

A HYBRID JAY FROM CHIAPAS, MEXICO

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In January, 1951, a lone and peculiar jay was observed and collected by Alvarez del Toro at Santa Rita in western Chiapas (fig. 1). It appeared more robust than the locally common Magpie-jay (*Calocitta formosa*) and behaved differently from it. The locality, northwest of Tuxtla Gutiérrez, is five miles north of San Fernando, a small village recently renamed Villa Allende. The specimen was sent to the Museum of Vertebrate Zoology, and the interest aroused by it resulted in several visits to the area by Alvarez del Toro and Selander, in 1953 and 1954. Their efforts were directed toward obtaining information on geographic and ecologic distribution of the jays locally present and, if possible, further specimens which would help unravel the mystery presented by the one which Alvarez del Toro collected.

Because the Santa Rita specimen superficially resembles *Calocitta* more than any other jay (see fig. 2), it was first thought that it could be a variant of the dark type of *C. formosa* which occurs in increasing proportion in populations west of Chiapas. Between the black-throated, dark-faced race (*C. f. colliei*) occupying the northwestern end of the species' distribution and the westernmost of the white-throated, light-faced races (*C. f. formosa*), there occur individuals combining color characters of these forms in various ways. This is in an area over which the distribution of Magpie-jays is virtually continuous. Even the main features of this intergradation are not known yet, but the mixed characters of specimens from this area, and particularly the incidence of contrasting individuals in single populations, indicate that the changes from the "*formosa*" type to the "*colliei*" type are manifest in fairly complex manner over an area that is large. Hence the view that the Santa Rita specimen might represent some extreme expression of this situation.

Two other possible explanations for the peculiarities of this specimen were at first also entertained. It could be a hybrid between *Calocitta formosa* and *Psilorhinus mexicanus*. This possibility arises from the fact that the area in which the specimen was taken is one of the few where the distributions of these two large lowland jays meet and overlap (fig. 3).

The last explanation was simply that we were dealing with a new species of jay, and in the light of the train of relatively recent surprises offered by the Mexican avifauna, this hypothesis did not seem to be too far-fetched. There are nine species of jays in the region of the Isthmus of Tehuantepec, and one more conceivably could occur. Witness the presence of *Cyanocorax dickeyi* in western México and of other species with similarly restricted distributions elsewhere in México and Central America. Field explorations by Selander, however, disclosed no habitat conditions which would strengthen the notion that a new species was involved. From October 10 to 21, 1953, and again from April 25 to 30, 1954, the area was examined by him to see if there were any habitat with distinctive features of vegetational structure and of substantial area, or if there were any patterns of habitat interspersions peculiar to the area, which could be the domain of the strange jay. No such situation was found, and although additional specimens of both *Calocitta* and *Psilorhinus* were collected, all these were normal. As no definite evidence of still a third kind of large jay in the area was obtained, the possibility that the Santa Rita specimen represented a new species was dismissed.

Closer study of the specimen has led us to dismiss also the view that it is merely a variant of *Calocitta*. Rather, the totality of facts appears to favor the view that it is a hybrid, and the information now to be given is organized on this assumption.

MORPHOLOGICAL CHARACTERS OF THE HYBRID

In color, the Santa Rita specimen, an adult male, is more or less intermediate in most characters, and indeed perhaps in all characters depending on one's interpretation of variational range and character recombination.

The back is dull bluish slate gray, falling fairly midway between the grayish blue of *Calocitta* and the brown of *Psilorhinus* taken in the same region. The upper surface of the rectrices is slate blue, likewise fairly intermediate between the dark purplish blue of *Calocitta* and the brown of *Psilorhinus*. Contrast between back and rectrices is marked

