

Trends in systematics

Tenerife Robin – a species of its own?

Two populations of European Robin *Erithacus rubecula* inhabit the Canary Islands. In the western Canary Islands (El Hierro, Gomera and La Palma), robins are found which are similar to continental European birds, both in vocalizations and plumage. Similar populations are found in the Azores and on Madeira. These populations, sometimes regarded as forming a separate subspecies ('*E r microrhynchus*'), are classified as belonging to the continental European subspecies *E r rubecula* (Vaurie 1959) (hereafter *rubecula*). Early ornithologists visiting the central Canary Islands (Gran Canaria and Tenerife) realized that the robins breeding in these islands were different, especially their song impressed them (Bolle 1854). This population is classified as being a separate subspecies of European Robin, *E r superbus* (hereafter *superbus*). In the eastern

Canary Islands (Fuerteventura and Lanzarote), *rubecula* of continental European origin are regular but rare winter visitors (cf Martin 1987).

Song

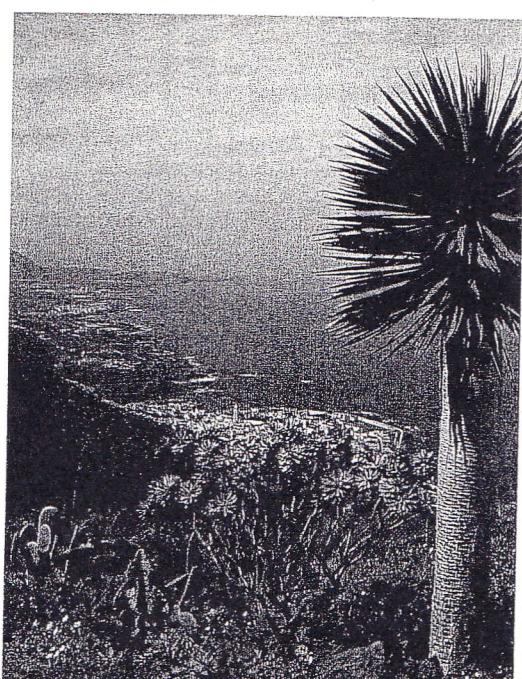
Like in *rubecula*, the song of *superbus* has a wistful and at the same time mercurial quality. Also, the mean pitch is virtually the same: 4.7 kHz (Stock & Bergmann 1988). This is also true for the mean durations of elements and intervals between elements within song strophes. These two variables result in almost identical singing speeds: 6.25 ± 1.91 elements per second (mean \pm SD, n=91 strophes) for *rubecula* and 6.30 ± 4.29 elements per second (n=163 strophes) for *superbus*.

Despite these similarities, the song of *superbus* differs from that of *rubecula*. It is short (figure 1b-c). The song strophes of *superbus* have a mean duration of 1.29 ± 0.82 s (mean \pm SD, n=163) whereas those of *rubecula* average 2.41 ± 0.78 s

162 Pijaral, Anaga mountains, Tenerife, February 1998 (Hans-Heiner Bergmann). Famous laurisilva, endemic Canarian laurel forest, natural habitat of Tenerife Robin *Erithacus superbus*

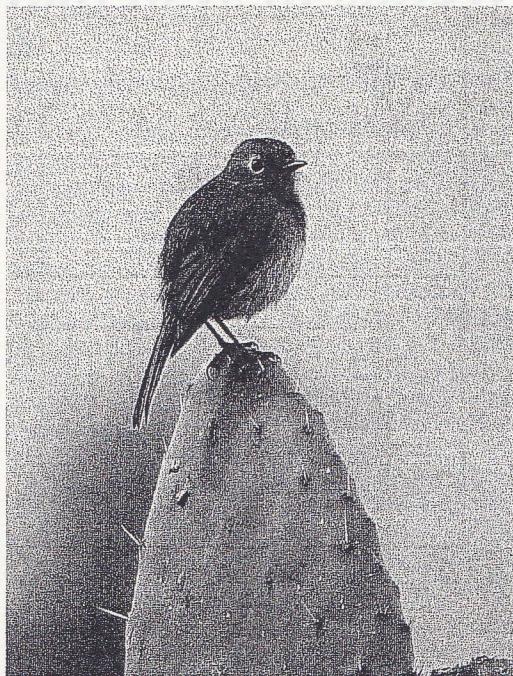


163 Genoves, Tenerife, Canary Islands, February 1998 (Hans-Heiner Bergmann). Parks and gardens are also inhabited by Tenerife Robin *Erithacus superbus*





