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## Systematic Notes on Palearctic Birds. No. 22 Fringillidae: *Emberiza schoeniclus*

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### INTRODUCTION AND ACKNOWLEDGMENTS

A study of the genus *Emberiza* was undertaken in preparation of a contemplated check list of the Palearctic region. A number of systematic notes were made, and, as might be expected, those on *E. schoeniclus* are the most numerous for any one species. It is desirable, I believe, to present these separately, not only because the remainder of the manuscript is already bulky but also because more interest has attached to this species than any other, as it is the most variable geographically and the most difficult in the genus.

I should like to express my gratitude to Drs. Dean Amadon and Finn Salomonsen with whom I had the pleasure of discussing this species and for their comments.

### GENERAL REMARKS

The Reed Bunting varies geographically to a conspicuous extent, and its populations, generally speaking, can be divided into three groups, the distribution of which is shown in figure 1. The three are: the nominate *schoeniclus* group in which the bill is very small, thin, and attenuated, and in which the males in worn plumage are heavily streaked on the mantle and relatively dark; the *pyrrhuloides* group in which the bill is very large, thick, and highly arched and the males are less heavily streaked and very pale; and the well-named *intermedia* group (the *tchusii* of authors) in which the bill is larger than in the *schoeniclus* group but smaller, more attenuated, and relatively longer than in the *pyrrhuloides* group. These