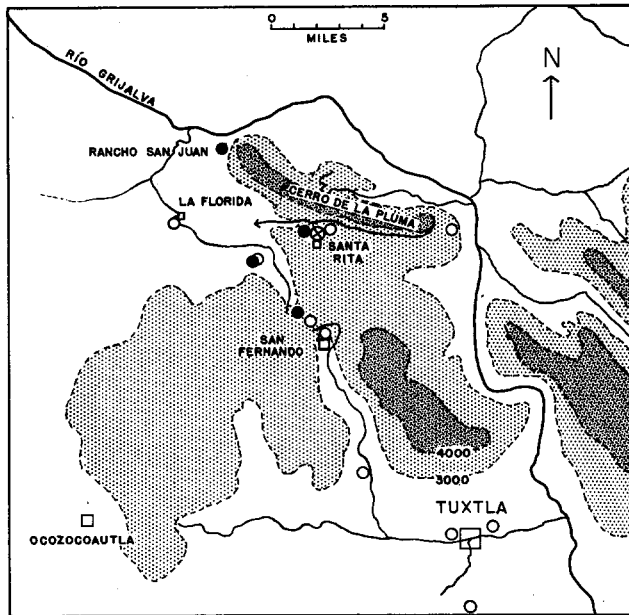


Fig. 1. Map of area north of Tuxtla Gutiérrez, Chiapas, showing localities mentioned in text; circles indicate records of *Calocitta*, dots indicate records of *Psilorhinus*, and circle with cross shows locality where hybrid was collected. Elevational contours shown in feet.

in *Calocitta* and virtually nil in *Psilorhinus*, and the Santa Rita specimen falls between them. Rectrices 3 to 6 are white-tipped, as is true of both *Calocitta* and *Psilorhinus*, but the area of the white tips is comparable to that of *Calocitta*, hence not intermediate. Rectrices 2-2, white-tipped in *Psilorhinus* but not in *Calocitta*, are so colored in the Santa Rita specimen but only partly, and hence are intermediate.

Characters of color and pattern in which the Santa Rita specimen deviates from both *Calocitta* and *Psilorhinus* occur on the head, which is black except for the white-throat patch already mentioned, a broad grayish-white superciliary stripe, and a poorly defined whitish triangular malar patch (see fig. 4). On these light areas, flecks of black and blue occur except in the fore-part of the malar patch, which is clear white tinged with blue. While it is stated that these characters are deviations, it should be admitted that within the interpopulational genetic substrate controlling the widely varying color pattern of the head of *Calocitta*, the pattern seen in the Santa Rita specimen could probably

arise, and evidently the overall darkening is still further indication of the influence of *Psilorhinus*.

The crest characters, at first appearing unique, are perhaps easily regarded as the result of interaction between genetic controls in two parent jay species with markedly dissimilar crests. *Calocitta* has a long, recurved, and erectile crest arising alone from frontal crown feathers; it lacks bristly frontal feathers. *Psilorhinus* is crestless but has bristly frontal feathers that form a slight crest. The Santa Rita specimen has a short frontal crest of feathers which are neither so bristly as in *Psilorhinus* nor possessed of

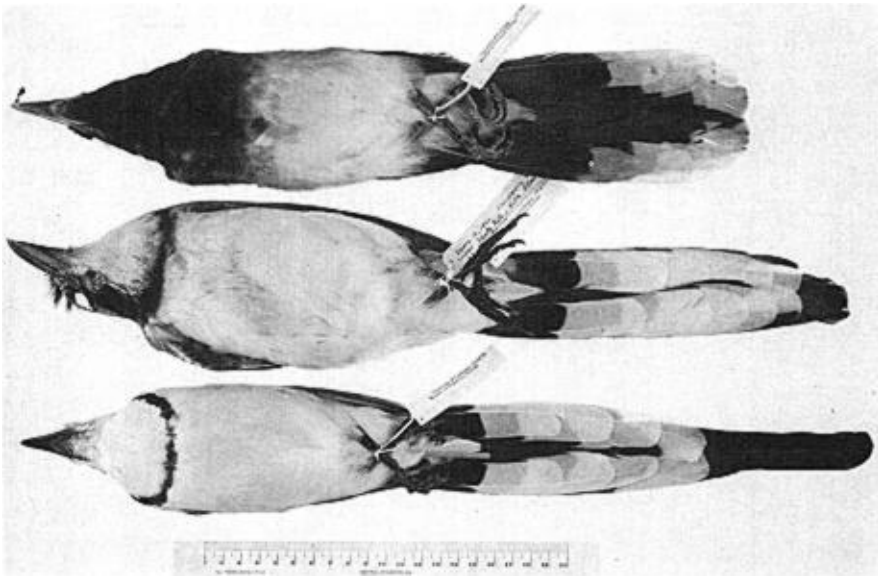


Fig. 2. Specimens of jays, all adults, collected north of Tuxtla Gutiérrez, Chiapas; top to bottom, Brown Jay (*Psilorhinus mexicanus*), hybrid, and Magpie-jay (*Calocitta formosa*); scale in centimeters.

so well-developed vanes as in *Calocitta*. In some respects the crest is reminiscent of that of *Cissilopha san-blasiana* in its first-year plumage, and of several species of the genus *Cyanocorax*, *sensu* Amadon (1944).

