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## Systematic Notes on Palearctic Birds. No. 36 Picidae: The genera *Dendrocopos* (Part 2)<sup>1</sup> and *Picoïdes*

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The following notes were made during a study of the Palearctic races of *Picoïdes tridactylus* and the small Palearctic species (the pygmy or "ladderback" woodpeckers) of the genus *Dendrocopos*. The larger species of *Dendrocopos* (*D. medius*, *D. leucotos*, and *D. major* and its relatives) were reviewed in part 1 of the study of this genus.

This study was based primarily on the collections of the American Museum of Natural History, but I have also examined the series in the British Museum (Natural History) and borrowed many specimens. My gratitude is due to Mr. J. D. Macdonald and his staff for the kind reception and help they extended to me in London and to the following institutions and individuals for the loan of specimens: British Museum (Natural History) (Mr. J. D. Macdonald), Chicago Natural History Museum (Dr. A. L. Rand and Mr. M. Traylor), Museum of Zoology of the University of Michigan (Dr. R. W. Storer), and the Reichsmuseum Alexander Koenig in Bonn (Dr. G. Niethammer). I have also had the pleasure of discussing some species with Dr. F. Salomonsen.

### *Dendrocopos hyperythrus*

The Rufous-bellied Pied Woodpecker inhabits the Himalayas from Kashmir to Assam, Sikang, the hills of Assam south of the Brahma-

<sup>1</sup> For Part 1, see American Museum Novitates, no. 1946, 1959.

putra, Burma, northern Siam, and northern and western Yunan; an isolated colony is found also in southern Annam and another in central and southern Manchuria. Peters (1948, Checklist of birds of the world, Cambridge, Harvard University Press, vol. 6, p. 193) recognized four subspecies: one in Annam (*annamensis*) and three that are Palearctic exclusively or partly so. These last three, ranging from west to east, are: *marshalli* Hartert, 1912, type locality, Murree in extreme northwestern Punjab; nominate *hyperythrus* Vigors, 1831, type locality, Nepal; and *subrufinus* Cabanis and Heine, 1863, type locality, southern Manchuria.

*Dendrocopos h. marshalli* and *subrufinus* are larger than nominate *hyperythrus*, and *subrufinus* differs from the other two by being duller, ochre in worn plumage and pale chocolate brown in fresh plumage, but not rufous as in *marshalli* and nominate *hyperythrus*; the white markings of the upper parts average also slightly bigger. In specimens of *marshalli* and nominate *hyperythrus* in comparative plumage the hue and shade of the rufous pigment of the under parts vary individually but to the same extent in both races; in *marshalli* the crimson area on the head of the male is more extensive than in nominate *hyperythrus*, extending, as a rule, farther back onto the nape and also to the sides of the neck. The wing length of males in the three races is: *marshalli*, 124–131 (127.7) in 13 specimens; nominate *hyperythrus*, 115–124 (120.2) in 18 specimens from the Himalayas; *subrufinus*, 125–136 (131.3) in nine specimens.

Peters (*loc. cit.*) has apparently overlooked *heinrichi* Stresemann (1940, Mitt. Zool. Mus. Berlin, vol. 24, p. 235), type locality, Chin Hills; and two new forms were described recently by Koelz: *haemorrhous* (1952, Jour. Zool. Soc. India, vol. 4, p. 44), type locality, Karong, Manipur; and *henoticus* (1954, Contrib. Inst. Reg. Explor., no. 1, p. 22), type locality, Mawryngkneng, Khasia Hills. However, I find that these forms are not separable from one another, or from nominate *hyperythrus*, with which the three names should be synonymized. The series that I have seen from the Chin Hills, Manipur, Khasia Hills, and Himalayas exhibit a certain amount of individual variation in the size of the white markings, or the hue of the red pigment of the under parts, but the variation is slight, and the range of variation is precisely the same in all four series, many specimens being identical. The only evidence of geographical variation is in size, the birds south of the Brahmaputra averaging smaller, those of Manipur being smallest. However, some of the individuals from the Himalayas are small, and the populations of the Chin and Khasia Hills are intermediate in size.

It is best, therefore, not to recognize any dimensional races. The individual wing lengths of the males in the populations under discussion are: Himalayas, Nepal, 119, 119, 120, 121, 122; Himalayas, Sikkim, 115, 119, 119, 120, 122, 123, 124, 124; Himalayas, Bhutan, 115, 116, 119, 123, 123; Khasia Hills, 112, 114, 117, 119, 119, 119, 121; Manipur, 114, 114, 114, 114, 115, 115, 116; Chin Hills, 112, 114, 114, 115, 116, 117, 118, 119, 122. The material of *heinrichi* that I have compared with series from the Himalayas consists of six paratypes and five additional topotypes; of *haemorrhous*, six paratypes and two topotypes; and of *henoticus*, nine specimens, including seven paratypes. I am particularly grateful to Dr. Storer for making the paratypes of the forms described by Koelz available to me.

Another synonym of nominate *hyperythrus* is *miniakorum* Meise (1934, Abhandl. Ber. Mus. Dresden, vol. 18, no. 2, p. 53), type locality, Tatsienlu [now Kangting, eastern Sikang]. Yen (1933, L'Oiseau, p. 622) states that his four specimens from Tatsienlu resemble "very closely" those of the Himalayas, and *miniakorum* has been synonymized with nominate *hyperythrus* by Peters (*loc. cit.*). One specimen each that I have seen from central and eastern Sikang are identical with nominate *hyperythrus*.

The range of *subrufinus* is said by Peters to be "Central Manchuria and northern Korea southward through eastern and central China to northern Tonkin." However, Peters does not seem to have been aware that *subrufinus* is very decidedly migratory, as the other subspecies are not, and is known to breed with certainty only in Manchuria from Harbin southward. It seems likely that it breeds also in Korea, as stated by the "Hand-list of the Japanese birds" (1942, ed. 3, p. 90), at least in the north where it has been collected in May and June, according to Austin (1948, Bull. Mus. Comp. Zoöl., vol. 101, p. 165), but definite proof is lacking. *Subrufinus* is a regular but uncommon migrant in northern China in Hopeh, where Shaw (1936, Zool. Sinica, ser. 8, vol. 15, p. 557) says it passes through in May and from the end of August to September. Migrants have been examined by me from Hopeh (May 10-26 and September 11) and Shantung (September 5), and I have examined two typical winter visitors collected at Laokay and Chapa in Tonkin (December 17, 22). See also map 84 in Cheng's "Distributional list of Chinese birds" (1955, Peking) which shows *subrufinus* as breeding only in Manchuria and wintering from the Yangtze southward. La Touche (1931, A handbook of the birds of eastern China, London, Taylor and Francis, vol. 2, p. 13) quotes a record of *subrufinus* for July 7 in "Szechwan" given by Thayer and Bangs. Reference to these

authors (1912, Mem. Mus. Comp. Zoöl., vol. 40, p. 160) shows that this record is from Tatsienlu [Sikang], though another specimen was collected at "Nochianghsien, Szechwan," on April 23. It seems probable to me that the July record applies to a specimen of nominate *hyperythrus* misidentified by Thayer and Bangs.

*Dendrocopos auriceps*

The Brown-fronted Pied Woodpecker ranges from eastern Afghanistan and North West Frontier Province eastward along the outer ranges of the Himalayas to central Nepal. No subspecies were recognized until recently, when Rand and Fleming (1956, Fieldiana, zool. ser., vol. 39, no. 1, p. 1) described the birds of central Nepal, naming them *conoveri*. Unfortunately, Rand and Fleming have overlooked the existence of *Picus incognitus* Scully (1879, Stray Feathers, vol. 8, p. 246) which is based on a female collected in the "Valley of Nepal" [at Katmandu] on March 2, [1878]. The birds of central Nepal are smaller than nominate *auriceps* Vigors, 1831, type locality, Simla, and the females are said by Scully and by Rand and Fleming to be brighter yellow on the nape, more golden.