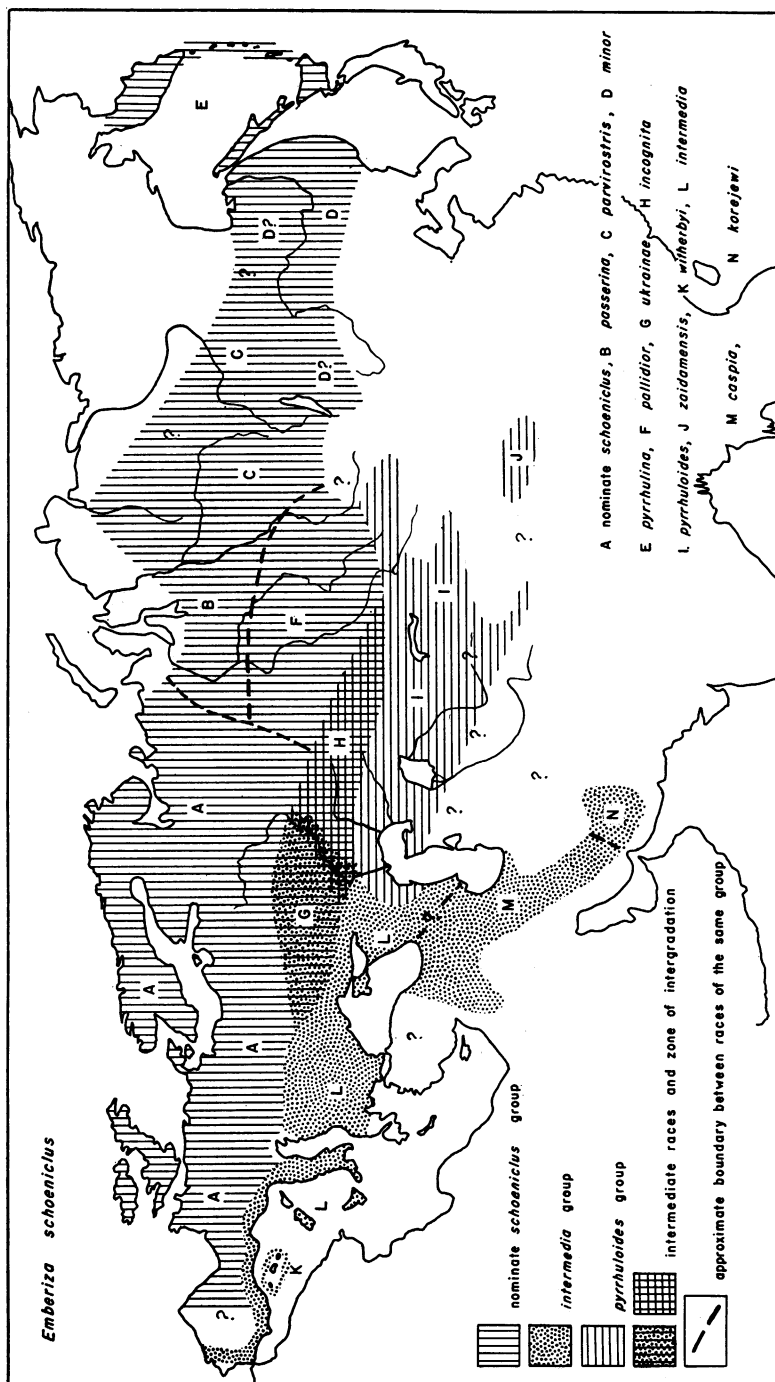


FIG. 1. Distribution of *Emberiza schoeniclus* during the breeding season.

statements as to the general size of the bill are relative, and the characteristic differences in size and shape in profile are illustrated in figure 2. The forms of the *intermedia* group are either darker or paler in general coloration than those of the nominate *schoeniclus* group but always darker than those of the *pyrrhuloides* group. The three groups vary also in size, the nominate *schoeniclus* group containing the smallest forms and the *pyrrhuloides* group the largest. Size, as expressed by the average wing length of adult males, in the most typical populations is 80 mm. in nominate *schoeniclus* from Scandinavia, 82 in *intermedia* from Dalmatia, and 87 in *pyrrhuloides* from Astrakhan and Russian Turkestan.

The differences enumerated were believed to be of specific importance until rather recently. For instance, as late as 1930, three species were recognized in Molineux's "Catalogue of birds." However, the three groups replace one another geographically and are connected by populations that are intermediate in every character. The study of the species is complicated, however, by these intermediate populations. Other complicating factors are that many races are migratory and that the shape and size of the bill, the characters that have been most extensively used for subspecific discrimination, vary individually.

The most important revisionary papers are those of Portenko (1929, Ann. Mus. Zool. Acad. Sci. U.R.S.S., vol. 29, pp. 37-74) and Steinbacher (1930, Jour. Ornith., vol. 78, pp. 471-487), but in my opinion these authors recognized too many subspecies. Portenko recognized 18 and listed two additional ones with a query, while Steinbacher recognized 24. Two others have been described since, one (*tzensis*) in 1934 from northwestern Siberia by Buturlin, and the other (*mackenziei*) by Bird in 1936 from the Outer Hebrides. The study of Portenko has been commented upon by Dementiev in his "Systema avium Rossicarum" (1934, L'Oiseau, pp. 525-529) and additional information has been contributed by Johansen (1944, Jour. Ornith., vol. 92, pp. 86-90). In the "Birds of the Soviet Union" (1954, vol. 5, pp. 482-495) the total number of subspecies recognized for the species was reduced to 11, but while in general agreement with this treatment I believe that 14 are probably recognizable, consisting of an additional one from southeastern Siberia and Manchuria and the others from the range of the *intermedia* group, the distribution of which is chiefly outside the territories of the Soviet Union.

The 14 races are listed below, with a discussion of their synonyms. The characters of a race are indicated, and its range discussed, only when the validity of the race or its affinities appear to be in question.

#### THE NOMINATE *schoeniclus* GROUP

1. *Emberiza schoeniclus schoeniclus* Linnaeus, 1758, type locality,

Sweden, with the following as synonyms: *turonensis* Steinbacher, 1930, type locality, western central France; *mackenziei* Bird (1936, Bull. Brit. Ornith. Club, vol. 56, p. 54), type locality, Outer Hebrides; and *steinbacheri* Dementiev (1937, Ornith. Monatsber., vol. 45, p. 86), new name for *Cynchramus septentrionalis* C. L. Brehm, 1831 (Handbuch der Naturgeschichte aller Vögel Deutschlands, p. 302), type locality, northern Europe, as he considered this name to be preoccupied by *Emberiza septentrionalis* C. L. Brehm, 1831 (*op. cit.*, p. 295), a synonym of *E. citrinella* Linnaeus.

