometimes hampered by variation in the coloration of the orange patch, but individuals with an atypical flank patch were generally logged as intermediates. The size of the patch varies considerably, averaging larger in males, but there is extensive overlap, so our classification focused primarily on the intensity of the colour rather than its extent. It should be stressed that the true sex of these individuals is unknown, but the scale was constructed with the variation shown by adult individuals (of known sex) in mind.

Birds showing a combination of male-

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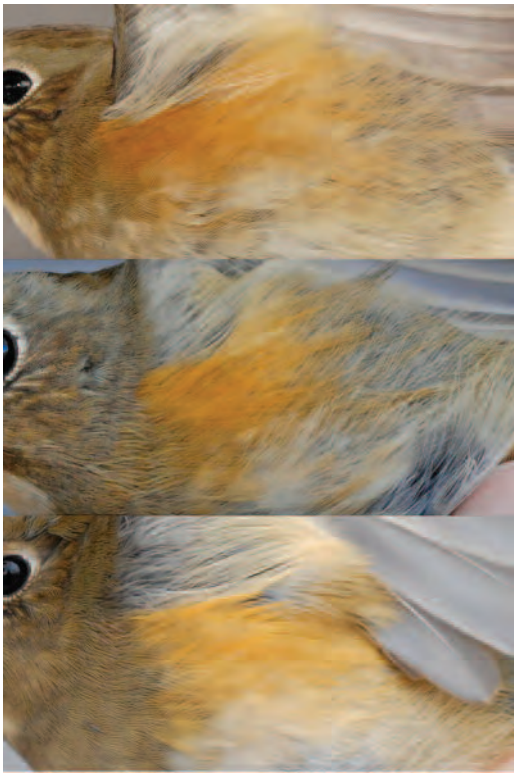
405. The three categories used for logging the colour of the tail and uppertail-coverts in first-winter Red-flanked Bluetails. Left: minimum intensity of blue required for a male-type. Centre: indeterminate. Right: maximum intensity of blue required for a female-type. Beidaihe, China, September and October 2012.

type rectrices and uppertail-coverts, male-type flank colour and with (at least) a pale bluish-grey hue present somewhere in the wing-coverts accounted for c. 40% of first-winter birds (n=243) examined, and the average wing length was 79.5 mm. Birds showing female-type rectrices and upper-tail-coverts, female-type flank colour and a plumage entirely lacking even the faintest hint of a bluish hue made up c. 20% of all first-winter birds, and had an average wing length of 77.2 mm. We believe that birds meeting these criteria can be assigned to the respective sex, while others should be left unsexed unless wing length provides strong support (81 mm or higher for males, 75 mm or below for females; table 3). Note that juvenile wings are c. 1.0–1.5 mm shorter than adult wings. In future studies we hope to test these criteria in sexed first-winter birds using genetic analysis.



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406. The three categories used for logging the colour of the orange flanks in first-winter Red-flanked Bluetails. Upper: minimum intensity of orange required for a male-type. Centre: indeterminate. Bottom: maximum intensity of orange required for a female-type. Beidaihe, China, September and October 2012.

Acknowledgments

We thank Yang Jinguang, warden at Beidaihe Bird Observatory, China, as well as Marcus Danielsson, Lina Jansson, Tom Malm, Bo Petersson and Andreas Wernersson, who were all ringers in Beidaihe during spring and autumn 2012. Many thanks also go to Alexander Hellquist and Roni Väisänen for providing valuable comments on the earlier draft, and to Stora Fjäderägg Bird Observatory for use of their data. For useful and productive discussions and help with references we would also like to thank Simon S. Christiansen, Aron Edman, Lars Larsson and Ari Rajasärkkä. The Swedish-Chinese Bird Banding Exchange Project is an ongoing co-operation between the Bird Ringing Centre at the Swedish Museum of Natural History (Stockholm) and the National Bird Banding Centre (Beijing), financially supported by the Swedish International Development Cooperation Agency (SIDA), and with the Swedish bird observatories at Ottenby and Falsterbo as co-operative partners. Bo Petersson is the project leader at Beidaihe Bird Observatory (bo@bingsmarken.se). This is contribution No. 276 from Ottenby Bird Observatory.

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Magnus Hellström and Gabriel Norevik, Ottenby Bird Observatory, Ottenby 401, S-386 64 Degerhamn, Sweden; e-mail magnus.hellstrom@ottenby.se

Magnus Hellström is a biologist and agronomist who works for the Swedish Ornithological Society as the head of Ottenby Bird Observatory. He was a member of the Swedish Rarities Committee during 2002–12 and is a tour leader for AviFauna with a special interest in the Eastern Palearctic region. **Gabriel Norevik** is a biologist and experienced bird ringer from Sweden. He has worked at several bird observatories in Europe, the Middle East, Africa and Asia, and for many years also at Ottenby, where he now is a member of the observatory's board.