

Rediscovery of an enigmatic Chinese passerine, the Blackthroat *Calliope obscura*: plumage, vocalizations, distribution, habitat choice, nesting and conservation

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Abstract The Blackthroat (or Blackthroated Blue Robin) *Calliope obscura* (previously *Luscinia obscura*) is one of the world's rarest "robins". It is extremely poorly known, with only a handful of records since it was firstly described in the 1890s. In 2011–2012, a series of field investigations were carried out in nature reserves in the Qinling Mountains, Shaanxi Province, China. During these surveys, a total of 14 males were found in 2011 and 24 males and 2 females in 2012 in the national nature reserves of Foping and Changqing. Based on these observations, we here describe the Blackthroat's vocalizations and habitat choice and review its distribution and conservation status. We also provide some notes on the plumage, especially of the female, and the nesting behaviour of this species. The present report confirms that the Blackthroat breeds on the southern slope of the Qinling Mountains in large, dense expanses of dwarf bamboo with scattered coniferous and broadleaved trees above 2,100 m. Our observations suggest

that it is more numerous than previously believed, although it appears to be highly localized. The locally dense populations found in 2011 and 2012 and the vast expanses of suitable habitat suggest that the breeding population might be healthy.

Keywords Blackthroat · Breeding habitat · Conservation · Qinling Mountains

Zusammenfassung

Wiederentdeckung eines rätselhaften chinesischen Sperlingsvogels, der Schwarzkehlnachtigall *Calliope obscura*: Gefieder, Lautäußerungen, Verbreitung, Habitatwahl, Nisten und Schutz

Die Schwarzkehlnachtigall *Calliope obscura* (ehemals *Luscinia obscura*) ist einer der weltweit seltensten Schnäpperverwandten. Über diese Art ist sehr wenig bekannt, und es gibt nur eine Handvoll Berichte seit der Erstbeschreibung in den 1890ern. In 2011–2012 wurde eine Reihe von Felduntersuchungen in Naturschutzgebieten im

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Qinling-Gebirge in der chinesischen Shaanxi-Provinz durchgeführt. Während dieser Untersuchungen wurden in den nationalen Naturschutzgebieten Foping und Changqing 2011 insgesamt 14 Männchen gefunden und 2012 24 Männchen und zwei Weibchen. Auf der Grundlage dieser Beobachtungen beschreiben wir hier Lautäußerungen und Habitatwahl der Schwarzkehlnachtigall, prüfen ihre Verbreitung und ihren Schutzstatus und machen einige Anmerkungen zum Gefieder, insbesondere bei den Weibchen, und zum Nistverhalten. Der vorliegende Bericht bestätigt, dass die Schwarzkehlnachtigall auf dem Südhang des Qinling-Gebirges in großen, dichten Zwergbambusflächen mit vereinzelt Nadel- und Laubbäumen oberhalb von 2,100 m brütet. Unsere Beobachtungen lassen darauf schließen, dass sie häufiger ist als bislang angenommen, obwohl ihr Auftreten anscheinend örtlich stark begrenzt ist. Die lokal dichten Populationen, die 2011 und 2012 gefunden wurden, und die großen Flächen geeigneten Habitats deuten darauf hin, dass die Brutpopulation gesund sein könnte.

Introduction

“Robins” (e.g. genera *Luscinia*, *Erithacus*, *Tarsiger*, *Calliope*) are small passerine birds which, as a group, are widely distributed in the Old World from northernmost Europe to southernmost Africa and across the temperate parts of Asia (Dickinson 2003; Collar 2005). Recent molecular phylogenetic analyses have shown that robins do not form a monophyletic group but are instead members of different clades containing other chats (*Cinclidium*, *Myiomela* and *Hodgsonius*), forktails (*Enicurus*), whistling thrushes (*Myophonus*), shortwings (*Brachypteryx*), robin-chats (*Cossypha*) and others within the family Muscicapidae (Sangster et al. 2010; Zuccon and Ericson 2010). Most species are sexually dimorphic, with distinct male plumages and cryptically colored females, inhabit undergrowth in forests, feeding mostly on invertebrates on the ground, and are generally rather secretive (Collar 2005). Some northerly breeding species are migratory, wintering thousands of kilometers south of their breeding areas. Two robins, the European Robin *Erithacus rubecula* and Common Nightingale *Luscinia megarhynchos*, are well known in Europe (Lack 1965; Cramp 1988; Collar 2005), whereas others, such as the Rufous-headed Robin *Larvivora ruficeps* and Blackthroat *Calliope obscura*, are extremely poorly known (Collar et al. 2001; Collar 2005).