Steinbacher revived *septentrionalis* [= *steinbacheri*] for the populations of northern Europe and described *turonensis* for those of France because of differences in the size of the bill, but these are extremely slight and not constant, and neither *steinbacheri* nor *turonensis* is valid in my opinion. I did not examine topotypical *turonensis* but, judging by the statements and measurements given by Mayaud (1933, *Alauda*, p. 192), the difference between this population and that of Sweden is not constant and scarcely appreciable. According to Mayaud, the bill, measured from the nostril, measures 7–8 (7.6) in a series of 15 males from western France which includes the type and paratypes of *turonensis*. In a series of 10 males from Sweden measured in the same manner by me it measures 6.5–8 (7.3). The race described by Bird was said by this author to be darker than nominate *schoeniclus* in females, but specimens I have examined from the Outer Hebrides are not constantly darker at all, and *mackenziei* has already been rejected by the British ornithologists, for instance, by Witherby (1938, *Handbook of British birds*, vol. 1, p. 140). The validity of *steinbacheri* has been denied by Salomonsen (1949, *Dansk Ornith. For. Tidsskr.*, vol. 43, p. 37), and the "Birds of the Soviet Union" (p. 484) has synonymized both *steinbacheri* and *turonensis* with nominate *schoeniclus*.

2. *Emberiza schoeniclus passerina* Pallas, 1771, type locality, Ural Basin on migration, with *tazensis* Buturlin (1934, *Sbornik Trud. Gosud. Zool. Muz.*, vol. 1, pp. 91, 100), type locality, mouth of the Taz River, as a synonym. This last is a mere redescription of *passerina*, and I cannot agree with Buturlin that he was correct in proposing *tazensis* for northwestern Siberia, because I believe that Pallas recognized full well that the breeding range of his *passerina* was northwestern Siberia. This is shown by his stating, when he discussed *passerina* again (1811, *Zoographia Rosso-Asiatica*, vol. 2, p. 49) that it occurs at Berezovo on the lower Ob and near the Yenisei in August, emphasizing that it occurs in the south only on migration.

3. *Emberiza schoeniclus parvirostris* Buturlin, 1910, type locality,

Olekminsk on the Lena, with *pallidissima* Portenko, 1929, type locality, upper Nizhnyaya Tunguska and Olekminsk, as a synonym. *Pallidissima* is a new description of *parvirostris* as shown by Buturlin (1934, *loc. cit.*) and Dementiev (*loc. cit.*) This last author states that *pallidissima* was based on the material described as *parvirostris* by Buturlin who designated several of these specimens as types. One of the latter, better called a paratype, was designated by Portenko as the paratype of *pallidissima*.

4. *Emberiza schoeniclus minor* Middendorff, 1851, type locality, Stanovoi Range and Uda River Basin. My reasons for recognizing this race and for my belief that *minor* was correctly identified by Middendorff as a form of *E. schoeniclus* must be discussed in detail. In the literature, *minor* is almost universally considered to be a form of *E. pallasi*, perhaps because Hartert (1904, *Die Vögel der paläarktischen Fauna*, p. 194) placed *minor* in the synonymy of that species. Hartert may have been influenced by Sharpe who also considered *minor* to be a form of *E. pallasi*, but Sharpe (1888, *Catalogue of the birds in the British Museum*, vol. 12, p. 485) confused some of the forms of these two species for one another, because although he gives a good description of *pallasi*, stating correctly that its lesser [upper] wing coverts are ashy gray, he calls the bird he is describing by the name *passerina*. The latter, of course, is not a race of *pallasi* but of *schoeniclus* in which all forms have the lesser upper wing coverts rufous or chestnut, not gray.

