

Systematic notes on Asian birds. 60.
Remarks on the systematic position of *Ficedula elisae*
(Weigold, 1922) ¹

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Elise's Flycatcher was described as a full species *Ficedula elisae* (Weigold, 1922a), but in 1937 was made a subspecies of the Narcissus Flycatcher *Ficedula narcissina* (Temminck, 1836), and Zheng et al., 2000, mistook its males for an undescribed species which they named "*Ficedula beijingnica*". More recently, owing to its phenotypic characteristics and analyses of its bioacoustics, it has been proposed that *elisae* should be restored to rank as a full species. After re-examining the full range of evidence it is here recommended to continue treating the taxon subspecifically as *Ficedula narcissina elisae* pending further information.

Introduction

Elise's Flycatcher *Ficedula narcissina elisae* (Weigold, 1922a) ² is a distinctive taxon in the Narcissus Flycatcher group, whose distribution (Cheng 1987; see also Fig. 3 below) within the range of the Yellow-rumped Flycatcher *Ficedula zanthopygia* (Hay, 1845) led to confusion about its taxonomic status. The form was described and treated as a distinct species, *Muscicapa elisae* Weigold, 1922a, until Steinbacher (1937) noted the similarity of *elisae* to *F. narcissina* (Temminck, 1836) ³ as being greater than that of *zanthopygia* to *narcissina*, and switched their relationships, isolating *zanthopygia* and linking *elisae* with the various forms of the Japanese islands. Apart from the recent erroneous description of its subadult males as a species "*Ficedula beijingnica*" by Zheng et al. (2000), from that point *elisae* was accepted as a subspecies of *narcissina*. Most recently, it has been proposed to return *elisae* to full species status (Zhang et al. 2006).

In the debate about *elisae*'s systematic position a number of articles in German containing biological and distributional information (Weigold, 1922b, 1937; Steinbacher 1937) and biometrical analyses (Eck, 1996, 1998) have been overlooked. To help avoid further misinterpretations of *elisae*'s status within the group, this paper brings together the relevant information from the literature and also provides previously unpublished data on measurements and proportions of these flycatchers. It should be emphasised

¹ Dedicated to the memory of Dr. Siegfried Eck (1942-2005).

² As Weigold named it after his wife Elise, the most appropriate name in English would be "Elise's Flycatcher" (cf. the German "Elisenschnäpper").

³ Not 1835 as cited by Watson (1986: 338), see Dickinson (2001).

that most comments on “morphology” in the literature refer to external plumage characters. No extensive morphometric data on plumage proportions has yet been published. The paper concludes with a recommendation for the appropriate taxonomic treatment of *elisae* on the basis of the Biological Species Concept (BSC).

Methods and materials

The biometric data presented in this study were gathered by Siegfried Eck and were taken from a total of 267 skins in the collections of the American Museum of Natural History (AMNH), New York, the Beijing Normal University (BNU), the Museum Alexander Koenig Bonn (ZFMK), the Museum für Naturkunde Berlin (ZMB), the Museum für Tierkunde Dresden (MTD) and the Zoological Institute St. Petersburg (ZISP). Wing length was measured as maximum chord, tail length from between the middle rectrices, at the place where their bases emerge from the skin, to the tip of the closed tail. Wing/tip indices (WTI) and tail/wing indices (TWI) were calculated using these data. Owing to the different conditions of the skins, the number of birds included in the calculations varied, hence “n” is given separately for each assessment.

