Myzomela cruentata MEYER (Aves, Meliphagidae) in the Bismarck Archipelago

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NOONA DAN PAPERS NO. 20

Very little is known about the distribution and geographical variation of *Myzomela cruentata* in the Bismarck Archipelago. This little honey-eater, of which the males are almost uniform bright carmine red, has its main distribution in New Guinea, from where the nominate form was described by A. B. MEYER in 1875. Shorty after it became known from the Bismarck Islands, and in 1878 RAMSAY separated the population of the Duke of York Islands as *Myzomela coccinea* and that of New Ireland as *M. erythina* (emended to *erythrina*). In 1884 SHARPE described the birds from New Britain as *M. kleinschmidti*. All these names were based on a single specimen each, and the descriptions were so inadequate that GADOW (1884, Cat. Birds Brit. Mus., **9**: 140) synonymized them all with *cruentata*. Subsequently, REICHENOW (1899, Mitt. Zool. Samml. Mus. Naturk. Berlin, **1**, no. 3: 102) accepted *coccinea*, but not the two other species. He had not personally examined specimens of any of the three forms, however. In 1923–24 A. F. EICHHORN collected a number of specimens on New Ireland and New Hanover, which were described by HARTERT (1924, Novitates Zool., **31**: 210, and **32**: 133). HARTERT united the populations of these two islands as *erythrina* Ramsay, adding that there were no tangible differences between New Britain and New Ireland birds, and he, therefore, synonymized *coccinea* and *kleinschmidti* with *erythrina*. He had only one specimen from New Britain, however. During the Whitney South Sea Expedition W. F. COULTAS collected in New Britain in 1932–33 and obtained three specimens of *M. cruentata* in the Baining Mountains at an altitude of 5000 feet, but unfortunately they were all immature specimens. Furthermore, COULTAS in 1935 collected no less than 12 specimens of *M. cruentata* on Tabar Island, an island which from a zoological view-point was completely unknown prior to his visit. Recently MAYR (1955, Amer. Mus. Novitates, No. 1707: 42–43) made a very interesting study of the Bismarck forms of *cruentata*, basing it on EICHHORN's and COULTAS' collections. He described the Tabar and New Hanover birds as a new subspecies, *cantans*, adding that "the New Hanover population is somewhat intermediate between Tabar and New Ireland birds". On the other hand, MAYR was unable to define the New Britain form *(coccinea)* owing to insufficient material. In 1958, however, the late THOMAS GILLIARD during his expedition to the Whiteman Mountains in the western part of New Britain, collected a large series of *coccinea*, which is now in the American Museum of Natural History, New York.

During the Noona Dan Expedition I collected a long series of this species in New Ireland, and a smaller series (five

specimens) on Dyaul Island. The latter island was previously unexplored. *M. cruentata* is now known from New Britain, Duke of York Islands, New Ireland, New Hanover, Dyaul and Tabar. The bird life of the different islands in the Bismarck Archipelago is now so comparatively well known that it is unlikely that this species will turn up on other islands than those mentioned.

The present study was partly carried out during a visit to the American Museum of Natural History in New York. At my disposal were the series collected by EICHHORN and COULTAS, *i. e.* the same material which was formerly utilized by MAYR. In addition to this I had the Noona Dan collection and, further, the series of *coccinea* collected by GILLIARD in 1958. My thanks are due to the authorities of the American Museum of Natural History and to Dr. DEAN AMADON, Chief-Curator of the Department of Ornithology, for their kind permission to let me examine the material of *Myzomela cruentata* in the museum. I am also much indebted to Dr. TH. GILLIARD for giving me access to his collection of *coccinea*.

I am confining myself in this paper to the morphology and taxonomy of the Bismarck populations only, while notes on life habits and ecology will be published elsewhere at a future date.

As far as the taxonomic characters are concerned, there is a major break between the populations of New Britain – Duke of York Islands and those of the remaining islands. The former are very near to nominate *cruentata* from New Guinea, whereas the latter are strikingly different and can be separated as a special subdivision, the *erythrina*-group. This group comprises four subspecies, which are rather similar, however, the most distinct one being the form inhabiting Dyaul Island. The juvenile birds of these forms differ much more from each other than do the adult ones, and in three of the forms juvenile birds, therefore, have been chosen as type specimens.

It is necessary shortly to mention the different plumages which can be distinguished in these birds. The first plumage (after the natal down) is the juvenile dress, which in comparison with the adult plumage is characterized by the looser texture of the feathers, the smaller proportions throughout with particularly short wings, the swollen gape and the characteristic plumage pattern differing from that of the adult birds. It is possible to distinguish the two sexes in the juvenile dress. This dress is very soon replaced by the first adult one, in which the short juvenile wings are retained, while the colour pattern of the plumage is similar to that of the subsequent adult stages, although somewhat more dull, at least in the males. Even in the adult plumages the two sexes can be distinguished.