Buturlin (1910, *Messenger Ornith.*, p. 43) under the title "A forgotten bird" remarked that *minor* is a form of *E. schoeniclus*. His remark went unheeded, and he restated it in 1934 (*loc. cit.*), and Dementiev (*loc. cit.*) has also made a similar observation. Buturlin and Dementiev argue that Middendorff in his description of *minor* (1851, *Reise in den äussersten Norden und Osten Sibiriens*, vol. 2, pt. 2, pp. 144-146), which he called "*Emberiza schoeniclus* L. var. *minor*" and which was based on one male collected on April 27 (old Russian calendar, corrected to May 9 by Dementiev), stated that this specimen has broad rufous edges on the coverts. Middendorff stated "die oberen Deckfedern besitzen noch breitere rostfarbig Säume" but, as Buturlin says, *pallasi* in May [i.e., worn plumage] does not have the coverts edged with rufous. In *pallasi* at this season the pale edges of the coverts are narrow and are whitish or creamy, and even when in very fresh unworn plumage these edges cannot be said to be "rostfarbig." I may add that in male *schoeniclus*, although the centers of the larger feathers of the coverts are blackish, these dark centers are very much smaller than in *pallasi* and do not show if the feathers are not disturbed. In fact, the most conspicuous color difference separating the males of the two species in all plumages is that in *schoeniclus* the lesser upper

wing coverts appear uniform rufous or chestnut rather than ashy gray or blackish as in *pallasi*. In short, it seems that Buturlin and Dementiev are on sound ground and that *minor* must be considered a form of *schoeniclus*.

The populations of this species which breed from Transbaicalia eastward on the continent and from Kamchatka south through the Kuriles to Hokkaido are all called *pyrrhulina* Swinhoe, 1876. Whether or not *minor* should replace *pyrrhulina* is not certain, because there is some evidence that two distinct forms of *schoeniclus* breed in these regions. Apparently the bird described by Middendorff was small, as evidenced by its name. Middendorff did not give its wing length, but Buturlin in 1934 said he had a specimen from southern Manchuria that corresponded exactly to the description of *minor*, and in 1910 he gave the wing length of this specimen as 73.5. It was collected on September 11, but the measurements given by Meise (1934, Abhandl. Ber. Mus. Dresden, vol. 18, no. 2, p. 24) show that small birds appear to breed in Manchuria. In that paper, Meise states that his four adults (which he calls *pyrrhulina*) from Manchuria, two of which were collected in May and June and the others in August and on September 16, measure 70–76.5. These specimens are considerably smaller than true *pyrrhulina*, because 10 adults that I have measured from Japan have a wing length of 79–87 (83). One additional specimen from Japan, an adult female, has a wing of 73 but, as it was collected on October 20, could have been a migrant or visitor. It is probable therefore that two races of *schoeniclus* exist in the Far East and that is why, at least provisionally, I have recognized both *minor* and *pyrrhulina*. The range of *minor* is uncertain, but, if one can judge by the specimens of Meise, Manchuria appears to be part of its range but apparently not coastal Ussuri-land, because an adult male collected on July 4 along the coast on the Tumnin River that I have measured has a wing of 83 +.

I do not believe that the name proposed by Gmelin in 1789 and recently disinterred by Stresemann (1949, Ibis, pp. 244–245) should be placed into use. According to Stresemann, it was based by Gmelin on an English name given by Pennant to a specimen, now no longer in existence, said to have been collected in Kamchatka. Gmelin's name was never placed into use until Austin and Kuroda (1953, Bull. Mus. Comp. Zool., vol. 109, p. 603) substituted it for *pyrrhulina*, although Stresemann had made a plea that the newly interpreted name should be considered an obligatory synonym. The Principle of Conservation adopted in 1953 at the Fourteenth International Congress of Zoology in Copenhagen bars the use of such names. Furthermore, matters of nomenclature aside, it is probable, as shown above, that more than one form breeds in the Far East. Austin and Kuroda did not examine specimens from Kamchatka, and they are

not available to me, but it is not certain that this population belongs to the same race that breeds on Hokkaido.

5. *Emberiza schoeniclus pyrrhulina* Swinhoe, 1876, type locality, Hokkaido. This race belongs to the nominate *schoeniclus* group but has a slightly longer wing, a bigger bill, and is paler than the more typical races of this group. It is very similar to *pallidior* of western Siberia in coloration and bill characters but is less whitish below, more buffy above, and its bill averages slightly larger. It is interesting to note that these two races approach each other in character. In the case of *pallidior*, its paler coloration and slightly larger bill show a tendency towards the characters of the *pyrrhuloides* group via the intermediate race *incognita* which replaces it directly to the south and in which it probably intergrades, but in the case of *pyrrhulina*, which is well isolated on the extreme periphery of the range, the fact that it is generally so similar to *pallidior* is probably an instance of parallel adaptation.