The males that I have measured from central Nepal have a wing length of 110, 111, 111, 111, and the 10 measured by Rand and Fleming one of 105, 105, 108, 109, 109, 110, 111, 111, 112, 115, giving an average of 109.9 for the 14 specimens, as against 114, 115, 116, 116, 117, 117, 117, 117, 119, 119, 119, 120, 121 (117.4) in males from Simla measured by me.

The color characters are not constant in the material I have seen. Only four of 12 females examined from central Nepal are brighter yellow, one of these being the type of *incognitus*. Rand and Fleming mention also that the fore crown is more fulvous in specimens of both sexes from Nepal and that the males average more yellow on the nape, but they add that this character is not constant and consider that the difference in the color of the fore crown is slight. These two characters do not seem to be diagnostic, as they are even more inconstant in the material that I have examined than the color of the nape in the females.

Rand and Fleming remark that "Neither character [i.e., size and color of the nape in the females] would perhaps merit naming the eastern bird, but the two characters together seem an adequate basis for separating two subspecies." The color difference is not constant, but, if a subspecies is recognized in Nepal, its correct name is *incognitus*.

The specimens measured by Rand and Fleming suggested that a cline of decreasing size runs from west to east, but this is not well shown by the specimens I have measured, the wing length of males listed from west to east being: North West Frontier Province, Murree, and Kashmir, 115, 117, 117, 117, 119, 120 (117.5); Chamba, Kulu, Kangra, and Dharmasala, 112, 112, 113, 114, 114, 114, 115, 115, 115, 116, 116, 116, 116, 117, 117, 118, 119, 120 (115.6); Simla, 114–121 (117.4) see above; Mussoorie, 114, 116, 117, 119 (116.5); Kumaon, 113, 115, 116, 120 (116); central Nepal 110, 111, 111, 111.

### *Dendrocopos minor*

The Lesser Spotted Woodpecker ranges from northwest Africa and Europe, including England and Wales, eastward to Asia Minor, the Caucasus, and Iran, and, in the north, eastward across Siberia south to Dzungaria and northern Mongolia, to Anadyrland, Kamchatka, Sakhalin, Hokkaido, and from Amurland and Ussuriland south to central Manchuria and northern Korea. It varies geographically, but its variation is relatively slight and predominantly clinal in character, the populations becoming darker and smaller from north to south and larger and paler from west to east. Nevertheless, it has been badly oversplit; for instance, Domaniewski (1927, *Ann. Zool. Mus. Polonici Hist. Nat.*, vol. 6, pp. 60–91) divided its populations into 21 subspecies. Seven additional subspecies have been described since. Dementiev (1937, *Alauda*, vol. 9, pp. 287–299) has synonymized a number of forms in his study of the eastern populations, but Peters (*op. cit.*, pp. 195–198) still recognizes 19 subspecies. It seems amply sufficient to me to recognize only 13, several of which are only slightly differentiated. It is possible that one of the 13, namely, *hyrcanus*, is not valid, but I have seen no specimen of *quadrifasciatus* to which it should be compared. Dementiev (*loc. cit.*) has questioned the validity of *hyrcanus*, and this name was synonymized with *quadrifasciatus* by Gladkov (1951, *Birds of the Soviet Union*, vol. 1, pp. 602–608). The 13 races are listed below, with a brief diagnosis and statement of their ranges.

1. *Dendrocopos minor minor* Linnaeus, 1758, type locality, Sweden, with the following synonyms: *transitivus* Loudon, 1914, type locality, Livonia; *lönnerbergi* Domaniewski, 1927, type locality, Lapland; *menzbieri* Domaniewski, 1927, type locality, Saratov, southern Russia; and *obliotus* Gavrilenko (1948, *Uchenia Zapiski Poltava Gos. Ped.*, vol. 6, p. 126), type locality, Ukraine. This race is whitish below, slightly washed to a varying degree with ocher, moderately or slightly streaked with black on the sides of the breast and flanks, and moderately spotted

with black on the under tail coverts. It inhabits northern continental Europe and the northern parts of western Siberia southward to East Prussia, northern and eastern Poland, the Ukraine, the gouvernements of Voronezh and Saratov, and the forests along the Volga to the head of its delta.

The southern and eastern limits of the breeding range cannot be defined with certainty, as nominate *minor* intergrades with *hortorum* to the south and into *kamtschatkensis* to the east and southeast, the populations between the Urals and the Irtysh being more or less intermediate between the latter and nominate *minor*. On the northern borders of the range, from northwestern Siberia westward across northern Russia to northern Finland and Lapland, the populations average whiter and less streaked and have received the names *transitivus* and *lönnerbergi*, the latter being a synonym of *transitivus* which was based on migrants and winter visitors to Livonia. Many specimens from the north are, however, indistinguishable from topotypical nominate *minor*, and Dementiev (*loc. cit.*) and Gladkov (*loc. cit.*) have synonymized *transitivus* as well as *lönnerbergi* with nominate *minor*. These authors have also added *menzbieri* and *obliotus* to the synonymy.

2. *Dendrocopos minor kamtschatkensis* Malherbe, 1861, type locality, Okhotsk, with the following synonyms: *mongolicus* Buturlin, 1908, type locality, Dzungaria; and *neglectus* Portenko (1937, Fauna Ptits Vnepoliar, Chasti Severnogo Ural, pp. 80, 226), type locality, Omsk, western Siberia. This race differs from nominate *minor* by being paler and slightly larger. It is whiter on the back, not streaked on the under parts or only faintly so in a few specimens, and less heavily and symmetrically barred with black on the tail. This diagnosis is based on specimens that I have seen, collected from the Yenisei eastward, which are clearly separable from nominate *minor*, but the validity of *kamtschatkensis* has been questioned because, as stated above, the populations in the west grade into nominate *minor* and those from the Altai and Sayans to Lake Baikal and Transbaikalia are inconstant, many specimens being more or less similar to *amurensis*, a race that is very similar to nominate *minor*.

The range of *kamtschatkensis* extends from the Urals and Siberia (east and south of nominate *minor*) to the coast of the Sea of Okhotsk north to about longitude 150° E., southward to the forested steppes, Zaisan Nor, northwestern Dzungaria, northern Mongolia, Transbaikalia (to perhaps northwestern Manchuria), the Stanovoi Range, and the Gulf of Uda.

The forms *mongolicus* and *neglectus* represent intermediates be-

tween nominate *minor* and *kamtschatkensis* and are not considered to be sufficiently distinct by Johansen (1955, Jour. Ornith., vol. 96, p. 391) to warrant recognition.

Measurements of the northern and eastern races (wing and bill length in males measured by me) follow:

NOMINATE *minor*: Scandinavia, 89, 90, 92, 92, 93, 93, 93.5, 94, 94, 94, 94, 94, 94, 94, 95, 95, 95, 95, 96, 97 (93.7); 17, 17.5, 17.5, 18, 18, 18, 18, 18, 18, 18, 18.5, 18.5, 18.5, 18.5, 19, 19, 19, 19, 19.5, 19.5, 20.5 (18.5).

*Dendrocopos m. kamtschatkensis*, 94, 94, 94, 95, 96, 96, 96, 96, 96, 97, 98, 98, 98.5, 101 (96.4); 18.5, 18.5, 19, 19, 19, 19, 19, 19.5, 20, 20, 21, 21, 21 (19.5).