164 Tenerife Robin / Teneriferoobstor *Erithacus superbus* on its song post, Tenerife, Canary Islands, February 1987 (Hans-Heiner Bergmann)



165 Tenerife Robin / Teneriferoobstor *Erithacus superbus* on *Opuntia* cactus, Tenerife, Canary Islands, February 1998 (Hans-Heiner Bergmann)

(n=91), constituting a highly significant difference. High-pitched elements of just less than 8 kHz occur more frequent in *superbus* than in *rubecula*. In *superbus*, the strophe usually begins with one or two short very high notes followed by a lower motif, which is usually repeated a number of times, or a trill, or a combination of these. In *rubecula*, the contrast between high and low material is also a striking feature of the song, but the general pattern of high units near the start, followed by lower material is more often than not repeated in the course of the much longer strophe, so that there is often a return to high units in the middle of the strophe (Magnus Robb in litt.) It is unknown whether female *superbus* sings. Female *rubecula* does so, at least during territory establishment in autumn (Lack 1939, Hoelzel 1986).

Imitations

As one of the most intriguing characters, *superbus* is exceptionally good at imitating songs and calls of other birds. Von Thanner (1910) was among the first to note imitations of calls of Red Kite *Milvus milvus*, Tenerife Blue Tit *Parus (caeruleus)*

teneriffae and Blue Chaffinch *Fringilla teydea*. Lack & Southern (1949) recorded song imitations of Common Nightingale *Luscinia megarhynchos* (a surprising observation since this species does not breed in the Canary Islands) and Song Thrush *Turdus philomelos* (which can be heard on Gran Canaria and Tenerife in winter).

Figure 2a shows an imitation of a typical song phrase of Atlantic Canary *Serinus canaria* and figure 2b a possible model. Also, sequences of low-pitched whistling elements commonly heard in songs of *superbus* could go back to this model. Figure 2d shows song elements of Northern Chiffchaff *Phylloscopus collybita* of the subspecies *P. c. collybita* and figure 2c an imitation by a *superbus*. Also, elements of songs of Tenerife Blue Tit and Canary Island Chaffinch *F. coelebs tintillon* and call imitations of Common Blackbird *T. merula*, Canary Island Chaffinch and Atlantic Canary can be frequently heard. The high incidence of trills and rhythmically frequency modulated elements in songs of *superbus* may be due to the high degree of imitating sounds of other birds. If there is a lot of phrasing in the models, for instance, the songs of Tenerife Blue Tit and Atlantic