6. *Emberiza schoeniclus pallidior* Hartert, 1904, type locality, Russian Turkestan on migration. As suggested above, this race shows a tendency towards the *pyrrhuloides* group but is still very much closer to the nominate *schoeniclus* group, while the reverse is true of *incognita*.

7. *Emberiza schoeniclus ukraineae* Zarudny, 1917, type locality, Gouvernements of Poltava and Kharkov, Ukraine. I have not examined specimens that I could be certain were typical of this race, but its characters, as indicated by various authors, leave no doubt that it is an intermediate between the nominate *schoeniclus* and the *intermedia* groups.

#### THE *pyrrhuloides* GROUP

8. *Emberiza schoeniclus incognita* Zarudny, 1917, type locality, Kirghiz Steppes, with *volgae* Stresemann, 1919, as a synonym. According to Stresemann, the type of *volgae* was collected in March by Tancre's collectors in "southern Russia," and Stresemann believes it was taken in the region of Sarepta. It is known that the localities of Tancre are not always reliable, but whether or not the type was collected near Sarepta, the description of *volgae* is a good diagnosis of the characters of the populations that are intermediate between *pallidior*, *ukraineae* and probably *tschusii* [= *intermedia*], and *pyrrhuloides* Pallas. These populations, which range from the lower Volga eastward through the Kirghiz Steppes north of *pyrrhuloides*, have a longer wing, a larger bill, and are paler than *pallidior*, *intermedia*, and *ukraineae*, but they are less pale and their bill is less heavy and not so highly arched as that of *pyrrhuloides*. On the whole they are, however, much closer to the latter.

The diagnosis of *volgae* is about the same as that given by Zarudny for

his *härmsi*, and Stresemann later (1925, Ornith. Monatsber., vol. 33, pp. 90-91) came to the conclusion that *volgae* was a synonym of *härmsi*. The "Birds of the Soviet Union" (p. 492) also calls the intermediate race of the Kirghiz Steppes by the name *härmsi*, with *incognita* as a synonym. However, it does not seem possible to use the name *härmsi* for the intermediate race, and it should be replaced, I believe, by *incognita*. The original description of the latter is not available but, according to Grote (1919, Jour. Ornith., vol. 67, p. 367), *incognita* is based on specimens from Akmolinsk, Semipalatinsk, and the Turgai region. These localities are within the intermediate zone, whereas *härmsi* is based on specimens from localities far to the south and within the breeding range of *pyrrhuloides* Pallas, namely, on breeding birds collected in the middle and lower Syr Darya Valley and in the basins of the Chu and Sary Su rivers.

9. *Emberiza schoeniclus pyrrhuloides* Pallas, 1811, type locality, "in australibus ad Volgam et Rhymnum, versus mare caspium," restricted below to Astrakhan, with the following synonyms: *centralasiae* Hartert, 1904, type locality Maralbashi, Chinese Turkestan; *harterti* Sushkin, 1906, type locality, Zaisan Nor; *härmsi* Zarudny, 1911, type locality, Russian Turkestan (see above); and *zaissanensis* Buturlin, (1929, Systematic notes on the birds of northern Caucasus, p. 33), type locality, Zaisan Nor. As stated above, *härmsi* was described from localities that seem to be within the breeding range of *pyrrhuloides*. Its diagnosis does not differentiate it clearly from the latter, except that Zarudny says it has a smaller bill. Topotypes of *härmsi* are not available but, pending confirmation that this form is well differentiated, it seems best to consider it as a synonym of *pyrrhuloides*. In view of the fact that more than one race may eventually be recognized from the range now believed to be inhabited by *pyrrhuloides*, it seems desirable to restrict its type locality to a definite one, and I do so to Astrakhan from where I have examined typical specimens collected during the breeding season.