*Dendrocopos m. amurensis*, 90, 90, 90, 91, 91, 92, 92, 92, 92, 93, 93, 94, 94, 94, 95, 95, 96, 96 (92.8); 16, 17, 17, 17, 17, 17, 17, 17.5, 17.5, 18, 18, 18, 18, 18, 18, 18.5, 19, 19 (17.7).

*Dendrocopos m. immaculatus*, 97, 97, 99, 99; 20.5, 21, 21.5, 22.

3. *Dendrocopos m. amurensis* Buturlin, 1908, type locality, lower Amur River, with *nojidoensis* Yamashina, 1930, type locality, northern Korea, as a synonym. This race is very similar to nominate *minor*, but the under parts are a little more grayish, not washed with ocher, and, as a rule, are better streaked; the white area on the back is usually a little more heavily barred with black; and the wing and bill average slightly shorter.

The range of *amurensis* is Amurland (intergrading with *kamtschatkensis* in the west), south to Ussuriland, northern and central Manchuria (but perhaps replaced in the northwest by *kamtschatkensis* or intermediate populations), northeastern Korea, and the islands of Sakhalin and Hokkaido. However, according to Austin and Kuroda (1953, Bull. Mus. Comp. Zoöl., vol. 109, p. 491), there are no breeding records for Hokkaido, and the species has not been collected on the island in recent years, but Austin and Kuroda believe that it may breed in the northern part of the island and that its numbers have probably declined because of extensive deforestation.

Voous (1947, Limosa, vol. 20, pp. 1-142) has synonymized *amurensis* with nominate *minor* in his review of the genus *Dendrocopos*. However, although *amurensis* is poorly differentiated from nominate *minor*, and some specimens of the two forms are identical, I agree with Johansen (*loc. cit.*) that it seems misleading to synonymize *amurensis* with nominate *minor*. The two are very widely separated geographically, and, though they have come to resemble each other closely, it seems desirable to recognize *amurensis* on slighter morphological grounds than would otherwise be acceptable. The specimens that I have seen from northern Korea are identical with toprotypical *amur-*

*ensis* and show that *nojidoensis* is not valid, a conclusion already reached by Austin (1948, Bull. Mus. Comp. Zoöl., vol. 101, p. 162).

4. *Dendrocopos minor immaculatus* Stejneger, 1884, type locality, Kamchatka. This race is whiter than the preceding, being virtually snow white on the lower back and under parts which are not streaked, the under tail coverts are not spotted, and it averages larger. It is restricted to the forests of Anadyrland south to the region of Gizhiga on the northern gulf of the Sea of Okhotsk and to Kamchatka.

5. *Dendrocopos m. hortorum* C. L. Brehm, 1831, type locality, Thuringia, Germany, with the following synonyms: *bacmeisteri* Kleinschmidt, 1916, type locality, northern France; *silesiacus* Kleinschmidt, 1917, type locality, Silesia; and *jordansi* Götz, 1925, type locality, Salzburg, Austria. This race is poorly differentiated, as it is intermediate in coloration and size between nominate *minor* and *buturlini*, being more earthy and better streaked below than nominate *minor* and darker, more barred with black on the back but slightly less brownish and less streaked below, than *buturlini*, a little whiter on the back, and somewhat less heavily barred with black on the tail.

The range is western and central Europe, south of nominate *minor* with which it intergrades, from Poland and Germany south to France, Switzerland, Austria, and Hungary. It is not found in Denmark where the species does not breed, and the populations of France and perhaps also Hungary are more or less intermediate between *hortorum* and *buturlini*. The limits of the range cannot be defined with certainty.

Voous (*loc. cit.*) states that the populations of Switzerland and Austria are not separable from *buturlini* and accordingly suggests that *jordansi* is a synonym of *buturlini*, questioning the decision of Hartert and Steinbacher (1933, Die Vögel der paläarktischen Fauna, Ergänzungsband, p. 370) who had synonymized *jordansi* with *hortorum*. However, Voous had only one specimen of *buturlini* and no specimens from Austria. The specimens that I have compared from Lichtenstein, Carinthia, and the region of Vienna to a long series of topotypical *buturlini* are certainly not distinguishable from *hortorum*, but specimens from the Valais and Tessin in southern Switzerland, though intermediate between *hortorum* and *buturlini*, are more similar to the latter on the whole. The two specimens that Voous reports from Hungary seem also to be intermediate, but one that I have seen from western Hungary is *hortorum*.

Measurements of the southern races (wing and bill lengths in males measured by me) are as follows:



*Dendrocopos m. hortorum*, Germany: 87, 87, 89, 90, 90, 90, 91, 91, 91.5, 92, 93 (90.1); 16, 16.5, 16.5, 16.5, 17, 17, 17.2, 17.5, 17.5, 17.5, (17).

*Dendrocopos m. comminutus*: 85, 85, 85, 85, 86, 86, 86, 86, 86, 86, 87, 87, 88, 88, 88, 88, 88, 89, 89, 90 (86.9); 15.5, 16, 16, 16, 16, 16, 16.5, 16.5, 16.5, 16.5, 16.5, 17, 17, 17, 17, 17.5, 18 (16.5).

*Dendrocopos m. buturlini*, Italy: 85, 87, 87, 87, 89, 89, 89, 89 (87.7); 15.5, 16, 16.5, 16.5, 17, 17, 17.2, 17.5 (16.7).

*Dendrocopos m. ledouci*: 87, 87, 88; 16, 16.5, 18.

*Dendrocopos m. danfordi*, Taurus: 85, 85, 86, 87, 88; 17, 17.5, 17.5, 18.5, 18.5.

*Dendrocopos m. colchicus*, northern Caucasus: 90, 91, 91, 92, 92; 16.5, 17, 17, 17, 17.2.

*Dendrocopos m. hyrcanus*: 82; 17.5.

*Dendrocopos m. morgani*: 84, 86, 88, 88; 17, 17.5, 18, 20.

6. *Dendrocopos m. comminutus* Hartert, 1907, type locality, England. This race is similar to *hortorum* in general coloration but distinctly darker and browner and less streaked below, the streaks being much reduced in size and number and only faintly indicated in many specimens; it averages a little smaller. The range is England and Wales where it is local.

7. *Dendrocopos m. buturlini* Hartert, 1912, type locality, Italy, with the following synonyms: *wagneri* Domaniewski, 1927, type locality, Romania; *serbicus* Buturlin (1936, Polny Opredel. Ptits S.S.S.R., vol. 3, p. 205), type locality, Montenegro; *hispaniae* von Jordans (1938, Falco, vol. 34, p. 52), type locality, Spain; and *heinrichi* von Jordans (1940, Izv. Tzar. Prirod. Inst. Sofiya, vol. 13, p. 131), type locality, Bulgaria. This race is compared above to *hortorum*. Its range is southern and southeastern Europe in the Iberian, Italian, and Balkan peninsulas. It intergrades with *hortorum* in France and southern Switzerland and probably eastern and southern Hungary and shows a tendency towards *danfordi* in Greece and one towards *ledouci* in Spain south of the Pyrenees.

