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## Systematic Notes on Palearctic Birds. No. 2 Geographical Variation in *Ficedula tricolor*

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The small Slaty-blue Flycatcher (*Ficedula tricolor*) breeds in dense, mixed, evergreen, or conifer forests with undergrowth in the Himalayas, the Khasia, Manipur, and Chin Hills, the northern part of Yunnan, and the mountains of western China (fig. 1). Altitudinally, it breeds from about 6000 feet up to perhaps the timber line, the usual range being between 8000 and 12,000 feet. It is usually said to be non-migratory, but the western populations come down to winter in the foothills or adjacent plains, and the present study suggests that the eastern populations undertake extensive migratory movements.

The status of these eastern populations is confused. Many authors identify these populations (from Yunnan eastward) as *F. t. cerviniventris* described from Manipur, while a few others maintain that they should be referred to nominate *tricolor* described from Nepal. The second opinion expresses the correct affinities, but nomenclatural separation of these eastern populations from nominate *tricolor* seems desirable, as is shown by the present study which is based on specimens from virtually all of the known populations of the species. To present a clearer discussion of the geographical variation of the species, I propose here as follows:

### *Ficedula tricolor diversa* Vaurie, new subspecies

TYPE: A.M.N.H. No. 605993, Rothschild Collection; adult male; Lungan, now Pingwu, Mo Tien Ling Range, on the borders of Szechwan and Kansu; April 24 [May 8], 1893; Berezowski, collector.

SUBSPECIFIC CHARACTERS: Differs very distinctly from *F. t. cerviniventris* from Manipur and Chin Hills by lacking in both sexes the dull orange coloration of the under parts, including the throat, characteristic of these populations, and by being larger (table 1). Similar to

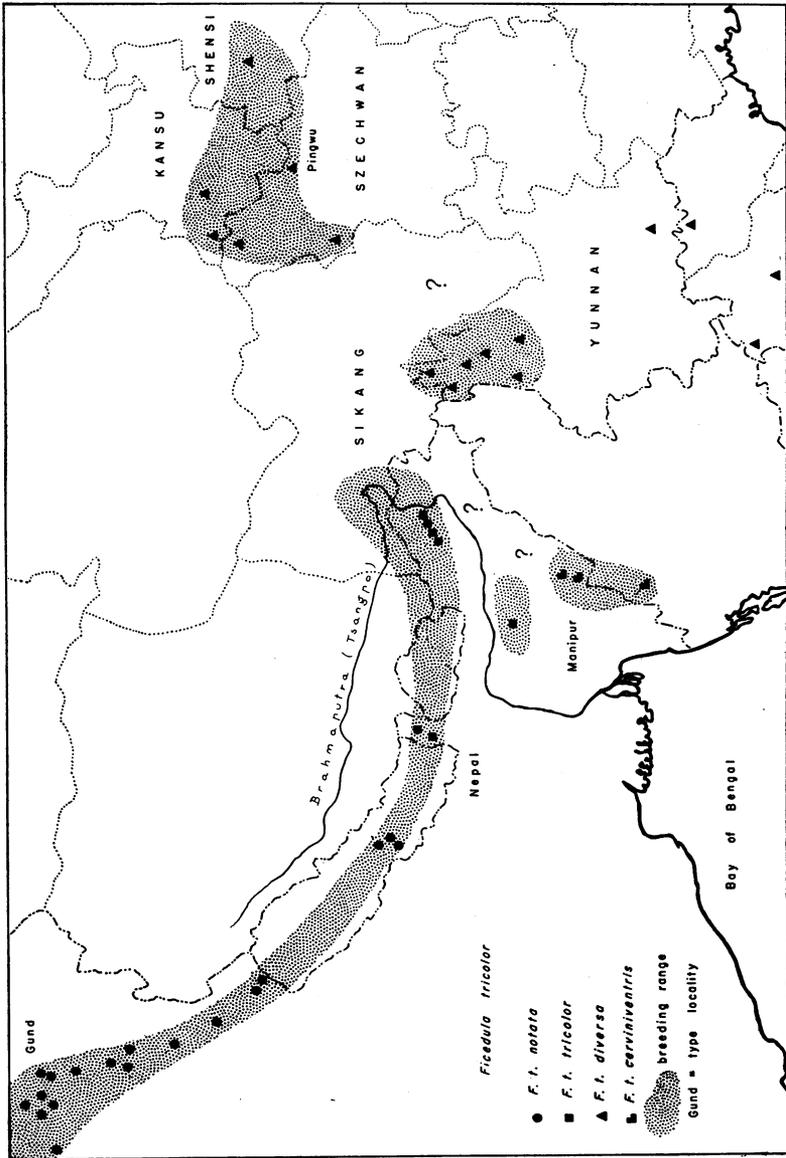


FIG. 1. Distribution of *Ficedula tricolor*.

