

COMPARATIVE NOTES ON FUERTES AND ORCHARD ORIOLES

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In March of 1888, W. B. Richardson collected and preserved what was probably the first scientific specimen of the American oriole which was later named *Icterus fuertesi* by Chapman (1911). This first specimen was not discussed critically, oddly enough, until 1939 (Sclater, 1939:142). Wetmore (1943:323-324), reporting on specimens collected by Carriker, added to our knowledge concerning the size and distribution of *fuertesi* and hinted that it might actually be a race of the Orchard Oriole (*Icterus spurius*). Blake (1953:512) thus chose to regard it, although little more was known of the bird and its habits than when Chapman's description appeared.

We had opportunity to make observations on the Fuertes Oriole during the course of our work along the coast of Tamaulipas in the summer of 1953. In presenting our data on *fuertesi*, we have included a comparison between it and *spurius*.

DISTRIBUTION

The breeding range of *Icterus fuertesi* extends, as Wetmore (1943:324) pointed out, along the eastern coast of Mexico from southern Tamaulipas to at least Tlacotalpam in southern Veracruz. Its wintering grounds are apparently unknown. On the Tamaulipas coast, we found that Fuertes Orioles bred at least as far north as Moron, where they were fairly common.

Whether or not the Orchard Oriole actually breeds in Mexico, except near the United States border, still seems to be a moot point. The occurrence of that species in Mexico in the summer months cannot be considered as evidence of breeding, as migrants may occur in May and July even in southern Mexico. From our experiences in the Tampico region in June, we feel quite certain that *spurius* does not breed in that area, whereas *fuertesi* is a common bird. Whether the ranges of the two forms overlap farther to the north, we did not learn. We left the Tampico region on June 28, and went to Moron which lies only 35 miles to the north. Near Moron, we found Orchard Orioles, but not until July 3, when we saw an adult male with six female or immature individuals. On July 4, we saw an adult male *spurius* (typically dark chestnut-colored) which sang as we watched it; then we lost sight of it and did not see it again. Perched within 25 yards of this *spurius* was an adult male *fuertesi*, also singing. We collected the latter and found that it had much enlarged testes. Like five other singing males of the same form which we saw in the vicinity, it was probably holding a breeding territory. It was over two weeks before we saw another Orchard Oriole, and then not individual birds but non-singing, obviously transient flocks of both sexes.

Thus, the lone male *spurius* we saw on July 4 may possibly have been a breeding bird, in which case the two forms come together in the Moron region. Although the singing is hard to account for, we are inclined to the view that the bird was an early transient. Warner and Mengel (1951:294) found transient flocks of *spurius* as early as July 16 near Boca del Rio, Veracruz, and the group which we saw on July 3 could well have been a transient flock.

HABITAT

The Fuertes Oriole is concentrated in a distinct habitat—the narrow belt of dune vegetation along the coast (fig. 1). This habitat is an extremely well lighted one with whitish sand and salt flats on all sides. Nesting pairs were especially numerous in the dense, sprawling clumps of majagua or hibiscus (*Hibiscus tiliaceus*) and mangle negro (*Conocarpus erecta*) just behind the dunes, within 15 to 20 paces of the waters of the Gulf. We found at least one nesting pair in nearly every clump. The species' breeding grounds

must originally have been restricted to this narrow, semi-marshy, unforested trough. Fuertes Orioles have probably invaded more inland parts of the coastal plain only in recent years, due to increased deforestation, especially along man's transportation routes, such as rivers and highways. This is indicated by the aggregation of nesting *fuertesi* in the dunes habitat. We found the population considerably less dense around Altamira (only 6 to 8 miles inland) where the orioles occur in scattered pairs in "hedge rows" at the margins of cultivated fields and in scrubby thorn thickets of bull's horn

