

Distribution and Status of the Ryukyu Robin *Erithacus komadori*

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Abstract The distribution of the Ryukyu Robin *Erithacus komadori* was investigated from field observations, museum skins, references and personal communications. The species is endemic to southwestern Japan, with a single specimen, a male, from Korea and one sight record from Taiwan. Many individuals have been observed in the northern Tokara Islands in the breeding season, but few remain in winter, while on the other hand, there are few records of the species in the southern, Yayeyama, islands, and all are from nonbreeding season. It seems that some of its northern populations would have migrated south in winter. The measurements and plumage characters described by Kuroda (1923) for his new form, *subrufus*, are not distinctive enough, in our comparison, from those of the race *komadori*. Furthermore, the type specimen of *E. k. subrufus* was collected in Yonakunijima in the migratory season, October. It is, therefore, concluded that the race *subrufus* is a synonym of *komadori*. The sporadic present distribution of the Ryukyu Robin reveals its recent relic status from its former more extensive distribution.

Introduction

The Ryukyu Robin was first described as *Sylvia komadori* by Temminck (1835). Stejneger (1886) treated the Okinawa Island population as a different species *Icoturus namiyei*, based on one specimen. Kuroda (1923) reported a specimen from Yonakunijima Island, southern Ryukyus, belonging to another subspecies *I. komadori subrufus*.

Now the Ryukyu Robin is classified as one species, and three subspecies are recognized. One is *Erithacus komadori komadori*, which is distributed in the Danjo Islands, Yakushima, Tanegashima, northern Ryukyus (Tokara Isls., Amamiyoshima Is., Tokunoshima Is.); another is *E. k. namiyei* from central Ryukyus (Okinawa and Tokashiki Isls.); and the other is *E. k. subrufus* from southern Ryukyus (Ishigakijima, Iriomotejima and Yonakunijima Isls.) (O.S.J. 1974). O.S.J. (1974) reported that they are all resident, possibly partially migrant within the breeding range. But few studies have been conducted regarding the distribution and status of this species. We report on the subject here from field observations, museum skins, references, and personal communications. We will also focus on the systematic status of subspecies *E. k. subrufus* from southern Ryukyus.