Analysis of the systematic position of *Ficedula elisae* (Weigold, 1922a)

Ficedula elisae and *F. zanthopygia*

Hartert (1907) treated a broad species *narcissina*, of which one form was *zanthopygia*. Following the discovery of *elisae*, Weigold (1922a, b) emphasised the specific distinctness of *elisae* from *zanthopygia*, having found the two breeding sympatrically in the oak forest near the eastern “Emperors’ Tombs” near Peking. Weigold (1922a, b, 1937) noted their markedly different songs, as well as structural and colour differences in their plumage (see also plate in Xu et al., 1996). Hartert (1923: 47-48) accepted *elisae* as a separate species and provided a description, mentioning that *elisae* bred sympatrically with *zanthopygia*. He also gave a phonetic rendering of its song, almost identical with that in Weigold (1922b), and paraphrased Weigold in saying that fully adult males and subadult males⁴ looking like females both sang this way. In Hartert & Steinbacher (1934: 236), where the whole descriptive paragraph from 1923 is repeated verbatim, without the description of the song, however the view that *elisae* was a separate species was challenged, it being noted that other observers agreed that the song of *elisae* seemed to be just like

⁴Weigold (1922b) referred to the subadult males as “wohl zweijährige” (‘presumably also two year old’), based on the Zwischenkleid (intermediate plumage) worn by six of his ten males. It seems clear from his label data that such birds do already breed. Weigold’s comments on plumage sequence have also been under-reported. He said “Erstes, wohl geflecktes, und zweites Jugendkleid nicht bekannt. Letzteres sicher wie die weniger schönen Ex. des nächsten Zwischenkleides, das nach den verschiedenen Graden der Schönheit mindestens im 1. und 2. Brutjahr im Frühjahr angelegt wird.” This translates as “The first, probably spotted, and second juvenile plumages are unknown. The second is quite probably like the less beautiful of the specimens in their next Zwischenkleid, which is seen in various degrees of beauty at least in the spring of the first and second breeding years.”

that of *narcissina*. And yet the authors⁵ continued to treat *elisae* outside the species *narcissina* and to treat *zanthopygia* within that species and failed to consider the possibility that *zanthopygia* was the form that should be seen not to fit into the broad species *narcissina*.

When Steinbacher (1937) re-examined the situation, and claimed that there was confusion (he actually wrote "Misstrauen und Zweifel"), he referred to Weigold's findings about the biological differences between *elisae* and *zanthopygia*, re-emphasised their distinctness and underlined the fact of breeding sympatry, meaning that, despite external resemblances, not more than one could belong to the species *narcissina*. Meanwhile, Wilder (1936) had confirmed the differences in the song of these two. Steinbacher (1937) explained the relationships he perceived as a chain of *narcissina* subspecies in which nominate *narcissina* and *elisae* constituted the two extreme forms. Of these forms, *elisae* was the only mainland representative hence the only one that could occur sympatrically with *zanthopygia*, and based on plumage characters he concluded it was *zanthopygia* that needed to be recognised as a separate species. But here Steinbacher did not repeat what Hartert & Steinbacher had reported about the reputed similarity of the songs of *elisae* and *narcissina*.

⁵ Steinbacher (1937) emphasised that where, in the "Ergänzungsband", there were differences of opinion between him and Hartert, Hartert's view prevailed, and that this changed only in the fourth part, after Hartert's death.