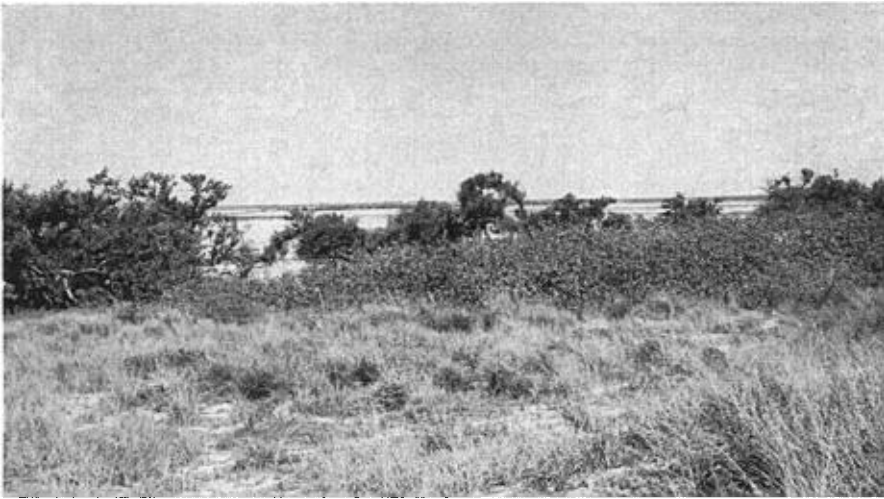


Fig. 1. Habitat of Fuertes Oriole, one mile east of Loma del Real, Tamaulipas. Dune grass in foreground, then hibiscus and mangle negro shrubs, and then a row of mangle trees (*Avicennia nitida*); salt flat in background; photo taken looking inland (westward).

acacia (*Acacia* sp.) and other plants. The spread is further pointed out by the fact that Nelson and Goldman (Goldman, 1951:259) apparently did not find this oriole in the vicinity of Altamira during their visit for 28 days in April and May of 1898, when that region was better forested. It is true that Chapman's type series came from 35 miles inland along the Tamesi River, but both the date of his observations (early April) and the fact that there were transient flocks of Orchard Orioles about indicate that his *fuertesi* may have been transients where he found them.

Pearson, Brimley and Brimley (1942:335) and Dennis (1948:15) mentioned the preference of *spurius* in the states of North Carolina and Mississippi for the coastal lowlands. Thomas (1946) and others have pointed out the semi-colonial nesting habits of the Orchard Oriole. Our experience in Kansas leads us to believe that these birds do not always aggregate in certain favored localities but also nest in scattered single pairs.

Our data corroborates Beecher (1950:78) in his assumption that the habitat requirements of *fuertesi* are essentially like those of *spurius*. Judging from the denseness of the population of *fuertesi* along the coast, and the fact that additional suitable habitat is being made available, this species may become one of the commonest forms throughout the coastal plain of eastern Mexico, just as *spurius* has in the eastern United States.

MIGRATION

The migration periods of *spurius* and *fuertesi* apparently coincide to some extent, in both spring and fall, but at least in the fall that of *spurius* starts earlier and continues

later in southern Tamaulipas. This is possibly a natural consequence of greater numbers and broader range. In July when the first individuals of *spurius* came southward down the coast through the area occupied by the population of *fuertesi*, the latter were for the most part still occupied with the care of young birds, many of which were already out of the nest. On July 24, when we left the coastal area, some Fuertes Orioles were still feeding young birds, although all we saw were out of the nest and fairly well grown. Adults were still not in flocks, and we occasionally saw a male singing. Flocks of Orchard Orioles were evident on all sides, migrating in earnest. When we returned to the region again on August 23, flocks of *spurius* were still evident, but we saw only one individual of *fuertesi*, and none thereafter. August 26 was our last day in the field, and on that date we identified *spurius* but no *fuertesi*. It should be emphasized that only adult males of the two forms could be identified in these transient flocks.

BREEDING BEHAVIOR

In general, breeding behavior of orioles of the genus *Icterus* does not vary greatly, and one would expect two forms as similar in appearance and habitat requirements as *spurius* and *fuertesi* to be similar in other respects. Such, in our experience, proved to be the case.

Like the migration period, that of nesting must correspond quite closely in *spurius* and *fuertesi*. Lloyd (1887:290) stated that Orchard Orioles (males) arrived in western Texas about April 13, and his earliest dates for nests with eggs were May 19 and June 1. He also stated that males were not seen after August 5 while females (or young of the year) were seen as late as mid-September. Dennis (1948:13) gave March 28 as the arrival date for males in Mississippi, stating that nest-building began about May 1 and that the last nest under construction was observed July 4.

