

Notes on the Marianas Mallard¹

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THE MARIANAS MALLARD, *Anas oustaleti*, is one of the most interesting species of Micronesian birds. Found only on Saipan, Tinian, and Guam, three small islands of the Marianas, it is very scarce both in museum collections and in its native habitat. Special precautions, therefore, should be taken to protect it from extermination.

The Marianas Mallard was first reported by Bonaparte (1856) as *Anas boschas* a. *Freycineti* (*nom. nud.*) based on the single specimen preserved in the Paris Museum, which was said to have come from "Les Isles Malouines." Later Salvadori (1894) described the same specimen as *Anas oustaleti*, but its exact abode was not known until Oustalet (1896) reported six specimens from Guam. Afterwards, Hartert (1898) added Saipan to its range, and Phillips (1923) added Tinian. Its habits and status, however, were unknown until Japanese investigators studied them after 1931.

Anas oustaleti is found in two places in Saipan. One is a lagoon covered with mangroves, north of Garapan village, where Hyojiro Orii, my collector, obtained 11 specimens in 1931 and Takeo Kozima later took four more for me. The second place is a small fresh-water pond called Charan-Kanoa, south of Garapan village, surrounded by a rich growth of aquatic plants.

Tinian Island, south of Saipan, is at present the main habitat of this duck. Hagoi Pond, in the northern part of that island, is a small body of fresh water surrounded by about 40 acres

of marsh. My collectors obtained nine specimens there between 1931 and 1933. Kuroda obtained 10 more specimens from this locality in 1936, and in 1940 he received four live birds which he kept in his aviary in Tokyo for several years. According to Kuroda, his collector observed two flocks of *Anas oustaleti* there at the time, each containing 50 to 60 ducks, the largest flocks of this duck ever seen.

In Guam, where *Anas oustaleti* was first discovered, the Marianas Mallard seems to be least plentiful in comparison with the other two islands. According to Phillips (1923) only a few ducks remain in the Talafofo Valley.

In general habits *Anas oustaleti* resembles *Anas poecilorbyncha* (including *superciliosa*), which is widely distributed from New Zealand through Micronesia and the Philippines to China and Japan. The duck resides in lagoons and fresh-water ponds throughout the year, and according to Phillips (1923) breeds in Guam in January and February, at the end of the rainy season. On Saipan and Tinian eggs and ducklings have been collected in June and July, which are in the dry season (Kuroda, 1942). Saipan natives speak of their breeding from January to March. Thus, this duck seems to breed at all seasons of the year. Kuroda (1942) described a nest with seven eggs taken July 4, 1941, at Hagoi Pond, Tinian Island. It was found among the rushes, and was made of dead leaves, stems, and roots, and lined with down. The eggs were grayish white with a pale greenish tinge, and measured 61.6×38.9 mm.

Anas oustaleti has two types of plumage, one resembling *Anas platyrhynchos*, and the other *Anas poecilorbyncha*. Therefore, certain earlier

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investigators, who saw only the *platyrhynchos* type, were convinced that *Anas oustaleti* is a near relative of *Anas platyrhynchos* (Salvadori, 1894), while others, who saw only the *poecilorhyncha* type, thought it nothing but a subspecies of *Anas superciliosa* (= *Anas poecilorhyncha superciliosa*) (Hartert, 1930). I was inclined to think, after obtaining a series of specimens from Saipan Island, which includes adult males of both types, that *Anas oustaleti* must have two color phases, a *platyrhynchos* type and a *poecilorhyncha* type. Kuroda later proved this conjecture correct by observing the moult of living specimens (Kuroda, 1941, 1942). The descriptions of both types are as follows:

A. PLATYRHYNCHOS type:

Adult male in nuptial plumage: Whole head is dark green, except at the sides where buff feathers are plentifully intermingled, a dark brown streak through the eye, and faint white ring on the lower neck. Feathers on scapulars and sides of body are as those of *Anas poecilorhyncha*. Sides of body are vermiculated but some brown feathers are found even in the full nuptial plumage. Upper breast is dark reddish chestnut with dusky spots. Upper and under tail coverts are as in *Anas platyrhynchos*. Speculum is as that of *Anas platyrhynchos*, but the tips of the greater coverts are buff instead of white. Central tail feathers are more or less curled upward. Base of bill is black, tip is olive color. Iris is dark brown. Feet, reddish-orange, webs darker.

Adult male in eclipse plumage: Resembles the eclipse plumage of *Anas platyrhynchos*.

A. POECILORHYNCHA type:

Adult male in nuptial plumage: Resembles *Anas poecilorhyncha pelewensis* from the Palau Islands and Truk Island, but sides of head are browner, superciliary stripes and ground color of cheeks are more buffy. Feathers on upper breast and sides of body are more broadly edged with brown. Speculum is usually violet-purple as in the *platyrhynchos* type, but in two speci-

mens from Saipan and Tinian, respectively, it is dark green as in *Anas poecilorhyncha pelewensis*. Tips of the secondaries are usually white, but sometimes very faint as in *Anas poecilorhyncha pelewensis*, and in one specimen from Saipan they are buffy. Bill is olive color with a black spot in the center of the upper mandible. Iris, dark brown. Feet, dark orange, darker in joints and webs.

Adult male in eclipse plumage: Same as the nuptial plumage.