As implied by its name, the male Blackthroat has a black throat and breast, and adult and at least some first-summer males are also black on the side of the head. The species was first observed in 1886 in Gansu province, north central China (Berezowski and Bianchi 1891; Dresser and Morgan

1899; Collar 2005) (Fig. 1; Table 1). In the late nineteenth and early twentieth centuries, about ten individuals were collected at two localities in Shaanxi and Gansu provinces during the breeding season (May–August), and breeding was confirmed at the Gansu site. Since then, there have been very few records of this species. The records have come from the Sichuan and Yunnan provinces of China and from Thailand (Fig. 1; Table 1). Those from China are mostly from the presumed breeding area, except those from Yunnan province, China and those from Thailand, which were birds in wintering areas or on migration (Ripley and King 1966; Cheng et al. 1995; Collar et al. 2001; Björn Anderson, pers. comm; Wei and He 2011). A few individuals have also recently been found in bird markets in China (Wei and He 2011) (Fig. 1; Table 1). It is listed as Vulnerable by IUCN (IUCN 2012), and human-induced deforestation and habitat fragmentation are believed to be major threats (Collar et al. 2001). As there are so few records of Blackthroats in its breeding grounds, next to nothing is known about its breeding habitat requirements and other ecological characteristics.

We here report on the discovery of breeding populations of Blackthroat at two localities in the Qinling Mountains, Shaanxi province, China in 2011 and 2012. We describe the species' vocalizations, some plumage aspects, including the poorly known female plumage, breeding habitat, and breeding biology. We also review its distribution, and discuss its conservation status.

Methods

Study area

We visited six nature reserves in the Qinling Mountains (Fig. 2). Four of these are national nature reserves (Zhouzhi, Laoxiancheng, Foping and Changqing), one is a key nature reserve of Shaanxi province (Pingheliang) and the sixth is a nature forest park (Honghegu). Honghegu, Zhouzhi and Laoxiancheng are primarily located at the northern slopes of the Qinling Mountains, Foping and Changqing are on the southern slopes, whereas Pingheliang is a ridge platform on the eastern edge of the Qinling Mountains. All of these nature reserves have large vertical ranges, and the vegetation consists of coniferous as well as broadleaved forests with an abundance of understorey plants.

Field survey and previous records

During 25 May to 19 June 2011, PA, HG, XG, FL, GS, ZY and YZ visited 6 nature reserves in the Qinling Mountains, Shaanxi province, China (Fig. 2). During 16–20 May as well as 9–10 June 2012, PIH visited Foping, with the

specific aim to study the Blackthroat. In Foping and Changqing, XG and YZ carried out a series of field surveys for the Blackthroat from April to July 2012, respectively.

In each of these reserves, we surveyed different habitats with elevations that were as low to as high as possible. The highest elevations reached were 2,750 m a.s.l. (Honghegu), 2,000 m a.s.l. (Laoxiancheng), 2,000 m a.s.l. (Zhouzhi), 2,550 m a.s.l. (Foping), 2,740 m a.s.l. (Changqing), and 2,095 m a.s.l. (Pingheliang). The survey routes were mostly along roads or forest trails and all birds along those elevational transects were noted.

We also reviewed the literature to summarize and evaluate all previous records of the Blackthroat.

Plumage and vocalizations

Birds were observed in the field, and an adult male was collected in Foping on 10 June 2011 (kept at the Institute of Zoology, Chinese Academy of Sciences, Beijing, No. 62531). A male and a female were photographed by YZ in Changqing. Songs were recorded by PA ($n = 5$ different individuals), XG ($n = 6$ individuals) and PIH ($n = 7$ individuals), using a Marantz PMD661 solid-state recorder and a Telinga Pro Twin Science microphone (PA), a Marantz PMD661 recorder and Sennheiser MKH416 (XG), and a Sound Devices 722 hard-drive recorder with a Telinga Pro 7 parabolic microphone (PIH), respectively. Sonograms were produced in Raven Pro 1.4 (www.birds.cornell.edu/raven).

Results

2011–2012 records

In 2011, we observed a total of 14 singing males: 7 in Foping and 7 in Changqing (Figs. 1, 2). These were all discovered by their distinctive songs. In 2012, 15 and 9 birds were recorded in Foping and Changqing, respectively. Most of these were singing males, but in Changqing a breeding pair with a nest was found, and 1 female was observed in Foping.

The earliest observation was made on 4 May in Foping, and the latest record on 30 June in Changqing. Birds were apparently already within their breeding territories in the first week of May, but they were extremely difficult to detect once they stopped singing in late June.

Historical records

Prior to our observations, we found various published records from China: from 1 locality in Shaanxi, 1 in Gansu, 5 in Sichuan and 2 in Yunnan province, 18 adults (non-