The populations of *buturlini* are not perfectly homogeneous and show several trends in their geographical variation, but this variation is very slight and, judging by the material I have seen, has been greatly overemphasized by Domaniewski and von Jordans. Four specimens from Romania, which consist of the type and three paratypes of *wagneri*, average only faintly paler, more grayish, and less streaked than topotypical *buturlini*. All the differences are scarcely appreciable. The type and one cotype of *heinrichi* can be matched perfectly with the type of *buturlini*, but some specimens from Italy are very slightly darker, less whitish, though somewhat less heavily streaked, than the two specimens from Bulgaria. These are the only specimens I have seen

from that country, and a series might show a difference in average coloration, but the type and cotype of *heinrichi* do not suggest a constant difference of taxonomic importance. A series of 15 specimens from Spain collected south of the Pyrenees and which includes nine topotypes of "*hispaniae*," two of which are labeled "cotype," averages purer white and deeper black than topotypical *buturlini*, thus showing some approach to *ledouci* of North Africa. However, such differences as exist between the birds of Spain and those of Italy can be discerned only with difficulty, and, furthermore, the difference between *ledouci* and *buturlini* is not sufficiently well marked to warrant the recognition of a vaguely differentiated intermediate form in the Peninsula. Specimens examined from the Pyrenees are identical with topotypical *buturlini*. This is true also of a series of 14 birds from Hercegovina, Serbia, Montenegro, and Albania which shows that *serbicus* is not valid.

There is some doubt, however, concerning the subspecific status of the birds of Macedonia and Greece. Stresemann (1920, *Avifauna Macedonia*, Munich, Dultz and Co., p. 211) had one specimen from Macedonia, and Voous (*loc. cit.*) had two from Greece, which they identified as *danfordi*, a race that differs from *buturlini* chiefly by having a more or less well-indicated band of black behind the ear coverts connecting the black malar stripe to the black of the crown. However, two specimens that I have seen from Macedonia are not separable from *buturlini*, though one shows a vague band of black behind the cheek. I believe the populations of Macedonia and Greece will probably be found to be more or less intermediate between *buturlini* and *danfordi*, but until more abundant material can be compared it seems desirable to restrict the range of *danfordi* to Asia Minor.

I am especially grateful to Dr. G. Niethammer who kindly lent me, among other material, the type and cotype of *heinrichi* and the cotypes and topotypes of *hispaniae*.

8. *Dendrocopos m. ledouci* Malherbe, 1855, type locality, Algeria. This race, which is restricted to the oak forests of northern Algeria and northern Tunisia, differs only slightly from *buturlini*, but the black areas of its plumage are a little deeper and purer black, the pale areas purer white, and the back is also a little more heavily and broadly banded with black.

9. *Dendrocopos m. danfordi* Hargitt, 1883, type locality, Asia Minor. This race differs from *buturlini* by having, as stated above, a band of black behind the ear coverts, a character that distinguishes it also from all the preceding races. It is similar to *buturlini* in size and general

coloration but is a little more heavily streaked on the flanks. *Danfordi* is known so far only from the Taurus, but the distribution of bird life in Asia Minor is imperfectly known, and it probably occurs in other regions, as specimens from Transcaucasia are more or less intermediate between *danfordi* and *colchicus*, which suggests that the two races intergrade.

10. *Dendrocopos m. colchicus* Buturlin, 1908, type locality, northern Caucasus, with *harterti* Domaniewski, 1927, type locality, region of Tiflis, Transcaucasia, as a synonym. *Harterti* Domaniewski, 1927, is preoccupied by *Dendrocopos major harterti* Arrigoni, 1902, and was renamed *ernsti* by Domaniewski in 1933. This race is whiter on the back than *danfordi*, the back being less heavily banded with black, and has a somewhat longer wing (see above). The black connecting band behind the ear coverts is present in some specimens but lacking in others, but when present is less distinct than in *danfordi* and more or less interrupted. Its range is the Caucasus and Transcaucasia.

Domaniewski has described a subspecies from Transcaucasia, naming it *harterti*, stating that it is similar to *colchicus* but has a more slender bill and is less white on the back. The new race was based on one specimen from the region of Tiflis selected for the type, three from Lagodekhi, and one from Zakataly near Lagodekhi. The type and the specimen from Zakataly are in the collection of the American Museum of Natural History and are identical, I find, with a series from the northern Caucasus as far as the shape or size of the bill is concerned, but these two specimens are somewhat less white on the back. The difference is slight and does not warrant nomenclatural separation, but these specimens are interesting, as they suggest that *colchicus* and *danfordi* may intergrade in Transcaucasia. The color of the back is intermediate, and the type of *harterti* has a very distinct and unbroken band of black behind the ear coverts, but in the specimen from Zakataly the band is interrupted and only vaguely shown as in most specimens from the Caucasus.

11. *Dendrocopos m. quadrifasciatus* Radde, 1884, type locality, Talych. This race, which is restricted to the forests of Talych at the southwestern corner of the Caspian Sea, was not examined by me. It is said to be darker below than *colchicus*, more brownish, more heavily streaked, not banded with black behind the ear coverts, and not spotted with white at the tips of the middle upper wing coverts; these coverts are tipped with white in all the races listed so far. All these characters are shown by three specimens of *hyrcanus* that I have seen, and it is possible that *hyrcanus* is a synonym of *quadrifasciatus*. Hartert

(1921, Die Vögel der paläarktischen Fauna, p. 2188) states that *hyrcanus* is darker brown and more streaked below than *quadrifasciatus*, but it is not clear if he has examined the latter. Stresemann (1928, Jour. Ornith., vol. 76, p. 397) recognized *hyrcanus* but without comparing it to *quadrifasciatus*. Dementiev (*loc. cit.*) states that "very probably" *hyrcanus* is not valid but did not examine it.

12. *Dendrocopos m. hyrcanus* Zarudny and Bilkevitch, 1913, type locality, Gurgan, at the southeastern corner of the Caspian. This race, if valid (see above), is restricted to the southern Caspian districts of northern Iran where, so far, it has been reported and collected only in Mazanderan.

13. *Dendrocopos m. morgani* Zarudny and Loudon, 1904, type locality, Bakhtiari, Zagros, southwestern Iran. This race, which inhabits the Zagros Mountains eastward to Fars, is well differentiated. The ground color of the breast and abdomen is quite pale, about as whitish as in nominate *minor*, but the throat is buffy brown and contrasts with the breast and abdomen, and the breast and sides of the body are very sharply streaked with black down to the lower flanks. A black connecting band is present behind the ear coverts in most specimens, and the middle upper wing coverts are tipped with white. The bill is proportionately longer than in any other race and very attenuated in some individuals.

#### *Dendrocopos canicapillus*

The Gray-headed Pygmy Woodpecker ranges from Ussuriland, eastern Manchuria, and Korea southward through China, including Formosa and Hainan, to the Indo-Chinese countries south through the Malay Peninsula to Sumatra and Borneo, and west through Assam to eastern Bengal and the foothills of the Himalayas to northern Punjab. It varies quite a good deal geographically, and many subspecies have been described. Greenway (1943, Auk, vol. 60, pp. 564–574) has recognized 15 but questions the validity of one of these, and several represent only rather poorly differentiated forms. He states that, with some exceptions, "all [races] are more or less ill-defined, unsatisfactory forms." Peters (*op. cit.*, pp. 198–200) recognized the same races as Greenway. Biswas (1950, Proc. Zool. Soc. Bengal, vol. 3, no. 1, pp. 1–37) has also reviewed the species and recognizes the same subspecies but has revived an additional one, namely, *szetschuanensis* Rensch, 1924, which had been synonymized with *omissus* Rothschild, 1922, by Greenway, Peters, and Hartert and Steinbacher (1935, Die Vögel der paläarktischen Fauna, Ergänzungsband, p. 374). The revival of *szetschuanensis* is not warranted, as discussed below in the brief review of the Pale-

arctic races. These are only three in number, and their geographical variation is clinal in character.

1. *Dendrocopos canicapillus doerriesi* Hargitt, 1888, type locality, Askold Island, Ussuriland. This race, which ranges from Ussuriland from about latitude 49° N. southward to Askold Island, eastern Manchuria, and Korea, inhabits the northern extremity of the range of the species and is the palest and largest.