Materials and Methods

We made field observations in Tairajima and Nakanoshima Islands, Tokara Islands

Received 2 June 1989, accepted 21 August 1989

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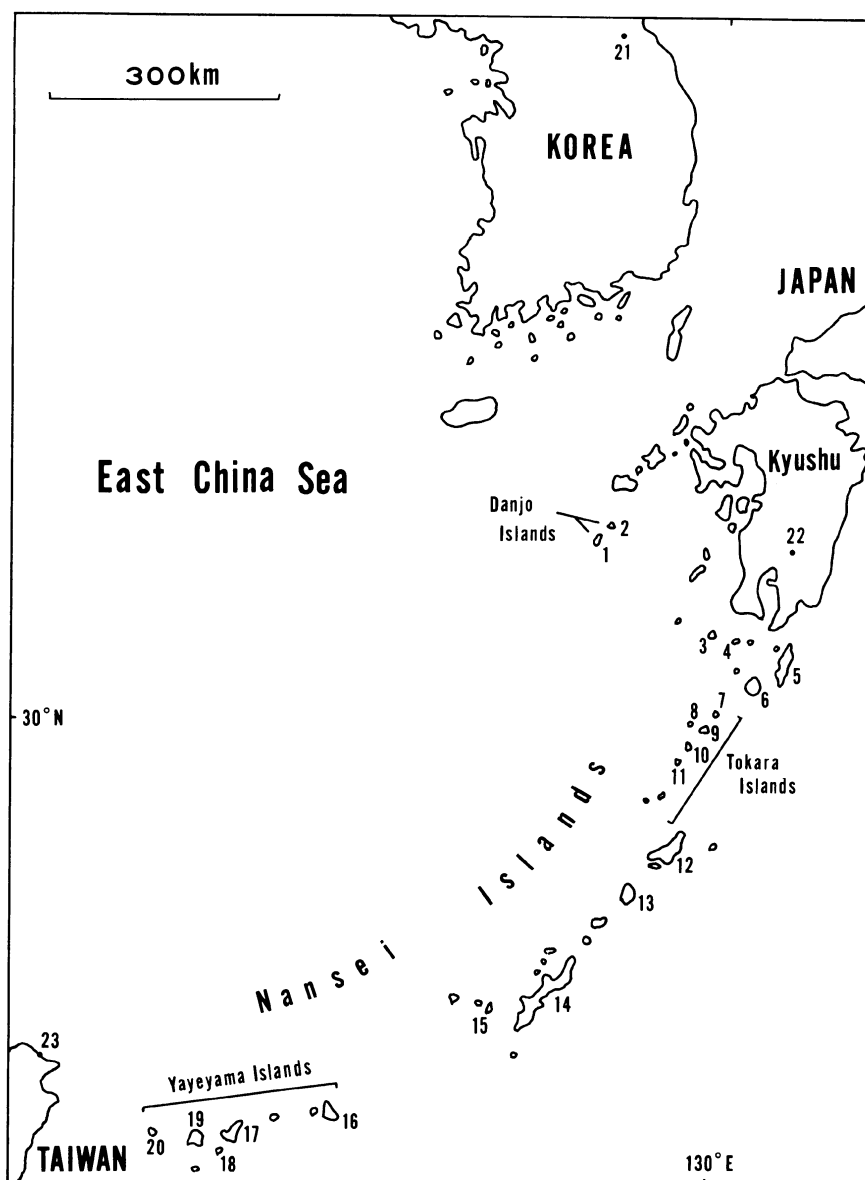


Fig. 1. Map showing the localities where the Ryukyu Robin has been observed or collected. 1, Meshima Is.; 2, Oshima Is.; 3, Kuroshima Is.; 4, Iohjima Is.; 5, Tanegashima Is.; 6, Yakushima Is.; 7, Kuchinoshima Is.; 8, Tairajima Is.; 9, Nakanoshima Is.; 10, Suwanosejima Is.; 11, Akusekijima Is.; 12, Amamiyoshima Is.; 13, Tokunoshima Is.; 14, Okinawa Is.; 15, Kerama Isls.; 16, Miyakojima Is.; 17, Ishigakijima Is.; 18, Taketomijima Is.; 19, Iriomotejima Is.; 20, Yonakunijima Is.; 21, Kwangwon-do, Korea; 22, Kirishima; 23, Ho-ping Is., Taiwan.

(Fig. 1) from March 1987 to February 1989, examined all references ever published, and also obtained reliable personal communications in some islands.

We measured a total of 44 skins stored in the Yamashina Institute for Ornithology, Kyushu University, Ryukyu University, the National Science Museum, and the Forestry and Forest Products Research Institute. Eight characters were measured with a caliper to the nearest 0.1 mm; total culmen, naospi, bill height and bill breadth at the posterior edge of nostril, wing length, tarsus, tail length, and the breadth of the black frontal band (male only). Wing formula and moult conditions were also investigated. The measurements were tested by the GT-2 method (Sokal & Rohlf 1981).

Results

1. *Distribution and status*

The areas in which Ryukyu Robins have been observed or collected were mostly restricted to the southwestern part of the Japan islands (Fig. 1). One male was collected from Korea, and one male was observed in Taiwan (Wang 1986). The status in each area was as follows:

1) Danjo Islands (Nos. 1 and 2 in Fig. 1)

The islands lie far west of the Kyushu mainland. The Ryukyu Robin was first found in Meshima Is. (No. 1, Fig. 1) in April 1970, and then in Oshima Is. (No. 2, Fig. 1) in August 1972 (W.B.S.J. 1978). E.A. (1981) estimated the population in the islands as 1,000 based on a spot census. They inhabit the wooded areas 100 m above sea level.