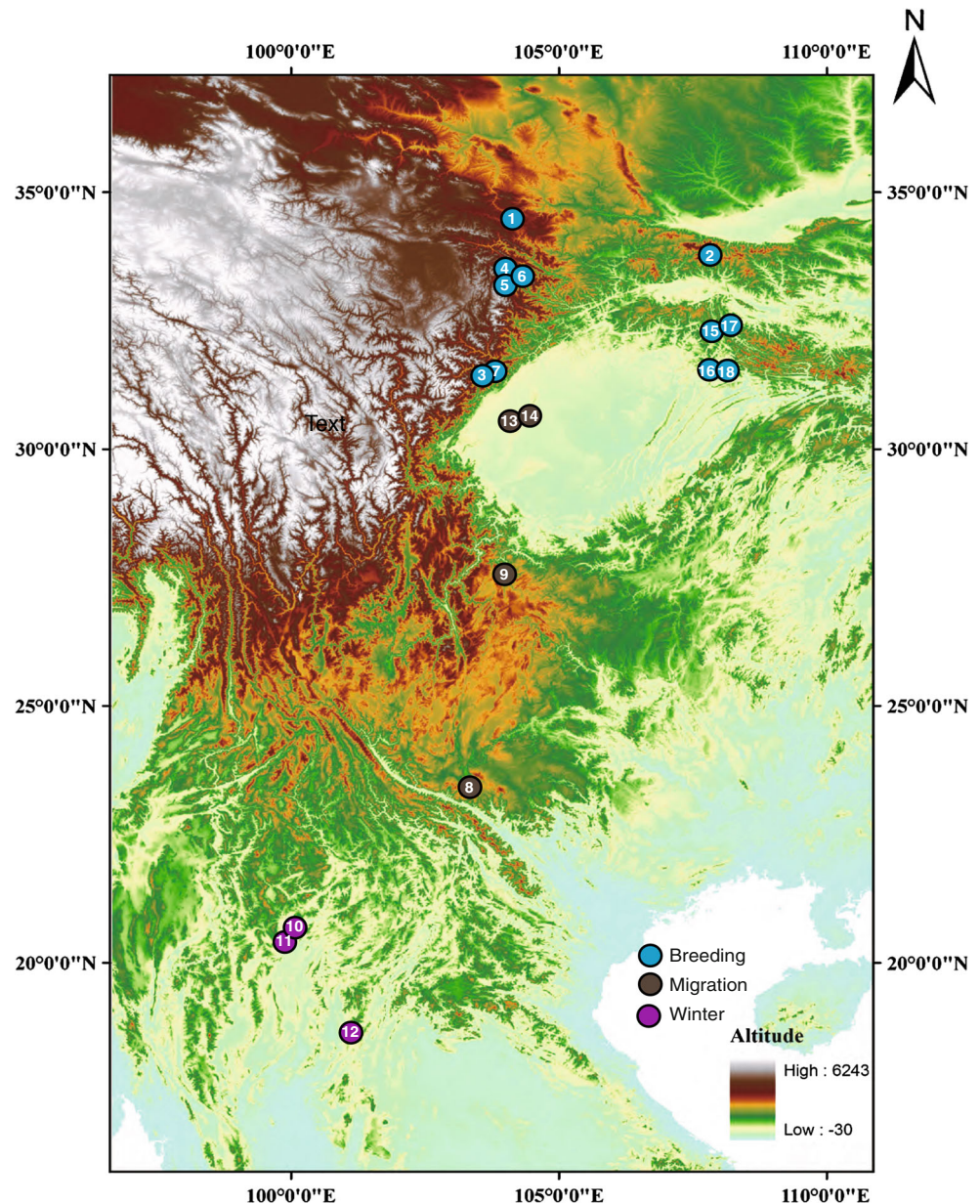
juvenile) in total (Fig. 1; Table 1). However, some of these records are “in litt.” and lack proper documentation. The first record, from August 1886, is the only confirmed breeding record. It involved four adult males and four unfledged juveniles that were observed in Minxian, Gansu Province (Berezowski and Bianchi 1891; Deditius 1897; Dresser and Morgan 1899). The most recent observation from a potential breeding site is from Sichuan, where a male was observed on 2–3 June 2007 (Björn Anderson, pers. comm.). Three of the records, one from Chengdu, Sichuan, one from northeastern Yunnan, and one from southern Yunnan, were made during migration in May. Recently, a second calendar-year male was photographed on migration in Sichuan (Wei and He 2011). Three field observations from Thailand, made during December to March, are undocumented (Phil Round, pers. comm.); a female collected on 3 February 1965 by Ben King (kept in the US National Museum, Smithsonian Institution, Washington, DC, USA, No. 518898) is believed to be of this species (see below).

Plumage

The plumage of the adult male Blackthroat is well known and well illustrated (e.g. Collar 2005; Fig. 3a), and is not confusable with any other species. The first-summer (second calendar-year) male is similar to the adult male, but the retained juvenile feathers of the wings are browner and more worn than in the adult, contrasting more strongly with the blue-grey upperparts and forming a moult contrast with the second-generation blue-grey lesser, median and inner greater coverts (Fig. 3a; cf. photos in Wei and He 2011; also cf. photo in Davies 2011). At least some first-summer males show less extensive black on the side of the head (cf. photos in Wei and He 2011).