For size comparisons, because of present uncertainties concerning certain aspects of variation in both *Calocitta* and *Psilorhinus*, we have preferred to compare the Santa Rita specimen only with specimens of the parental species taken in the same general area, even though these are few. The results are given in table 1. Although more data are needed, particularly for *Psilorhinus*, the available figures give no reason for thinking the Santa Rita specimen is anything but more or less intermediate again, or actually closer to *Psilorhinus* as suggested by wing size and by the closer approach of some of the other figures to *Psilorhinus* than to *Calocitta*. The figure of 202 mm. for wing chord of the Santa Rita specimen will surely fall within the range of variation for this character in a good sample of *adult males* of *Psilorhinus*. The bird's weight was not recorded.

A character of *Psilorhinus* apparently unique among jays is the presence of a furcular pouch (Sutton and Gilbert, 1942) which is inflated to produce a characteristic "hiccuping" note. Unfortunately, a detailed examination of the interclavicular region of the hybrid specimen was not made at the time it was prepared as a study skin. How-

ever, examination of the dried specimen quite clearly indicates that while a fully formed pouch was not present, the skin of the interclavicular region is thicker and less pliable than that of specimens of *Calocitta*, suggesting that a partly developed pouch was present.

Table 1

Measurements of Jays from Western Chiapas

	<i>Calocitta</i> ¹	Hybrid ²	<i>Psilorhinus</i>
Wing chord	184.9 mm. (176-191 ¹)	202 mm.	195, ³ 185 ⁴ mm.
Tail length	277.0 (255-292)	248	195, 199
Tarsus	42.5 (39.6-44.4)	46.7	48.6, 48.1
Bill length	23.2 (22.1-24.1)	27.8	27.3, 28.8
Bill depth	13.4 (12.7-14.0)	15.5	16.5, 15.7
Crest	63 (60-68)	25	5±

¹ 8 specimens; 3 only for crest; all adult males.

² Adult male (testes not measured) taken January 10, 1951, at Santa Rita, 3000 feet, 5 miles north of San Fernando, Chiapas, M. A. del T. number 296, M.V.Z. no. 126534.

³ Adult female.

⁴ First-year male.

It is worth noting that according to the sequence of plumages determined for jays of the genus *Aphelocoma* (Pitelka, 1945) and since then found to be characteristic of all other American jays, the hybrid has undergone at least one complete molt. It was therefore at least one and one-half years old when collected.

DISTRIBUTION AND HABITAT OF *Calocitta* AND *Psilorhinus*

There are two principle types of vegetation in western Chiapas near Tuxtla Gutiérrez and in the hills north of the Tuxtla Valley, arid tropical forest and tall subdeciduous forest (Miranda, 1952:87, 103). Arid tropical forest is low, composed in large part of deciduous thorny species of leguminous trees or large bushes. It extends more or less continuously northward at least to the town of San Fernando, to an elevation of about 2500 feet. It also occurs again in canyons on the northwest slopes of the mountains north of San Fernando, between 1000 and 2500 feet, as at La Florida. This is a Pacific-slope floristic complex fingering northward across the isthmus and represented by such marginal, disjunct areas as that at La Florida. *Calocitta* is a bird characteristic of this vegetation in the central depression of Chiapas and along the Pacific coast generally.

Tall subdeciduous forest is similar in appearance to the rain forest of Caribbean lowlands, but according to Miranda (1952:87), the deciduous habit is more marked and the leaves are lost for longer periods than in true evergreen forests closer to the Caribbean coast. In height, this vegetation is similar to rain forest; in composition it includes some species characteristic of rain forest and others characteristic of arid tropical forest. Hence the tall subdeciduous forest is transitional between these two types. It extends southward to near Tuxtla, along a line marked by the distributional boundary of *Bumelia persimilis*. This forest is present between 3000 and 3700 feet along its southern limits but occurs at lower elevations northward, where it blends into rain forest of the Caribbean lowlands. *Psilorhinus* is a bird characteristic of this vegetation and its margins. The Green Jay (*Cyanocorax yncas*) is also present.