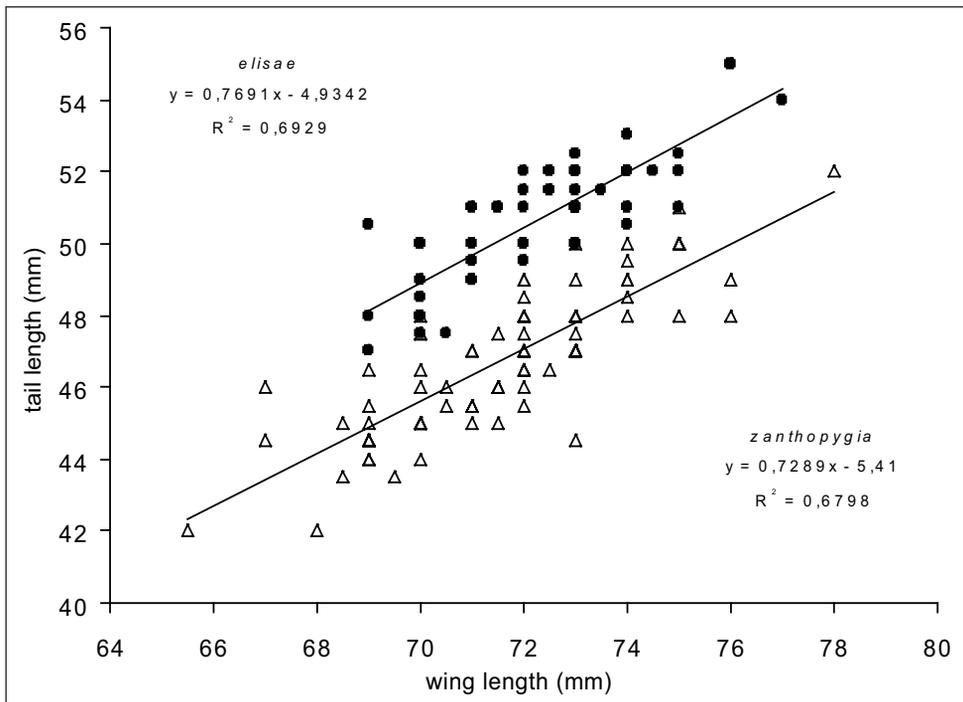


Fig. 1. Comparison of wing and tail lengths of *Ficedula zanthopygia* (both sexes, n=61) and *F. narcissina elisae* (both sexes, n=79).

Most taxonomic works since then have treated *zanthopygia* as a monotypic species and *elisae* within the species *narcissina* (e.g., Vaurie, 1959; Watson, 1986, Dickinson, 2003). Recently, the distance between *zanthopygia* and *elisae* was re-confirmed by Zhang et al. (2006) who noted a marked acoustical difference between their voices. Measurements of wing and tail length also reveal that the two taxa are morphological well segregated (Fig. 1). Differences in key ratios taken from measurement of the flight feathers underline their distinctness. A mean WTI of 27% (sexes combined, n = 80) and a TWI of 65.3% (sexes combined, n = 80) in *zanthopygia* contrast with a WTI of 23.8% (sexes combined, n = 60) and a TWI of 70.1% (sexes combined, n = 61) in *elisae*.

Eck (1996) further pointed out that including *Ficedula zanthopygia* and *F. narcissina* in a superspecies, as proposed by Watson (1986), is inappropriate if *elisae* is considered to be a *narcissina* subspecies since, by definition, members of a superspecies do not breed sympatrically (Amadon, 1966). However, a superspecies might be appropriate for *narcissina* and *elisae* if the latter were treated as specifically distinct, with sympatric *F. zanthopygia* outside the superspecies.

Ficedula elisae and “*F. beijingnica*”

In 2000 a supposedly new species of *Ficedula* flycatcher was described from within the Chinese range of *elisae*, as “Beijing Flycatcher” *F. beijingnica* Zheng et al., 2000. It turned out that this bird was merely the subadult of *elisae*, but although many ornithologists had recognised this fact, it took some time for it to be explained in print (Eck & Töpfer 2005, Zhang et al. 2006).

The description of *Ficedula beijingnica* by Zheng et al. (2000) was accompanied by the assertion that the males given this name had fully developed testis although their plumage looked like that of young male, or female, *elisae*. However, Weigold (1922b) had already explicitly pointed out that subadult males of *elisae* breed in an intermediate plumage which resembles the female. So the description of male plumage characters in “*beijingnica*” simply refers to the young *elisae* male. Moreover, it is not true that there was no description of the female *elisae*, as asserted by Shaw (1936). Zheng et al. (2000) suggested that no females had been collected before Shaw and that he was the first to describe the female plumage. In fact, when describing *elisae* Weigold (1922a) mentioned that he had also collected females, and later published a description of the female plumage and reported four specimens (Weigold, 1922b).