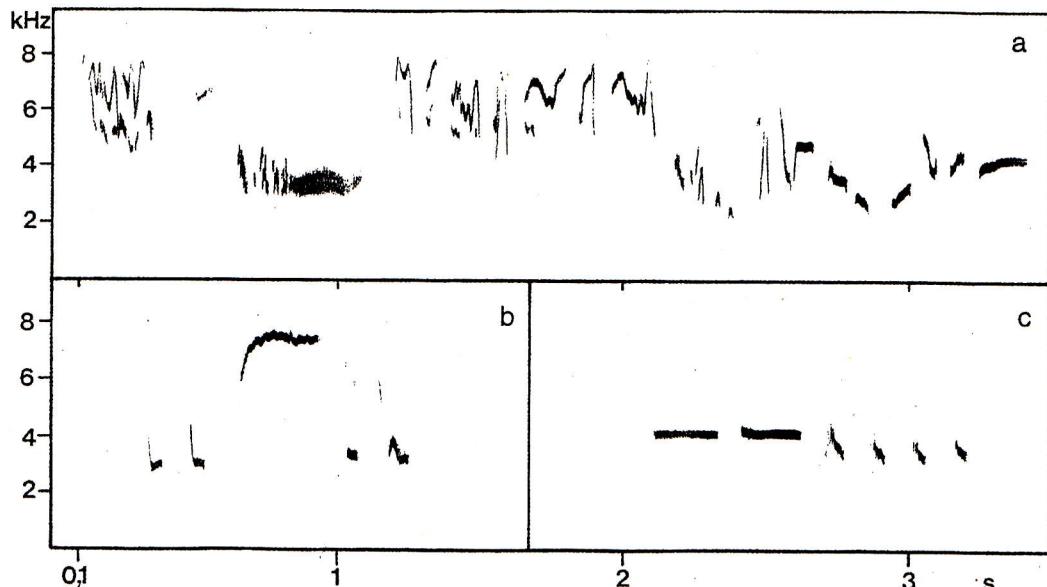
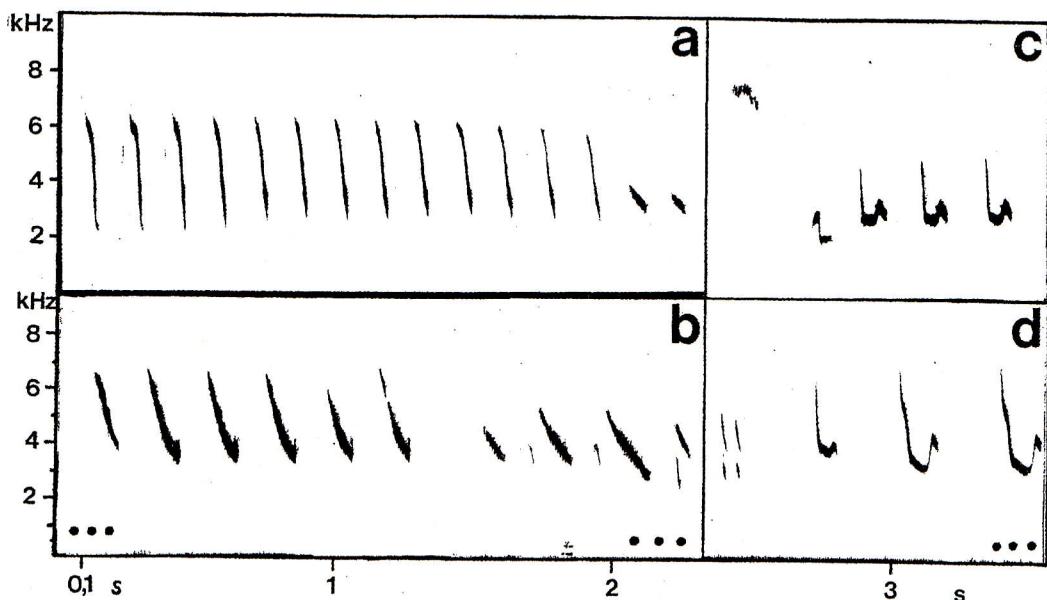


FIGURE 1 Sonagrams of songs of European Robin / Roodborst *Erythacus rubecula* and Tenerife Robins / Teneriferoedborst *E. superbus* (Hans-Heiner Bergmann). a, European Robin, Volkesfelden, Dillkreis, Hessen, Germany, 18 April 1976. b-c, Tenerife Robin, Monte del Agua, Teno mountains, Tenerife, Canary Islands, 20 February 1987. Songs of *superbus* are significantly shorter

FIGURE 2 Sonograms of song imitations by Tenerife Robin / Teneriferoedborst *Erythacus superbus* (Hans-Heiner Bergmann, except 2d). a, possible song imitation of Atlantic Canary *Serinus canaria*, Genoves, Tenerife, Canary Islands, 16 February 1987. b, model for a: typical song phrases of Atlantic Canary / Kanarie, Vilaflor, Tenerife, Canary Islands, 10 April 1972. c, song strophe imitating song of Northern Chiffchaff *Phylloscopus collybita* of subspecies *P. c. collybita*, Monte del Agua, Teno mountains, Tenerife, Canary Islands, 20 February 1987. d, possible model for c: song of Northern Chiffchaff / Tjiftja, Weil, Baden-Württemberg, Germany, date unknown (E Arendt). Three dots indicate that songs are shortened in sonograms