The descriptions in the literature (e.g. Mackinnon and Phillipps 2000; Collar 2005) of adult female plumage are probably all based on one individual collected in northern Thailand on 3 February 1965 (Table 1). That individual was assumed to be this species after eliminating all other known species. The female that we observed in Changqing in June 2012 (Fig. 3b, c) was uniformly grey-brown above, with slightly more rufous outer edges to the primaries and, especially, uppertail coverts and tail. The lores and ear coverts were slightly more buffish-tinged than the upperparts, and the face was very plain, with an ill-defined pale buffish eye-ring, mainly visible as a crescent above/behind the eye. The underside was clearly paler than the upperside, with pale buffish-grey throat and breast, slightly darker and more greyish on the breast than on the throat, and with a warmer tinge on the side of the lower throat; the flanks were slightly warmer brownish than the breast, and the undertail coverts were warmer buffish; the belly was dingy

Fig. 1 Observations of Blackthroat. Each coloured circle represents one or more records, and the numbers in the circles correspond to the numbers in Table 1. Note that “Breeding” refers to record during breeding season, not necessarily to confirmed breeding



whitish, diffusely set off against the rest of the underparts. The bill was all blackish, iris dark brown (“blackish”) and the tarsi, toes and claws medium grey. This individual appeared to be adult based on the rather fresh wings without any apparent moult contrasts. It is unclear how the female Blackthroat differs from the also poorly known female Firethroat *Calliope pectardens*, but we suggest that it is probably overall less warmly coloured, especially on the underparts.

Vocalizations

The song is beautiful and varied (Fig. 4). It consists of short, varied strophes that are delivered at a fairly slow pace, with pauses of a few seconds between each strophe.

Many strophes are rather simple and consist of a few whistled notes, sometimes clear but more often with a slightly harsh, rolling quality; frequently, one or two notes are repeated, e.g. in the order 1-1-2 (e.g. *trree-trree-trruuu*), 1-2-2 (e.g. *trruuu-trree-tree*), 1-2-1-2 (e.g. *pi-trüü-pi-trüü*), 1-1-2-3-3 (e.g. *pi-pi-trree-trruu-trruu*) or 1-2-1-2-1-2-1 (e.g. *ti-tu-ti-tu-ti-tu-ti*). More drawn-out, harsh, buzzing notes are frequently given, either in combination with whistles or on their own, as are fast or slow hammering series of notes. The tempo varies considerably within and among strophes. The pitch is rather low and uniform, generally c. 2–4.5 kHz. Each strophe is frequently repeated a few to several times. Masterful imitations are often included, and we have noted mimicry of e.g. Grey-headed Woodpecker *Picus canus*, Chinese Sparrowhawk

Table 1 Records of Blackthroats

No.	Date	Number	Sex/age	Locality	Habitat	Documentation
1	May–August 1886 ^a	8	4 males and 4 nestlings ^b	Minxian, Gansu province, China	Bamboo thickets on the top of ridge at 3,050–3,350 m a.s.l.	Berezowski and Bianchi (1891) (see Deditius 1897); Dresser and Morgan (1899); Stepanyan and Loskot (1998); Collar et al. (2001); lectotype, No. R-91311, in ZMMU; paralectotypes in ZIN RAS, Nos. 148704 and 148705
2	30 May and 14 July 1905 ^c	4	Males	Taibai Shan, Shaanxi province, China	Unknown	Hartert (1907); specimens in AMNH, Nos. SKIN579878–579881
3	June 1931	1	Female	Shulingou, Sichuan province, China	Unknown	No documentation (Collar et al. 2001)
4	May 1985	1	Male	Baihe Nature Reserve, Nanping, Sichuan province, China	Unknown	Sound recording (Ben King); Collar et al. (2001); Ben King and Björn Anderson, pers. comm.
5	June 1984	1	Male	Jiuzhaigou Nature Reserve, Nanping, Sichuan province, China	Unknown	No documentation (Collar et al. 2001)
6	June 2007	1	Male	Baihe Nature Reserve, Nanping, Sichuan province, China	Mixed coniferous and broadleaved forest with dense undergrowth of herbs and ferns at c. 2,800 m a.s.l.	No documentation (Björn Anderson, pers. comm.)
7	May 1991	1	Male	Wolong National Nature Reserve, Wenchuan, Sichuan province, China	Unknown	No documentation (Collar et al. 2001)
8	May 1921	1	Female	Mengzi, Yunnan province, China	Unknown	No documentation (Collar et al. 2001)
9	May 1997	2	Male and female	Haoziba, Yongshan and Daguan county, Yunnan, China	Unknown	No documentation (Collar et al. 2001)
10	3 February 1965	1	Female	Nong Bong Khai (Bung Khai), Chiang Saen district, Chiang Rai province, Thailand		Ripley and King (1966). Specimen in USNMNH, No. 518898
11	December 1981	1	Female	Doi Inthanon, Chiang Saen district, Chiang Rai province, Thailand		No documentation (Collar et al. 2001)
12	March 2000	2	Male and female	Mae Jarim National Park, Nan, Thailand	Lowland forest near stream	No documentation (Collar et al. 2001)
13	Before 2004	1	Male	Chengdu, Bird market		Photo in Wei and He (2011)
14	2 May 2011	1	Male	Chengdu, Sichuan province, China	Small patch of wood and shrubbery in university campus	Photos in Wei and He (2011)
15	1–12 June 2011	7	Male	Foping, Shaanxi province, China	Open coniferous and mixed coniferous-broadleaved forest with large, dense expanses of bamboo, at 2,130–2,515 m a.s.l.	Present study; sound recordings; 1 male specimen (IOZ No. 62531)
16	13–17 June 2011	7	Male	Changqing, Shaanxi province, China	Large, dense expanses of bamboo with coniferous and broad-leaved trees and shrub mixed in, at 2,200–2,450 m a.s.l.	Present study; sound recordings