The form *harterti* appears to be a very poorly defined intermediate based by Sushkin on specimens from a region on the northeastern border of the range of *pyrrhuloides* where the population would be expected to grade from *incognita* into *pyrrhuloides*. I have not examined specimens from Zaisan Nor, and I follow the "Birds of the Soviet Union" which has synonymized *harterti* with *pyrrhuloides*. Neither the "Birds of the Soviet Union" nor any other publication mentions *zaissanensis* but, as this form is based also on specimens from Zaisan Nor, it appears to be a redescription of *harterti*.

The validity of *centralasiae* appears to be very dubious. According to Hartert, this form differs from *pyrrhuloides* only by having a distinctly



smaller and proportionately shorter bill, but in *pyrrhuloides* the bill varies a great deal individually in shape and size. Before a race should be separated from it on the basis of differences in the bill alone, one should be certain that the differences are clear cut and constant. That this is probably not the case in *centralasiae* is shown by the remarks of Hellmayr (1929, Field Mus. Nat. Hist., zool. ser., vol. 17, p. 63) concerning the series he examined from Chinese Turkestan. In that series, which included the type of *centralasiae*, he found that some specimens matched the type in having a small bill, but that in others it was larger and virtually identical with that of *pyrrhuloides*. The series was a mixed one consisting of breeding and winter birds, but Hellmayr believed that it represented a single form and that the variation was merely individual. He cautioned also that his comparative material of *pyrrhuloides* was "rather unsatisfactory," but, despite this reservation and the possibility that the series may have included winter visitors, his statements throw some doubt on the validity of *centralasiae*. It is not even certain that the name *centralasiae* can be applied to the breeding birds of Chinese Turkestan, because the type was collected in January and could have been a winter visitor. Hellmayr does not believe that other races winter in Chinese Turkestan, but the "Birds of the Soviet Union" states that *härmsi* [= *incognita*, see above] winters in Chinese Turkestan and *pallidior* in "central Asia," and Ludlow (1933, Ibis, p. 674) confirms that the latter is an abundant winter visitor in Chinese Turkestan. Both of these races have a smaller bill than *pyrrhuloides*. The only specimen examined by me from Chinese Turkestan is a female collected at Kashgar on January 25 and is a winter visitor of *pallidior*. It is possible that *centralasiae* is valid, but it should be confirmed that the breeding birds of Chinese Turkestan are really distinct and that they match the type.

10. *Emberiza schoeniclus zaidamensis* Portenko, 1929, type locality, Zaidam. Specimens from this region are very rare in collections, and I have examined none, but *zaidamensis* is a well-isolated form and is probably valid. According to Portenko, it is a very large race, and brighter, more buffy and yellowish, than any other race and apparently has a large bill similar to that of *pyrrhuloides*.

#### THE *intermedia* GROUP

11. *Emberiza schoeniclus witherbyi* von Jordans, 1923, type locality, Balearic Islands, with *lusitanica* Steinbacher, 1930, type locality, Tagus Valley, Portugal, as a synonym. It seems to me that the populations of the Iberian Peninsula require further study before *lusitanica* can be accepted, but comparative material from the Peninsula is virtually lacking,

and even records are very few. Other than in the region of Lisbon it has apparently been collected during the breeding season only in the Ebro Delta on the east coast by Witherby (1930, Bull. Brit. Ornith. Club, vol. 50, p. 74) who found his specimens to be identical with those of the Balearic Islands. It seems to breed also near Valencia and in the Guadalquivir marshes below Sevilla. More material should be collected and compared before two races are accepted.

Ticehurst and Whistler (1935, Ibis, p. 556) have confirmed that specimens from the region of Lisbon differ from nominate *schoeniclus* by being darker and by having a higher and thicker bill, but this does not necessarily confirm the validity of *lusitanica* because these differences are precisely those by which *witherbyi* differs from nominate *schoeniclus*. Their observations suggest, in fact, that *lusitanica* is not separable from *witherbyi*, because they found that the bill in their specimens from Portugal matched that of specimens from the Balearic Islands. Their specimens from these islands were winter birds, and Ticehurst and Whistler believe they were visitors, but there is no reason to assume that these were not *witherbyi*, because there is some evidence that this form is sedentary (see von Jordans, 1924, Jour. Ornith., vol. 72, p. 402).