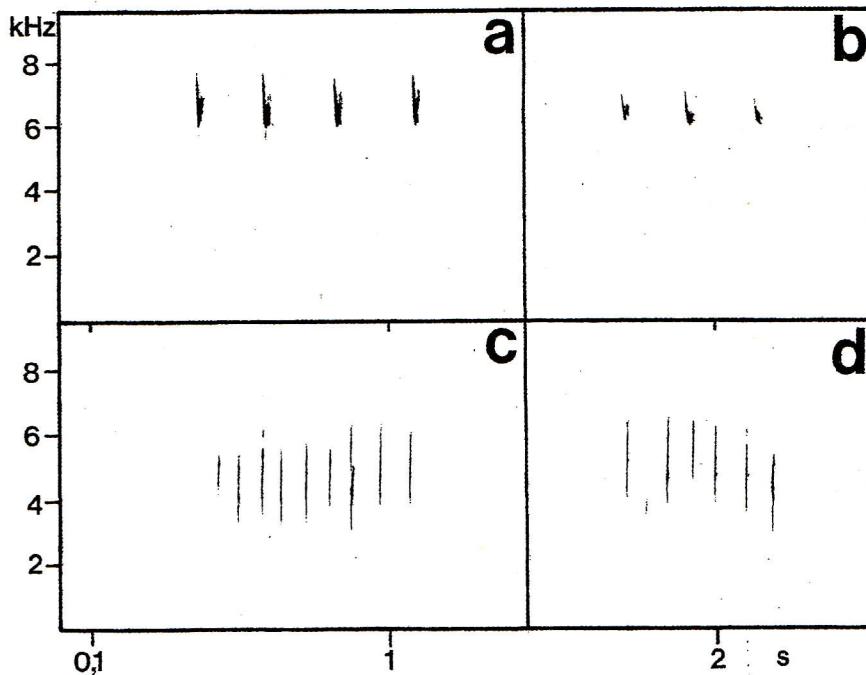


FIGURE 3 Sonograms of alarm calls of Tenerife Robin / Teneriferoobdstor *Erithacus superbus* and European Robin / Roodborst *E. rubecula* (Hans-Heiner Bergmann). a-b, Tenerife Robin, Monte del Aguja, Teno mountains, Tenerife, Canary Islands, 20 February 1987. c-d, European Robin, Marburg, Hessen, Germany, 16 July 1978

Canary, then this should be reflected in the imitative songs of *superbus* as well. Imitations increase the complexity of the songs of *superbus*. Complexity and length play a role in mate choice (cf Catchpole & Slater 1995). So, increasing the size of the song repertoire through imitations may play a role in mate choice in *superbus*.

In some rare cases, *rubecula* has been found to imitate songs of other birds as well. Von Pernau (1702) knew that they are able to imitate songs of Common Nightingale when reared in cages. J Hall-Craggs in Cramp (1988: 609) showed a song strophe of Common Chaffinch mimicked by a *rubecula*. This is however not typical. Although repertoires of elements and motives show high individual differences in *rubecula* (Brémond 1968, Hoelzel 1986), imitations of other birds are not easily identified. Presumably, they are present but adapted very much to the robin's own singing style (cf Bergmann & Helb 1982).

An intriguing alternative interpretation is that *rubecula* imitates a great deal but the imitations tend to be incorporated into the song more subtly than in *superbus* (M Robb in litt). Thus, imitations in *rubecula* are often extremely short, making

them harder to recognise. The difference is that the song of *rubecula* in general appears more fluid and 'plastic', that of *superbus* being actually simpler and more clearly segmented. According to this interpretation, imitations simply stand out more clearly in the song of *superbus* than in *rubecula*.

