ORIENTAL FORMS OF *PICUS CANUS*

BY J. C. GREENWAY, JR.

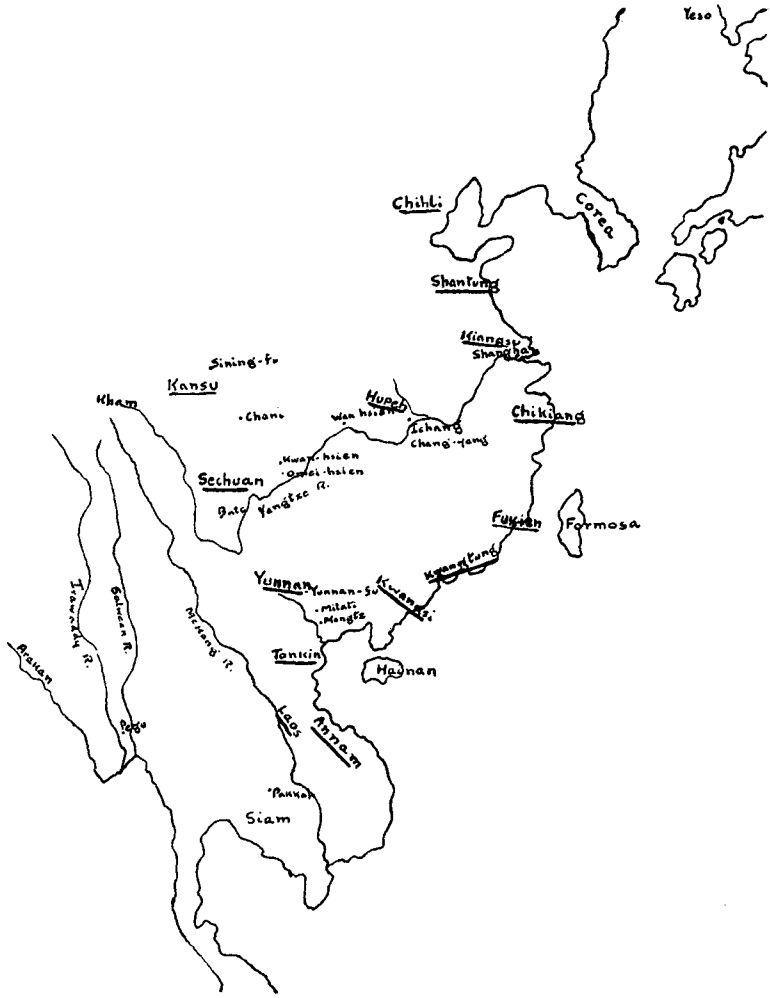
IN this group there are six characters which may be used for subspecific diagnosis. These are: general color tone, amount of black on nuche and occiput, length of wing and bill, and sometimes the width of the stripes on the primaries and amount of whitish on the outer rectrices. Of these the first is at the same time the most striking and the most obscured by variation.

This group appears to undergo but one molt a year and in the majority of cases, it takes place in the months of August, September and October. To this general rule there are exceptions to the number of approximately one in twenty-five. These exceptions are less frequent in the eastern coastal populations. It follows that specimens taken in November, December, January and February are in fresh plumage. *Only these are material for subspecific identification.* Adult females from southern Yunnan and from the Kham country and an adult male from the Pegu Yomas, however, appear in very much worn and faded plumage in January and February, and these, as well as three fresh skins taken in July, illustrate the exceptions to a general rule.

Birds taken in March often begin to show signs of wear through the edges of the feathers of the back becoming pale yellow or brownish. In May and June this condition is intensified and the birds become grayish below, and so worn above that they cannot be identified by morphological characters and must be classified by geographical areas, a procedure which is, of course, to be deplored in cases where it can be avoided.

Birds of the year are readily identifiable by their long first primaries which are rounded at the tip. Particularly in the populations of western China are young birds likely to be very dark gray, and this, I think, may have led to confusion in the belief that this variation was typical adult *Picus canus sordidior*. Juveniles may also be pale green with whitish bars on the flanks. I cannot account for this variation. I have seen nestlings from Chihli [Hopei] in late June, and we may suppose from the regularity of the post-nuptial molt that there is equal regularity in the breeding season. At any time of year, but of course usually in summer, birds may be stained with sap or fruit juices. They are often reddish and, of course, unrecognizable. There is also individual variation among adults, particularly in the

size of the bill, which may sometimes be extremely long and pointed. It has been suggested that this may be due to a habit of feeding continually on the ground. There is also a peculiar variation in the



TEXT-FIG. 1.—Sketch map of eastern Asia.

length of the adult first primary which may be longer than the norm, and this is particularly noticeable in the series from Mt. Victoria, Burma. However, such specimens cannot be confused with first-year birds, since the latter as a rule have the first primary 40–50 mm. in length.