2) Tanegashima Is., Yakushima Is. and their neighbors (Nos. 3–6)

(1) Kuroshima and Iohjima Islands (Mishima Islands)

Both islands are located south of the Kyushu mainland. The songs of the species were sometimes heard in the breeding season in Kuroshima, and there was a breeding record on Iohjima (Sako pers. comm.).

(2) Tanegashima Island

Araki (1918) observed many Ryukyu Robins on this island, and Kuroda (1925) described three male and four female specimens collected in the island. But E.A. (1974) reported only 13 records from 1963 to 1972, and none have been observed since then.

(3) Yakushima Island

Nagai (1951) reported that two specimens (a male and a female) from the island had been exhibited in a junior high school in Kagoshima City, but these were then lost. Shirai (1956) observed this species between 200 and 600 m above sea level on 28 May 1950, but E.A. (1975, 1981) did not find it. Hanawa (1984) heard the song only, at an altitude of 510 m on 6 June 1983.

4) Tokara Islands (Nos. 7–11)

Nagai (1951) reported that the robins were common breeders in these islands. O.S.J. (1974) listed this area as one of the distributional ranges of the species. We saw many individuals in the two islands Nakanoshima and Tairajima in the breeding season, but there are few in the non-breeding season. They breed among the bamboo

thickets, in nest boxes, and inside houses in these islands. In the other three islands, Kuchinoshima, Akusekijima and Suwanosejima, there are many observation records (Sako and Hori pers. comm.). The southernmost two islands, Takarajima and Kodakajima, lack the robins now.

5) Amamioshima Island (No. 12)

There are many observation and collection records from this island (Horii 1918, Kuroda 1925, Kobayashi 1930). E.A. (1981) reported that this species inhabited not only broad-leaved evergreen forests but also coniferous plantations with dense scrub. It is seen throughout the year. The estimated number of the robins is 37,500 in this island (E.A. 1981).

6) Tokunoshima Island (No. 13)

There are a few collection records by Kuroda (1925). E.A. (1974) reported that the habitat of this species is mainly evergreen oak forests, and E.A. (1981) estimated that the population in this island was 21, 364.

7) Okinawa Island (No. 14)

Stejneger (1886) described a specimen on 21 March 1886. Kuroda (1925) and Kobayashi (1930) collected some specimens from this island. The estimated population was about 30,000 (E.A. 1981). W.B.S.J. (1986) reported two observation records of *E. k. komadori*, a northern subspecies, from this island on 22 and 26 September 1985.

8) Kerama Islands (No. 15)

O.S.J. (1974) reported *E. k. namiyei* in Tokashiki Island. But in recent years Yonashiro (1978) reported only two observation records, one male in Kerumajima and one female in Akajima.

9) Yayeyama Islands (Nos. 16–20)

All the records from the Yayeyama Islands are shown in Table 1.

(1) Miyakojima Island (No. 16)

Kugai and Yamamoto (1981) reported a female was observed on 18 October 1980 after a typhoon. The songs are sometimes heard here in the autumn migratory season

Table 1. Specimens and observation records of the Ryukyu Robin from the Yayeyama Islands.

Name of island	Date	Specimens or observations
Miyakojima Is.	18 Oct. 1980	One female observed, Kugai & Yamamoto (1981)
Ishigakijima Is.	23 Feb. 1910	One female specimen in Forestry & Forest Products Research Inst.
	24 Nov. 1921	Two male specimens, Kuroda (1925)
	5 Oct. 1979	One male observed, E. A. (1981)
Iriomotejima Is.	6 Nov. 1921	One male specimen, Kuroda (1925)
	Feb.–Apr., Sep.	Sometimes observed, E. A. (1981)
Taketomijima Is.	24 Oct. 1979	One male observed, E. A. (1981)
Yonakunijima Is.	13 Oct. 1921	One male specimen, Kuroda (1925)
	Nov. 1981	Song heard, W.B.S.Y. (1983)
Yayeyama*	3 Feb. 1887	One male specimen in Yamashina Inst.
	Apr. 1888	One female specimen in Yamashina Inst.

