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## BIRDS COLLECTED DURING THE WHITNEY SOUTH SEA EXPEDITION. V.

BY ROBERT CUSHMAN MURPHY AND GREGORY M. MATHEWS

Identification of many of the forms listed in this paper had been undertaken by the senior author (Murphy), and the text dealing with the Sylviidæ of the Society and Marquesas Islands had been completed, when it was proposed that Mr. Mathews lend his services to a continuation of the study. Accordingly, a small selection of Polynesian Passeres was sent to England early during 1928, and Mr. Mathews has since given much time to the work. He has compared the American Museum material with the invaluable types and other pertinent specimens in British and continental museums, has made himself responsible for a combing of the literature, and has sent full notes to his co-author who has, in turn, extended the comparisons, measurements, and descriptions through the use of the larger series in the Whitney Expedition collection. For the final preparation of the manuscript the senior author is responsible.

### Muscicapidæ

#### *Pomarea nigra nigra* (Sparrman)

*Muscicapa nigra* SPARRMAN, 1786, 'Mus. Carlson.,' fasc. 1, Pl. XXIII (Tahiti, Society Islands).

Society Flycatcher, LATHAM, 1787, 'Suppl. Gen. Synops. Birds,' pt. 1, p. 174 (Tahiti).

*Muscicapa lutea* GMELIN, 1789, 'Syst. Nat.,' I, pt. 2, p. 944, founded on "The Luteus Flycatcher" of LATHAM, 1783, 'Gen. Synops. Birds,' II, pt. 1, p. 342 (Tahiti).

*Muscicapa atra* FORSTER, 1844, 'Descr. Animal.,' edit. Lichtenstein, p. 170 (Tahiti).

ADULTS (sexes alike).—Entire plumage black, with a slight iridescence, except inner vanes of remiges and under surfaces of both wing and tail quills, which are somewhat fuscous and without gloss; shafts, lighter on the under surfaces of the quills, becoming whitish basally; concealed bases of the body feathers, dark grayish. Iris, dark brown; bill, light slaty blue; tongue and lining of mouth, blue; legs and feet, slaty blue, lightest on front of tarsus.

<sup>1</sup>Previous papers in this series comprise American Museum Novitates, Nos. 115, 124, 149, and 322.

MEASUREMENTS.—(5 males, 3 females): wing, 88–97; tail 70–77; exposed culmen, 16–17; bill from nostril, 11–12.3; tarsus, 26–27; middle toe with claw 19–20 mm.

RANGE.—Tahiti, Society Group.

Specimens from Tahiti, collected during December, 1920 and May, 1921.

Adults are uniform in appearance except that two among twelve specimens had bills prevailingly horn-colored, like those of the young. The juvenal plumage of the latter is well represented in our series of May birds. It ranges from cinnamon to tawny on the head, back, and flanks, lighter on throat and breast, and dirty white on the belly. The rectrices are tawny basally and fuscous-black distally. On the remiges the tawny hue is confined to the narrow outer webs. Over the rump of all specimens is a great spreading fan of fluffy black feathers.

The general cinnamon and tawny aspect, and even the nearly white appearance of the belly, are due entirely to the distal coloration of the juvenal feathers. The first black plumage is largely the result of wear; as the loss of the yellowish and whitish tips exposes the dark underlying portions of the feathers, the birds assume a motley of tawny and black, the latter element being reinforced by all black feathers succeeding the post-juvenal moult.

Notations regarding the gonads of such intermediate specimens indicate that the birds probably breed before assuming the immaculate black garb of full maturity. Among the adults there is nothing to show a correlation between season of the year and nesting time.

Measurements of the culmen, tarsus, and toe are somewhat unsatisfactory in birds of this group, scarcely any two workers deriving the same results. The length of the bill from the nostril is, however, likely to prove consistent, and as useful for comparison with larger or smaller subspecies as the dimensions of wing and tail.

### ***Pomarea mendozæ* (Hartlaub)**

*Monarcha Mendozæ* HARTLAUB, 1854, Journ. für Ornith., p. 170 (Tahuata Island, Marquesas Group).

SPECIFIC CHARACTERS.—Bill distinctly more compressed than in *Pomarea nigra*. Sexes unlike, the adult males resembling *nigra*, but with a higher iridescence; adult females, black and white, or black, white, and buff, in a pattern which varies distinctively among several geographic races; juvenal plumage, much darker than in *P. nigra*.

RANGE.—Tahuata, Hivaoa, Motane, Huapu, and Nukuhiva Islands, Marquesas Archipelago.

Hartlaub proposed this species as a new name for the bird described by Forster on p. 172 of the 'Descr. Animal,' edit. Lichtenstein, 1844. The type was apparently not an adult, but its locality was fixed *in insula Sanctæ Christinæ seu Weitaho* (=Tahuata). On page 171 Forster lists it as *Muscicapa atra* (*M. nigra* of Sparrman, Linnæus, Gmelin, and Latham).

The typical race of the species is, therefore, *Pomarea mendozæ mendozæ* (Hartlaub.)

***Pomarea mendozæ mendozæ* (Hartlaub)**

**SUBSPECIFIC CHARACTERS.**—Adult female with black head and remiges, buffy ventral surface, white back, rump, and tail.

**ADULT FEMALE.**—Entire head, dull brownish black, intermingled on the throat with a few whitish feathers; back, scapulars, and rump, white, faintly blotched with grayish wherever the dark proximal parts of the feathers appear at the surface; tail, white, with variable brownish subterminal spots, and occasionally with a rectrix prevailing blackish brown on one or both webs; shafts of tail quills, dark dorsally, white below; ventral surface caudad from the throat, pale ochraceous-buff; primaries and their coverts, black, sometimes with whitish outer edgings; secondaries, black with broad white outer borders and terminations, these borders enlarging on the secondary coverts and the tertials; lining of wing, somewhat whitish. Iris, brown; bill, bluish; legs, bluish, with the feet nearly black.