Table 1 continued

No.	Date	Number	Sex/age	Locality	Habitat	Documentation
17	4 May– 30 June 2012	15	14 males, 1 female	Foping, Shaanxi province, China	The same habitat as in 2011	Present study; sound recordings
18	22 April–12 July 2012	9	6 male, 1 female and 2 nestling chicks	Changqing, Shaanxi Changqing, province, China	The same habitat as in 2011	Present study; photos

AMNH American Museum of Natural History, New York; USNMNH US National Museum of Natural History, Smithsonian Institution, Washington, D.C.; IOZ Institute of Zoology, Chinese Academy of Sciences, Beijing; ZIN RAS Zoological Institute, Russian Academy of Sciences, St. Petersburg; ZMMU Zoological Museum of Moscow University, Moscow

^a According to label, ZMMU No. R-91311 was collected on 23 May, ZIN RAS No. 148704 on 20 June, and ZIN RAS No. 148705 on 2 August

^b The nestlings were apparently not collected

^c Specimen No. 579881 was collected on 30 May and the other 3 specimens were collected on 14 July

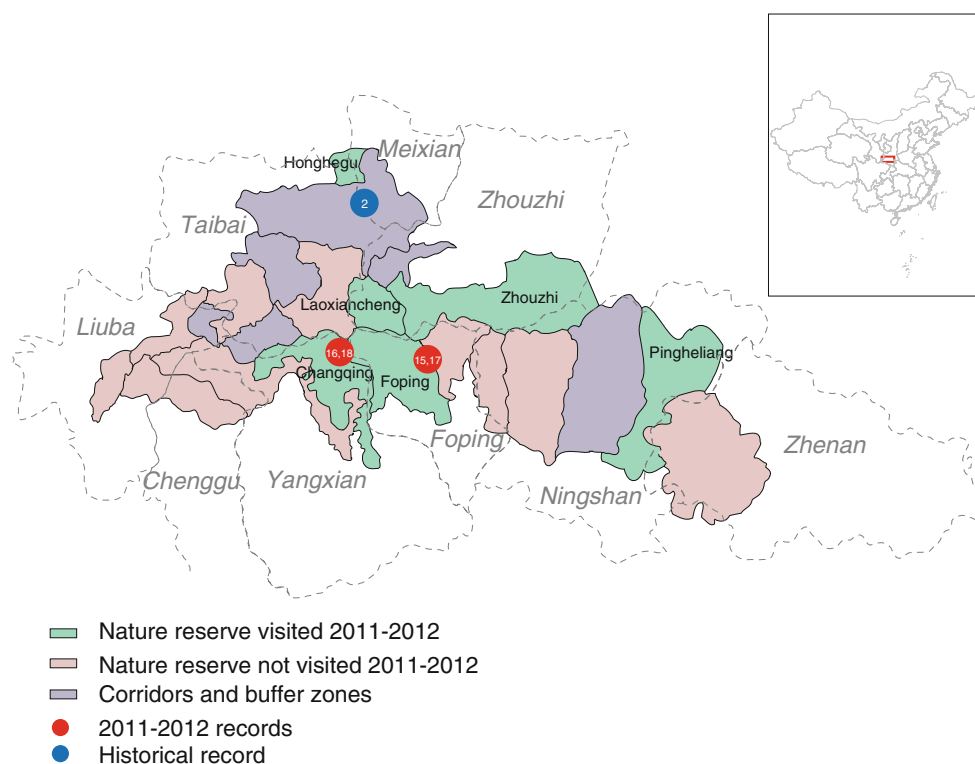


Fig. 2 Reserves in the Qinling Mountains region and locations of observations from that area. *Inset:* location of the Qinling Mountains. *Dots* are colour coded so as to be consistent with the records in Fig. 1. Counties are delineated by dotted lines, and their names are shown in *italics*

Accipiter soloensis, Baikal Bush Warbler *Locustella davidi* song, Large-billed Leaf Warbler *Phylloscopus magnirostris* song, Elliot's Laughingthrush *Garrulax elliotii* call, Red-billed Blue Magpie *Urocissa erythrorhyncha*, Spotted Nutcracker *Nucifraga caryocatactes*, Eurasian Jay *Garrulus glandarius* call, Long-tailed Minivet *Pericrocotus ethologus* flight calls, Collared Finchbill *Spizixos semitorques* song, Collared Grosbeak *Mycerobas affinis* song,