Characterising the song of “*beijingnica*” as remarkably different, Zheng et al. (2000) did not name the *narcissina* subspecies used for comparison, or whether they had recorded the song of *elisae* for comparison. To be sure of their ground the authors would have needed to consult a reliable recording of *elisae*. Zhang et al. (2006) have now pointed out that there is no significant difference in song between these subadult males and fully adult *elisae* males and thus have proved the identity of “*beijingnica*” with *elisae* in terms of acoustics. The authors also mentioned an unpublished molecular study (Li in Zhang et al., 2006) that supports this finding.

Measurements of wing and tail length (Fig. 2) when compared also strongly support the finding that there is no difference between “*beijingnica*” and *elisae*. These birds belong to one morphological unit and have proportions in common.

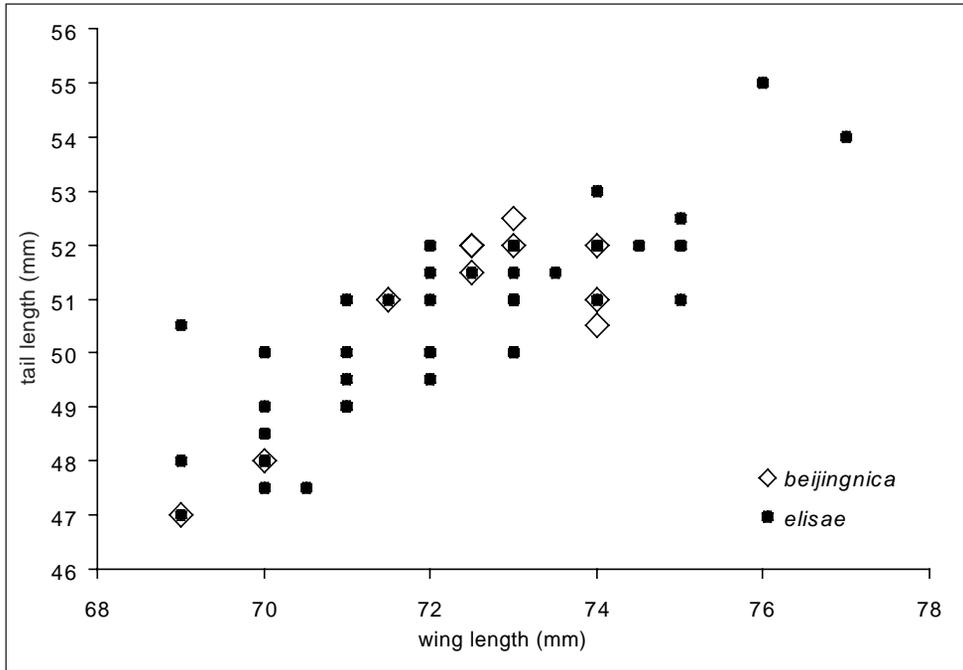


Fig. 2. Comparison of wing and tail lengths of *Ficedula elisae* (both sexes, n=50) and "*F. beijingnica*" (both sexes, n=11).

Ficedula elisae and the *F. narcissina* subspecies

Steinbacher (1937) suggested that the transition in plumage coloration from nominate *narcissina* to *elisae* through the small-island forms *jakuschima*, *shonis* and *owstoni* (see Fig. 3) was gradual in nature.

Vaurie (1959) wrote "the forms *jakuschima* and *shonis* represent intermediate stages on the cline but are not well differentiated as about half of the specimens examined are not distinguishable"⁶ and included them in *owstoni*. Eck (1996, 1998) reconsidered the small-island subspecies, but having little material of *shonis* he recommended only *jakuschima* and *owstoni* be distinguished as valid. However, Dickinson (2003) mentioned that *jakuschima* and *shonis* may be separable

Analysing the relative proportions of the five taxa in wing and tail length, it becomes apparent that there is probably also a transition in morphometric characters (Fig. 4) although, unfortunately, small sample size particularly of *shonis* and *owstoni* limited the scope of the analysis. Nonetheless, it can be seen that *elisae* is the form with the shortest wings, and whereas all subspecies of *narcissina* have tails of much the same length, nominate *narcissina* has wings that are relatively longest. Between these two