Unfortunately, MAYR *(loc. cit.)* confused juvenile and adult females. His descriptions of the females of *erythrina* and *cantans* actually refer to juvenile specimens. Neither EICHHORN nor COULTAS collected any adult females, which apparently are difficult to collect in several species within the genus *Myzomela*. During the Noona Dan Expedition I collected an adult female on both Dyaul Island and in New Ireland, the first ones known in the *erythrina* group. These females appeared to differ considerably in colour pattern from the juvenile birds.

Nominate *cruentata* and *coccinea* are characterized by a strong sexual dimorphism in the adult birds, just as is the case in most other species of *Myzomela*. The males of nominate *cruentata* and *coccinea* are bright red, while the females are olive brown with paler, greyish under parts and a facial mask of dull red. The juveniles are similar to the adult females. Contrary to the condition in these two forms the adult females of the *erythrina* subspecies group are similar to the males,

being only slightly duller in the coloration. This development is of great principal interest. On the other hand, there is a considerable difference between the adult females and the juvenile birds, while, as said above, in the *cruentata* group the adult females and the juvenile birds are similar.

The two adult females collected (one in New Ireland, one on Dyaul) appear to be very similar. Likewise, the adult males, of which sufficient material is present of all four forms of the *erythrina* group, differ mutually only rather slightly. On this background it is noteworthy that the juvenile birds are subject to a very pronounced geographical variation.

The masculinization of the females in the *erythrina* group is not unique. A similar development has taken place in two other species of *Myzomela*, namely *M. nigrita* and *M. cardinalis*. In both these species as well as in *cruentata* the masculinization of the females is developed only in populations which inhabit small or medium-sized islands, while in the mainland populations the sexes are markedly different.[1]) In all three species the masculinization of the females represents a higher evolutionary level than the sexual dimorphism. The fact that in all three species masculinization of females is correlated with melanization and with increase in size constitutes a further parallelism. This close parallelism tends to demonstrate that the said development represents a fundamental evolutionary trend in island forms of *Myzomela*. It can be added that melanization has occurred three times, independently of each other, in the superspecies *M. lafargei*, inhabiting the Solomon Islands, but this is not followed by masculinization of the females, only by a slight increase in size.

The following notes concern the diagnoses of the subspecies and the subspecies groups which can be distinguished in the Bismarck Archipelago. Measurements of wing and bill of all individuals from the Bismarck Islands examined are given in Table 1.

Cruentata Group.

Adult males bright carmine red. Adult females with olive brownish upper parts, dusky greyish under parts with dull red on chin, upper throat and forehead. Juvenile birds very similar to the adult females.

(1) *Myzomela cruentata coccinea* RAMSAY, 1878.

Very similar to nominate *cruentata*, but adult males differing in having the carmine red colour slightly duller and paler, and females in having a faint carmine tinge on the upper parts. Bill on an average slightly larger.

Measurements: Four adult males (coll. TH. GILLIARD) have a wing length of 54–57 (average 55.6) mm, and bill 16–17 (average 16.6) mm, compared with wing 55–60 (average 57.0) mm and bill 15.8–16.5 (average 16.1) mm in 35 adult males of nominate *cruentata* measured by me.

Range: New Britain and Duke of York Islands.

Erythrina Group.

Adult males sombre vinaceous red. Adult females similar to adult males, but duller. Juvenile birds strikingly different from adult females and subject to strong geographical variation.

(2) *Myzomela cruentata erythrina* RAMSAY, 1878.

Adult males: Strikingly different from the

[1]) In the case of *M. cardinalis* the mainland is inhabited by the closely allied species *M. sanguinolenta*, with which it forms a superspecies.

Table 1. Individual measurements (in mm) of *Myzomela cruentata* in the Bismarck Archipelago. Measurements of specimens collected by the Noona Dan Expedition are *italicized*. The remaining material belongs to the American Museum of Natural History, New York.

	Wing	Bill
Adult Males		
coccinea	54.5, 55, 56, 57	16, 16, 17, 17.5
erythrina	57, 58, 58, *58*, 59, *59*, *59*, 59.5, 60, *60*	16.5, 16.8, 17, 17, *17.1*, *17.2*, 17.5, *17.5*, 18
lavongai	60, 60, 60.5, 62.5, 62.5	17, 17.5, 17.8, 18, 18.2
cantans	59, 61, 61, 62, 62, 62, 62, 63	17, 17, 17, 17.5, 17.5, 17.8, 18
vinacea	*63*, *64*, *65*	*18*, *18.5*, *18.5*
Adult Females		
erythrina	*54*	*16*
vinacea	*58.5*	*16*
Juvenile Males		
erythrina	55, *55.5*, *57*	16, *16.7*, *17*
lavongai	57.5	16.3
cantans	57, 57.5, 59	16.5, 17, 17.5
Juvenile Females		
erythrina	*51*, 53, *53*	16, *16*, *17*
lavongai	52.5, 54	16, 17
cantans	53	16
vinacea	*56*	*17*

preceding form by being much duller and darker and more sombre vinaceous red with the crown almost blackish.