Blanford's Rosefinch *Carpodacus rubescens* song, and Grey-headed Bullfinch *Pyrrhula erythaca* call. The song is very similar to the song of Firethroat, and the pronounced variation in both species, both within and among individuals, makes it hard to discern any consistent differences between these two species. Two of PA's recordings are available on-line at <http://www.xeno-canto.org> as well as www.slu.se/per-alstrom-research, while PIH's recordings

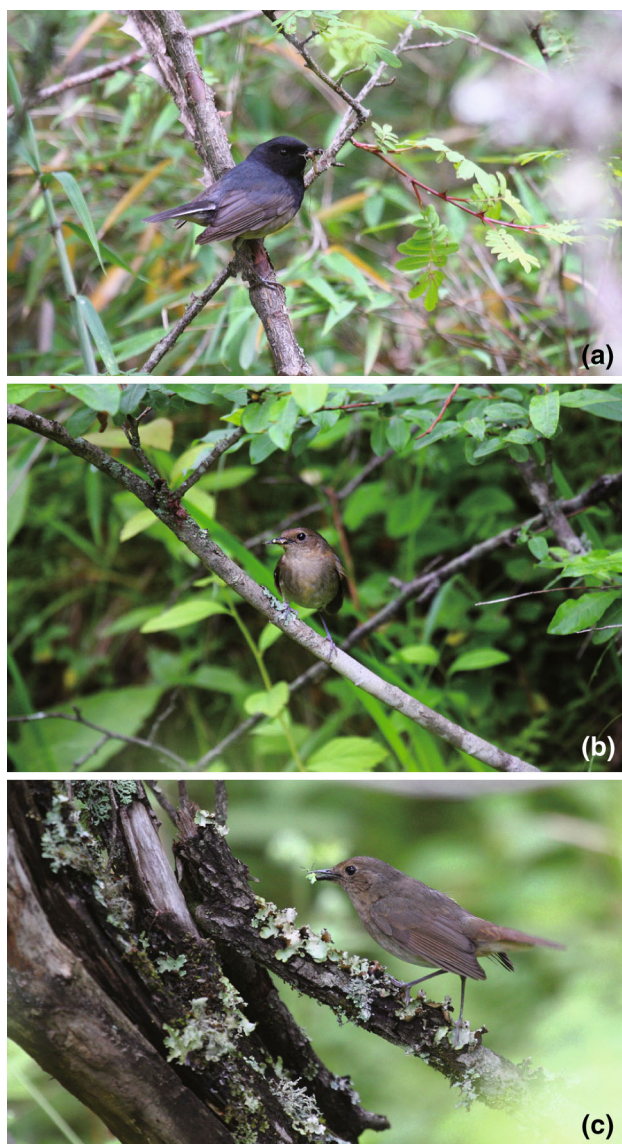


Fig. 3 Photographs of a nesting pair of Blackthroats, Changqing national natural reserve, Shaanxi province, China, 26 June 2012. **a** First-summer male. **b, c** Adult female (the same individual is shown in both images). Photos: Yongwen Zhang

have been deposited at the National Sound Archive, London.

The call of the Blackthroat is a rather mellow, hard *tack* or *tuc*, often doubled *tack–tack*, and sometimes repeated in a short, rather hurried sequence. It is very similar to the calls of both the Siberian Blue Robin *Larvivora cyane* and the Firethroat.

Behaviour

Most birds were very elusive, and in June we would not have noticed any of them if they had not been singing. Even when they were exposed to playback of their own

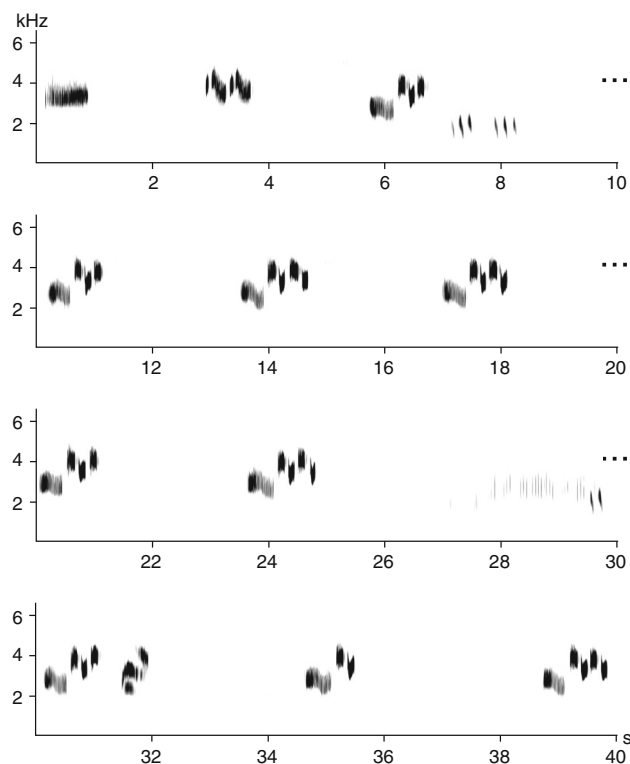


Fig. 4 Song of male Blackthroat, Foping, May 2012. Pauses between strophes have been shortened (indicated by dots). Recording: Paul I. Holt

song, their secretive habits and the dense vegetation still made them extremely difficult to observe. However, in early to mid-May, they were considerably easier to observe, probably due in part to slightly less dense vegetation, but they were also probably freshly arrived on territories and responded very well to playback. Both in Foping and Changqing, several birds were found in close proximity of each other, and up to three individuals could be heard simultaneously in both Foping and Changqing.

