

Our records of food deliveries to the Luzon nest also revealed important differences between Luzon and Mindanao. In terms of biomass contribution, the Northern Luzon Giant Cloud Rat was the most important prey species on Luzon, unlike Mindanao where the Long-tailed Macaques made up the highest biomass contribution (36.5%). In numerical terms the Northern Luzon Giant Cloud Rat was also one of the top prey species on Luzon, in place of the Philippine Flying Lemur *Cynocephalus volans* and Mindanao Flying Squirrel *Petinomys crinitus*, the most numerous prey items on Mindanao (Kennedy 1985, Ibañez *et al.* 2003, Ibañez 2007); these two species are absent from Luzon. On Luzon, reptiles numerically accounted for 37.4% of the prey items, compared with less than 10% on Mindanao (Kennedy 1985, Ibañez 2007), suggesting a greater variety of available prey on Luzon. Finally, it is noteworthy that no domestic animals were recorded from the Luzon nest, contrary to the observations of Concepcion *et al.* (2006) and Ibañez (2007) on Mindanao.

The differences in both nest location (altitude and habitat) and breeding period discovered during the investigation of this first confirmed breeding record on Luzon suggest that some temporal and range adjustments may be needed in ongoing nest search efforts in the region. More significantly, the noteworthy location of the two nests so far discovered in pristine forest interiors, as well as the apparent variety and sufficiency of wild prey, together strengthen the need to maintain and enhance existing local conservation strategies for the area.

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## First record of Yellow-bellied Tit *Pardaliparus venustulus* in Russia suggests a significant range extension of a species formerly endemic to China

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The Yellow-bellied Tit *Pardaliparus venustulus*, classified as Least Concern (BirdLife International 2015), is a species of forests and woodlands previously thought to be endemic to south-east and north-east China (Gosler & Clement 2016). Since 2011, a standardised bird ringing programme has been carried out as part of the Amur Bird Project at Muraviovka Park, Far East Russia (Heim & Smirenski 2013). The Muraviovka Park for Sustainable Land Use (49.874°N 127.704°E) is a non-government-managed nature reserve, about 50 km south-east of Blagoveshchensk, Amurskaya oblast (Heim 2016). It covers 6,500 ha of wetlands with small deciduous forest islands, along the middle reaches of the Amur River.

On 25 September 2013 at 11h00, a juvenile Yellow-bellied Tit was caught in a mist-net located in a deciduous grove close to farm

buildings (Plate 1). The following measurements were recorded: wing length 63.5 mm, p8 length 48.0 mm, tarsus length 17.0 mm, bill (to skull) 10.6 mm, fat score 2, muscle score 3, weight 11.0 g. Body feathers were collected for genetic analyses. Body dimensions matched the literature values for *P. venustulus*: wing (of male) 61–68 mm, tarsus 14.2–18.0 mm, weight 9.0–12.5 g (Harrap & Quinn 1996). Whilst this bird was being ringed, a pair of adult Yellow-bellied Tits were photographed near the mist-net (Plates 2 & 3). The ringed bird was recaptured (once) at 10h00 the following day.

The feather samples were used for genetic barcoding analysis with the standard marker cytochrome-oxidase I (COI). DNA was extracted using the sbeadex® forensic kit (LGC Genomics) according to the manufacturer's instructions. Standard bird primers and PCR

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**Plate 1.** Juvenile Yellow-bellied Tit *Pardaliparus venustulus* caught in a mist-net located in a deciduous grove close to farm buildings, Muraviovka Park, Far East Russia, 25 September 2013.



**Plate 2.** Male Yellow-bellied Tit, Muraviovka Park, Far East Russia, 25 September 2013.

profile for amplification were taken from Hebert *et al.* (2004). PCR products were purified using ExoSap-IT (GE Healthcare), adding 0.1 ml ExoSap-IT solution in 4 ml water to each sample and the sequencing of the PCR products was performed with BigDye™ 3.1 Dye Terminator Cycle Sequencing Kits (Applied Biosystems), according to the manufacturers' instructions. PCR products were purified using Sephadex (GE Healthcare), and sequenced in both directions in an ABI 3130xl DNA sequencer. The sequence was submitted to GenBank and is available under accession no KX687333; for comparison newly generated sequences of Willow Tits *Poecile montanus* and Marsh Tits *Poecile palustris*: KX687334–KX687340).



**Plate 3.** Female Yellow-bellied Tit, Muraviovka Park, Far East Russia, 25 September 2013.

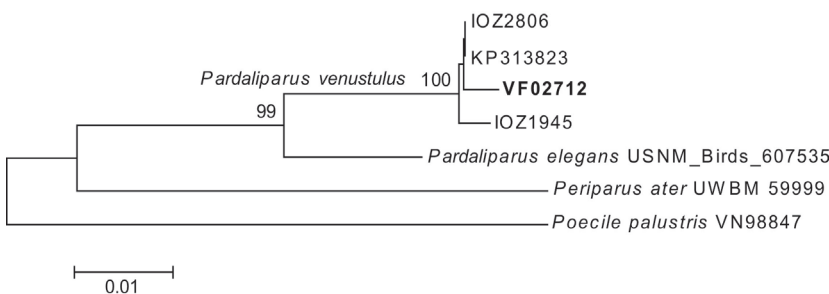
We received a 549 bp-long COI sequence from feather extracts processed in a BLAST search at GenBank. Our sequence matched three further COI sequences of *Pardaliparus venustulus*. Two of these sequences were backed by specimens that originated from the Chinese breeding range in Shaanxi (HM185325, specimen IOZ1945) and Hubei (HM185326, specimen IOZ2806), both from Dai *et al.* (2010); a third was not referenced to a voucher specimen (KP313823 mtDNA genome). In the distance tree of BLAST results, all *P. venustulus* sequences were sister to a clade including four sequences of *P. elegans*, a close relative of *P. venustulus* (Martens *et al.* 2006). For illustration of these results a neighbour-joining tree reconstructed with MEGA 6.06 (Tamura *et al.* 2013) is provided (Figure 1).