nominate *tricolor* from eastern Nepal (see discussion below) and Sikkim to northeastern Assam, but darker, more saturated. The difference between nominate *tricolor* and *diversa* is one of degree, *diversa* being the end of a cline. The males of *diversa* are darker below, grayer, less rufous, more olive, and their throat is buffy instead of white or whitish; above, they average somewhat less bluish, a duller slate. Females of *diversa* average less rufous, more olive above and below.

MEASUREMENTS: See table 1.

RANGE: Western China (see below).

### GEOGRAPHICAL VARIATION OF THE SPECIES

The geographical variation in the northern populations (from Kashmir to Kansu and Shensi) is clinal, a very gradual cline of increasing pigmentation running from west to east. The southern populations (*ceruiniventris*) have a restricted range in Manipur and Chin Hills and are not part of this cline.

In the westernmost northern populations (*notata*) the males are white and pure gray below, without a tinge of rufous or olive; the females are a brighter and clearer rufous olive and have a redder tail. The clinal increase in pigmentation was correctly stated by Whistler who, in his description of *notata*, finds that the population of Nepal, the type locality of nominate *tricolor*, is intermediate between *notata* and darker populations to the east of Nepal.

The material that I have examined from Nepal, seven males and females from the region of Katmandu in central Nepal, apparently differs from the material examined by Whistler, for these specimens, although very slightly more saturated on an average, can hardly be distinguished from specimens examined from Kashmir and northern Punjab. I am forced to conclude that the range of the western *notata* extends as far east as this region. On the other hand, six specimens from Sikkim show a clear change in characters. These specimens are distinctly more saturated below and have a tinge of rufous lacking in specimens from the region of Katmandu.

The type locality of nominate *tricolor* (1845) is Nepal, but there is no certainty that the type came from central Nepal. It may have come from eastern Nepal or even Sikkim, for, according to Kinnear (*in* Ludlow and Kinnear, 1937, p. 32), Hodgson had left Nepal for Sikkim in 1843. Examination of the type might not necessarily be helpful, for the characters discussed are clinal and best appreciated in series. At any rate there would seem to be no objection in principle to a restriction of

the type locality of nominate *tricolor* to eastern Nepal, and I accordingly so restrict it.

Specimens from the Lakhimpur district of eastern Assam continue to show increasing saturation, but these specimens and identical specimens from the Khasia Hills do not show, in either color or size, any approach to *cerviniventris* from Manipur and Chin Hills. In many bird species, as remarked by Baker (1933), populations from the Khasia Hills show much greater affinity to populations north of the Brahmaputra than to those in the southern adjoining hills. It is probable that the population of *F. tricolor* in the Khasia Hills was derived from the populations of the Assam Himalayas via the Naga Hills, but I lack specimens from this last region, and I know of no records. A gap in distribution (fig. 1) owing to unsuitable territory may possibly separate the population of the Khasia Hills from the populations of Manipur and Chin Hills.

East of Sikkim the species breeds abundantly in the forests of Bhutan and in the Himalayas to the east, as well as in forested regions north of the Himalayan Range in southeastern Tibet and in southwestern Sikang, including the region around and north of the bend of the Tsangpo (Ludlow and Kinnear, 1937, 1944; Ludlow, 1951). These populations, identified as nominate *tricolor* by these authors, were not examined, but Kinnear (1944) finds that the under parts of males in southwestern Sikang are variable and these populations probably grade into *diversa* from northern Yunnan.