In spite of the fact that characters, particularly the color tone of the body plumage, may be obscured by variations both of age and of season, birds in fresh plumage show distinct geographical variation. Contrary to Bergmann's law, the northern races are pale and the southern dark. Variation in size does not appear to take place below 10–15,000 feet. The largest races (*kogo* and *sanguiniceps*) occur at about 14,000 feet. The former is larger on the average than birds from the same altitudes farther south in western Yunnan (158.2 mm. as against 151.7) but considerably paler. At sea level, in eastern China, the northern races are likewise paler. The races of the mountainous regions of western China are much more difficult to diagnose, as is often the case in other genera (*Mesia, Microscelis, Stachyris*). In the case of *Picus canus* there are well-marked populations, and birds from these areas are easily identified, but these populations are small and there are large numbers of intermediates. For example, *"yunnanensis"* La Touche is closest to *setschuanus* but there are individuals which approach *sordidior* very closely. Birds of the middle Yangtze are very dark and green, with very heavily marked nuche and occiput, and these are typical *setschuanus.* The types of *"yunnanensis"* from Milati are also very dark and green and are *setschuanus.* Short series from Mongtz are, however, *setschuanus* $\geqq$ *hessei.* It is possible that isolated populations have given rise to familial characters but the problem is obscured by the fact that migrants and wanderers cannot at present be identified as such, and summer birds are not possible to diagnose.

Obscured as the situation may be, there can be no doubt that if mature specimens in clean, fresh plumage are compared season for season, morphological characters can be seen and these are correlated with geographical areas. In no case have I recognized a race of which less than 80 per cent of the individuals can be diagnosed.

Danis (L'Oiseau, 7: 246–271, 1937), in his careful review of *Picus canus,* reduces the oriental races to four: *guerini, hainanus, sanguiniceps* and *dedemi.* I do not believe this arrangement can be followed because of the differing morphological characters noted below. Concerning his group *guerini,* of which he considers *tancolo, kogo, sordidior, setschuanus, jacobsii, ricketti, yunnanensis* and *stresemanni* to be synonyms, he says, " . . . on y peut noter de nombreuses variations de pigmentation et de taille individuelles, dues surtout aux différences d'altitude et à l'état du plumage par rapport de la mue . . ." Here he appears to approach the problem from a rather unusual point of view, for as it is usually understood, 'individual variation' simply

includes the differences between individuals of the same population. The cause, though the varying characters may be attributed to combinations of genes, is obscure. Size, on the contrary, can usually be correlated with altitude according to Bergmann's law, and populations differing from each other in this way are usually recognized. As Ticehurst (Ibis, (14) 2: 357, 1938) pointed out, Danis's measurements show size variations of which Danis himself has not taken cognizance.

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PICUS CANUS JESSOENSIS Stejneger

Picus canus jessoensis Stejneger, Proc. U. S. Nat. Mus., 9: 106, 1886 (Jesso = Hokkaido).

Picus canus perpallidus Stejneger, Proc. U. S. Nat. Mus., 9: 107, footnote, 1886 (Sidinij, Ussuri, eastern Siberia).

My material is not adequate to judge of the validity of *perpallidus* but specimens of the two races before me are not distinguishable. Hartert and Steinbacher (Vögel Pal. Fauna, Erganzungsband, 1935, p. 363) have synonymized *perpallidus* as well as the following race.

Range.—Manchuria (?), eastern Siberia, Hokkaido Island. If *griseoviridis* and *zimmermanni* are not recognized the range will include Corea, Chihli (Hopei) and Shantung.

Material.—3 ♂, 1 ♀, Hokkaido (Mar., Apr.); 1 ♂, Sidemi, eastern Siberia.

? PICUS CANUS GRISEOVIRIDIS (Clark)

Gecinus canus griseoviridis Clark, Proc. U. S. Nat. Mus., 32: 473, 1907 (Seoul, Corea).

Although every specimen from Corea but one before me is at once distinguishable from *jessoensis* by its darker and purer-green coloration, the series of *jessoensis* is inadequate and it is probable that were a larger series of seasonally comparable birds at hand the apparent geographical variation would disappear.