When excited, birds were seen to raise their tails slowly and deliberately, once even partially spreading the tail to display a bit of white.

Habitat

Of the six nature reserves we visited in 2011–2012, only Foping and Changqing are located on the south slopes of the Qinling Mountains. These areas are in the contact zone between the subtropical and warm temperate zones (Kang and Zhu 2007). The topology is quite complex, with numerous ridges and valleys. The vegetation varies considerably along the elevational gradient. The Blackthroats were observed at 2,130–2,515 m a.s.l. At this elevation, the vegetation consists of mixed broad-leaved and coniferous forests, with the dominant trees being *Betula albo-sinensis*,

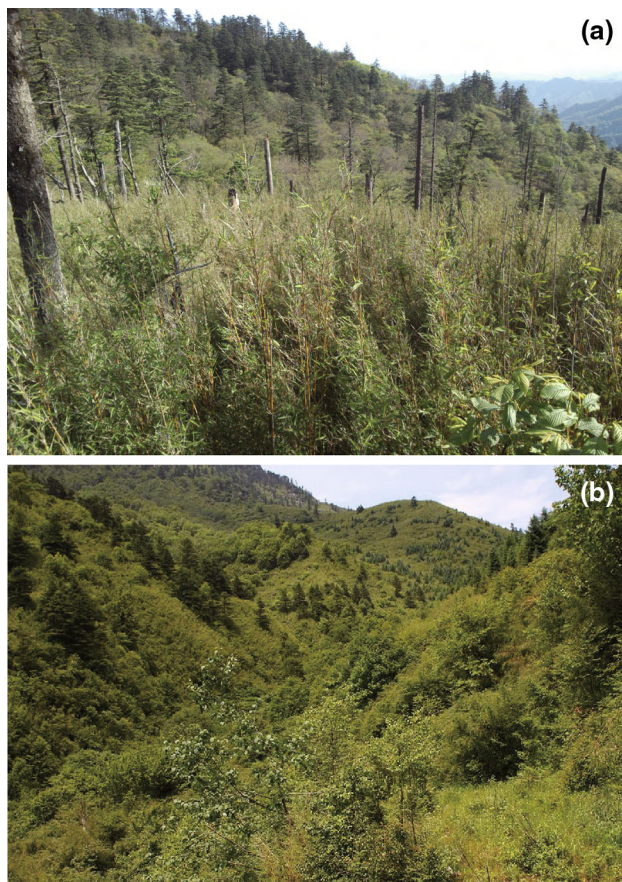


Fig. 5 Breeding habitat of Blackthroat in the Qinling Mountains. **a** Foping, and **b** Changqing. Photos: Xuebin Gao and Yongwen Zhang

Abies fargesii, *Abies chinensis*, *Fraxinus mandschurica* and *Pinus armandii*. The understory consists of dense shrubs e.g. *Rosa omeiensis*, *Lonicera tangutica*, *Spiraea myrtilloidea* and various herbaceous plants, as well as dense stands of bamboo, e.g. *Fargesia qinlingensis*, *Bashania fargesii* (Yue et al. 1999; Zhao et al. 1999). In Foping, all Blackthroats were found in large, dense expanses of *Fargesia qinlingensis* with scattered coniferous and broad-leaved trees (Fig. 5a). In Changqing, some birds were found in broad-leaved shrubs at 2,200–2,350 m a.s.l. (Fig. 5b), whereas the others were found at 2,370–2,450 m a.s.l. in a similar habitat to that in Foping.

Breeding

A breeding pair with two nestlings was found in Changqing on 26 June 2012. The cup-shaped nest was set in a natural, south-facing burrow under a small rock. The nest was made mainly of leaves and grass stems. The habitat adjacent to the nest was characterized by dense bamboo and shrubs, and the entrance of the nest was covered by broadleaf herbaceous plants.

Both parents fed the nestlings, although during one hour of observation on the morning of 26 June 2012, the female was more active than the male (7 vs. 3 times). The nestlings were noted to be fed mainly Myriapoda, Diptera, Lepidoptera, Mantodea and other kinds of arthropods. The young fledged before 30 June, and they were fed by their parents also after fledging. The family was not found on a visit on 12 July.