This last population continues to show increasing saturation, and the darkest populations of all are reached in Szechwan, Kansu, and Shensi. However, since the changes in characters discussed are very gradual, the population of northern Yunnan averages only slightly darker and grayer than the specimens from northeastern Assam, and, indeed, one male (Wantsang Ku Forest in extreme northwestern Szechwan) of five from Szechwan, Kansu, and Shensi has a whitish throat and is not separable from the specimens from northeastern Assam.

A gap (fig. 1) in southern Sikang separates the populations of northern Yunnan from those of Szechwan, splitting the range of *diversa* into two parts. The species was not found in this region by the two Dolan expeditions (Stone, 1933; Schäfer and de Schauensee, 1939), but while it cannot be expected on the steppes, it is not conspicuous and may occur in the forested river valleys of the southern parts of this region. If not, the population of northern Yunnan may be closer in its affinities to the populations of the eastern Himalayas than it is to the populations from Szechwan, Kansu, and Shensi. On the whole, however, it seems best referred to *diversa*.

Baker's statements of the breeding range of *cerviniventris* (1924,

1933) require comment. This author states that this race replaces nominate *tricolor* in "Northern Cachar, Manipur, Chin Hills to Yunnan, Shan States, Northern Siam and the hills of central Burma to Karenni, Yunnan." Actually the only breeding records cited are from the Khasia Hills and the Chin Hills. *F. t. cerviniventris* also breeds in the Manipur Hills, and comparison shows that this population and that of the Chin Hills are identical. It is possible that the species occurs elsewhere in Burma but probably only as a migrant, and it is not listed as occurring in Siam by Deignan (1945).

The species has been collected in southern Yunnan at Mengtsh, in Tonkin, and in northern Laos, but all the records are outside the breeding season which apparently does not start before early May. La Touche specimens from Mengtsh (1923) were collected from October 17 to April 20; from Tonkin on December 23 (Kinneer, 1929), and on April 6 (Bangs and Van Tyne, 1931); and from Tonkin and northern Laos from November to January (Delacour and Greenway, 1940). All the specimens examined by me, including those taken by La Touche at Mengtsh at the two extreme dates cited, and specimens from Tonkin and Laos are unmistakable *diversa*, some specimens being as dark as the darkest specimens from Szechwan, Kansu, and Shensi. I conclude that the species is only a winter visitor in these regions.

The nomenclature and ranges of the four races follow:

*Ficedula tricolor notata* Whistler

*Cyornis tricolor notatus* WHISTLER, 1930, Bull. Brit. Ornith. Club, vol. 50, p. 70, Gurd, Kashmir.

RANGE: Western and central Himalayas from Kashmir to central Nepal (region of Katmandu). Whistler reports a specimen, probably a migrant, taken in winter at Kohat in North West Frontier Province.

*Ficedula tricolor tricolor* Hodgson

*Digenea tricolor* HODGSON, 1845 (August), Proc. Zool. Soc. London, p. 26, Nepal, here restricted to eastern Nepal. *D. tricolor* Hodgson is not preoccupied by *Muscicapa tricolor* Hartlaub, 1845 (after December 10), Rev. Zool., p. 406 = *Ficedula zanthopygia* (Hay), beginning of 1845.

RANGE: Eastern Nepal east through Sikkim and Bhutan to Assam Himalayas, adjoining regions of southeastern Tibet and southwestern Sikang, and in the Khasia Hills.

*Ficedula tricolor diversa* Vaurie

RANGE: Western China, in northern Yunnan, and in western and northern Szechwan to southern Kansu and the Tsing Ling Range in

southern Shensi; migrates to southern Yunnan, Tonkin, and northern Laos.

*Ficedula tricolor cerviniventris* Sharpe

*Digenea cerviniventris* SHARPE, 1879, Catalogue of birds in the British Museum, vol. 4, p. 460, Manipur Hills.

RANGE: Manipur Hills and Chin Hills.