This race also has been synonymized by Hartert and Steinbacher (l. c.).

Range.—Corea.

Material.—7 ♂, 8 ♀, Corea: Koyogun, Keikido, Songdo, Yuensan (Jan., Feb., Mar., Apr., Dec.).

? PICUS CANUS ZIMMERMANNI Reichenow

Picus canus zimmermanni Reichenow, Ornith. Monatsb., 11: 86, 1903 (Tsingtao, Shantung).

The series before me is quite indistinguishable from the inadequate series of *jessoensis*. A poorly marked black nuchal patch appears in seven males in a series of fifteen, and in three females in a series of twelve. The character is, of course, too variable for subspecific recognition and I think it quite probable that adequate series of *jessoensis* will prove the two to be synonymous.

Hartert and Steinbacher (l. c.) recognize this form with the remark that the nuchal patch is poorly marked and its occurrence variable.

Range.—Chihli and Shantung.

Material.—19 ♂, 12 ♀, Chihli: Chingwangtao, Nanking, Pekin (Peiping), Nanyuan, Shankaiwan, Laishin; Shantung: Weihsien (Jan., Feb., Mar., May, Sept., Nov., Dec.).

PICUS CANUS GUERINI (Malherbe)

Chloropicos guerini Malherbe, Rev. Mag. Zool., 1849, p. 539 ("China," type locality restricted to Shanghai by Danis, 1937).

This form is darker and more golden green above, and darker and greener below than either *"griseoviridis"* or *"zimmermanni."* Specimens invariably have a well-marked nuchal patch. The occiput is more lightly streaked as a rule than in *ricketti*. The population of Chekiang is darker, being intermediate between *guerini* and *ricketti*.

There are two males in this series which cannot be distinguished from *"zimmermanni"* and two females which approach *ricketti*.

Range.—Kiangsu, Chekiang (*guerini* ≷ *ricketti*).

Material.—16 ♂, 15 ♀, Kiangsu: Nanking, Chingkiang, Kianginku, Mokanshanche (Jan., Feb., Mar., Apr., May, June, Aug., Nov., Dec.).

PICUS CANUS RICKETTI Baker

Picus canus ricketti Baker, Ibis, (11) 1: 187, 1919 (Fukien).

This race is more golden-brownish green, less grayish, on the back than *guerini* and darker (a dirty brownish), even in seasonally comparable birds. By what is probably coincidental parallelism, it is very close to *setschuanus* but differs in its more golden-brown coloration and its slightly smaller size. There is one specimen in the series of ten which is indistinguishable from *setschuanus*.

Range.—Fukien. It is also recorded from Kwangtung and Kwangsi by La Touche, and from Kwangsi by Stresemann.

Material.—10 ♂, 4 ♀, Fukien: Foochow, Chengfeng (Feb., Mar., Apr., May, Dec.).

PICUS CANUS SETSCHUANUS Hesse

Picus canus setschuanus Hesse, Ornith. Monatsb., 19: 193, 1911 (Setchuan, China).

Gecinus canus jacobsii La Touche, Bull. British Ornith. Club, 40: 50, 1919 (near Changyanghsien, Hupeh).

Picus canus yunnanensis La Touche, Bull. British Ornith. Club, 43: 44, 1922 (Milati, Yunnan).

Typical specimens from Kwanhsien, central Setchuan (in fresh plumage) are large and dark with a very heavily marked nuche and occiput, characters by which they differ from *guerini.* From *hessei* and *"gyldenstolpei"* they differ in being a purer, less brownish, green. This character is most apparent on the wing-coverts. This population is surrounded by intermediates, which one can only say resemble *setschuanus* more than they do other races. Skins from Wanhsien, in eastern Setchuan, are slightly paler, showing an approach to *guerini* but are larger than *guerini.*

The population of Hupeh is intermediate (*setschuanus* $\geqq$ *guerini*). Six specimens in a series of twenty-two are indistinguishable from *guerini,* while fourteen are referable to *setschuanus.* Bangs (Bull. Mus. Comp. Zoöl., 70: 230, 1930) has synonymized *jacobsii* with the remark that in Hupeh lowland birds are *guerini* and those of the highlands are *setschuanus.* I do not feel sure that this is the case, although there is a difference in altitude of 1,750 meters in the country where Zappey collected. He usually marked his altitude on the label when he thought he was at any considerable height.

Birds collected along the railway Hanoi-Yunnanfu by La Touche, some of which he differentiated (*"yunnanensis"*), are referable to the dark, brightly colored *setschuanus.* The two cotypes of *"yunnanensis"* are large, but if longer series were at hand the range of individual variation would, I think, be found to be greater. They are indistinguishable by color characters.