Reactions to songs of rubecula

When songs of *superbus* were played back to *superbus*, these reacted in all cases ($n=25$) by singing (Stock & Bergmann 1988). However, when after an interval of 2 min, songs of *rubecula* were played back to the same birds for 1 min, only 64% reacted in the same way. Most *superbus* approached the sound source of *superbus* but only 50% did so when songs of *rubecula* were played back. In *superbus*, the reaction times (the time from the start of the stimulus to the start of the reactions) were longer and the reaction intensities were lower to songs of *rubecula* than to those of *superbus*. All this makes clear that reactions to songs of *rubecula* are strongly reduced in *superbus*. Maybe reactions on *rubecula* would be still less intensive if they

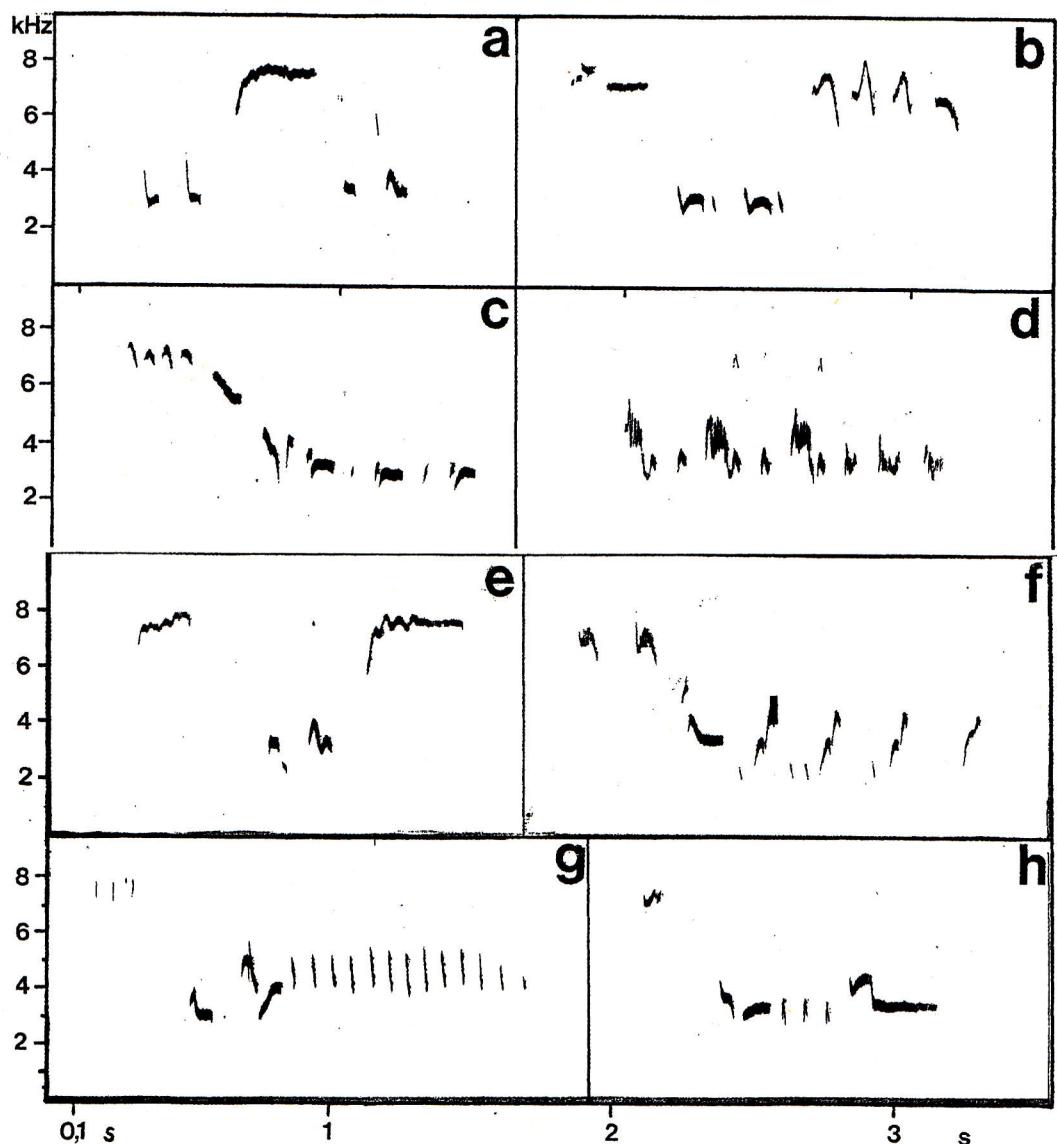


FIGURE 4 Sonagrams of songs of Tenerife Robin / Teneriferooborst *Erithacus superbus*, Monte del Agua, Teno mountains, Tenerife, Canary Islands, 20 February 1987 (Hans-Heiner Bergmann). Note rich structure