⁶ The type localities of *jakuschima* and *shonis* are, respectively, Yakushima and Amami-Oshima.

forms at least *jakuschima* is intermediate. This character transition is also visible in the WTI and TWI (respectively Figs. 5 & 6). The indices for *F. zanthopygia* are also given. Figures 5 and 6 suggest that the extent of biometric divergence between *elisae* and *jakuschima* is no more pronounced than that between *jakuschima* and nominate *narcissina*. If comparison is made only between the extreme forms *F. n. narcissina* and *elisae* the difference appears to be much larger, failing to reflect the biological fact that there are intermediate taxa. Independent of taxonomy, comparing the two figures it is apparent that taxa show either a high wing/tip index against a low tail/wing index or the converse. The biological mechanism responsible for producing this effect is still unknown (Eck 1998).

Conclusions on the taxonomic status of *Ficedula elisae* (Weigold, 1922a)

The following conclusions about the taxonomic rank of *elisae* are based on the Biological Species Concept (BSC), in which a species is defined as "a group of interbreeding natural populations which are reproductively isolated from other such groups" (Mayr, 2001).

Compared with *F. zanthopygia*, *elisae* is clearly distinct in respect of phenotype, morphology and bioacoustics. Their occurrence sympatrically and the stable character composition of each of these two taxa, there being no report of hybridisation, indicate that the two are reproductively isolated from one another and thus belong to different biological species in the sense of the BSC.

As described in the preceding sections, morphological character alterations of the *F. narcissina* subspecies grade across their geographical distribution, with nominate *narcissina* and *elisae* at opposite ends. Despite this, Beaman (1994) and Zhang et al. (2006) suggested that *elisae* be treated as a distinct species, on the basis of phenotypic and bioacoustic differences, respectively. The distribution of *elisae* presents problems of interpretation in the context of the BSC, as it has a geographically isolated range lacking contact zones with other supposedly closely related forms. Under such circumstances it

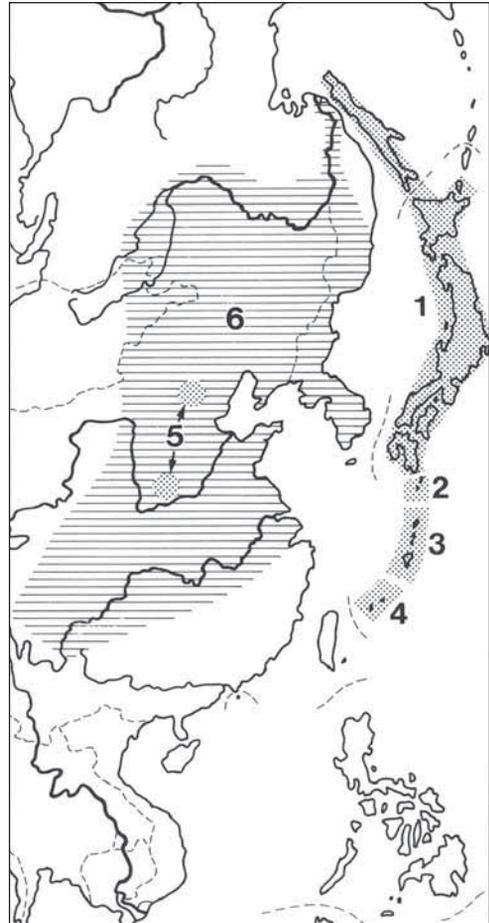


Fig. 3. Distribution of the Narcissus Flycatcher subspecies and the Yellow-rumped Flycatcher (1- *Ficedula n. narcissina*, 2- *F.n. jakuschima*, 3- *F.n. shonis*, 4- *F.n. owstoni*, 5- *F.n. elisae*, 6- *F. zanthopygia*). Taken from Eck (1998, Zool. Abh. Mus. Tierk. Dresden 50 (Suppl.): 93).