**NEOTYPE.**—No. 196,143, Amer. Mus. Nat. Hist.; ♂ ad.; Tahuata Island, Marquesas; November 27, 1922; R. H. Beck.

**MEASUREMENTS.**—(10 males, 5 females, from Tahuata and Hivaoa): wing, 88–95; tail, 70–79; exposed culmen, 17.8; bill from nostril, 11.6–12.5; tarsus 28; middle toe with claw, 20–21 mm.

**RANGE.**—Tahuata and Hivaoa Islands, Marquesas.

Specimens from Tahuata collected during November, 1922, and from Hivaoa collected during September, 1902, January, 1921, and October and November, 1922.

To date, this has remained the only form of flycatcher described from the Marquesas, and it has usually been confused with the Tahitian species. In the absence of an existing type specimen, it would be preferable to select a female as the neotype but, unfortunately, we have no adult female from Tahuata. Comparison of males of all ages, and of young and semi-mature females, with an excellent series of specimens from Hivaoa shows that an identical race occupies these two neighboring islands.

*Pomarea mendozæ mendozæ* is of substantially the same size and proportions as the Tahitian *nigra*. The bill of *mendozæ* is, however, about one millimeter (13 per cent) narrower at the base, which gives it a more slender and rounded, and less flycatcher-like, aspect. Furthermore,

the metallic gloss of the black male is highly developed and is more definitely bluish or purplish than in *nigra*. Finally, in addition to the total dissimilarity of the females, the dorsal coloration of the immature stage of *mendozæ* is close to Prout's brown, with little of the bright ochraceous hue of young *nigra*, while the patch of fluffy black feathers, so characteristic of the lower back of *nigra*, is entirely lacking.

Plumage succession is as in the Tahitian species, and the extraordinarily mottled, black and rusty sub-adults breed in that stage.

The colors of soft parts in adult males are as recorded for the females. In young birds the mandible is described as yellowish or flesh-colored, the feet and legs as grayish or slate. Adults had gonads in various stages of development during all the seasons represented, and some are noted as nesting birds.

#### ***Pomarea mendozæ motanensis*, new subspecies**

**SUBSPECIFIC CHARACTERS.**—Closely resembling *Pomarea mendozæ mendozæ* but slightly larger; females with fewer and smaller subterminal spots on the rectrices; juvenal plumage lighter and brighter, especially on back and tail (russet instead of Prout's brown).

**TYPE.**—No. 196,087, Amer. Mus. Nat. Hist.; ♂ ad.; Motane Island, Marquesas; November 22, 1922; R. H. Beck.

**MEASUREMENTS.**—(20 males and females): wing, 94–103; tail, 74–80; exposed culmen, 18–20; bill from nostril, 13–13.8; tarsus, 27.5–28.6; middle toe with claw, 20–21 mm.

**RANGE.**—Motane Island, Marquesas.

Specimens from Motane collected during November, 1922.

This race is nearly identical in appearance with that of Hivaoa and Tahuata, the differences apparent to a casual glance showing only in juvenals. It is, however, slightly but uniformly larger than the typical race, especially in the size of the bill and the length of the wing.

Some of the adults were caring for young during November. A nestling not ready for flight, and much darker in general tone than the active juvenals, was collected on November 22.

#### ***Pomarea mendozæ mira*, new subspecies**

**SUBSPECIFIC CHARACTERS.**—Larger than *Pomarea mendozæ motanensis*. Males of these two forms of similar appearance, but females totally unlike; adult female of *mira* uniform black save for a white tail and a white area covering the proximal two-thirds of the wing. Juvenal plumage duller and lighter than in either of the two preceding subspecies.

**ADULT FEMALE.**—Entire plumage, except that of wings and tail, black, slightly glossy, though less so than in the male; tail, including quill-shafts, white, a few small

and faint brownish blotches and speckles scattered irregularly on the rectrices of some specimens; upper and under tail coverts, basally black, terminally white; remiges, proximally white, distally clove brown, the white wing-patch extending progressively nearer the tips of the feathers toward the inner wing, the middle quills being solidly brown for nearly half their length, the inner quills for less; shafts of all the remiges, black; secondaries edged with white clear around their tips, enclosing a large brown spot; tertials entirely white on their outer webs, with a single brown subterminal spot on the inner web; secondary greater coverts, white; primary coverts, middle coverts, and marginals, mostly black. Colors of soft parts as in the preceding forms.

TYPE.—No. 195,881, Amer. Mus. Nat. Hist.; ♀ ad.; Huapu Island, Marquesas; November 2, 1922; R. H. Beck.

MEASUREMENTS.—(10 males, 5 females): wing, 102–109; tail, 78–84; exposed culmen, 18.5–20; bill from nostril, 13–14.6; tarsus, 30–32; middle toe with claw, 20.5–22 mm.

RANGE.—Huapu Island, Marquesas.

Specimens from Huapu collected during October, 1921, and September and November, 1922.

Adult males resemble those of the preceding races of this species, except for their slightly larger size and the fact that the blue iridescence of the black plumage is more pronounced on the belly than in the other forms. The under sides of wing and tail quills have a purplish sheen. Adult females, as would appear from the description, are absolutely distinctive. The juvenal coloration is duller and lighter than in *P. m. mendozæ* or *P. m. motanensis*, the general tone being close to Béné brown on the dorsal surface and light cinnamon-drab on the ventral.