Evidently a Yellow-bellied Tit family was observed at Muraviovka Park, although the nearest known breeding area is about 1,500 km to the south-west. The species is thought to be more or less sedentary, and indeed it seems rather unlikely that the family migrated a distance of 1,500 km to the north-east. Thus there might be unknown breeding populations in areas further to the north-east of the known range, closer to the Russian border or within Russia. Since 1985 the species has been regularly observed in large numbers in late April–May and late September–November at Beidaihe, Hebei province, northern China, indicating either a change in movements across this area or a range expansion (Williams *et al.*

1992). In the Republic of Korea the first individual was recorded 21 October 2005 (Moores 2005) and since then, the species has been seen regularly there, with singing males observed in May (Choi *et al.* 2011). According to Moores & Kim (2014), there is evidence that the species has colonised the north of the Korean peninsula and probably breeds in the Republic of Korea (N. Moores pers. comm.). On 1 December 2009 and later in spring 2010 the first birds were recorded from Japan (Ikenaga 2014); since then the species has been seen in different parts of the country (Y. Watabe pers. comm.) and two birds were ringed in 2015 (K. Ozaki pers. comm.). These records all suggest an eastward range expansion and further breeding records of the Yellow-bellied Tit outside China may be anticipated.

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**Figure 1.** Neighbour-joining tree of COI barcode sequences of the Yellow-bellied Tit *Pardaliparus venustulus* and allies; bootstrap support greater than 50 indicated at nodes; the Muraviovka specimen in bold letters (VF02712); sequence identifiers either refer to GenBank accession numbers or specimens in collections (IOZ= Institute of Zoology, Chinese Academy of Sciences, Beijing, China; USNM= Smithsonian National Museum of Natural History, Washington DC, USA; UWBM= Burke Museum of Natural History and Culture, Seattle, USA); one further Marsh Tit *Poecile palustris* sequence was also from a bird ringed at Muraviovka (VN98847).

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## First breeding record of Slaty Bunting *Emberiza siemsseni*

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The Slaty Bunting *Emberiza siemsseni* is a range-restricted Chinese endemic, breeding in the highlands of south Gansu province, south Shaanxi province and west and north-east Sichuan province (Zheng 2011). Although not rare and designated as Least Concern by BirdLife International (2015), very little is known about its breeding ecology (Madge 2015). Here, we describe for the first time the Slaty Bunting's eggs, nest, nest-site and breeding behaviour.

On 3 July 2014 we found a Slaty Bunting nest in Lianhuashan Nature Reserve, Kangle county, Gansu province (34.952°N 103.768°E). The nest was located 0.3 m from a small path in shrub-land and was positioned 0.4 m above the ground on a 0.7 m tall spruce sapling. About 50% of the nest site area (defined as a 5 m radius around the nest) was covered by shrubs, dominated by willows *Salix* sp., with an average height of 3.5 m.

When found, the nest contained four eggs. No further eggs were laid, hence incubation was already underway. The eggs were oval in shape and creamy white in colour, with irregular markings slightly concentrated at the large end (Plate 1). We weighed the eggs to the nearest 0.01 g, using a portable digital balance, and measured the length and breadth to the nearest 0.01 mm, using digital vernier calipers. Mean egg size was  $17.93 \pm 0.38$  mm  $\times$   $14.10 \pm 0.11$  mm, with a mean weight of  $1.89 \pm 0.07$  g.

The outer layer of the circular, cup-shaped nest was made mainly of broad leaves and grass-stems, with a lining of soft, thin grass-stems and livestock hairs. The inner diameter of the nest was 57.7 mm and the outer diameter 84.4 mm, with an inner depth of 44.7 mm and total height of 65.5 mm.

We placed an infrared-triggered camera near the nest to monitor parental activities. However, because of rainy weather and the

limitations of the camera, we obtained detailed incubation data only on 10 July. From 06h00 to 18h00 we observed 12 change-overs, and both sexes spent similar times incubating: 349 minutes (male) and 352 minutes (female). Three eggs hatched on 13 July, when the first images were captured of the adults feeding the nestlings, giving an incubation period of at least 10 days. One egg failed to hatch, and it was examined after the nestlings had left the nest: the yoke was still complete and no embryo development was evident, so we deduced that the egg was unfertilised.

Both sexes reared the nestlings, but detailed provisioning rates could not be obtained because of the two-minute intervals between consecutive triggered events on the camera. We watched 10 feeding sessions and observed that the parents mainly fed insects and insect larvae to their nestlings, with some spiders and other small arthropods. Ten days after hatching, the plumage of the nestlings resembled that of the female in colour and appearance (Plate 2). The young birds remained in the same vicinity at least until 29 July because the adults were observed carrying food near the nest site every day.

Recent phylogenetic analyses indicate that the Slaty Bunting is a sister species to Yellow-throated Bunting *E. elegans* (Alström *et al.* 2008). Compared with the Yellow-throated Bunting (Chen *et al.* 2015), our results suggest that the Slaty Bunting has smaller eggs and males may take a greater part in incubation. However, as we only observed one nest of the Slaty Bunting, we must be cautious in any general statement regarding its breeding biology.

Although Slaty Bunting is not a threatened species, its breeding range is relatively narrow; the Lianhuashan Nature Reserve is about 150 km north of the previously known breeding range of