Adult females: Very similar to the adult males, but red colour on upper parts slightly duller, chin and throat slightly paler vermilion, breast and abdomen paler red.

Juveniles: Strikingly differing from the juvenile plumage of the *cruentata* group by having upper parts and throat dull rosy carmine, breast and abdomen paler rosy brown contrasting with carmine throat. One specimen (of six examined) has breast and abdomen buffish grey without any rosy tinge. The two sexes are similar, but the males have throat more bright carmine red in stronger contrast to colour of breast.

Measurements: Slightly larger proportions than *coccinea*. Wing length of 10 adult males 57–60 (average 58.7) mm, bill 16.5–18 (average 17.2) mm.

Range: New Ireland.

Noona Dan material: Four ♂♂ ad. (no. 1387, 1399, 1541, 1594, collected 10th–29th April 1962, testis length 3.5–6 mm), one ♀ ad. (no. 1504, collected 19th April 1962, ovary coarsely granulated; bill black, legs dark greyish, iris black), two ♂♂ juv. (no. 1460, 1548, collected 16th and 22th April 1962, testis with diameter about 1 mm; no. 1460 has obtained adult plumage on upper parts), two ♀♀ juv. (no. 1433, 1522, collected 12th and 20th April 1962, oviduct straight, very thin). Coll.: F. Salomonsen.

American Museum material: Six ♂♂ ad., one ♂ juv., one ♀ juv. Coll.: A. F. Eichhorn.

(3) **Myzomela cruentata lavongai**, new subspecies.

Type: ♀ juv., New Hanover (= Lavongai), 6th Feb. 1923, coll. A. F. EICHHORN, in the American Museum of Natural History, New York, no. 693102.

Adult males: Very similar to *erythrina*, but upper parts slightly more bright and shining red.

Juveniles: Differ distinctly from *erythrina* in having breast and abdomen buffish grey, not rosy brown, but one out of six *erythrina* is not distinguishable from *lavongai*. The two sexes differ in the same way as in *erythrina*.

Measurements: Distinctly larger proportions than in *erythrina*. Wing length of five adult males 60–62.5 (average 61.1) mm, bill 17–18.2 (average 17.7) mm.

Range: New Hanover.

American Museum material: Five ♂♂ ad., one ♂ juv., two ♀♀ juv. Coll.: A. F. EICHHORN.

(4) *Myzomela cruentata cantans* MAYR, 1955.

Adult males: Similar to *erythrina*, but upper parts still darker and duller red, and under parts slightly darker red.

Juveniles: Very much darker than *erythrina* and *lavongai*, upper parts being much darker vinaceous red, under parts dark greyish brown with a vinaceous tinge and with the carmine red throat strongly contrasting.

Measurements: Similar to those of *lavongai*. Wing length of eight adult males 59–63 (average 61.5) mm, bill 17–18 (average 17.4) mm.

Range: Tabar Island in the Tabar group.

American Museum material: Eight ♂♂ ad., three ♂♂ juv., one ♀ juv. Coll.: W. F. COULTAS. MAYR *(loc. cit.)* refers to two of the ♂♂ juv. as ♀♀ juv., although they were sexed as males by the very careful COULTAS. I see no reason to reject COULTAS' sex determination.

(5) **Myzomele cruentata vinacea**, new subspecies.

Type: ♀ juv., Dyaul Island, 9th March 1962, coll. FINN SALOMONSEN during the Noona Dan Expedition, in Zoological Museum, Copenhagen, collector's number 1053.

Adult males: Indistinguishable from *lavongai*; upper parts more bright and shining than in *erythrina*.

Adult females: Virtually identical with the adult female of *erythrina*, perhaps slightly darker and duller vinaceous red on under parts.

Juveniles: Differ distinctly from the juveniles of all other forms within the *erythrina* group in being duller and darker throughout, having both upper and under parts of almost the same dark vinaceous colour, under parts only slightly lighter, more plum-coloured, and with throat only slightly contrasting with breast and abdomen in coloration.

Measurements: Distinctly larger than the other subspecies. Wing length of three adult males 63–65 (average 64.0) mm, bill 18–18.5 (average 18.3) mm.

Range: Dyaul Island.

Noona Dan material: Three ♂♂ ad. (no. 921, 1004, 1030, collected 2.–7. March 1962, testis length 4–5 mm; bill black, legs greyish brown, iris black; no. 1004 and 1030 (with wing length 63 and 64, respectively) are first year birds with the juvenile wings retained), one ♀ ad. (no. 990, collected 5th March 1962, ripe yolk in oviduct), one ♀ juv. (no. 1053, collected 9th March 1962, oviduct straight, very thin). Coll.: F. SALOMONSEN.

MS received 10th April 1966