Plumage succession is characteristic of the species. The tail quills of females, after completion of the post-juvenal moult, are grayish and brownish, with only restricted areas of white. Subsequent rectrices come in nearly or quite immaculate. The first feathers that show the outlines of the large wing-patch are likewise heavily tinged with brown and rufous, at least two moults preceding the pure white stage of maturity.

#### ***Pomarea mendozæ nukuhivæ*, new subspecies**

SUBSPECIFIC CHARACTERS.—Male practically indistinguishable from that of *Pomarea mendozæ mendozæ*. Female somewhat resembling the much larger female of *P. m. mira*, but differing in that the entire mantle, lower belly, and crissum are pure white.

ADULT FEMALE.—Head, nape, breast, belly, upper flanks, and thighs, black, with a slight iridescence on pileum and throat; feathers of belly more or less bordered with white in fresh plumage, giving a mixed appearance; back scapulars, rump, lower flanks, vent, crissum, and tail, including both upper and under coverts, white; remiges, clove brown, crossed by a large white wing-patch of practically identical pattern with that of *Pomarea mendozæ mira*. Iris, "light brown"; bill, bluish slate; legs bluish slate, with the feet black.

TYPE.—No. 195,991, Amer. Mus. Nat. Hist.; ♀ ad.; Nukuhiva Island, Marquesas; October 19, 1922; E. H. Quayle.

MEASUREMENTS.—(8 males, 5 females): wing, 90–96; tail, 75–80; exposed culmen, 18–19; bill from nostril 12–13; tarsus, 27.5–29; middle toe with claw, 19–20 mm.

RANGE.—Nukuhiva Island, Marquesas.

Specimens from Nukuhiva collected during September and October, 1922; also two females in the British Museum.

Nothing but locality could be invoked to identify the glossy blue-black males of this race with certainty. Fortunately, the females are striking and unmistakable.

The early fledgling plumage, as represented by a bird taken from the nest on October 19, is surprisingly dark (close to mummy brown on head and back). This agrees with the same stage in certain of the other races. Only later, after the young have left the nest, does the juvenal garb become distinctive. Immature specimens of *nukuhivæ* are considerably brighter in hue than those of *mira*, showing some rufescence on forehead, breast, back, and flanks. They are, however, less richly colored than the young of the other subspecies. Birds of intermediate age show more or less white in the tail and on the mantle simultaneously with the appearance of scattered black feathers on the head and breast.

#### ***Pomarea iphis*, new species**

SPECIFIC CHARACTERS.—Sexes unlike, the females retaining a plumage of the juvenal type, the males exhibiting a black and white garb which resembles the female pattern of two or more races of *Pomarea mendozaæ*.

RANGE.—Huahuna (Uahuka) and Eiao (Eiau) Islands, Marquesas Archipelago.

The type of the species is *Pomarea iphis iphis*.

#### ***Pomarea iphis iphis*, new subspecies**

SUBSPECIFIC CHARACTERS.—Adult male iridescent black, save for the wing and tail quills, which are brown, the breast and belly which are black and white, and the under tail coverts which are entirely white.

ADULT MALE.—Head, back, rump, upper tail coverts and chest, black, with an iridescence which is greenish rather than bluish; chin and interramal feathers, without gloss; quills, fuscous, the secondaries and, more especially, the rectrices, overlaid with a dark greenish gloss; wing coverts, black with a narrow glossy border on each feather; lower breast, belly, and flanks covered with mixed white and dull black feathers, giving a coarsely mottled aspect which is individually variable, some specimens being prevalingly black on the belly, others prevalingly white; under tail coverts, white, with dark gray bases; scattered white feathers in the throat, auriculars, scapulars, back, wing coverts, or secondaries of some specimens. Iris, brown; bill, black, with a bluish tone near the base; legs and feet, slaty black.

ADULT FEMALE.—Pileum and nape, olive-brown, with a few interspersed black feathers on the forehead and crown, and around the eye; back, scapulars, rump, and upper tail coverts, cinnamon-brown; quills, olive-brown, with narrow tawny outer margins, whitish inner margins on the rectrices, and whitish inner and terminal margins on the secondaries; wing coverts, olive-brown, with broad tawny margins and tips; ventral surface, whitish, streaked with black on throat and cheeks, and tinged with tawny on flanks, sides of breast, and crissum; lining of wing, whitish. Flesh colors, as in the male.

TYPE.—No. 196,041, Amer. Mus. Nat. Hist.; ♂ ad.; Huahuna Island, Marquesas; November 16, 1922; E. H. Quayle.

MEASUREMENTS.—(9 males, 6 females): wing, 90–96; tail, 72–81; exposed culmen, 17; bill from nostril 11–11.8; tarsus, 27–28; middle toe with claw, 18–19 mm.

RANGE.—Huahuna Island, Marquesas.

Specimens from Huahuna collected during October and November, 1922.

Juvenals resemble adult females save for the absence of dark streaking on head and throat. The transformation to the mature male plumage begins at the forehead and chin, the glossy black feathering working progressively caudad. The tail quills that succeed the post-juvinal moult still show considerable white, while olive-brown feathers persist for a long time on the lower back and rump. In this mixed plumage the birds breed, and doubtless the assumption of the final type of mature dress comes only after a post-nuptial moult.

### *Pomarea iphis fluxa*, new subspecies

SUBSPECIFIC CHARACTERS.—Smaller than *Pomarea iphis iphis*; white or white-mottled areas of the male much more extensive, including the breast, flanks, mantle, and lateral rectrices; only a faint gloss on any part of the black plumage; female with speckled throat and chest.