2. *Dendrocopos canicapillus scintilliceps* Swinhoe, 1853, type locality, Peking. This race is intermediate in coloration between *doerriesi* and *omissus*. It is darker, less white, more heavily barred with black on the back, than *doerriesi*, a little less pale and somewhat more heavily streaked below, and the white spots on the wing, including the coverts, are smaller. *Omissus* is darker above and below than *scintilliceps*, more heavily barred on the back, more brownish and more heavily streaked below, and its white spots on the wing are smaller. *Scintilliceps* inhabits northern and eastern China from Hopeh southward to northern Szechwan, Hupeh, Anhwei, and Chekiang, but its southern limits cannot be defined with certainty, as it grades into *nagamichii*, which replaces it in southern China, and with *omissus* in northwestern Szechwan. The trend towards *omissus* is discernible also in southern Shensi. *Scintilliceps* probably intergrades with *doerriesi* in the north.

3. *Dendrocopos canicapillus omissus* Rothschild, 1922, type locality, Likiang Range in northwestern Yunnan, with the following synonyms: *obscurior* Rothschild, 1922, type locality, Likiang Range, and *szetschuanensis* Rensch, 1924, type locality, Kwanhsien, western Szechwan. This race is compared above to *scintilliceps*. It ranges from northwestern Szechwan, southwestern Kansu, and the mountains of western Szechwan, westward through Sikang to northwestern Yunnan, grading farther south in Yunnan into *obscurus* La Touche, 1921, type locality, southeastern Yunnan.

Rensch had not seen *omissus* when he described *szetschuanensis*, comparing the latter only to *scintilliceps*, but two of his paratypes that I have seen from Kwanhsien are only very slightly paler than topotypical *omissus*. The difference is not of taxonomic importance, and Hartert and Steinbacher, Greenway, and Peters were correct in synonymizing *szetschuanensis* with *omissus*. However, Biswas believes *szetschuanensis* should be revived, stating that the birds of Szechwan and Shensi are intermediate in coloration between *scintilliceps* and *omissus* and differ from both by having a "larger" [i.e. longer] bill. He mentions also that Rensch stated that *szetschuanensis* differed from *scintilliceps* by being yellowish at the base of the lower bill [rather than grayish]. This last difference is not a taxonomic character, as specimens

which are more or less yellowish or grayish at the base of the bill are found throughout the range of the species. Older skins are grayish, and the color of the bill is probably correlated also with physiological factors. The measurements given below show no differences in the length of the bill or only very trivial ones in average.

The birds of Shensi are a little darker than those of Hopeh and Shantung (typical *scintilliceps*), but they are clearly paler, have larger white spots, and are much less heavily streaked, than those of western Szechwan (topotypical *szetschuanensis*), the latter differing only very slightly from topotypical *omissus* as stated above. It seems to me that Biswas was misled by the clinal variation in combining the populations of Shensi and Szechwan. This type of variation renders a division for nomenclatural purposes more or less arbitrary, but I believe that the ranges of *scintilliceps* and *omissus* are essentially correct as I define them above and that *szetschuanensis* should be synonymized with *omissus*.

*Dryobates obscurior* Rothschild is known from a single specimen that was described as a separate species, but critical examination of the type shows that it is an immature specimen of *omissus*. It is a female collected in May, 1921, by Forrest at apparently the same time that he collected other specimens of *omissus*, though this was not made clear by Rothschild (1923, *Novitates Zool.*, vol. 30, p. 39). Hartert (1925, *ibid.*, vol. 32, p. 147) has puzzled subsequent authors by stating in his discussion of the type of *obscurior* that it was "very peculiar" and that he was "not sure about its relationship," failing to mention that it was a young bird, though there can be no difference of opinion whatever that the bird was immature. Subsequent authors did not recognize *obscurior*, considering that it probably represented only an "aberrant" or "melanistic" individual of *omissus*, but the specimen does not seem aberrant or melanistic to me. All its characters (brownish black fore crown, heavy, diffused streaking, and small bill) are matched by those of other immature specimens I have seen.

Measurements of adult males, wing and bill lengths, are:

*Doerriesi*, 105, 105, 106, 106, 107, 107, 108, 108, 109, 110 (107); 19, 20, 20, 21, 21, 21, 21.2, 21.5, 21.5, 21.5 (20.8).

*Scintilliceps*: Hopeh and Shantung, 98, 99, 101, 102, 104, 106 (101.7); 18, 18, 18.5, 18.5, 19, 19, (18.5); Shensi (Tsinling Range), 99, 102, 102, 103, 104, 106, 108 (103.4); 18.5, 18.5, 19, 19.5, 19.5, 20, 20.5 (19.4).

*Omissus*: Western Szechwan, 102, 102, 104, (102.7); 18, 19, 20.5 (19.1); Likiang Range, 103, 103, 104, 104, 105, 108 (104.5); 18, 19, 19.5, 19.5, 20.5 (19.4).

*Dendrocopos kizuki*

The Japanese Pygmy Woodpecker ranges on the continent from Ussuriland south to Korea and northeastern Hopeh, and on the islands from Sakhalin and the southern Kuriles south through Japan to the southern Ryu Kyus and inhabits also Quelpart, Tsushima, and the Seven Islands of Izu. It varies geographically and has been split into about 20 subspecies, 13 of which were recognized by Peters (*op. cit.*, pp. 200–202). However, the geographical variation is relatively slight and clinal, and I believe it is ample to recognize only nine, some of which are slightly differentiated only, such as *matsudairai*, *kotataki*, *amamii*, and probably *orii*. The cline involves an increase in color saturation from north to south, accompanied by a decrease in size.

The material used for this review consists of the combined collections of the British Museum (Natural History) and the American Museum of Natural History, but I have been unable to see specimens of two races: *wilderi* from Hopeh and *orii* from the southern Ryu Kyus. These two races were described by Kuroda, whose collection was destroyed during the war. *Wilderi* is represented in the collection of the Academia Sinica in Peking, but *orii* was known from only two specimens in the Kuroda Collection.

1. *Dendrocopos kizuki ijimae* Taka-Tsukasa, 1922, type locality, Sakhalin, with the following synonyms: *kurilensis* Bergman, 1931 (November 24), type locality, Kunashiri Island, southern Kuriles; *permutatus* Meise, 1934, type locality, southern Ussuriland; and *nagamichi* Bergman (1935, Zur kenntnis Nordostasiatischer Vögel, Stockholm, p. 211), type locality, Eterofu Island, southern Kuriles. *Nagamichi* Bergman, 1935, is a new name for *kurodae* Bergman, 1931 (November 24), but it is preoccupied by *Yungipicus scintilliceps nagamichii* La Touche, 1932 (which equals *Dendrocopos canicapillus nagamichii* La Touche, 1932); *nagamichii* La Touche, 1932, is also a new name proposed by La Touche to replace *Yungipicus scintilliceps kurodai* La Touche, 1931 (May), which is preoccupied by *Dryobates leucotos kurodae* Götz, 1926, a synonym of *Dendrocopos leucotos namiyei* (Stejneger), 1886.

This, the palest and largest race, inhabits Sakhalin, the southern Kuriles, Hokkaido, and Ussuriland from about the mouth of the Khor River in the valley of the Ussuri and about latitude 45° N. on the coast southward to perhaps northeastern Korea. Meise named the birds of Ussuriland *permutatus* in the belief that they were larger than those of Hokkaido and Sakhalin, but the measurements listed below show a

great deal of overlap, and only a very trivial difference in average, amounting to only 1 mm. I did not measure sufficient material from Sakhalin and the Kuriles, but the measurements of these populations given by Gizenko (1955, *Birds of Sakhalin*, pp. 210–212) are about similar to those of the birds I have measured from Hokkaido and Ussuri-land.