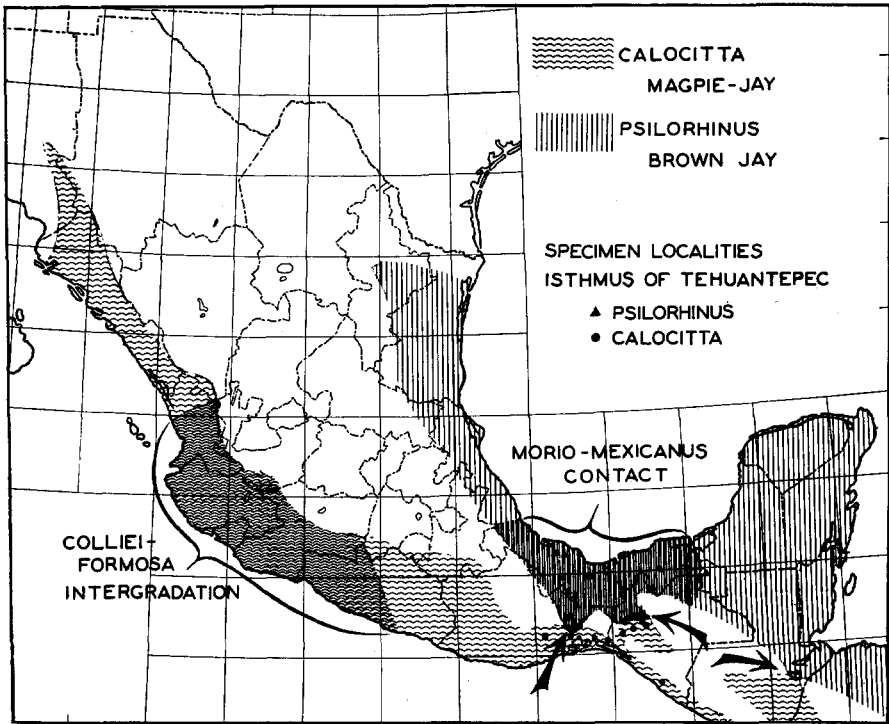


Fig. 3. Map showing distribution of the Brown Jay and Magpie-jay in México and Guatemala; localities from which specimens have been recorded are shown for the Isthmus of Tehuantepec only; areas of contact are indicated by arrows; broad belts of species contact in *Psilorhinus* and of intergradation between black-faced and white-faced races of *Calocitta* are shown only approximately.

North of San Fernando, tall subdeciduous forest occurs, or once occurred, over extensive areas between 2500 and 3500 feet. It appears that with cultivation, this forest has become restricted and, in some areas replaced by stands of more open, deciduous second-growth forest vegetation and that elements of the arid tropical forest have invaded northward and upward in the valleys to 3000 feet or higher (fig. 5).

In this contact across the isthmus between two major vegetation types, the two large lowland jays meet. *Calocitta* is common around Tuxtla and at least locally it is common northward as far as La Florida, at 1500 feet. Whether it occurs still farther north has not been determined satisfactorily. In this area, in the fall, it was observed in flocks of five to ten; in the spring it was scarcer in the mountainous region north of Tuxtla and more closely associated with the open arid vegetation at lower elevations. Occasionally it was observed along margins of the more mesic vegetation favored by *Psilorhinus*.