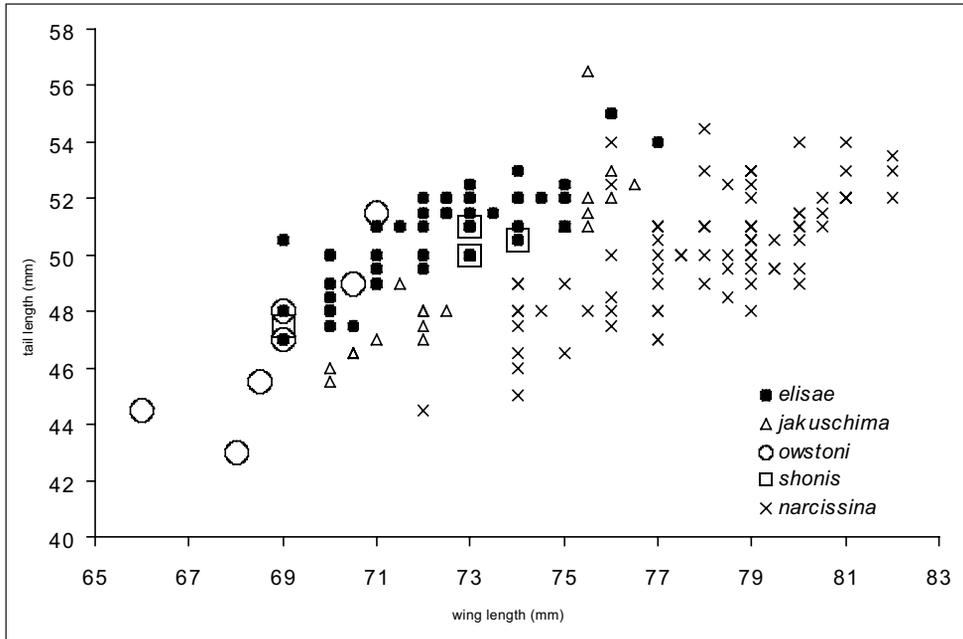


Fig. 4. Wing and tail lengths of the *Ficedula narcissina* subspecies *elisae* (n=61), *jakuschima* (n=20), *owstoni* (n=8), *shonis* (n=4) and *narcissina* (n=84). Linear regressions are not given due to the limited sample sizes of some subspecies.

is impossible to prove directly the existence or non-existence of reproductive isolation. It is therefore necessary to include as much information as possible in an overall assessment, combining morphology, bioacoustics and molecular genetics to evaluate the amount of differentiation between the insular *narcissina* forms and mainland *elisae*.

Eck (1998) already pointed out that Beaman (1994) did not consider the character transition of the insular *narcissina* forms to *elisae*. The proposal of Zhang et al. (2006) is based on the marked differences in bioacoustics of nominate *narcissina* and *elisae*. These authors reliably demonstrated that these differences are more pronounced than between other good allopatric species in other genera. Combining this with their different external appearance the authors regarded it as justified to assign species rank to *elisae*. Although the song analysis is very useful for examining the relationship of forms of questionable taxonomic status, the work of Zhang et al. (2006) did not include information on the other forms of *narcissina*. It is strongly recommended here that their songs be examined as well. Any genetic study to help resolve this issue must also include samples of every subspecies. To evaluate genetic distances on this scale will probably require that out-group comparisons be kept within the genus⁷.

⁷ However, it should be recalled that in circumscribing *Ficedula* Vaurie (1953: 492) included the type species of 19 other generic names, a total of 20 generic names having been assigned to the 26 species that he recognised.