12. *Emberiza schoeniclus intermedia* Degland, 1849, type locality, Dalmatia, with the following as synonyms: *tschusii* Reiser and Almásy, 1898, type locality, Dobruja; *reiseri* Hartert, 1904, type locality, Thessaly; *compiler* Mathews and Iredale, 1920, new name for *E. palustris* Savi, 1829, type locality, Tuscany, as this name is preoccupied by *E. palustris* Frenzel, 1801; and *stresemanni* Steinbacher, 1930, type locality, northern Yugoslavia. The populations of southern and southeastern Europe have been divided into more subspecies than those from any other region. They all appear to be identical in coloration, but big- as well as small-billed birds occur among them. There is some evidence that this variation is geographical to some extent, but it is difficult to assess because the individual variation is so great. In the material that I have examined from Dalmatia, the Dobruja, and Italy the range of this variation is about the same. In the material of *reiseri* examined, which consists of the type and the three paratypes, the type has a big bill; in one paratype it is slightly smaller; in another still smaller and matches that of specimens from Italy; and in the last paratype it is very small and, though slightly higher, is hardly bigger than in nominate *schoeniclus*. In view of the individual variation it seems to me that it is best not to recognize any subspecies and to synonymize all the names above with *intermedia*, as was done by the "Birds of the Soviet Union" (p. 491) which also adds *witherbyi* to the synonyms. No specimens of *stresemanni* were available

but, as this form is based on specimens from a region where the population is intermediate, I have followed the "Birds of the Soviet Union" in not recognizing this form. It is possible, however, that *stresemanni* is closer to *ukrainae* and should be synonymized with it rather than with *intermedia*.

13. *Emberiza schoeniclus caspia* Ménétries, 1832, type locality, near Baku. The populations that breed in Transcaucasia, Syria, and Iran seem to me clearly to belong to the *intermedia* group, their range being continuous with the latter along the western coast of the Caucasus. Hitherto, under the name *korejewi*, they have all been referred to the *pyrrhuloides* group, the "Birds of the Soviet Union" going so far as to include Iran within the range of *pyrrhuloides* Pallas and to deny the validity of *korejewi*. They do come, or may come, in contact with *pyrrhuloides* in the region northeast of the Caucasus where the latter breeds on the west coast of the Caspian as far as the Terek River. However, when one compares breeding specimens of *pyrrhuloides* from Astrakhan, also on the west coast of the Caspian, with breeding specimens of the nearest population of *caspia* from Lenkoran in Talych and Gilan in northwestern Iran, the two are very distinct. No two contiguous populations that I have examined from the entire range of the species are more distinct, whereas the difference between the specimens from Lenkoran and Gilan and *intermedia* is only one of degree, although it is of taxonomic importance.

The probable affinity of the populations of Iran with *intermedia* rather than *pyrrhuloides* is supported by their distribution (fig. 1). The range of the species, as stated above, is continuous along the western Caucasus, from there through Transcaucasia to northern and northwestern Iran and from the latter through the Zagros<sup>1</sup> and Persian Baluchistan to Seistan, but if exception is made of the region northeast of the Caucasus (discussed above), a very wide gap separates these populations from *pyrrhuloides*. The population on the southern coast of the Caspian is well separated from Turkestan by the sea and the Transcaspian deserts, and topotypical *korejewi* itself (Seistan) is even more widely separated. The species does not breed in Iran north of Seistan, but if Zarudny (1911) is correct that it breeds in the Hari Rud Valley (shown by a query above Seistan in fig. 1) and that this population belongs to *pyrrhuloides*, the two are not so widely separated as I believe. At any rate, the two forms are still very distinct. They both have a large bill, but in *korejewi* (fig. 2) the shape is not

<sup>1</sup> Zarudny (1911, Jour. Ornith., vol. 59, p. 214) suspected that the species bred in the Zagros but listed it from this region with a query. The breeding has been confirmed by specimens that I have examined collected by Koelz in the western Zagros and in eastern Fars.

the same, although it is so maintained by some authors, and they differ also in coloration, *korejewi* being distinctly darker above and more heavily streaked with broader streaks. In *korejewi* the bill is not so highly arched, is more attenuated, and has a narrower mandible.