In the same area, *Psilorhinus*, although apparently never common, nonetheless appears to occur fairly regularly. It has been observed at various points north and northwest of Tuxtla and occurs southward to within two miles of San Fernando. In the vicinity of San Fernando, hence in this marginal southward extension of its distribution, the occurrence of *Psilorhinus* may vary seasonally. It was not seen in October, but was present in January, April, and the summer months. It is present in small numbers on the north slopes of the Cerro de la Pluma, north of San Fernando, where Alvarez

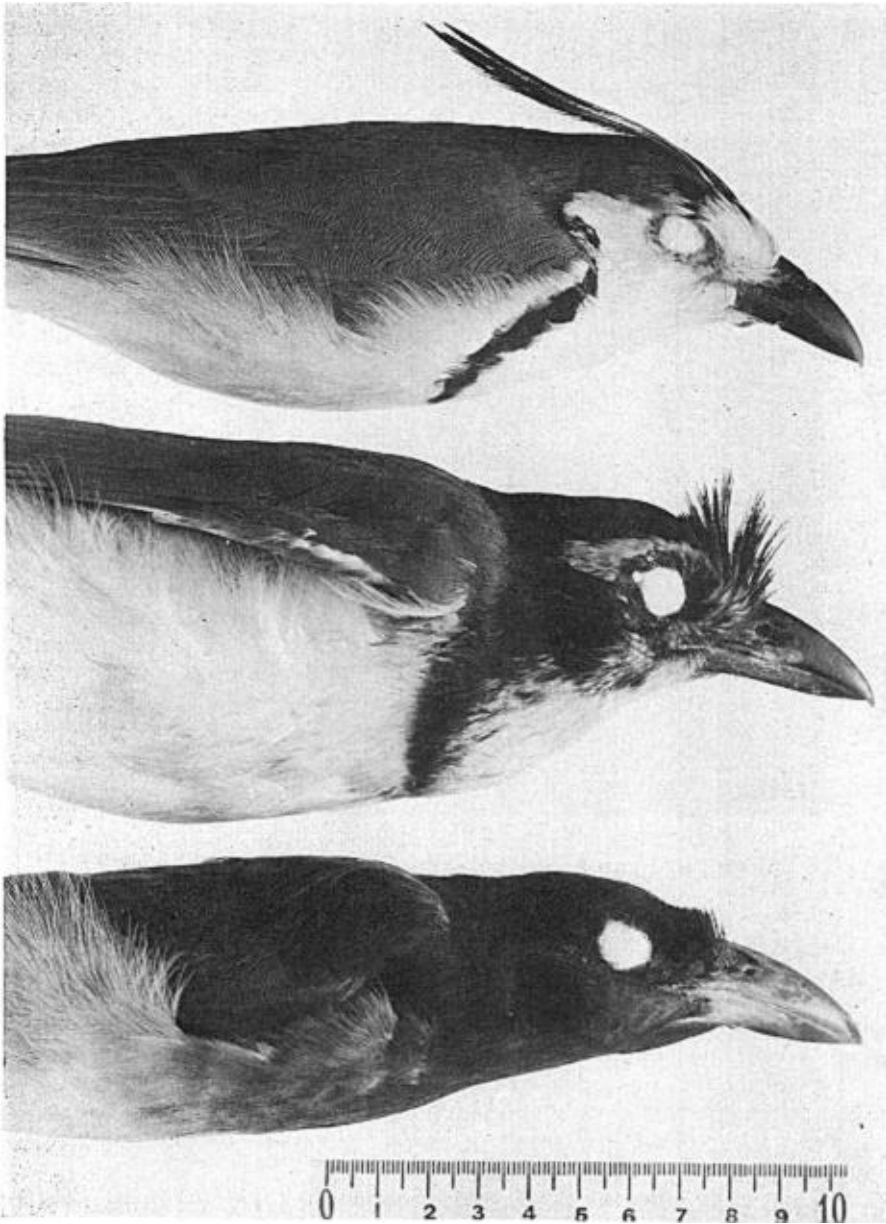


Fig. 4. Pattern and crest characters of hybrid jay (center) compared with Magpie-jay (above) and Brown Jay (below); scale in centimeters.

del Toro found a nest in April, 1953, at Rancho San Juan. Beyond these localities, toward the Caribbean along the Rio Grijalva, this species becomes increasingly common (Alvarez del Toro, MS).

Both *Calocitta* and *Psilorhinus* were observed by Selander at one time on April 28, 1954, when he was in a clearing in disturbed tall subdeciduous forest five miles northwest of San Fernando, but neither on this occasion nor any other recorded by him or

Alvarez were the two species seen in close association. Nonetheless, as *Psilorhinus* frequents the edges of the tall mesic forest, and as the remnants of this vegetation are interspersed with arid forest and clearings frequented by *Calocitta*, the two can easily come into contact.