166 Tenerife Robin / Teneriferoobborst *Erithacus superbus*, Genoves, Tenerife, Canary Islands, February 1998 (Hans-Heiner Bergmann). Note dark throat and breast



167 European Robin / Roodborst *Erithacus rubecula*, Kobbeduinen, Schiermonnikoog, Friesland, Netherlands, 27 March 1998 (Arnoud B van den Berg)

had not been preceded by songs of *superbus* as done by Stock & Bergmann (1988).

Calls

The normal alarm call of *superbus* is a slow sequence or even single sharp *tik* call that is visible in sonograms as a high-pitched short element of 6–8 kHz (figure 3a–b). In contrast, *rubeccula* produces fast phrases of lower-pitched short noisy elements of 4–6 kHz (figure 3c–d). Little is known in *superbus* about the prolonged *seet* calls used by *rubeccula* as aerial raptor alarm (Marler 1956, Thielcke 1970) or other social calls (cf Bergmann & Helb 1982, Glutz von Blotzheim & Bauer 1988). However, Magnus Robb (in litt) recently made sound recordings of this call type on the Central Canary Islands. The high-pitched *see* element found in many song strophes of *superbus* (cf Stock & Bergmann 1988) could play a special role in mate choice and pairing strategies (Harper 1985).

Plumage

Rubeccula has an orange-red face (formed by the forehead, lobe, ear-coverts, chin and throat) and breast. In *superbus*, these parts are a much more saturated red and the dark eye is surrounded by a prominent pale eye-ring. The ash-grey band running down from the forecrown to the sides of the breast is wider and more conspicuous. The upperparts are browner than those of *rubeccula* which are greyish-brown and olive tinged. The British subspecies *E r melophilus* differs from *rubeccula* in a similar but less intensive way: the

orange-red of the face and breast is slightly darker while the upperparts are browner and less olive tinged (cf Svensson 1992, Snow & Perrins 1998). Whereas Tenerife Blue Tit and Canary Island Chaffinch differ in bill morphology from their mainland relatives (Grant 1979, Martin 1991), nothing is known about this in *superbus*. Observations by Magnus Robb (in litt) suggest that *superbus* has a greater inclination to cock its tail than *rubeccula*, especially combining this with tail flicking when giving the high *tik* call described above.

Systematics and nomenclature

Taking into account the differences in vocalizations and plumage and the lowered reactions of *superbus* to songs of *rubeccula*, we think that the central Canarian population should be treated as a species: *Erithacus superbus* Koenig, 1889. Because *superbus* and *rubeccula* are both diagnosable and almost certainly reproductively isolated, this taxonomic treatment is in accordance with both the Phylogenetic Species Concept and the Biological Species Concept. *Superbus* could be regarded as an allospecies (*sensu* Eck 1996) belonging to the superspecies *E rubeccula*.

For a short popular name, the bird should be called Tenerife Robin in English and 'Teneriffa-Rotkehlchen' in German although it occurs on Gran Canaria as well. The Spanish name for robin is 'Petirrojo' and to our knowledge no difference is made between the central and western Canarian populations (for the vernacular Canarian names, see Martin 1987).

Biogeography

Gran Canaria and Tenerife play a special biogeographical role because of their richness in forest habitats (Kämmer 1982). This is, for instance, also illustrated by the endemic Blue Chaffinch whose breeding distribution, however, is linked to the distribution of the huge endemic pine tree *Pinus canariensis* on both Gran Canaria and Tenerife (Bergmann & Schäffer 2000). The high elevations and big size of the central Canarian islands may have been crucial for creating conditions to develop or conserve special taxa because both elevation and size allow for refuges under changing climate conditions.

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