* The actual name of the island is not known.

(Kugai pers. comm.).

(2) Ishigakijima Island (No. 17)

A female collected on 23 February 1910 is stored in the Forestry and Forest Products Research Institute. Kuroda (1925) described two male skins collected on 24 November 1921. E.A. (1981) reported an individual that died by crashing into a building on 5 October 1979.

(3) Taketomijima Island (No. 18)

Only one bird was reported by E.A. (1981). It died by accident.

(4) Iriomotejima Island (No. 19)

Kuroda (1925) noted one male skin collected on 6 November 1921. E.A. (1981) described that the songs were frequent in February to April and in September but were not heard in June and July.

(5) Yonakunijima Island (No. 20)

Kuroda (1925) reported a male specimen collected on 13 October 1921. Since then there is only one record by W.B.S.Y. (1983), who heard the song in November 1981.

In addition, there is a male skin collected on 3 February 1887 and a female one on April 1888, both of which are in the Yamashina Institute for Ornithology. The locality of these specimens is shown on the label only as "Yayeyama". We cannot specify the island name.

10) Korea (No. 21)

A male specimen labeled "Kwangwon-do, 25 April 1926" is stored in the Yamashina Institute. The plumage is very similar to that of a subspecies *E. k. komadori*.

11) Kyushu mainland (No. 22)

A female skin labeled "Kirishima, 15 November 1915" is stored in Kyushu University. The plumage is similar to that of *E. k. komadori*.

12) Taiwan (No. 23)

Wang (1986) reported the observation record of a male in Ho-ping Island near Jilong City, northernmost of Taiwan from 7 January to 5 March 1986. There is other evidence that this species was collected in Taiwan and was sold in a birdshop (Shigeta pers. comm.).

2. Measurements, wing formula, and plumage

The mean bill breadth of male *E. k. namiyei* specimens was significantly wider than that of male and female *E. k. komadori* ($P < 0.05$), and the female *E. k. namiyei* was significantly smaller in wing length than the male *E. k. komadori* ($P < 0.05$, Table 2). No other measurements showed significant differences between the two subspecies (*komadori* and *namiyei*). In *E. k. subrufus* all of the measurements except wing length of male were included in the ranges of the *E. k. komadori* measurements. The wing length of *E. k. subrufus* male was longer than the mean of *E. k. komadori* males.

Stejneger (1886) reported that the fourth, fifth and sixth primaries of *E. k. namiyei* were nearly equal and the longest, and that the second primary was about equal to the ninth. We found that in *E. k. komadori* the third, fourth and fifth were nearly equal and the longest, and the second nearly equal to the seventh. Also the six *E. k. namiyei* that we examined had a similar wing formula, but two specimens showed the same

Table 2. Measurements of morphological characters in the three subspecies of the Ryukyu Robin (mm).

	sex	Total Culmen			Nalosp			Bill Height			Bill Breadth		
		n	mean	s.e.	n	mean	s.e.	n	mean	s.e.	n	mean	s.e.
<i>E. k. komadori</i>	♂	22	17.45	0.14	22	9.05	0.07	21	4.23	0.04	21	4.35*	0.05
	♀	11	16.82	0.18	11	8.76	0.02	11	4.25	0.05	11	4.38 ^o	0.08
<i>E. k. namiyei</i>	♂	5	17.76	0.20	5	9.18	0.20	5	4.46	0.06	5	4.88** ^o	0.09
	♀	4	17.13	0.31	4	8.80	0.02	3	4.50	0.08	3	4.70	0.17
<i>E. k. subrufus</i>	♂	1	18.00	—	1	9.40	—	1	4.30	—	1	4.50	—
	♀	—	—	—	—	—	—	—	—	—	—	—	—