ADULT MALE.—Head, nape, chest, upper and under tail coverts, black, with a very slight iridescence; wings, including quills and coverts, sooty black; central rectrices, sooty black and slightly glossy, the outermost one or two pairs of rectrices usually white, though this condition is highly variable, some specimens having no more than a single white quill in the tail while others have all but the two central pairs white; back, scapulars, rump, breast, belly, and flanks, covered with mixed black and white feathers, giving a blotched appearance which is variable in the degree of prevailing whiteness or blackness; in a few specimens scattered white feathers extend cephalad in the black plumage to the chin and lores. Iris, brown; bill, black, bluish at base and on mandible; legs and feet, black.

ADULT FEMALE.—Resembling that of *Pomarea iphis iphis*, but lighter on the back, many of the tawny-olive feathers having whitish tips; more speckled on throat and chest, and more buffy on the whole ventral surface. Ventral speckling is still more pronounced in the juvenal stage of both sexes, and the dorsal surface is darker than in the adult female.

TYPE.—No. 195,919, Amer. Mus. Nat. Hist.; ♂ ad.; Eiao Island, Marquesas; September 27, 1922; R. H. Beck.

MEASUREMENTS.—(7 males, 5 females): wing, 79–86; tail, 69–77; exposed culmen, 14.5–16; bill from nostril, 10–10.8; tarsus, 26–27; middle toe with claw, 16.5–18 mm.

RANGE.—Eiao Island, Marquesas.

Specimens from Eiao, collected during September and October, 1922.

This race is characterized by small size and a short wing in addition to the peculiar and somewhat unstable pattern of its plumage. The primary formula is as in other forms of *Pomarea*, but the wing is perhaps more rounded than in any other Marquesan race, the third, fourth, fifth, and sixth primaries from the small outermost quill being subequal in length.

Plumage sequence is characteristic of the group. Juvenal males show a fine blotching or mottling on the ventral surface before white feathers have appeared on the back, and in this stage their outer rectrices are merely tipped with white spots or mottled with white. The entirely white quills appear after another moult.

#### ***Pomarea whitneyi*, new species**

SPECIFIC CHARACTERS.—Size very large; sexes alike, black.

ADULTS.—Plumage black, with dark purplish-blue iridescence on head, dorsum, and under surface as far caudad as the belly; on the wing coverts the iridescence is confined to a narrow margin on each feather, and on the remiges and rectrices to the outer border of each quill, save the outermost few primaries, which are dull; under side of quill-shafts, horny, whitish toward the base; under surfaces of quills with a glossy purplish sheen, though without iridescence; feathers of forehead and lores strongly antrorse, those of the throat and mentum slightly so and interspersed with fine filoplume bristles. Iris, brown; bill, "bluish horn"; legs, dark bluish gray, with the feet black.

TYPE.—No. 195,808, Amer. Mus. Nat. Hist.; ♂ ad.; Fatuhiva Island, Marquesas; December 6, 1922; R. H. Beck.

MEASUREMENTS.—(10 males and females): wing, 110–118 (113.7); tail, 97–105 (101.5); exposed culmen, 21–22; bill from nostril, 14.5–16 (15.3); tarsus, 32–33; middle toe with claw, 22–24 mm.

RANGE.—Fatuhiva Island, Marquesas.

Specimens from Fatuhiva collected during December, 1922.

This handsome species, the giant of the genus, is named in honor of Mr. Harry Payne Whitney, patron of the American Museum's work in Pacific ornithology.

Adults had gonads in all stages of development during December, and some are marked as nesting birds.



The plumage sequence of immature specimens resembles that among the other forms of *Pomarea* found at the Society and Marquesas Islands. A beautifully graded series of skins shows the progressive replacement of the buffy and whitish first plumage by black feathers.

Juvenals are prevailingly cinnamon-brown dorsally, darker and grayer on the crown and quills. The auricular region, sides of neck and breast, wing coverts, outer margins of remiges, and the crissum, are sayal brown, with scattered feathers of the same color throughout the whitish ventral surface. As among other Marquesan forms, nestlings are darker than the active juvenals, the subsequent change of shade being apparently due to wear and fading.

### Sylviidæ

#### *Conopoderas cafra cafra* (Sparrman)

*Sitta cafra* SPARRMAN, 1786, 'Mus. Carlson.,' fasc. I, No. 4, Pl. iv (no locality indicated = Tahiti).

*Tatare fuscus* LESSON, 1842, Rev. Zoöl., V, p. 210 (Tahiti).

*Tatare longirostris*, SHARPE, 1883, 'Cat. Birds Brit. Mus.,' VII, p. 525 (part).

*Tatare caffer*, OBERHOLSER, 1905, Proc. U. S. Nat. Mus., XXVIII, p. 900.

*Conopoderas cafra*, WETMORE, 1919, Bull. Mus. Comp. Zoöl., LXIII, No. 4, p. 206.

Specimens from Tahiti, collected during December 1920, August, 1921, July, 1922, and January, 1923.

Sharpe's description of the normal phase of this warbler, in the 'Catalogue of Birds,' was evidently based upon Tahitian specimens and is applicable to the American Museum series. The "brown" of the dorsal surface approximates the dark olive of Ridgway's 'Color Standards and Nomenclature,' while the yellow of the belly, throat and superciliary stripe matches the primrose yellow of the same authority.

According to the collector's labels, the iris was brown, the bill horny brown above and flesh color on the mandible, the inside of the mouth orange, the feet and legs greenish slate.

The dark phase, which has been described by Lesson as *Tatare fuscus*, is represented by a female dated Dec. 2, 1920, and a male dated Aug. 12, 1921. In common with other August specimens, the latter had enlarged gonads. In these birds the entire plumage, including concealed parts of the feathers, is brown, the color of the dorsal surface being close to clove brown, a few feathers of the back and scapulars showing faintly paler edgings. The ventral surface, from throat to tail coverts, is tinged with a lighter and warmer hue which ranges from cinnamon-brown to sepia. The female has a patch of normal yellow feathers in the inter-

ramal space. The bill is blackish on the maxilla, dark brown on the mandible.