Thus it is apparent that the *platyrhynchos* type is composed of characteristics 90 per cent peculiar to *Anas platyrhynchos*, and 10 per cent similar to *Anas poecilorhyncha*, while the *poecilorhyncha* type reverses the percentages, being 90 per cent similar to *poecilorhyncha* and 10 per cent to *platyrhynchos*. Therefore, *Anas oustaleti* may conceivably have originated from a compound of *Anas platyrhynchos* and *Anas poecilorhyncha* stock.

Having compared a number of both types, I find the *platyrhynchos* type to be less numerous than the *poecilorhyncha*. In the 50 known specimens of *Anas oustaleti* (36 of them formerly in Japanese collections) only six specimens were the *platyrhynchos* type. However, the ratio between the numbers of both types varies on each island. On Saipan, at the northernmost end of its distribution, four of the six known adult males were *platyrhynchos* type, while on Tinian, only one *platyrhynchos* type was discovered among 24 specimens. On Guam, the *platyrhynchos* type seems to be very rare, only one having been reported among about a dozen specimens.

There have been two hypotheses advanced as to the origin of *Anas oustaleti*. Phillips (1923) and Hartert (1930) thought it probably stemmed from *Anas superciliosa* (= *Anas poecilorhyncha superciliosa*), but this hypothesis does not explain the occurrence of the *platyrhynchos* type. Kuroda (1941-1942) and Delacour and Mayr (1945) supposed that *Anas oustaleti* must have descended from *Anas platyrhynchos* stock which arrived long ago from the north, chiefly

because *Anas oustaleti* resembles *Anas platyrhynchos*, especially in the color of the speculum. However, this assumption seems hardly to fit the case, because it overlooks the remarkable similarity of the *poecilorhyncha* type to *Anas poecilorhyncha superciliosa*. Furthermore, the speculum of *Anas oustaleti* does not always resemble that of *Anas platyrhynchos*, being sometimes dark green without conspicuous white edgings, and hence more like that of *Anas poecilorhyncha superciliosa*.

On the other hand, it is well known that *Anas platyrhynchos* can easily be crossed with *Anas poecilorhyncha* (including *superciliosa*), producing offspring very similar to the *platyrhynchos* type of *Anas oustaleti*. In the male of F_1 offspring of this cross in nuptial plumage the head is green except on the sides, where buff feathers are mixed plentifully, with a dark stripe through the eye. The mantle is as that of *Anas poecilorhyncha*, but breast, sides of body, wing, and tail are similar to those of *Anas platyrhynchos*, the central tail feathers curling backward. The female of this cross is intermediate between the parental species, showing the dark stripes on the cheeks found only in *Anas poecilorhyncha*. A particularly interesting fact is that the speculum of *Anas platyrhynchos* acts as dominant over that of *Anas poecilorhyncha*. The *platyrhynchos* type speculum in *Anas oustaleti* might be derived in this way, and the occasional occurrence of the *poecilorhyncha* type speculum may be explained by the formation of a homozygous condition governing the recessive gene of the *poecilorhyncha* type speculum. From these evidences we may deduce that *Anas oustaleti* originated from hybridization between a local race of *Anas poecilorhyncha*, probably formerly resident on the Marianas, and *Anas platyrhynchos* stock which straggled there occasionally from the north. The scarcity of the *platyrhynchos* type in the southern islands strengthens this supposition. The opportunity for hybridization should occur more rarely in the south, and thus more

frequent back-crossing of the hybrid with the indigenous *Anas poecilorhyncha* on Tinian and Guam explains the superabundance there of the *poecilorhyncha* type. As the hybridization should have taken place more frequently to the north in Saipan, the ratio of occurrence of the *platyrhynchos* type is logically higher there.

There is no evidence of previous occurrence of *Anas poecilorhyncha* (including *superciliosa*) in the Marianas Islands, but it seems logical, because *Anas poecilorhyncha* is found in the neighboring Caroline and Palau Islands, as well as in the Philippines and Japan. Neither is *Anas platyrhynchos* recorded from the Marianas, but its winter range reaches in the east to the Hawaiian Islands and in the west to Borneo and South India, and it winters frequently just north of the Marianas in the Bonin and Volcano Islands. Therefore, it is not unreasonable to suppose that *Anas platyrhynchos* has occasionally straggled to the Marianas, remained and produced hybrids with an *Anas poecilorhyncha* stock which was formerly indigenous there.²

According to recent cytogenetical investigations, the interspecies hybrid shows more or less sterility due to a dissimilarity of parental chromosome constitutions. This sterility, however, can be reduced by pure breeding after back-crossing, which forms new homozygotes having a chromosome constitution different from either of the parental species. The possibility of species formation in this manner was suggested by Danforth and Sandnes (1939). In the Marianas Islands, the habitat of this duck is restricted to very small ponds or lagoons found in each island. Consequently, the population is very small, and pure blood lines may be carried in each population occupying a certain pond or lagoon. The phenomenon suggested by Danforth and Sandnes (1939) seems to be realized by these circumstances.

² I believe *Anas wyvilliana* of the Hawaiian Islands and *Anas laysanensis* of Laysan Island originated from *Anas platyrhynchos* stock alone, because no dichromatic phases have been reported in either species and there is no evidence that a second species ever occurred in these islands.

Speciation by hybridization either in natural or under artificial conditions is often reported in the plant kingdom, but it is exceedingly rare among animals. *Anas oustaleti* could have developed only in the special environment of the Marianas Islands, and is therefore noteworthy from the viewpoint of evolution.

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