I can detect no difference in coloration between specimens from Sakhalin and those from the Kuriles, from Hokkaido, and from Ussuri-land, but I have seen only one specimen from the Kuriles and two from Sakhalin. However, the "Hand-list of the Japanese birds" (1942, ed. 3, pp. 91–93) considers that the populations of Sakhalin and Hokkaido are not separable but recognizes a distinct race (*kurilensis*) in the Kuriles. The statements of Gizenko (*loc. cit.*) seem contradictory; he considers apparently that the population of Sakhalin differs only in size from that of Hokkaido and is identical in coloration with that of the Kuriles, but adds that the latter is paler than that of Hokkaido. It is possible that the birds of the Kuriles average paler, but it seems doubtful that the difference is sufficiently well marked to warrant the nomenclatural recognition of *kurilensis*.

2. *Dendrocopos kizuki seebohmi* Hargitt, 1884, type locality, Yokohama, central Hondo, with the following synonyms: *nippon* Kuroda, 1922, type locality, Suruga Province, central Hondo; and *acutirostris* Yamashina, 1931, type locality, Kongosan, eastern Korea. This race inhabits Hondo, Quelpart, and Korea and differs from *ijimae* by being darker and smaller. It is darker brown above and on the sides of the breast and more heavily streaked below, the white spots on the wing are smaller, and the white bars on the back are narrower.

The population of southern Hondo is called *shikokuensis* by the "Hand-list of the Japanese birds" in the third as well as in the fourth edition (1958, p. 103), but specimens that I have seen from Nara Province in southern Hondo are identical with topotypical *seebohmi*. In view of the clinal variation, it is possible that the populations farther south in Hondo become more similar to nominate *kizuki*, but it seems best to restrict the latter (of which *shikokuensis* is a synonym) to the islands of Shikoku and Kyushu. One specimen that I have seen from southern Korea and two from Quelpart match specimens from Hondo, and the populations of Korea and Quelpart are said to be inseparable from those of Hondo by the "Hand-list."

No specimens from eastern Korea were available to me, but I believe *acutirostris* should be synonymized with *seebohmi*. Yamashina states that the birds of eastern Korea and Hondo are identical in coloration



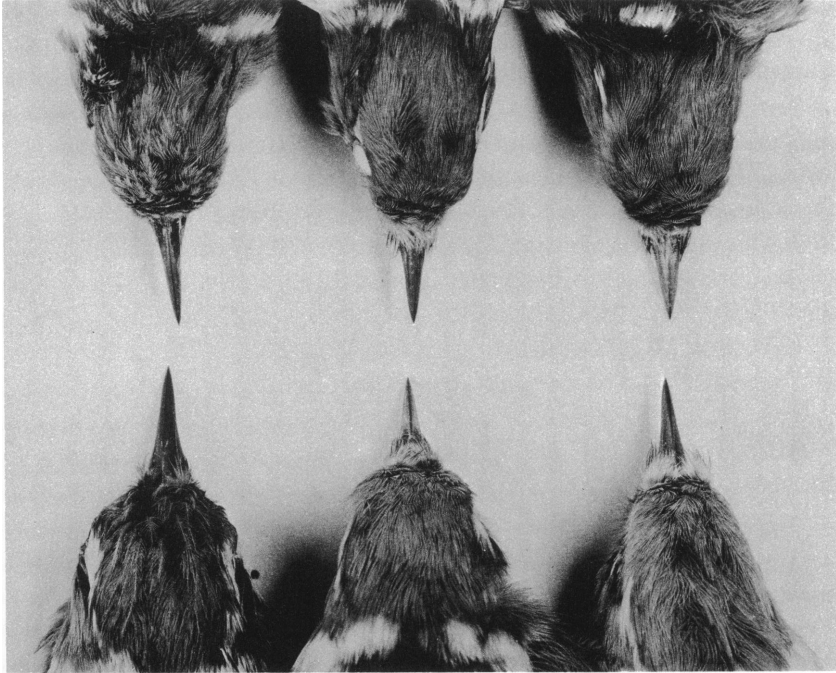


FIG. 1. Individual variation in the shape of the bill in *Dendrocopos kizuki seebohmi*. All the specimens are from central Hondo; males at the top and females in the bottom row. The bill should be compared at about the same level, as its base is denuded in the two specimens farthest to the left.

but that the former have a very attenuated and long bill, measuring 16, 17.5 in two males and 17, 18 in two females. However, I have examined individuals from Hondo in which the bill seems to be about as attenuated as in the specimen of *acutirostris* shown in Yamashina's photograph (1931, *Tori*, vol. 7, p. 111), and the bill measures 15.5–17.5 in the males and 16–18 in the females I have measured from Hondo. Figure 1 shows that the shape of the bill varies individually in Hondo and is very attenuated in some individuals. The bill may be somewhat more attenuated on an average in eastern Korea, but such a difference would not be of taxonomic importance.

The correct type locality of *seebohmi* is not Hokkaido but Yokohama, as shown by Meise in the description of *permutatus* (1934, *Abhandl. Ber. Mus. Dresden*, vol. 18, no. 2, p. 53). Hargitt stated in the description of *seebohmi* that it was found "*In insulis Japonicis Niphon et Yezo dictis*," and Stejneger (1886, *Proc. U. S. Natl. Mus.*,

vol. 9, p. 122) subsequently restricted the type locality to "Yesso" [= Hokkaido]. However, Hargitt states that the type of *seebohmi* is a specimen in his own collection and gives a reference to one of his earlier papers (1882, *Ibis*, p. 36) in which he stated that all his specimens are from Yokohama. I have examined the two cotypes of *seebohmi*, which consist of a male and a female labeled "Yokohama," and find that they match perfectly the dark coloration (see above) of the birds of central Hondo, not the pale coloration of the birds of Hokkaido. The male has a wing length of 85 and the female one of 89. In view of the fact that the correct type locality of *seebohmi* is central Hondo, *nippon* must be synonymized with *seebohmi*, of which it becomes a pure synonym.

3. *Dendrocopos kizuki kizuki* Temminck, 1836, type locality, Kyushu, with the following synonyms: *shikokuensis* Kuroda, 1922, type locality, Shikoku; and *petersi* Kuroda, 1929, new name for *Yungipicus kizuki harterti* Kuroda, 1923, type locality, Yakushima, preoccupied by *Dryobates major harterti* Arrigoni, 1902. This race inhabits Shikoku, Kyushu, and Yakushima and represents another stage on the cline, being darker and averaging smaller than *seebohmi*.

A series of five specimens from Shikoku and eight from Kyushu are identical in every respect. The population of Yakushima (*petersi*) was combined with that of the Seven Islands of Izu (*matsudairai*) in the third edition of the "Hand-list" (*loc. cit.*), but four specimens that I have seen from Yakushima, though not identical with the specimens from Shikoku and Kyushu, are more similar to them than to a series of five from the Seven Islands. The only difference that I can detect between the specimens from Yakushima and those of Shikoku and Kyushu is a very slight one in coloration, the birds of Yakushima being somewhat paler. It is best, therefore, to refer the population of Yakushima to nominate *kizuki*.

4. *Dendrocopos kizuki matsudairai* Kuroda, 1921, type locality, Miyakeshima, Seven Islands of Izu. This race, which inhabits the Seven Islands, is not well differentiated from nominate *kizuki*, but it is a little larger and has a somewhat heavier bill. It is also slightly darker, more blackish brown, above and somewhat less broadly barred with white on the back.