Tristram believed that the plumage just described represents the normal immature stage of the Tahitian form. He wrote (*Ibis*, 1883, p. 43), "According to the specimens in the Bremen Museum, the young of the Society Island species are of a uniform very dark brown, strangely unlike the coloration of the adult, and with no trace of yellow in their plumage." If the Bremen birds are actual nestlings, this supposition may be correct. Unfortunately, the American Museum series does not settle this point with finality. Since one of our brown birds was in breeding condition, however, we suspect that the plumage more probably represents a phase than an age, but the matter needs further investigation.

Albinism is a chronic tendency among several forms of *Conopoderas*, and it would be interesting to find the converse condition of pigmentation. If this should prove to be represented by our two Tahitian examples, it may be described as intermediate between erythrism and melanism.

As noted above, August specimens were mostly in breeding condition. The moult comes later in the year, many December birds showing renewal of the wing and tail quills.

Tahiti comprises the known range of the *forma typica*, for the supposedly synonymous *Turdus longirostris* of Gmelin, described from the neighboring island of Eimeo or Moorea, proves to be a distinct subspecies.

MEASUREMENTS.—(5 males, 4 of normal and 1 of dark phases [10 specimens for length of wing and tail]): wing, 94–100 (96.9); tail, 73–81 (78.3); exposed culmen, 25–28 (27.1); bill from nostril, 20–21.5 (20.8); tarsus, 30–32 (31.4) mm.

5 females: wing, 92–95 (93.4); tail, 72–76 (74.4); exposed culmen, 26–27 (26.6); bill from nostril, 19.5–21 (20.5); tarsus, 29.6–31 (30.2) mm.

### *Conopoderas cafra longirostris* (Gmelin)

*Turdus longirostris* GMELIN, 1789, 'Syst. Nat.', I, pt. 2, p. 823 (Moorea, Society Islands).

SUBSPECIFIC CHARACTERS.—Similar to *Conopoderas cafra cafra*, but larger in all dimensions except length of tarsus; tail, excepting the central pair of rectrices, prevailing yellowish-white.

ADULTS (sexes alike).—Pileum, hind neck, back, scapulars and upper tail coverts dark olive, the feathers margined with yellowish, narrowly on forehead and hind neck, least on the crown, but with increasing breadth toward the base of the rump, which is prevailing straw yellow; rectrices clove brown, the primaries narrowly margined with yellowish on their outer webs and slightly tipped with white; innermost primary and the secondaries more broadly tipped with creamy white which extends proximally

along the edges of both webs in some instances for half the length of the feathers; wing coverts clove brown, broadly margined with barium yellow, several of the feathers in one specimen being mostly of the latter color which pales toward the tips; bend of wing, barium yellow; central pair of rectrices clove brown, tipped with creamy white; the remaining tail quills creamy white both above and below, slightly more yellowish on their outer webs and with irregular clove brown blotches on both vanes of one or more feathers; lower eyelid, a narrow superciliary stripe, lores, cheeks and entire ventral surface, including under wing and tail coverts, yellow (barium yellow at areas of maximum intensity), the cheeks, lores, sides of breast and lower flanks invaded somewhat by dark olive feathers similar to those of the dorsal plumage; under surface of rectrices mouse gray, paler toward the bases and slightly tinged with yellowish on the outer webs of the feathers. Iris, "olive brown"; bill, horny above, flesh color on mandible; feet and legs, "slate."

MEASUREMENTS.—(2 males, 1 female): wing, 103–106 (104.3); tail, 85–90 (88); exposed culmen, 29–30 (29.3); bill from nostril, 22.3–23.5 (22.9); tarsus, 30–32 (31) mm.

RANGE.—Moorea Island, Society Group.

Three specimens from Moorea, Aug. 5 and Oct. 28, 1921; collected by E. H. Quayle.

The outstanding distinction between this race and that of Tahiti lies in the length of the tail, although *longirostris* is also larger in general proportions. Because of the uncertainty attending the measurement of the "exposed culmen" in this group, as in the genus *Pomarea*, we have included also the dimension "bill from nostril," which permits a more satisfactory comparison of bill length.

### *Conopoderas caffa percernis* Wetmore

*Conopoderas percernis* WETMORE, 1919, Bull. Mus. Comp. Zool., LXIII, No. 4, p. 213 (Nukuhiva, Marquesas Islands).

SUBSPECIFIC CHARACTERS.—Differs from *Conopoderas caffa caffa* as follows: entire plumage suffused with a deeper and richer yellow; inner margins of primaries, in ventral aspect, white instead of buffy; wing and tail slightly longer; bill decidedly shorter and slightly stouter, with the curve of the culmen more pronounced.

MEASUREMENTS.—(5 males [10 for length of wing, tail, and bill from nostril]): wing, 98.103 (100.6); tail, 81.6–87 (85); exposed culmen, 22–24 (23); bill from nostril, 17–18.2 (17.9); tarsus, 31.5–32.6 (31.9) mm.

5 females: wing, 95–102 (98); tail, 79–86 (82.1); exposed culmen, 23–24.2 (23.5); bill from nostril, 18–19 (18.2); tarsus, 31–33 (31.8) mm.

RANGE.—Nukuhiva Island, Marquesas Group.

Specimens from Nukuhiva, collected by R. H. Beck and his associates during September and October, 1921, and September, October, and November, 1922; also specimens from the Bishop Museum dated May, 1902.

This form was described with characteristic fullness and accuracy

by Wetmore. With his account the more extensive American Museum material closely agrees. The whiteness of the center of the abdomen, however, is not conspicuous, being confined to the basal parts of the feathers and mostly concealed by the yellow tips. The condition of moult, and the state of the gonads vary greatly and seem to have little relation to the dates of capture. Colors of soft parts, as recorded on the labels, are as follows: iris, brown; bill, blackish brown above, horny or flesh color below; feet grayish or slaty.