In Yunnan there is the following variation in size as correlated with altitude:

Locality	*Altitude*	*Wing in mm.*
Mongtz	± 4,000 feet	average 148
Milati*	± 5,000 feet	average 155.5
Yunnanfu	± 6,000 feet	average 153
Likiang district	±10,000 feet	average 150

* Two cotypes of *yunnanensis.*

There is no appreciable difference in wing length between specimens taken in June in worn body-plumage and those in fresh plumage in April. Birds from this region apparently incline to be unstable and are therefore hard to identify. For example, two skins from Mongtz are rather golden yellow, approaching *hessei,* but the majority of skins in fresh plumage are referable to *setschuanus* in color tone, and almost all in the heavily marked occiput and nuche.

Bangs (l. c.) lists *yunnanensis* without comment. He here reverses his formerly held opinion that all these forms are referable to *guerini.*

The specimen from Mongtz mentioned by La Touche (Ibis, (11) 6: 284, 1924) is a juvenile bird, as proved by the flanks which are barred with grayish, and the first primary which is long and rounded at the tip. The female from Lotukow, which was collected on May 11, is mature but is in abraded plumage. The yellow on the back is due simply to the loss of lipochrome by green feathers, due to wear.

Hartert and Steinbacher (t. c., p. 363) have synonymized this race with *sordidior,* but I do not think this is a possible solution, in view of the very dark-green population in the vicinity of Kwanhsien. In southern Yunnan and western Setchuan there are many intermediates.

Range.—Hupeh (intermediate), Setchuan, southwestern Yunnan north to the vicinity of Yunnanfu.

Material.—10 ♂, 7 ♀, 6 imm., Setchuan: near Kwanghsien, Omeihsien, Bate, Merge, Wanhsien, Yachow, Hsifan region (Jan., May, July, Nov.); 24 ♂, 16 ♀, Hupeh: Ituhsien, Yangtzehsien, Changyanghsien (type locality of *jacobsii*), Ichanghsien, Hsienshanhsien, Hochaping (Jan., Feb., Mar., Apr., May, June, Sept., Nov., Dec.); 12 ♂, 8 ♀, 1 imm., Yunnan: Lotukow, Milati, Mongtz, Kopaotsun (Mar., Apr., May, Nov.).

PICUS CANUS SORDIDIOR Rippon

Picus canus sordidior Rippon, Bull. British Ornith. Club, 19: 32, 1906 (western Yunnan).

This race is close to *setschuanus.* However, of a series of seventeen birds representing both races, all in fresh plumage, only three cannot be classified satisfactorily on morphological characters. Approximately 85 per cent show it to be, as a rule, slightly paler and more grayish green below. The occiput is, in the large majority of specimens, less heavily streaked and the black nuchal patch is less extensive. The dark barring on the tail is lighter than in *setschuanus* and somewhat narrower, as a rule. It is smaller than *kogo,* and darker.

I restrict the type locality to the Shweli River at lat. 28° N., long. 98° E.

Two specimens of the form listed by de Schauensee (Proc. Acad. Nat. Sci., Philadelphia, 90: 197, 1938) as *sordidior* are young birds with long, rounded first primaries and, as he says, the other two are in heavy molt and in very worn condition. These are indeed so worn and stained that it is quite impossible to identify them, but since they were shot in the Hsifan Mountains between Tatsienlu and Chengtu, they would more likely be *setschuanus* than *sordidior.*

The birds recorded by Anderson (Zool. Researches Exped. Yunnan, p. 585, 1879) are *sordidior* (fide Rothschild, 1926).

Range.—Northwestern Yunnan (see below).

Material.—9 ♂, 9 ♀, 4 imm., northwestern Yunnan: Tengyueh, Shweli valley, Mekong valley, Likiang range.

PICUS CANUS KOGO Bianchi

Picus canus kogo Bianchi, Bull. British Ornith. Club, 16: 69, 1906 (Mekong headwaters, Kham country).

This race is to be distinguished at once from any other by its larger size and much paler, more grayish-green coloration. There can be no question of the distinctness of topotypical specimens from the region described by Dolan (Proc. Acad. Nat. Sci., Philadelphia, 90: 180, 1938) as follows: "Feb. 7, Camp 47, Gartoh Gomba (elev. 13,400 ft.) willows; coniferous forest below; many Lammergeiers." The intermediates are more difficult.