Discussion

Distribution, habitat and phenology

Previous studies suggest that the Blackthroat breeds in the mountains of Sichuan, Gansu and Shaanxi, China, and winters in northern Thailand (Collar et al. 2001). Most of the previous breeding-season records are from the Minshan Mountains in Sichuan and Gansu provinces, with only one record from the Qinling Mountains (Taibai Shan), Shaanxi province. Based on our observations, it seems likely that the main distribution of this species is in the Qinling Mountains. Whether the Minshan Mountains are important breeding areas for the Blackthroat or are just on the periphery of its range remain uncertain. The southernmost records from potential breeding sites in Sichuan province are unconfirmed. Both of these were recorded in May, and as migrants have been observed elsewhere in May, it is possible that these encounters in Sichuan also referred to birds on migration rather than on breeding grounds. One of these sites, Wolong, has been visited annually for many years in May and June by numerous birdwatchers, and its avifauna is relatively well known. Firethroat is a well-known and sought-after breeding species at Wolong and, given the similarity of their songs, more records of Blackthroat would have been expected if it genuinely breeds there.

The elevation range at Foping and Changqing (approximately 2,100–2,500 m) is surprisingly narrow, and we found no Blackthroats in seemingly suitable habitats at higher or lower elevation. For example, no birds were observed in mature coniferous forest. It is also somewhat surprising that in 2011 all Blackthroats in Foping were recorded in bamboo thickets at 2,360–2,515 m a.s.l., whereas in 2012 they were in mostly broad-leaved forest with dense undergrowth and bamboo at 2,130–2,450 m a.s.l. It is possible that the birds had already stopped singing at lower elevations during our 2011 visit, which took place approximately 3–4 weeks later than the 2012 survey. Alternatively, some of the birds observed in 2012 were still on the move to higher elevations. However, the fact that the birds in 2012 responded very strongly to playback suggests that they had already established

breeding territories. In Min Xian, Gansu, and in Baihe, Sichuan (in 2007), Blackthroats were observed in the breeding season at higher elevations than in Foping and Changqing, at 3,050–3,350 m a.s.l. and c. 2,800 m a.s.l., respectively. At least at Baihe, there was no bamboo at the Blackthroat site, unlike in Foping and Changqing (Björn Anderson, pers. comm.). The two latter localities are both on the south slope of the Qinling Mountains, where the climate is warmer than in northern Sichuan and southern Gansu. More research is needed to investigate whether the habitat differences between the Minshan and Qinling mountains are normal.

The earliest observation in 2012 was on 4 May, but as the area was not visited earlier than that, the exact arrival date is still uncertain. It seems likely to be in early May. The records of migrants—the one from Sichuan (May 2, 2011) and the other two individuals from Yunnan—are both in May (Collar et al. 2001). The breeding period apparently varies somewhat according to locality and elevation. In Foping, males appeared to be territorial at 2,130–2,450 m a.s.l. already in mid-May. In Changqing at 2,309 m a.s.l., the young fledged at the end of June, whereas at Min Xian in Gansu province at 3,050–3,350 m a.s.l., unfledged young were recorded in August (Collar et al. 2001; Dresser and Morgan 1899). There are no autumn records at all.

Population size and conservation

The number of Blackthroats observed in the Qinling Mountains in 2011–2012 exceeds the total number of birds observed since the species was discovered in the late nineteenth century. Although there is a risk of overcounting, as some birds may have been observed in both years, our survey results indicate a consistent number for the Blackthroat population in Foping and Changqing. As we only covered small areas, and the Blackthroat's favoured habitat is extensively distributed in the Qinling Mountains, this species may be much more numerous than previously believed. BirdLife International (Collar et al. 2001) estimated the population size as 3,500–15,000 individuals (IUCN 2012). This would seem high at the time, as it was based on a total of fewer than 20 birds observed over a period of 110 years.

The Blackthroat was listed by IUCN (2012) as Vulnerable “because it is inferred to have a small, declining population as a result of destruction of temperate forest through logging and conversion to cultivation and pasture”. In the light of our findings, this status needs to be re-evaluated. The habitat destruction suggested by BirdLife International (2001) to be a major threat to the Blackthroat does not seem to be a serious problem in the Qinling

Mountains, and the locally dense populations found in 2011 and 2012 and the vast expanses of suitable habitat suggest that the breeding population is actually healthy. Although there is much habitat destruction in the putative winter range, and some evidence of trapping of migrants for the bird trade (Wei and He 2011), there seems to be no imminent threat to the survival of the species. However, it should be noted that we only found Blackthroats in two neighbouring reserves out of the six reserves that we visited, so the population is still sensitive to scenarios of loss and fragmentation of suitable habitat due to cultivation and pasture.

The Qinling Mountains are one of the main mountain ranges in central China, and this area preserves high biodiversity and species endemism. Several nature reserves have been designated in this region and are designed primarily to protect Giant Panda *Ailuropoda melanoleuca*, Golden Takin *Budorcas taxicolor bedfordi*, Golden Snub-nosed Monkey *Rhinopithecus roxellana* and other rare and endangered mammals. All three of these are found in (at least partly) the same habitat as Blackthroat, and it is obvious that the Blackthroat benefits from the protection of these charismatic species.

Although our findings have contributed to a significant improvement in our knowledge of this rare passerine, further surveys in the Qinling Mountains and elsewhere are warranted to get a better estimate of the distribution and status of the Blackthroat.

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