Treatment of the Marquesan warblers as races of *Conopoderas caffra* seems to be most in accordance with the indicated facts of distribution and evolution. The birds of the Society and Marquesas islands are obviously representative forms, one of another, and their distinguishing characters are of subspecific degree.

#### ***Conopoderas caffra mendanæ* (Tristram)**

*Acrocephalus mendanæ* TRISTRAM, 1883, Ibis, p. 43, Pl. I, ("Marquesas Islands" = Hivaoa or Tahuata, Islands, Marquesas).

*Tatare mendanæ*, SHARPE, 1883, 'Cat. Birds Brit. Mus.,' VII, p. 526.

*Conopoderas mendanæ*, WETMORE, 1919, Bull. Mus. Comp. Zoöl., LXIII, No. 4, p. 213.

SUBSPECIFIC CHARACTERS.—Similar to *Conopoderas caffra percernis*, but of distinctly paler yellow coloration on the entire ventral surface and on the feather borders of the dorsal plumage.

MEASUREMENTS.—(5 males from Hivaoa [10 for length of wing, tail, and bill from nostril]): wing, 96.6–102 (99); tail, 79–84 (82); exposed culmen, 23–24.8 (24); bill from nostril, 17.7–19.8 (19); tarsus, 31.3–33 (32.1) mm.

5 females from Hivaoa: wing, 94–102 (97.3); tail, 77–92 (79.8); exposed culmen, 23–24.6 (23.8); bill from nostril, 18.7–20 (19.2); tarsus, 30.5–33 (31.3) mm.

5 males from Tahuata (10 for length of wing, tail, and bill from nostril): wing, 97–102 (99.7); tail, 80.6–85 (83); exposed culmen, 23–24 (23.5); bill from nostril, 18.5–19.8 (19); tarsus, 31.7–32.5 (32) mm.

5 females from Tahuata: wing, 95.5–100 (96.6); tail, 78–84.6 (79.3); exposed culmen, 23–24.3 (23.8); bill from nostril, 18.6–19.9 (19.1); tarsus, 30–31.2 (30.7) mm.

RANGE.—Hivaoa and Tahuata Islands, Marquesas.

Specimens from Hivaoa collected during January and October, 1921, and October and November, 1922. Specimens from Tahuata, November, 1922. Hivaoa is here designated the type locality.

This form was not rediscovered, after the time of Tristram's original publication, until the Whitney Expedition collections were received at the American Museum. No particular island of the Marquesas was cited by Tristram, and neither his plate nor his textual description could be made to match any Marquesan warblers subsequently studied. Thus

Wetmore, in proposing the name *Conopoderas percernis* for the bird of Nukuhiva, pointed out a difference in coloration of the rectrices between skins of *percernis* and the colored plate of *mendanæ*.

Our warblers from Hivaoa, Tahuata, Fatuhiva, Motane, Huapu, Huahuna, Nukuhiva, Eiao, and Hatutu Islands agreed no better with the plate, but when specimens were compared by the junior author with Tristram's type skins, the latter were found to be identical with birds from the closely adjacent islands of Hivaoa and Tahuata. The discrepancies of the plate may, therefore, be charged against the artist.

The differences between the forms *percernis* and *mendanæ* are such as would not seem impressive if single skins of each were laid side by side. When long series are juxtaposed, however, the contrast is striking enough to be instantly apparent. In *percernis* the brighter areas of the cheeks, throat, and breast are citron yellow, or of even a slightly richer hue. In *mendanæ* the same regions are much less vivid, approximating baryta or straw yellow. The differences show particularly well when the throat and malar areas of the two insular races are compared. In dorsal aspect, *percernis* is a consistently "greener" bird.

*C. c. mendanæ* is, in fact, closer in appearance to the Tahitian race than is *percernis*. It is distinguishable, however, both by its proportions and by the whiteness of the inner margins of the primaries as seen from below.

Flesh colors, according to the labels, are as recorded for *percernis*.

#### **Conopoderas caffra consobrina, new subspecies**

SUBSPECIFIC CHARACTERS.—Similar to *Conopoderas caffra mendanæ* but averaging slightly smaller, particularly in the length of the bill; yellow of ventral surface slightly more intense, and dorsal feathers with broader yellowish margins.

TYPE.—No. 195,481, Amer. Mus. Nat. Hist.; ♂ ad.; Motane Island, Marquesas Group; November 22, 1922; R. H. Beck.

MEASUREMENTS.—(5 males [10 for length of wing, tail, and bill from nostril]): wing, 94.4–99 (96.8); tail, 77.5–84 (80.8); exposed culmen, 21–22.7 (21.8); bill from nostril, 16.–17.8 (17); tarsus, 31.4–31.7 (31.6) mm.

5 females: wing, 92–98 (95.1); tail, 78–84 (80.3); exposed culmen, 20.5–22 (21.2); bill from nostril, 15.5–17.3 (16.4); tarsus, 29.5–31.1 (30.2) mm.

RANGE:—Motane Island, Marquesas.

Specimens from Motane collected during November, 1922.

This subspecies is compared with *mendanæ*, rather than with *percernis*, because it appears to be very close to the warbler of Hivaoa and Tahuata. Motane lies ten to twelve miles from the nearest points of its two neighboring islands, and about twenty-five miles from the next near-

est island, which is Fatuhiva. The conditions parallel those exhibited by the resident forms of *Pomarea*. *Conopoderas caffra consobrina* bears the same relation to *Conopoderas caffra mendanæ*, of Hivaoa and Tahuata, that *Pomarea mendozæ motanensis* does to *Pomarea mendozæ mendozæ*, which likewise inhabits Hivaoa and Tahuata. Both the warbler and the flycatcher of Motane may be described as distinct though "weak" geographic races, i. e., weak when compared with the highly distinctive forms inhabiting Fatuhiva and some of the other islands.