Specimens from southern Kansu (Choni) have, on the average, shorter wings than typical *kogo* and the occipital region is more heavily streaked. But they resemble *kogo* (and are at once distinguishable from *setschuanus* and *sordidior*) by their paler, grayer coloration and longer bills. Though slightly different, they may be identified as *kogo* until we have more knowledge of the following race and other populations of Kansu.

Range.—Eastern Tibet: Kham country (also eastern and southern Kansu?).

Material.—2 ♂, 4 ♀, Tibet: Kham district, ± 10,500 feet (Feb.); 8 ♂, 5 ♀, Kansu: Choni, mountains southwest of Pikow (Feb., Apr., May, July, Sept.).

? PICUS CANUS STRESEMANNI Yen

Picus canus stresemanni Yen, Ornith. Monatsb., 41: 17, 1933 (Siningfu, Kansu).

I have no topotypical material of this race which is described as being larger and paler than *guerini,* and paler than *sordidior,* the wings measuring: ♂ 155, 158 mm.; ♀ 156, 157, all of which accords exactly with our conception of *kogo,* overlooked by Yen. It is synonymized without comment by Hartert and Steinbacher (t. c., p. 363).

PICUS CANUS HESSEI Gyldenstolpe

Picus canus hessei Gyldenstolpe, Ornith. Monatsb., 24: 28, 1916 (Pakkoh and Denchai, northern Siam).

Picus canus microrhynchus Robinson and Kloss, Bull. British Ornith. Club, 40: 12, 1919 (Koh Lak, southwestern Siam).

This race is considerably more golden-brownish green than any other population except *"gyldenstolpei"* Baker of Assam from which it is doubtfully separated, though material at hand shows it to have a longer bill. There is no difference in the amount of black on nuche and occiput. Specimens from the northern part of its range, Mt.

Victoria, northern Siam, have longer wings than populations both to the north and to the south. There is considerable overlap and I think this is due to a large range of individual variation rather than altitudinal variation.

Picus canus microrhynchus, described as differing from *hessei* only in its shorter bill, cannot be maintained (see measurements).

Range.—If, as may be strongly suspected, *gyldenstolpei* is inseparable from *hessei,* then the range of the latter will be Assam south to Mt. Victoria, Arakan and Pegu Yomas; Siam, Tonkin, Laos and Annam.

MEASUREMENTS BY REGION

Locality	*Wing in mm.*	*Bill in mm.*
Northern Cachar	143–149 (av. 145.9)	38–40
Assam	140–143 (av. 140)	38–40
Chin Hills, Naga Hills	140–143 (av. 141.5)	38–40
Mt. Victoria	152–154 (av. 153)	40–42
Pegu Yomas	145–149 (av. 147)	42
Northern Siam	149–156 (av. 151)	42–45
Southwestern Siam	141–150 (av. 145.6)	41–44
Tonkin, Laos	142–147 (av. 145)	41–44

I have not enough Indo-Chinese birds to make comparative measurements convincing. Delacour gives 35–45 mm. as the measurement of bills of *hessei,* and Danis 33–34. For *gyldenstolpei* the latter records 34–38 mm., which reverses my findings.

Material.—3 ♂, 4 ♀, northern and eastern Siam: Pak Chang, Kengkai; 1 ♂, southern Shan States (Feb., Aug., Oct., Dec.); 2 ♂, 1 ♀, 1 imm., Indo-China: Bac Tan Tran, Bac Kan (Tonkin), Nam Khueng (Laos); Hoi Chuan, Dalat (Annam) (Nov., Dec., Jan., Apr.); 6 ♂, 5 ♀, 8 imm., southwestern Siam: Ban Thung Luang, Khoa Nok Wua, Kempenpet, Khoa Luang (Jan., Mar., Aug., Sept.); 9 ♂, 5 ♀, 2 imm., Burma: Pegu Yomas, Rangoon, "Tenasserim," "Arakan," Thayet near Schwebo, Dudaw Taung, Chin Hills (Feb., Mar., July, Dec.).

? PICUS CANUS GYLDENSTOLPEI Baker

Picus canus gyldenstolpei Baker, Bull. British Ornith. Club, 39: 19, 1918 (Sadiya, Lakhimpur, Assam).

As I have pointed out above, this name is most probably a synonym of *hessei.*

Material.—6 ♂, 2 ♀, upper Assam: near Margherita; Nepal: Darjeeling (Apr., Dec.); 5 ♂, 3 ♀, northern Cachar: Gallipur, Gunyon, Maka (Mar., Apr., Dec.); 1 ♂, Naga Hills: Mokokchang; 3 ♂, upper Chindwin: Lonkin, Homalin (Jan., Mar.).