Thus, there is ample ecological evidence of opportunity for *Calocitta* and *Psilorhinus* to meet and evidently also to interbreed if the Santa Rita specimen is correctly regarded as a hybrid. At this time, we see no possibility of another conclusion. Modifications in local vegetational pattern wrought by clearing of land and farming activities north of



Fig. 5. Habitat in area of overlapping distributions of *Calocitta* and *Psilorhinus* between San Fernando and Santa Rita, Chiapas, elevation approximately 2800 feet. Note extent of clearing and interspersion of vegetational elements. Island of trees in upper right-hand corner is second-growth or disturbed sub-deciduous forest about 50 to 60 feet high; below this are corn fields.

Tuxtla have increased and diversified the local intermingling of the two regional vegetation types. As a result, local habitat conditions here favor more frequent contact between *Calocitta* and *Psilorhinus* than was true earlier.

In view of the fact that other areas of contact are known, it would seem incorrect to regard the one north of Tuxtla as a purely recent development, hence our statement that agricultural activities have merely *increased the frequency* of meeting between the two species there.

At least at three other points in the distributions of *Psilorhinus* and *Calocitta* the two are known to meet. There is one contact in eastern Oaxaca, at Matias Romero north of Tehuantepec (L. Irby Davis, in conversation; and Skutch, 1953:68) and another in the Motagua Valley of Guatemala between Gualán and Quiriguá (Skutch, *loc. cit.*). Both of these are shown in figure 3. Although *Psilorhinus* remains a species of Caribbean slopes and lowlands over most of its distributional area, in the southern parts of its range, at least in Costa Rica (Carriker, 1910:774-775, and Skutch, *op. cit.*: 69), it occurs on both Caribbean and Pacific slopes. Here *Psilorhinus* and *Calocitta* evidently intermingle more than anywhere else.

We now have a case of a hybrid produced between two superficially so dissimilar

species as *Calocitta formosa* and *Psilorhinus mexicanus*, in a passerine family in which naturally occurring hybridization is rare. The specimen proves to be of special interest as evidence bearing on questions of relationships among American jays (Pitelka, MS), and while this is not the place to wander in phylogenetic speculation, one point may be mentioned. The *Cyanocorax-Psilorhinus-Calocitta* section of the American jays (Pitelka, 1951:203) is more closely knit than recent taxonomic treatments indicate, and in any case the generic limits now recognized do not reflect the pattern of phylogenetic radiation shown by preliminary study of the members of these genera. Amadon's (1944) review of the genera of Corvidae has already indicated need for certain changes. The event of this hybrid would seem to suggest, for example, that *Psilorhinus* and *Calocitta* are not so divergent as their taxonomic isolation in separate genera indicates. Also, notice may be taken of the remarks of Skutch (1953:69-70) and Carriker (1910:775), who comment on similarity of call-notes between *Psilorhinus* and *Calocitta*. Selander's observations are in agreement. Finally, it is perhaps more than coincidence that these two "genera" are so allopatric as they are and that contact points involve such small areas of overlap. In this connection ecologic distribution and habits of these jays as manifest in Costa Rica would be worth comparing with those of segregated populations to the north. It may be added that in the western part of the Pacific slope of Guatemala, where *Psilorhinus* is absent, Skutch (1953:69) reported that *Calocitta* occurs at elevations up to 3700 feet "and here resides in a region where . . . abundant rainfall has produced forests as heavy as those of the Caribbean slope."

SUMMARY

A hybrid between the Magpie-jay (*Calocitta formosa*) and the Brown Jay (*Psilorhinus mexicanus*) is reported from western Chiapas. It was a male and was fully adult by plumage characters used for jays. In most characters of color and pattern, the specimen is more or less intermediate even though the supposed parental species are conspicuously dissimilar. In size, it is also intermediate. The locality where the hybrid was obtained is one of the four known areas of contact between *Calocitta* and *Psilorhinus*. Modification of habitat is considered to have facilitated the association of these species with each other. The event of hybridization between *Calocitta* and *Psilorhinus* supports recent views that these two "genera" are more closely related than is indicated by earlier taxonomic reviews of American jays.

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