The differences between *consobrina* and *mendanæ* can best be seen in dorsal aspect, the former being perceptibly "yellower." Similar differences in hue crop up among other Marquesan forms, as will appear under the consideration of the warblers inhabiting Huapu, Eiao, and Hatutu.

Among all races of *Conopoderas*, males average somewhat larger than females, a condition apparently not obtaining in the genus *Pomarea*. The sexual discrepancy should be noted when measurements are compared.

Several of the Motane specimens are labeled "nesting." A fledgling taken on November 22 is dark olive gray on the back, with faint yellowish terminal margins on some of the feathers. The under surface is creamy white, tinged with yellow on chin, breast, and belly.

#### ***Conopoderas caffra fatuhivæ*, new subspecies**

SUBSPECIFIC CHARACTERS.—Similar to *Conopoderas caffra percernis*, but with a longer bill and tarsus, brighter and more extensive yellow coloration on the rump, and paler feet and legs.

TYPE.—No. 195,588 Amer. Mus. Nat. Hist.; ♂ ad.; Fatuhiva Island, Marquesas Group; November 30, 1922; R. H. Beck.

MEASUREMENTS.—(5 males [10 for length of wing, tail, and bill from nostril]): wing, 95.5–101 (98.4); tail, 80–89 (83.7); exposed culmen, 24.5–25.7 (25); bill from nostril, 19–20.8 (20); tarsus, 32.6–34 (33.1) mm.

5 females: wing, 93–96.5 (94.8); tail, 79–83.4 (80.9); exposed culmen, 23.6–26 (24.9); bill from nostril, 18.2–21 (19.7); tarsus, 31–33 (32.1) mm.

RANGE.—Fatuhiva Island, Marquesas.

Specimens from Fatuhiva collected during November and December, 1922.

The warbler of Fatuhiva has the longest bill of any of the Marquesan subspecies. Among fifteen measured specimens, the minimum length of the exposed culmen, and the minimum distance between the anterior end of the nostril and the tip of the maxilla, are about equal, respectively, to the maxima of these dimensions among thirty examples of *Conopoderas caffra mendanæ*, which has the next largest bill.

In the general brightness of the yellow underparts, *fatuhivæ* agrees with *percernis* of Nukuhiva rather than with its nearer neighbor on the islands of Hivaoa and Tahuata. In dorsal aspect, however, *fatuhivæ* is at once distinguishable from either *percernis* or *mendanæ* by the extensive yellow area of the rump and greater part of the upper tail coverts. This region, which ranges in color from straw yellow to colonial buff, forms a continuous area with the flanks and crissum, practically without admixture of olivaceous feathers. The plumage of the back is more broadly margined with yellow than in either *percernis* or *mendanæ*, making *fatuhivæ* appear less green. The inner borders of the primaries, seen from beneath, are not white as in the two preceding races, but are distinctly tinged with yellowish.

The above descriptive remarks apply to specimens in fresh plumage. Wear and fading produce marked changes in general appearance, causing the back to turn brownish as the yellow feather-borders disintegrate, while the rump and ventral surfaces pale notably.

In contrast with the nestling plumage of *C. c. percernis*, that of *fatuhivæ* is quite unlike the adult state. As illustrated by three specimens collected on December 6 to 8, 1922, juvenals are of a color intermediate between buffy brown and olive-brown on the dorsal surface, the feathers of the interscapular region showing whitish borders and those of the lower back rufescent borders. On the under surface the plumage is creamy white, slightly tinged with yellowish on the breast and with buffy on belly, flanks, and crissum. Through a complete post-juvinal moult, this plumage is succeeded by that of maturity.

Every condition with reference to feather replacement and the breeding period seems to be represented among birds taken contemporaneously. Colors of soft parts are as in the preceding subspecies, except that the feet and legs are usually described as "grayish" or "whitish," an indication of lighter coloration that is apparent in the dried skins.

#### ***Conopoderas caffra idæ*, new subspecies**

SUBSPECIFIC CHARACTERS.—Similar to *Conopoderas caffra percernis*, but smaller in all dimensions, and with a particularly short and slender bill.

TYPE.—No. 195,504, Amer. Mus. Nat. Hist.; ♂ ad.; Huahuna Island, Marquesas Group; November 9, 1922; R. H. Beck.

MEASUREMENTS.—(5 males [10 for length of wing, tail, and bill from nostril]): wing, 85–93 (89.3); tail, 73–81.7 (77.1); exposed culmen, 18–19.6 (19); bill from nostril, 14.4–16.1 (15.1); tarsus, 29.2–31 (30.1) mm.

5 females: wing, 85–91 (88.4); tail, 73–79 (75.2); exposed culmen, 18–19.5 (18.7); bill from nostril, 13.8–15.8 (15); tarsus, 29.5–29.8 (29.6) mm.

RANGE.—Huahuna (Uahuka) Island, Marquesas.

Specimens from Huahuna collected during November, 1922.

Small size, particularly obvious in the bill, is the only apparent character of the warbler inhabiting the island of Huahuna. It is the smallest of all the Marquesan subspecies. In general coloration it agrees with *percernis* rather than with *mendanæ*, but the maximum lengths of the wing, culmen, bill from nostril, and tarsus, in a representative series, are less than the respective minima among the two other races.

Birds in various stages of plumage, some with small and some with enlarged gonads, were collected together during the month of November.