PICUS CANUS SANGUINICEPS Baker

Picus canus sanguiniceps Baker, Bull. British Ornith. Club, 46: 70, 1926 (type locality restricted to Mussoorie by Stresemann, 1921).
Picus canus occipitalis Gould and *Picus canus barbatus* Gray (nomina preoc.).

This race differs from *"gyldenstolpei"* and, of course, *hessei*, in its purer-green, less yellowish or bronze, coloration, its more heavily marked occiput and its larger size. This is the largest race.

Range.—Himalayas to Nepal.
Material.—2 ♂, 4 ♀, Dankali, Rampur, Dehra Dun, Dudhli near Mussoorie (Sept., Dec.).

PICUS CANUS TANCOLO (Gould)

Gecinus tancolo Gould, Proc. Zool. Soc., London, 1862, p. 283 (Formosa).
Gecinus hainanus Ogilvie-Grant, Ibis, (7) 5: 584, 1899 (Hainan Id.).

This race differs from all others in its smaller size (wing 130–140 mm.). It is darker green below than either *ricketti* or *hessei*. There is not one individual in this series which cannot be distinguished from either form at a glance.

There is no character in the series before me which can be used to separate *hainanus*. Though the material is scanty, it is in fresh plumage and seasonally comparable, and there is an average difference in length of wing of only 1.4 mm. It is probable that the difference in length of bill which now appears would disappear were larger series available.

Range.—Formosa and Hainan Islands.
Material.—3 ♂, 3 ♀, Hainan; Mt. Wuchi = Five-finger Mt. (Jan., Apr., Mar.); 1 ♂, 2 ♀, Formosa (Dec.).

PICUS CANUS ROBINSONI Ogilvie-Grant

Picus canus robinsoni Ogilvie-Grant, Bull. British Ornith. Club, 19: 11, 1906 (Gunong Tahan, Malaya).

This form, of which I have seen no specimen, is described as darker than *Picus canus occipitalis* (= *sanguiniceps* Baker), the crown nearly uniform black like the nape . . . the back and under parts dark olive green instead of olive, and the tail-feathers black with very faintly indicated greenish-gray bands on the edges of the middle pair of rectrices. It is probably a recognizable race.

PICUS CANUS DEDEMI van Oort

Picus canus dedemi van Oort, Notes Leyden Mus., 34: 59, 1911 (Battack Mts., Sumatra).

This is a very distinct form. The back and upper breast are ma-

roon. The belly is suffused with dark green and the rump, which is yellow in all other forms, is carmine in this one. The chin, throat and ear-coverts are gray. The throat and sides of the neck are tinged with green. The tail is black without bars.

Range.—Sumatra.

Material.—1 ♀, Goenoeng Dempa (2300 meters), southwestern Sumatra.

MEASUREMENTS OF *Picus canus* RACES

Locality	*Wing in mm.*	*Bill in mm.*
Hokkaido (*jessoensis*)	143–147 (av. 145)	39–42
Corea (? *griseoviridis*)	144–148 (av. 147)	38–41
Chihli (? *zimmermanni*)	143–149 (av. 147)	39–43
Kiangsu (*guerini*)	139–142 (av. 141.6)	40–44
Fukien (*ricketti*)	141–148 (av. 143)	37–41
Setchuan (*setschuanus*)	140–154 (av. 146.7)	37–41
Southwestern Yunnan (*"yunnanensis"* = *setschuanus*)	156 (see note p. 555)	39–43
Northwestern Yunnan (*sordidior*)	149–160 (av. 151.7)	39–41
Southwestern Kansu (? *stresemanni*)	149–160 (av. 151)	42–44
Kham country (*kogo*)	155–159 (av. 158.2)	41–45
Western Himalayas and Nepal (*sanguiniceps*)	157–165 (av. 160.6)	46–49
N. Cachar, Assam, Chin Hills, Naga Hills — *"gyldenstolpei"*	140–149 (av. 143.2)	38–40
Mt. Victoria, Pegu, Northern Siam, Tonkin, Laos, Southwestern Siam — *hessei*[1]	141–156 (av. 148.8)	41–45
Hainan Island (*"hainanus"*)	130–135 (av. 132.7)	36–38
Formosa (*tancolo*)	135–140 (av. 133.3)	37–41

[1] See measurements in text.

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