### MOLT AND PLUMAGES

A few molting specimens were examined, and the following notes may be in order as the publications consulted make no mention of the molt. Adults have a complete post nuptial molt which is well advanced or nearing completion in a male taken on July 26 in Kashmir and in August (August 22; no further dates) in males and females taken in northern Yunnan. A male taken on August 2 in Kashmir is very interesting. In this specimen the olive-brown body plumage and upper wing coverts are being replaced by slaty-blue feathers, and the middle primaries are half grown. These new quills are adult feathers, but the old primaries are rounded and seem to be juvenal feathers. According to Baker (1924), "The adult plumage is attained by degrees, and many young males breed in a halfway plumage between that of male and female." In this specimen the testes were minute and not in breeding condition, and the adult plumage was being acquired all at once. A specimen sexed as a female and noted as "laying" on May 6 in northern United Provinces has, however, a tail which is slaty-blue although not so dark as in the adult male. This specimen, despite the notation on the label, may be a first winter male. If I am correct, first winter males, or some of them at any rate, can be distinguished from the adult female by the shape of the primaries and, perhaps, the color of the tail feathers.

The immature is well spotted and the post juvenal molt seems to be partial and involves only the body plumage, the juvenal quills being retained.

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TABLE 1  
MEASUREMENTS OF ADULTS OF *Ficedula tricolor*

Race and Region	N	Wing	Tail	Bill from Skull
<i>F. t. notata</i>				
Kashmir . . . . .	4 ♂	60-63 (61.5)	49-54 (51)	12.5-13 (12.6)
	4 ♀	55-59 (57)	45-52 (50)	12.5-13 (12.6)
Kangra-Chamba . . . . .	6 ♂	59-63 (61)	49-55 (51)	12.5-13 (12.6)
	2 ♀	56, 58	43, 47	12, 13
Tehri-United Provinces . . . . .	2 ♀	57, 60	48, 50	12, 13
Central Nepal . . . . .	3 ♂	61-62 (61.3)	51-54 (52.6)	all 13
	3 ♀	54-60 (57)	44-48 (47)	all 13
<i>F. t. tricolor</i>				
Sikkim . . . . .	5 ♂	59-63 (61)	47-54 (50.5)	12.5-13 (12.7)
	1 ♀	55	45	12.5
Northeast Assam . . . . .	4 ♂	59-64 (61)	47-52 (52)	12-13.5 (12.6)
	3 ♀	57-58 (57.3)	44-48 (46)	12-13.5 (12.3)
Khasia Hills . . . . .	1 ♂	63	52	12.5
	1 ♀	58	48	12
<i>F. t. diversa</i>				
North Yunnan . . . . .	10 ♂	60-64 (62)	48-54 (50.5)	11.5-13.5 (12.6)
	5 ♀	59-61 (60)	45-51 (47.5)	12.5-13 (12.6)
South Yunnan, Tonkin, and Laos <sup>a</sup>	6 ♂	59-63 (62)	47-56 (53)	12.5-13 (12.7)
	3 ♀	58-59 (58.3)	all 49	12-13.5 (12.5)
Szechwan . . . . .	3 ♂	59-61 (60)	51-52 (51.3)	12.5-13 (12.6)
	2 ♀	60, 60	50, 51	12, 13
	♂ <sup>b</sup>	60	52	13
Kansu . . . . .	2 ♂	59, 63	50, 52	12.5, 13
Shensi <sup>c</sup> . . . . .	2 ♂	59, 61	50, 52	12.5, 12.5
	4 ♀	56-58 (57)	45-50 (47)	12-12.5 (12.2)
<i>F. t. cerviniventris</i>				
Manipur . . . . .	1 ♂	59	46	11.5
	1 ♀	55	46	11
Chin Hills <sup>d</sup> . . . . .	9 ♂	55-58 (56)	46-51 (49)	11-12.5 (12)
	5 ♀	52-54 (53)	44-49 (46)	11-12 (11.6)

<sup>a</sup> Winter visitors, see text.

<sup>b</sup> The type of *F. t. diversa*.

<sup>c</sup> All specimens very worn.

<sup>d</sup> Specimens measured by Stresemann from the Chin Hills (1940, Mitt. Zool. Mus. Berlin, vol. 24, p. 190) which include most of the material above, measure for the wing, 10 males, 54-58; eight females, 53-54.

The difference in size between *diversa* and *cerviniventris* is best shown by the wing and bill measurements which in all specimens is, in males: *diversa*, 23 specimens, wing, 59-64 (61.5); bill, 11.5-13.5 (12.7); *cerviniventris*, 10 specimens, wing, 55-59 (56.5); bill, 11.5-12.5 (11.9).

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