The various populations of Iran are not identical. In the birds of the northwest the bill (fig. 2) is distinctly smaller than that of *korejewi*, approaching that of *intermedia*, and in specimens in worn plumage, those from the northwest differ from those of Seistan by being distinctly grayer, while those from the southwest and south (western Zagros and Fars) are more buffy than the other two populations and their bill is intermediate. The populations (especially those of the northwest and Seistan) differ at least as much from one another as the majority of the preceding races recognized in this paper, and I do not believe therefore that they can all be called *korejewi*.

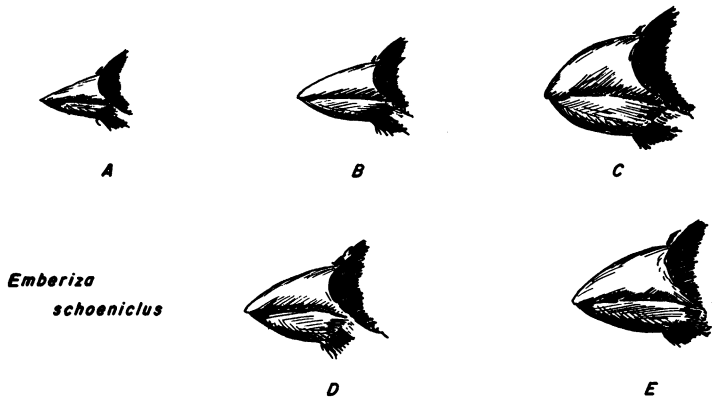


FIG. 2. Shape of the bill in profile in adult males of some races of *Emberiza schoeniclus*. Key: A, nominate *schoeniclus*, May 15, Orebro, Sweden; B, *intermedia*, May 3, near Livno, Dalmatia; C, *pyrrhuloides*, April 21, Astrakhan; D, *caspia*, April 18, Pahlevi, Gilan, northwestern Iran; E, *korejewi*, June 3, Seistan, southeastern Iran. Average specimens of each race were selected, and the bills, though shown slightly larger than natural size, were drawn to scale.

The name *caspia* Ménétries can probably be revived for the birds of the northwest and southern Caspian, as it is based on breeding birds collected near Baku, a locality not far from Lenkoran. My specimens show that this race is distinctly grayer above, less heavily streaked on the mantle, and has a larger bill than *intermedia*. The difference between it and *korejewi* is mentioned above. It differs from *pyrrhuloides* by its smaller bill (fig. 2) and by being much grayer, not buffy or sandy, by having darker and

broader shaft streaks on the mantle and the edges of the feathers of the mantle, wing, and tail more rufous and not so pale.

The intermediate populations of the Zagros and Fars seem, on the whole, best referred to *caspia*, as probably does that of Syria. The lone adult that I have examined from Syria is not separable, however, from the specimens from Seistan, but until more specimens become available it seems more logical to refer this population to *caspia* than to split the range of *korejewi* which is best restricted to Seistan and Persian Baluchistan.

14. *Emberiza schoeniclus korejewi* Zarudny, 1911, type locality, Seistan and Persian Baluchistan.

### SUMMARY

In summary it can be said that, while it is convenient to arrange the various races of *Emberiza schoeniclus* into three groups, the boundary between them is very arbitrary in some parts of the range. In other regions the bill characters vary a great deal individually, and it is best not to use them for subspecific discrimination, and many races are slightly differentiated or relatively so in both bill characters and coloration. If these, as well as those that are purely intermediate, are eliminated, only a very few remain, namely, nominate *schoeniclus*, *pyrrhulina*, *pyrrhuloides*, *intermedia*, and *korejewi*. *Pallidior* is well differentiated from nominate *schoeniclus* but not from *pyrrhulina*. *Pallidior* and *pyrrhulina* are very far removed geographically and probably owe their general similarity to parallel adaptation. In view of the fact that all the races with a large, though not necessarily identical, bill occur in the more southern and generally drier parts of the range, the tendency towards large bills also seems an instance of parallel adaptation. In this connection, it is of interest to note that the forms inhabiting the most arid regions have the largest bill of all, as in Turkestan, Seistan, the Syrian Desert, the Tarim Basin, and the Zaidam.