	sex	Wing Length			Tarsus			Tail			B.F.B.		
		n	mean	s.e.	n	mean	s.e.	n	mean	s.e.	n	mean	s.e.
<i>E. k. komadori</i>	♂	20	74.47#	0.52	22	27.37	0.17	16	50.74	0.94	15	3.71	0.27
	♀	11	72.74	0.69	11	27.40	0.32	11	49.01	0.50	—	—	—
<i>E. k. namiyei</i>	♂	5	72.78	1.08	5	28.48	0.47	5	52.46	1.17	3	1.17	0.50
	♀	4	70.13#	0.25	4	28.20	0.23	4	50.05	0.75	—	—	—
<i>E. k. subrufus</i>	♂	1	78.50	—	1	29.00	—	1	51.80	—	1	4.00	—
	♀	1	74.80	—	1	28.40	—	1	52.00	—	—	—	—

B.F.B., Breadth of black frontal band of male.

The means of paired data indicated by ***, ^o, # are significantly different from each other by GT-2 test ($P < 0.05$).

formula as Stejneger described.

The upperparts (head to tail) of the *E. k. komadori* specimens were dull orange in both sexes. The throat and upper breast were black in the male, but the female lacked the black parts and had an ashy tinge with a black edge on the tip of the upper breast and throat feathers, which looked like scales. The male had small black patches in its flanks and axillaries. The rest of underparts was white. The upperpart plumage of the *E. k. namiyei* specimens was similar to that of *E. k. komadori*. The breast and throat were black, but the rest of the underparts was uniformly ashy. The black frontal band of *E. k. namiyei* was narrower than that of *E. k. komadori*.

The type specimen of *E. k. subrufus* had lighter orange in its upper parts than the *E. k. komadori* specimens described by Kuroda (1923), but there are many variations of tinges from paler to darker in the *E. k. komadori* population. The plumage of the female *E. k. subrufus* specimen was not different from that of female *E. k. komadori* specimens. The width of the black frontal band of the *E. k. subrufus* type specimen (4.0 mm, measured by the authors) was included in the range of *E. k. komadori* (1.9–5.3 mm, by the authors).

Discussion

1. Distribution

Temminck (1835) reported that the Ryukyu Robin inhabits the woody areas near the shoreline in Korea. Kuroda (1925) pointed out that Temminck's designation "Coree (Korea)" was wrong, and corrected the locality as the northern part of the Ryukyu Islands. However, the Yamashina Institute has a male specimen from Korea. So it is possible that the species used to be in Korea. Considering that the species has also been recorded on Kyushu mainland, the species may have had a much wider distribution in the past. The present scattered distribution of the species supports that idea.

In Amamioshima, Tokunoshima and Okinawa Islands many individuals have been recorded in winter as well as in the breeding season (e.g. E.A. 1986). On the other hand, few individuals have been observed in winter in Nakanoshima and Tairajima of the Tokara Islands. In Nakanoshima, we recaptured a female adult on 2 May 1988 that had been banded first on 29 August 1987 at the same place. We investigated there in November to February, and recorded few individuals. In addition, in the migratory season two observation records of subspecies *komadori* were obtained from Okinawa Island, which subspecies *namiyei* inhabits (W.B.S.J. 1986). On the other hand, in the Yayeyama Islands, the southernmost islands in the Ryukyu Island chain, all of the records are in migratory or winter periods. These facts suggest that the northern populations of the species migrate to the south in winter. Brazil (1985) also suggested that the northern populations may migrate. The evidence of the species wintering in Taiwan (Wang 1986) supports the possibility.