Forbush (1927:439) indicated that *spurius* was single-brooded, at least in the northern part of its range. Dennis (*op. cit.*) showed that one complete nesting cycle of the Orchard Oriole in Mississippi required slightly over a month. We believe that Fuertes Orioles are also generally single-brooded, since the numbers of stub-tailed juveniles which we saw in late June in southern Tamaulipas probably represented the first broods of the bulk of the *fuertesi* population in that region, and by August 20 virtually all of the adult orioles had migrated.

On June 17, we visited the dunes habitat east of Loma del Real, where we saw several Fuertes Orioles. Thereafter, between Tampico and Loma del Real we saw dozens of these birds and found five active nests between June 18 and 25. We also saw several pairs which were feeding stub-tailed young out of the nest during this time. All of the nests also contained young birds, indicating that the nesting season was well advanced and that the stage of development was consistent in all cases.

Of the five active nests, two were placed in hibiscus shrubs, two in guayaba trees (*Psidium guajava*) 10 to 15 feet in height, and one in the top of a twenty-foot strangling fig (*Ficus* sp.). The nests in the hibiscus were placed high in the shrubs within six inches of the tips of the branches, about eight or nine feet above the sand. They were located about three to five feet in from the margin of the clumps which form rows about five to ten feet wide and 30 to 50 feet long. These nests were well shaded by the large, roughly circular, fairly thick leaves of this shrub. These two nests were less than 50 feet apart, as were the two nests in the guayaba trees. Nests may have been spaced even closer than this, as we once saw two separate pairs carrying food into the same clump, whereas we found only one nest. Occasionally as many as six orioles would scold us at a single clump of vegetation.

The nests were all well-woven baskets, much like those of *spurius*. They were sup-

ported by strands of nesting material wound about adjacent twigs and were cradled in the forks of branches. One of the nests was partly supported by having the nesting material woven through holes in the hibiscus leaves. One such leaf was pulled into contact with the nest wall, a habit which Beecher (1950:61) mentions as being characteristic of the nectar-adapted complex of orioles. This suggests that Beecher may be correct in relating *spurius* to *prosthemelas* through *fuertesi*.

The nests reflected the habitat in that they were made of rather coarse, water-tolerant grasses. One of the two nests which we collected is composed largely of a species of *Eleocharis*, the other of *Spartina* probably. Dennis (1948:15) mentions the use of the latter by *spurius* in the marshes of the Mississippi delta. There was no apparent lining in any of the nests of *fuertesi* that we checked. It was possible to see through the nest walls, but not through the bottom. The absence of lining is of interest since Orchard Orioles even in the southern part of their range generally do use some soft, downy plant materials as nest lining (see Dennis, 1948:15, and Forbush, 1927:439). The nests of *fuertesi* had the same coarse grasses on the inside as on the outside of the nest. This lack of lining may be linked adaptively with the rather high temperatures of the habitat of this bird.

The measurements of the two used nests we collected were 3.5 and 4.5 inches in outside depth, with walls varying from 0.5 to less than 0.25 inch in thickness, being thickest at the bottom. The inside diameter at the top was approximately 2 to 2.5 inches.

As previously indicated, the nesting cycle was already well advanced when we first found these birds, and we failed to find a nest with fresh eggs. A nest found on June 25 contained a nestling only a few days old and an egg which showed no signs of development. The egg measures 0.80 by 0.55 inches, average for *spurius* (Roberts, 1932:307). The markings on the egg are black with a purplish cast, these largely concentrated at the blunt end. In both respects it is similar to eggs of *spurius*. The ground color is white, but that of the eggs of *spurius* is light blue.

Clutch size for the Orchard Oriole is given by various authors as four to six, or generally five. Dennis (1948:19) found a range from two to five in 66 nests, with four of most frequent occurrence. We have no data on clutch size in *fuertesi*, but in the three nests into which we could actually see, there was evidence for no more than two-egg clutches. One held an egg and a bird in natal down; another two nestlings not far from fledging; and the third an oriole in pin feathers and a Red-eyed Cowbird (*Tangavius aeneus*). The latter nearly filled the nest, although it was at about the same stage of development. *Tangavius* is also known to parasitize the Orchard Oriole (see Merrill, 1877:86).