5. *Dendrocopos kizuki kotataki* Kuroda, 1922, type locality, Tsushima. This race, which inhabits Tsushima and perhaps also Oki Island, though the status on this island is not clear, is very well differentiated from *seebohmi* by being much darker throughout. It is larger than nominate *kizuki* but not well differentiated from it, or from *matsudairai* and *amamii*, in coloration. However, *kotataki* is a little

darker than nominate *kizuki*, more blackish brown above, a little darker brown on the sides of the breast, and more heavily streaked on the flanks; similar above to *matsudairai* but a little browner and better streaked below and slightly less dark than *amamii*, somewhat less blackish above and more broadly barred with white, the white spots on the wing being also slightly larger in *kotataki* than in *amamii*.

6. *Dendrocopos kizuki amamii* Kuroda, 1922, type locality, Amami Oshima. This race inhabits Amami and Tokunoshima in the northern Ryu Kyus and is the darkest race. It represents the extreme in the cline of increasing color saturation though not of decreasing size.

7. *Dendrocopos kizuki nigrescens* Seeböhm, 1887, type locality, Okinawa. This race, which inhabits Okinawa and the small island of Yagachishima north of Okinawa, is the smallest race that I have examined, the extreme in the cline of decreasing size being reached apparently in the southern Ryu Kyus with *orii*. In view of the clinal increase in color saturation from north to south, one would have expected to find darker birds on Okinawa than in Amami, but, contrary to expectation, the nine birds I have seen from Okinawa are a little paler, less blackish above and somewhat less heavily streaked below, than the birds of Amami. *Nigrescens* resembles nominate *kizuki* in general coloration, but the white spots on its wing are a little smaller and the white bars on the back average slightly narrower.

8. *Dendrocopos kizuki orii* Kuroda, 1923, type locality, Iriomote, southern Ryu Kyus. This race was known from only two specimens collected on the island of Iriomote, which were destroyed during World War II. According to Kuroda, they resembled *nigrescens* but differed from it by having two broad bars of black on the inner web of the outer tail feathers instead of three narrower bars. They were also somewhat darker on the back and smaller, the wing measuring 78.5, 79, both being females.

9. *Dendrocopos kizuki wilderi* Kuroda, 1926, type locality, Eastern Tombs, northeast of Peking. This race, which ranges from southwestern Manchuria southwest of Jehol to northeastern Hopeh, was not examined by me. It is said to be dark, resembling *kotataki* in the dark coloration of the upper parts but grayer on the crown, and paler, less brown, below. These characters suggest that *wilderi* represents the extreme in the cline of increasing color saturation on the continent.

Measurements of wing lengths of the males and females and bill lengths of the males in specimens measured by me are:

*Dendrocopos kizuki ijimae*: Kuriles, female, 90. Sakhalin, females, 88.5, 89. Ussuriland, males, 85, 87, 87, 87, 88, 88, 88, 88, 88, 88, 88, 88, 89, 90, 90, 90, 92

(88.5); 15.5, 16, 16, 16, 16, 16, 16.5, 17, 17, 17, 17.5, 17.5, 18, 18, 18.5 (16.8); females, 89, 89, 89, 90, 90, 90, 91, 91, 92, 92, 92, 92, 92, 92, 92, 92, 93, 93, 93.5, 94, 94, 94 (91.7). Hokkaido, males, 86, 86, 86.5, 88, 88, 88, 88, 88.5, 89.5 (87.6); 15.5, 16, 16, 16, 16, 16, 16.5, 17, 17 (16.2); females, 88, 89, 90, 90, 92, 95 (90.6).

*Dendrocopos kizuki seebohmi*: Central Hondo, males, 83, 83, 84, 84, 86, 86, 86, 86, 86, 86.5, 87 (85.3); 15.5, 16, 16, 16, 16, 16.2, 16.5, 16.5, 16.5, 16.5, 17, 17.5, (16.4); females, 83, 83, 85, 85, 85, 86, 86.5, 87, 87, 87, 88, 88, 89, 89, 90 (86.6).

*Dendrocopos kizuki kizuki*: Shikoku, males, 82, 5, 84; 16.2, 17; females, 84, 84, 86. Kyushu, males, 79, 81, 82, 83; 16, 16, 16, 17.5; females, 82, 83, 85, 86. Yakushima, males, 80, 81, 83; 16, 16, 17.5; female, 85. The wing length of the nine males averages 81.7; the bill length, 16.5.

*Dendrocopos kizuki matsudairai*: Seven Islands of Izu, males, 83, 86, 86; 17.5, 17.5, 18; females, 89, 89.

*Dendrocopos kizuki kotataki*: Tsushima, males, 83, 85, 85, 86, 87 (85.2); 16.8, 17, 17, 17.2, 18 (17.2); females, 87, 88.

*Dendrocopos kizuki amamii*: Amami Oshima, males, 82, 83, 86; 17, 17.2, 18; females, 84, 84, 85.

*Dendrocopos kizuki nigrescens*: Okinawa, males, 79, 80, 80, 80; 16, 17, 18, broken; females, 79, 80, 81, 82, 83.

#### *Picoïdes tridactylus*

The Three-toed Woodpecker<sup>1</sup> is a Holarctic species which in Eurasia ranges from Scandinavia and northern Europe eastward across Siberia to Anadyrland and Kamchatka south to northern Mongolia, Manchuria, Ussuriland, northeastern Korea, Sakhalin, and Hokkaido, with three isolated populations: one (*alpinus*) in the Alps, Carpathians, and mountains of southeastern Europe, another (*tianschanicus*) in the Tian Shan, and the third (*funnebris*) in the mountains of western China. In North America it inhabits Alaska, Canada east to Labrador and Newfoundland, south to Oregon, the Rocky Mountains, northern Minnesota, Ontario, northern New York, and northern New England. Three subspecies are recognized in North America, and perhaps eight can be recognized in Eurasia, two of which (*kurodai* from Korea and *inouyei* from Hokkaido) are known, however, from only a few specimens and require further study. The Palearctic races are listed and briefly discussed below.

1. *Picoïdes tridactylus tridactylus* Linnaeus, 1758, type locality, Sweden, with the following synonyms: *dzungaricus* Buturlin, 1907, type locality, northwestern Mongolia; and *sakhalinensis* Buturlin, 1907, type locality, Sakhalin. This race inhabits northern Europe and southern Siberia, south to northern Mongolia, Manchuria, Amurland, Us-

<sup>1</sup> Called "Northern Three-toed Woodpecker" in America.

suriland, and Sakhalin. It is replaced in northern Siberia by *crissoleucus* and in Kamchatka by *albidior*. The geographical variation appears to be clinal, the populations becoming whiter from west to east through northern Siberia to Kamchatka. In the mountains of central Siberia (Altai, Sayans, the region of Lake Baikal, and probably also northern Mongolia), and in Transbaicalia, Amurland southward, and in Sakhalin, the populations are darker than those of northern Siberia and are not separable taxonomically from those of northern Europe, clines of increasing color saturation probably running southward in Siberia.