2. The problem of the subspecies *subrufus*

It is quite problematical that *subrufus* is a valid taxon. Kuroda (1923) reported

that the upper parts of *E. k. subrufus* are paler and lighter than those of *E. k. komadori*, and that the outer edges of all the quills and both webs of the tertiaries are orange-rufous. Also the black frontal band is somewhat broader. However, our measurements and examination of the specimens show that the morphological and plumage characters of the *E. k. subrufus* specimens are included in the character ranges of the *E. k. komadori* specimens. Furthermore, it is noteworthy that a type specimen of the subspecies *subrufus* from Yonakunijima was collected in the migratory season. E.A. (1981) reported that Ryukyu Robins in the Danjo Islands looked paler than the other *komadori* populations. Although Bush Warblers *Cettia diphone* and Narcissus Flycatchers *Ficedula narcissina* in the Ryukyu Islands have paler plumage than their northern populations (Morioka 1974), there is a general tendency for populations in warmer and more humid areas to be more heavily pigmented (Mayr 1963). Because some of the *E. k. komadori* specimens have orange-rufous tertiaries, the plumage character of the subspecies *subrufus* may also not be peculiarly their own. The lone female specimen labeled *E. k. subrufus* in the Yamashina Institute seems to have been so identified in recent years without detailed analysis. Kuroda (1923, 1925) recognized the specimens from Ishigakijima and Iriomotejima as the subspecies *komadori*, not *subrufus*. Vaurie (1959) also mentioned some doubts about the separation of the subspecies *subrufus*. O.S.J. (1974) commented that *subrufus* is known only by specimens taken in October and November, and could be a migrant from the north. Therefore, we conclude here that *E. k. subrufus* is a synonym of *E. k. komadori*, and the type specimen of *E. k. subrufus* should be included in the race *E. k. komadori*.

On the other hand, the subspecies *namiyei* is certainly restricted to Okinawa Island and some of the Kerama Islands, and it is a permanent resident there. The wing formula, especially the longest primary, usually shows much variation within a species (e.g. Svensson 1984), and it is affected by moult conditions. Hence, wing formulae may not be useful to separate the subspecies of the Ryukyu Robins. But the ashy coloration of the underparts and the less black frontal band should be useful in separating *E. k. namiyei* from *E. k. komadori*.

Acknowledgements

We are grateful to Dr. J. Abe, Dr. D. Kuo, Messrs. K. Kugai, K. Kedashiro, S. Sako, Y. Shigeta, K. Seki, S. Hanawa, H. Hirabayashi, H. Hori, Y. Yonashiro for their useful information and helpful advice. We also thank Dr. S. Shiraishi, Dr. H. Morioka, Mr. K. Miyagi and staff of the reference room of Yamashina Institute for Ornithology for offering the convenience for the skin examination, and Dr. L. Adams for commenting on a draft of this paper.

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- (The title in parentheses is tentative translations from the original Japanese title by the authors of this paper)

アカヒゲ *Erithacus komadori* の分布と亜種の問題について

- 1) トカラ列島中之島および平島の現地調査, ならびに文献, 確実な情報収集などによって, アカヒゲの現在および過去における正確な分布を調べた。
- 2) これまで知られていた, 北は男女群島から南は与那国島までの島々での生息記録に, 新たに朝鮮江原道 (山階鳥類研究所所蔵), 鹿児島県霧島 (九州大学農学部所蔵の標本) の2採集例と, 台湾和平島での越冬観察例が加えられた。
- 3) トカラ列島では繁殖期に多数個体が見られるものの, 冬期にはほとんど見られなくなる。また, 琉

球列島南部の八重山諸島では秋期および早春期の記録があるものの、夏期にはほとんど観察されていない。このことから、より北方のアカヒゲ个体群は、越冬期により南部へ移動することが予想された。

4) ウスアカヒゲ *E. k. subrufus* の模式標本を亜種アカヒゲ *E. k. komadori* の標本と比較したところ、Kuroda (1923) により記載されている前者の標徴形質は後者の範疇に含まれ、ウスアカヒゲは亜種アカヒゲの synonym と考えられた。

5) アカヒゲは以前にかなり広い地域に生息していたものが、現在は南西諸島を中心に遺存固有の分布を示すようになったと考えられた。

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