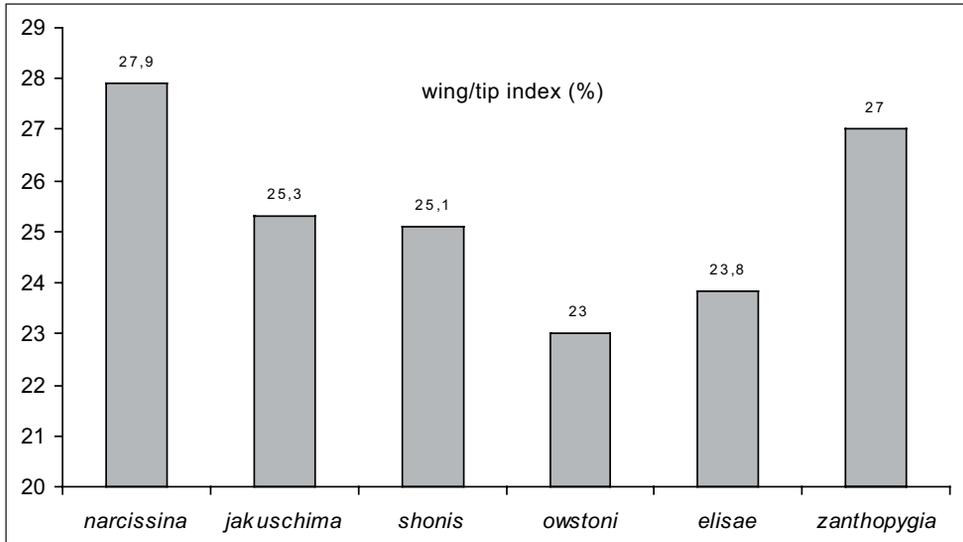


Fig. 5. Wing/tip index of the *Ficedula narcissina* subspecies *elisae* (n=60), *jakuschima* (n=22), *owstoni* (n=8), *shonis* (n=4) and *narcissina* (n=83).

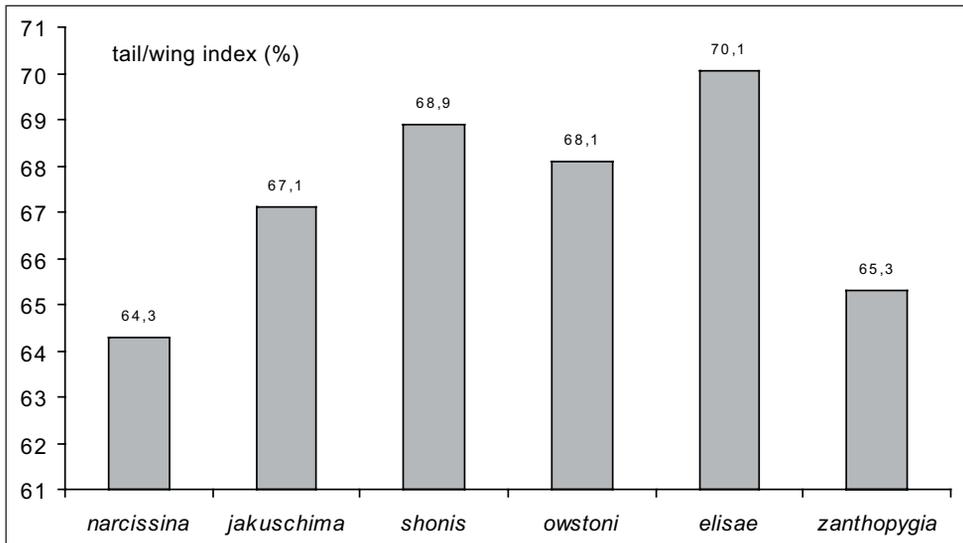


Fig. 6. Tail/wing index of the *Ficedula narcissina* subspecies *elisae* (n=60), *jakuschima* (n=20), *owstoni* (n=7), *shonis* (n=4) and *narcissina* (n=84).

If *elisae* should then turn out to be very distinct, it may be justified to regard it as a full species. However, our current knowledge does not prove convincingly that *elisae* is reproductively isolated from the other *narcissina* subspecies. For now it seems more reasonable to continue treating *elisae* as a *Ficedula narcissina* subspecies, pending further bioacoustic and molecular information on all *narcissina* forms.

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