The accounts given by the Russian authors concerning the northern populations vary widely, as the geographical variation is complicated by individual variation, intermediate populations, migration, and the fact that some populations consist of dark and pale individuals which some authors consider are color phases. My material from Siberia is insufficient, and the reader should consult the accounts given by Portenko (1937, Fauna Ptits Vnepoliar. Chasti Severnogo Urala, Moscow and Leningrad, Akademia Nauk, pp. 81-84), Mikheiev (1938, Bull. Soc. Nat. Moscou, new ser., vol. 47, sect. biol., pp. 167-173), Gladkov (1951, Ptitsy Sovetskogo Soiuza, vol. 1, pp. 569-574), and Johansen (1955, Jour. Ornith., vol. 96, pp. 392-394). In the northern part of the range, Portenko would recognize four races (nominate *tridactylus*, *crissoleucus*, *kolymensis*, and *albidior*); Mikheiev and Gladkov synonymize *crissoleucus* and *kolymensis* with nominate *tridactylus*; and Johansen apparently advocates the recognition of nominate *tridactylus*, *crissoleucus*, and *albidior*, stating that *kolymensis* is a "mixed" form, very variable individually, which apparently represents the result of secondary intergradation between *crissoleucus* and *albidior*.

Two specimens that I have seen from the region of Markovo in Anadyrland, and three from Gizhiga at the northern end of the Sea of Okhotsk, show a tendency towards *albidior* but are much more similar to *crissoleucus*. These specimens suggest that *kolymensis* is best synonymized with *crissoleucus* and that true *albidior* is restricted to Kamchatka.

No specimens from northwestern Mongolia were available to me, but it seems incorrect to synonymize *dzungaricus* with *tianschanicus* as Mikheiev (*loc. cit.*), Gladkov (*loc. cit.*), and also Peters (*op. cit.*, p. 216) have done. *Tianschanicus* seems to be restricted only to the Tian Shan and is very heavily barred with black below and on the tail, whereas Buturlin states that *dzungaricus* is white below and not heavily barred with black on the tail. Kozlova (1933, Ibis, p. 596) states that the birds

of northern Mongolia are nominate *tridactylus*, and I believe *dzungaricus* should be synonymized with the latter. A single specimen that I have seen from Sakhalin is identical with topotypical nominate *tridactylus*. Mikheiev (*loc. cit.*), Gladkov (*loc. cit.*), and also Gizenko (1935, Ptitsy Sakhalin Oblast., Moscow, Akademia Nauk, p. 201) consider that *sakhalinensis* is invalid and a synonym of nominate *tridactylus*.

It seems to me, therefore, that it is sufficient to recognize only nominate *tridactylus*, *crissoleucus*, and *albidior* in the northern part of the range. *Crissoleucus* differs from nominate *tridactylus* by being paler, whiter on the back, under parts, and tail, much less streaked on the sides of the breast and barred on the flanks, some specimens being all white on the under parts of the body; its under tail coverts are whiter also. *Albidior* is still whiter throughout, all white on the under tail coverts and tail, and has much larger white spots on the wing, the white spots merging together on the inner web of the primaries and also to a lesser extent on the outer web.

2. *Picoïdes tridactylus crissoleucus* Reichenbach, 1854, type locality, forests on the Irtysh River in October; with *kolymensis* Buturlin, 1917, type locality, Olekminsk and Sredne Kolymsk, as a synonym.

3. *Picoïdes tridactylus albidior* Stejneger, 1888, type locality, Kamchatka.

4. *Picoïdes tridactylus alpinus* C. L. Brehm, 1831, type locality, Switzerland. This race is restricted to the Alps, Carpathians, and mountains of southeastern Europe and is much darker than nominate *tridactylus*, less white above, including the spots on the crown, and much more streaked and barred with black below and on the tail feathers. Its bill averages a little more slender.

5. *Picoïdes tridactylus tianschanicus* Buturlin, 1907, type locality, Tian Shan. This race differs conspicuously from nominate *tridactylus* but is not well differentiated from *alpinus*. However, it is separable from the latter by several slight differences. It is usually a little whiter on the back and better spotted with white on the short upper tail coverts, the white spots being fewer and smaller in *alpinus* or lacking, and, as a rule, the black malar stripe is a little more conspicuous and the black bars on the tail are a little broader; the yellow crown of the male is very slightly darker on an average. The two races are similar in size, the wing, tail, and bill of 10 males of each measuring: *tianschanicus*, 126–132 (128.3), 79–85 (82.5), 32–36 (33.5); *alpinus*, 123–131 (127.8), 76–86 (80.3), 33–35 (34).

?6. *Picoïdes tridactylus kurodai* Yamashina, 1930, type locality,

Nojido, northeastern Korea. This form is doubtfully separable from *tianschanicus* but may be slightly smaller and average slightly darker above. *Kurodai* was based on five specimens which Yamashina described as follows: "much similar to *Picoïdes tridactylus tianschanicus* but far more blackish, differs from it in having no white tinge on the interscapular region, less white on the back, and wider stripes on the under parts. Smaller than *tianschanicus*, the measurements of five adults being: wing, 118-123, exposed culmen, 28.5-31.5 mm." However, one female that I have seen from northeastern Korea is identical in coloration with half of 12 females of *tianschanicus*, the bill measures only 1 mm. shorter, and the wing length is the same as that of the smaller specimens of *tianschanicus*. The other six females of the latter are slightly whiter on the back. This female, which was collected on May 10, 1912, only 13½ miles from the type locality of *kurodai*, has a wing length of 124 and a bill length of 39, 12 females of *tianschanicus* measuring 124-130 (126.3), and 30-33 (31.3), the bill being measured from the skull. The measurements of male *tianschanicus* are given above.

?7. *Picoïdes tridactylus inouyei* Yamashina (1943, Bull. Biogeogr. Soc. Japan, vol. 13, p. 43), type locality, Mitsumata, Katô district, Tokachi Province, Hokkaido. This form, which I have not examined, is known only from three specimens collected at the type locality in November and December. These specimens are the first record of the species for Hokkaido, but it is said to have been observed on several occasions since at the same locality, where it is believed to be resident.

Yamashina states that his three specimens resemble *kurodai* and *tianschanicus* but are whiter on the back than the former, and differ from both *kurodai* and *tianschanicus* by being more broadly streaked with black on the breast and by having a paler yellow crown in the male; the black bars on the flanks and abdomen are more numerous than in *kurodai* and narrower than in *tianschanicus*. However, Yamashina states that he has examined only two specimens of *tianschanicus*, a number that seems insufficient to me, as the extent of the black streaking or barring varies individually in *tianschanicus*. The shade of the yellow varies so very slightly geographically in this species that this character is of dubious value. The specimens of *inouyei* measure, according to Yamashina: wing length, 126 in the male, 120, 122 in females; and exposed culmen, 29 in the male and 24.5 in the two females.

It seems to me that *inouyei* and *kurodai* probably do not differ sufficiently from each other and from *tianschanicus* or *alpinus* to warrant nomenclatural separation. The regions inhabited by these four forms

are widely isolated from one another, but throughout Eurasia all the populations of this species show a very strong and parallel tendency to become darker as they range farther south. This results in the existence of populations which, though widely separated geographically, do not differ taxonomically or do so only very slightly. As stated above, *tianschanicus* can be separated only with some difficulty from *alpinus*, although the Tian Shan and the Alps are far removed, and the populations of southeastern Siberia, though they are even farther removed from those of northern Europe, cannot be separated taxonomically from the latter.

8. *Picoïdes tridactylus funebris* Verreaux, 1871, type locality, Pao-hing, eastern Sikang. This well-named race differs very conspicuously from all the others by being almost black below. The feathers of the breast, flanks, abdomen, and under tail coverts retain some small white tips, but the black pigment has coalesced, so that the bird appears to be spotted rather than streaked and barred below. Its throat is pale buffy brown rather than white, the tail is very heavily barred with black, and the white area is more reduced on the back. *Funebris* ranges from southern Kansu and the mountains of western Szechwan westward through southern Tsinghai and Sikang to the borders of Tibet (Kongbo and Takpo), south to the Likiang Range in northwestern Yunnan.