Thomas (1946:166) and Dennis (1948:17) clearly point out that there is virtually no defense of nesting territories by *spurius*. This seems also to be the case with *fuertesi*. Only once did we see one male chase another; otherwise there was no evidence of territoriality. Two males frequently perched and even sang in the same tree. The birds did not appear to range far from the nest site. Although both males and females were active in feeding the young, males seemed to take a more active part in this duty. The birds almost always flew to the low vegetation of the dunes to catch insects. Frequently they flew over the dunes to near the shore for food. Beecher (1950:82) has pointed out that orioles of this type are adapted for nectar feeding. We saw at least one pair flutter before the large, yellow, bell-shaped flowers of *Hibiscus* only a few feet from their nest and probe repeatedly.

In spite of the lateness of the season, Fuertes Orioles were singing rather persistently in late June. Interestingly, Louis A. Fuertes was led to discover the species which bears his name by its distinctive song. Chapman (1911) indicated that the song of *fuertesi*,

although "of the Orchard Oriole type," differed from the song of that species. We had not read Chapman's description previously, but our notes mention the same kinds of differences that Chapman did, that is, that the song of *fuertesi* is softer and less brilliant than that of *spurius*.

Dennis (1948:17) makes note of social nesting between the Orchard Oriole and the Eastern Kingbird (*Tyrannus tyrannus*). A similar relationship may exist between *fuertesi* and the Tropical Kingbird (*T. melancholicus*), as one of the oriole nests we found was only 8 feet directly above an active kingbird nest in the same strangling fig.

COMPARISON OF SPECIMENS

In every instance, mention of *I. fuertesi* in the literature has included mention of *spurius*. This obvious notice of apparent close relationship is to be expected since there is no difference in pattern between the two forms. Chapman (1911:2-4) indicated that there was a significant size difference between the two, and his few specimens showed no actual overlap in length of wing or tail. Wetmore (1943:324) reported on two specimens (male and female) of *fuertesi* which fell within the size range of *spurius*.

The measurements of seven male and two female specimens are summarized in table 1. All but one female fall within the size limits of *spurius*. In order to analyze the

Table 1

Wing and Tail Length in *Icterus spurius* and *Icterus fuertesi*

	Wing				Tail			
	Observed limits	Mean	S.E. (mean)	S.D.	Observed limits	Mean	S.E. (mean)	S.D.
Males								
<i>I. spurius</i> (33) (North U.S.)	75-81.5	78.45	0.30	1.75	67-75	70.18	0.44	2.50
<i>I. spurius</i> (10) (S. Texas)	73-78	75.85	0.48	1.53	65-71.5	69.10	0.61	1.93
<i>I. fuertesi</i> (7) (Tamps. Mex.)	73-77	74.86	0.91	2.42	67-73	69.29	0.51	1.35
Females								
<i>I. spurius</i> (10) (North U.S.)	72-76.5	74.35	0.44	1.39	65-70	67.70	0.45	1.44
<i>I. fuertesi</i> (2) (Tamps. Mex.)	71, 73	65, 66.5

size relationship between the two species, we felt that we should know more about the size limits of *spurius*, and so borrowed a considerable series representing a variety of localities.

The race *I. s. affinis* named from southern Texas by Lawrence in 1852 was considered to be a population of smaller birds. The race has been accepted by some authorities, but not generally so. Amadon and Phillips (1947:579) suggested that *affinis* might be valid on the basis of both size and color characters.

Dickey and van Rossem (1938:533) pointed out that the use of specimens collected between April 1 and August 15 to represent "breeding birds" is misleading. Northward migration of *spurius* may last into May and the southward migration is in full swing probably early in July. Specimens of known breeding Orchard Orioles from any part of the species range are rare in collections; hence in order to obtain at least a small series of birds to represent the southern part of the range and still eliminate transients as much as possible, we used specimens collected in southern Texas between May 17 and June 25.

Dickey and van Rossem (*loc. cit.*) also stated that the difference between typical *spurius* and *affinis* was less a matter of linear measurements than of actual bulk; that is, that the latter had more slender bill, tarsus, and feet. In our small series, such differences are not apparent. Our series did show an actual difference in wing length, but not of tail in males of the two groups. Table 2 gives values for mean difference (d) in wing and tail length, and the statistic " t " as a measure of the significance of the difference in mean between *spurius* from the northern part of the species range (Michigan, Illinois, Iowa, Nebraska, Wisconsin, Pennsylvania, and Ontario), *spurius* from southern Texas, and

Table 2
Statistical Comparison between *I. spurius* of Northern United States¹ and Related Populations to the South

	Wing		Tail	
	d^2	t^3	d	t
<i>I. spurius</i> from southern Texas (10 spec.)	2.60	4.23	1.08	1.25
<i>I. fuertesi</i> from southern Tamaulipas (7 spec.)	3.60	5.95	0.89	0.88

¹ Basic data drawn from 33 specimens; see table 1.