Juvenals resemble the young of *percernis*, being well tinged with yellow on the ventral surface. The back, however, is less greenish, the prevailing color being hair brown with scarcely perceptible lighter margins on the feathers.

Field labels record the colors of soft parts as in the other forms except that the legs are described as "greenish slate."

We take pleasure in naming this subspecies in honor of Ida M. (Mrs. Rollo H.) Beck, who has accompanied her husband during the greater part of his Polynesian travels.

#### ***Conopoderas cafra dido*, new subspecies**

**SUBSPECIFIC CHARACTERS.**—Larger than *Conopoderas cafra idæ*, particularly in the size of the bill; smaller than the subspecies *mendanæ* and *percernis*; in coloration most closely resembling *percernis*, but the yellow of the ventral surface is even more intense, being strontian yellow, rather than citron-yellow, on the throats and breasts of specimens in fresh plumage.

**TYPE.**—No. 190,460, Amer. Mus. Nat. Hist.; ♂ ad.; Huapu Island, Marquesas Group; October 3, 1921; R. H. Beck.

**MEASUREMENTS** (5 males [10 for length of wing, tail, and bill from nostril]); wing, 91.5–96 (93.8); tail, 77–82 (79.3); exposed culmen, 21.6–22.6 (21.9); bill from nostril, 16.1–17.3 (16.8); tarsus, 29.5–31 (30.2 mm.).

5 females: wing, 88–95 (91.1); tail, 72.7–80 (76); exposed culmen, 20.7–22 (21.1); bill from nostril, 15.5–17.3 (16.5); tarsus, 28.2–30.2 (29.3) mm.

**RANGE.**—Huapu (Uapu or Uapa) Island, Marquesas.

Specimens from Huapu collected during October, 1921 and September and November, 1922.

The warbler of Huapu is the brightest of all the subspecies in the color of the breast, and is readily distinguishable from any of the Marquesan insular forms thus far described in this paper. When compared with those which follow, it must be confessed that the systematist is hard put to find words through which the slight though constant differences can be made to appear tangible. Variation in size among the remaining forms



is slight, and variation in color is sometimes hard to see except when series of ten or more skins from each of the several islands are laid side by side. Under the latter circumstances, however, slight distinguishing characteristics, coupled with separate insular ranges, are made discernible, and the taxonomic procedure becomes clearly indicated. We are witnesses of actual biological differences between isolated colonies of closely related organisms. The differences may, indeed, be far wider and deeper than the clothing of the dead skins reveals. Whether or not the phenomena are associated with the beginning of speciation, there is no course but to give each of the entities a name.

Descriptive notes on the flesh colors of *Conopoderas caffra dido*, and of the forms that follow, are the same as those upon the labels of *percernis*.

***Conopoderas caffra aquilonis*, new subspecies**

SUBSPECIFIC CHARACTERS.—Resembling *Conopoderas caffra dido*, of Huapu Island, but with slightly less intense yellow coloration on the ventral surface, and with a smaller bill; larger in all dimensions than the subspecies *idæ*, of Huahuna Island.

TYPE.—No. 195,357, Amer. Mus. Nat. Hist.; ♂ ad.; Eiao Island, Marquesas Group; October 2, 1922; R. H. Beck.

MEASUREMENTS.—(5 males [10 for length of wing, tail, and bill from nostril]): wing, 91–96 (93.6); tail, 77.5–84 (80.8); exposed culmen, 19.2–20.2 (19.8); bill from nostril, 14.4–16 (15.4); tarsus, 30.5–31.3 (30.8) mm.

5 females: wing, 87.5–98 (91.9); tail, 74–83 (77.8); exposed culmen, 20–20.5 (20.2); bill from nostril, 15–16.2 (15.8); tarsus, 29–31.2 (30.1) mm.

RANGE.—Eiao (Eiau) Island, Marquesas.

Specimens from Eiao collected during September and October, 1922.

With reference to this form, there is little to add to the description. Adults had gonads in every stage of development, but no specimen in the series is certainly recognizable as a juvenal.

In comparing dimensions of the several subspecies, the normal size difference between the sexes must be kept in mind.

***Conopoderas caffra postrema*, new subspecies**

SUBSPECIFIC CHARACTERS.—Resembling *Conopoderas caffra aquilonis*, of Eiao Island, but averaging slightly smaller, except in the size of the bill, and with a less yellowish and more olivaceous dorsal surface.

TYPE.—No. 195,395, Amer. Mus. Nat. Hist.; ♂ ad.; Hatutu Island, Marquesas Group; September 27, 1922; R. H. Beck.

MEASUREMENTS.—(5 males [10 for length of wing, tail, and bill from nostril]): wing, 86–95.5 (91.7); tail, 72–81.1 (77.4); exposed culmen, 18.7–20 (19.8); bill from nostril, 14.6–16 (15.4); tarsus, 29–30.7 (29.6) mm.

5 females: wing, 87–92 (89); tail, 71–78 (74.6); exposed culmen, 19–20 (19.5); bill from nostril, 15.3–16 (15.6); tarsus, 28.5–30.7 (29.3) mm.

RANGE.—Hatutu Island, Marquesas.

Specimens from Hatutu collected during September and October, 1922.

Eiao and Hatutu Islands lie a little more than three miles apart, some sixty miles from Nukuhiva, which is the next nearest land mass in the archipelago. This remote pair of small islands might be expected to harbor closely related warblers. The relative difference between the subspecies *postrema* and *aquilonis* may be expressed roughly by saying that the former has a "grayish-green" back, the latter a "yellowish-green" back. When fifteen skins from each island were selected at random, and laid on their bellies with the labels concealed, an observer who had no knowledge of the circumstances was able to divide the specimens correctly. With only two or three specimens available, the distinctions would be harder to appreciate.