² d = difference in mean length.

³ t = statistic " t "; use 41 degrees of freedom for " t " of the two *spurius* populations, and 38 degrees for " t " of *spurius* and *fuertesi*.

fuertesi from southern Tamaulipas. A " t " of 4.23 for the difference in mean wing length between the two populations of *spurius* indicates that there is a probability of less than one per cent that the difference could be due to chance. Thus, there is a real difference in wing length between the two groups (see also table 1), but the amount of overlap is too great to warrant the recognition of *affinis* on this character. A " t " of 5.95 for the mean difference in wing length between northern *spurius* and that of *fuertesi* again indicates a real difference, though not necessarily a greater difference than between the two groups of *spurius*.

It is also interesting that no real difference in tail length is indicated either between the two *spurius* populations or between *spurius* and *fuertesi*. Thus, *fuertesi* could be fitted into the *spurius* size-cline fairly well.

Available weights do not indicate a notable difference in body bulk between the two species. Four adult male *fuertesi* weighed 19, 20, 20.5, and 22 grams, the sub-adult male 19, and two females 20 and 22 grams, respectively. None of these birds was fat, and the weights do not differ from comparable *spurius*.

Chapman (*op. cit.*) made no mention of color differences between females of the two species, but Wetmore (1943:323) stated that *fuertesi* differed "in faintly paler hue of the under-surface and the rump." We saw several Fuertes Orioles at their nests and feeding young out of the nest, but collected only two adult females. These show quite a variation in color. One (RRG 2272) was taken June 22, 1953, one-half mile west of Altamira. It was in the company of an adult male, and both were greatly alarmed by our presence, as we were probably near their nest. This female has the pale coloration of rump and underparts noted by Wetmore. Our other specimen (RRG 2245) was shot at its nest along with its mate (a fully adult male) on June 18, one mile east of Loma del Real. This specimen is no paler in any part than any of several female *spurius* at hand and differs only in its possession of a blackish patch on the throat and upper chest which suggests slightly the bib of the male. Although this pigmented condition could have been overlooked in the field, we did not see it in other females and do not believe that it is necessarily characteristic of female Fuertes Orioles. There is then a good chance

of overlap in both color and size characters in female *spurius* and *fuertesi* (see table 1). This raises the question whether females of the two forms are actually separable from one another morphologically.

Although there may be a tendency toward paler coloration and smaller size of female *fuertesi* than *spurius*, on the basis of our two specimens which were known mates of adult *fuertesi* males, we feel that it is highly unlikely that migrant female birds can be correctly differentiated. The same is very likely true of sub-adult males. A first-year male which we collected at its nest one mile east of Loma del Real on June 24 is also

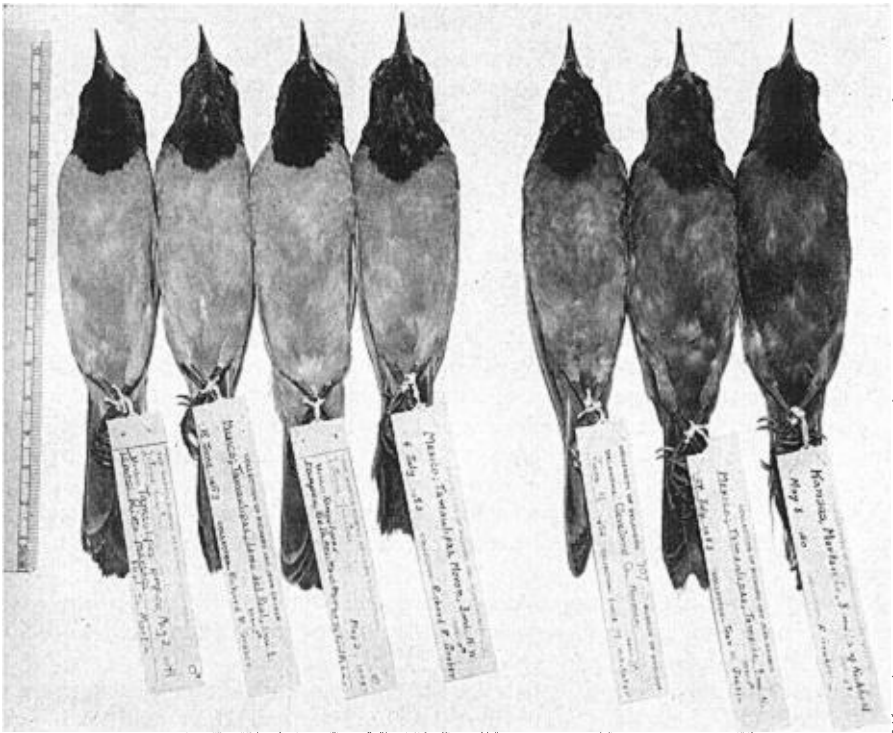


Fig. 2. Series of three Orchard and four Fuertes orioles showing tendency toward intergradation in color. Our northernmost specimen (R.R.G. no. 2316) of *Icterus fuertesi* is the bird in the center of the series.

richly colored and inseparable on this basis from comparable *spurius*. Our specimen measures: wing, 73 mm.; tail, 67; culmen from back edge of nostril, 13; and tarsus, 22. Again, in this plumage, color and size fall within the limits of *spurius*.

In view of the above similarities, then, it is extremely interesting that there is an apparent difference in color in the juvenal plumages of the two forms. Two stub-tailed, sibling female *fuertesi* which we collected just after they left the nest on June 18 weighed 13 grams each. One (RRG 2249) is slightly brighter colored, but both are notably paler than any of the eight (3 male and 5 female) juvenal *spurius* on hand. This series shows little, if any, sexual dimorphism, and is remarkably uniform throughout. The young of *fuertesi* differ from those of *spurius* as follows: the head and back are buffy gray, not olive or yellow green as in *spurius*; the rump is pale buff, not greenish. The tail is buff-gray, broadly light-tipped, not olive-green as in *spurius*; the wing bars are whiter and

notably narrower than in *spurius*; the throat, breast, belly, and undertail coverts are pale (buffy on breast) yellow throughout, in sharp contrast to the bright, rich yellow underparts of juvenal *spurius*. If our specimens are representative (bear in mind they come from one nest), the two forms may easily be differentiated in the juvenal plumage.

Beside that of juveniles, the other readily identifiable plumage is, of course, that of the adult male. This is probably the only plumage in which an intermediate between *fuertesi* and *spurius* would be very obvious. Apparently no such intermediate is known as yet. However, even within the small series of *fuertesi* at hand (5 specimens), there is considerable variation in intensity of coloration. Interestingly, our northernmost specimen (RRG 2316) is the darkest, and approaches slightly the palest *spurius*, though it is clearly a member of the *fuertesi* population (fig. 2).

A nest which we found on June 25 contained one undeveloped egg and a nestling in natal down probably less than a week old. Down of the crown and nape in this specimen is light gray, while that of the rest of the body is white; there is no down on the upper throat, breast, and hind-neck. Pale yellow feathers are just pushing through on the ventral pterylae of the nestling, while the dorsal tracts are quite dark with pin feathers. Primary quills are about one centimeter long and the secondaries slightly shorter. We find no description of the natal down in *spurius*.

Obviously the relationship between *Icterus fuertesi* and *spurius* is a close one. We cannot present any very strong argument against their being considered conspecific. The difference in juvenal plumage is interesting, yet probably no more striking than between the races of the Cowbird, *Molothrus ater ater* and *M. a. obscurus*.

On the other hand, several of the American orioles are quite similar, not alone in color and pattern, but also in their breeding habits. If ornithologists in general accept the view that the relationship is best expressed at the subspecific level, then it may be more consistent to treat others such as *Icterus galbula* and *bullockii* as conspecific. To introduce nomenclatural changes without sufficient knowledge of the forms involved is not good scientific practice, and in the present case our knowledge is exceedingly poor. *Icterus fuertesi* is a distinct form, and it does not seem inconsistent with the present classification of the genus *Icterus* to maintain it at the level of species until we have more facts.

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