

Morphological characteristic of black-winged myna (*acridotheres melanopterus*)*

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Abstract. Black-winged myna (*Acridotheres melanopterus*) is an endemic bird of Java and Bali, currently critically endangered based on International Union of Conservation for Nature (IUCN) since 2010. The study about black-winged myna morphological characteristic is important because it has two relatives with almost identical features of morphology. The information can be used as a basis in breeding management to avoid hybridization. The study aims to determine the morphological characteristics of black-winged myna. The sample selection was done using purposive sampling method. Data was taken from 36 black-winged mynas with ≥ 2 years old. Data collection was done by measuring and documenting every morphological feature of the observed body parts. Documentation of the wings, back, chest, head and sides of the body are taken from each bird using a digital camera. The results showed that almost the entire body of black-winged myna covered by white feather, black feather only present on the cover of the wings and tail. Black eyes surrounded by yellow skin without feather. The beak is orange with blackish parts around the nostrils. The bird has yellow legs with three fingers at the front and one finger at the back. The average body length of this bird is 22.5 cm, weight 89.02 g, width 5.98 cm, body circumference 14.36 cm and wingspan 38.49 cm.

1 Introduction

Black-winged myna (*Acridotheres melanopterus*) is an endemic species that can only be found on the island of Java and Bali, Indonesia. The bird is omnivore, which means it is eat everything but mostly insects and fruits [1,2]. The status of this bird is critically endangered according to the International Union of Conservation for Nature or IUCN since 2010 until now. The bird was divided into three different species, there are *Acridotheres melnopterus* from West Java, *Acridotheres tricolor tricolor* from East Java, and *Acridotheres tertius Sturnus* from Bali [3,4] The Indonesian government has designated black-winged myna as a protected animal, this bird entered the list of rare birds protected by the Indonesian government through The Law number 5 of 1990 on the Conservation of Biological Natural Resources and Ecosystem and PP. 7 of 1999 on the Utilization of Plant and Wildlife.

The three species of black-winged myna are having a very similar morphological characteristic, but it can be distinguished by their feather pattern. The bird has medium size with a body length of approximately 23cm as adults. His body is dominated by white feather and some black feather on the tail and wings. The feather on

the back and wings of the *Acridotheres melanopterus* is white, for *Acridotheres tertius* is blackish-gray and for *Acridotheres tertius* is gray. The young black-winged myna is having gray feathers on the head, nape, back and scapular. Morphological characteristic of these birds are identic. The eye circle is yellow with no feather, gray at a young age [5,6].

Research into the morphological characteristics of black-winged myna is important as a basis for distinguishing each species. Some research has been conducted and show how morphology is essential for the conservation effort [2,7,8] The researches that need to be done are related the factors leading the black-winged myna to extinction. Uncontrolled hybridization in captivity can be one of the factors causing the bird on the verge of extinction. The study aims to understand the criteria of *Acridotheres melanopterus* in terms of morphology [4,7]. Information about the black-winged myna morphological characteristics as the result of the research can be a reference to distinguish it from two other species and prevent the hybridization in captivity.

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2 Materials and Method

2.1 Study area

Cikananga Conservation Breeding Center (CCBC) is a wildlife center located in the hilly area of the southern Sukabumi, West Java, Indonesia. Cikananga administratively located at Cisitu village, Nyalindung district, Sukabumi. It is approximately 2 hours' drive from the city of Sukabumi. Cikananga is the protection and preservation wildlife center for the Indonesian protected animals. It is providing a home for many species that need help. One of the animals is black-winged myna, CCBC has been conducting a program to breed and release them. The breeding program is a big success followed by the release program regularly. The location of CCBC can be seen on the image below (Figure 1).



Fig. 1. Cikananga Conservation Breeding Center location map.

2.2 Procedure

The morphological observations were performed directly to the black-winged myna in captivity. The location of the data collection is at the animal breeding center built for conservation purposes, it is at Cikananga Conservation Breeding Center (CCBC) located in Sukabumi, Indonesia. CCBC has the record of all the black-winged mynas that it has, it is very important to help the research. The sample selection is done by purposive sampling method, the bird must be at least two years old to ensure the bird is already in the adult phase and no longer experiencing morphological changes. The morphology of the black-winged myna also has to be ascertained from the characteristics of the hybrid. There is no gender distinction in the selection of the sample because the male and female black-winged myna is having the same morphological characteristics. Some measurement also has been conducted to know the

average size of the bird, the detail can be seen on the figure 2.

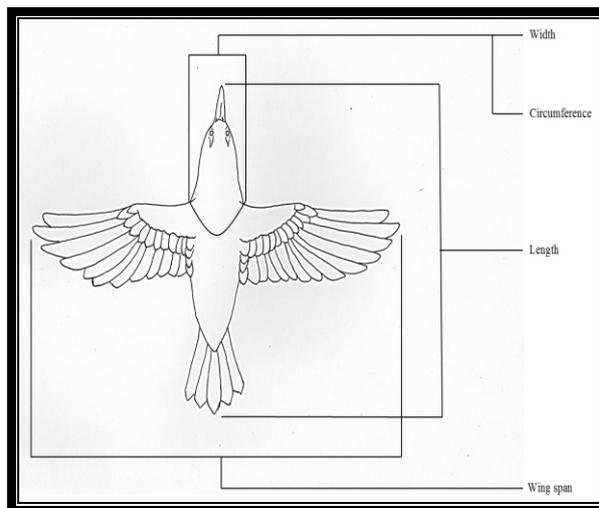


Fig. 2. Black-winged myna measurement detail.

The image above (Figure 2) shows the definition of each measurement that has been conducted. Data collection process was conducted on 14th until 20th May 2017. The first process is to catch the bird and put it into the prepared bag, weight it with the hanging scale. The bird identity is needed to be noted before the work. Take out the bird from the bag and hold the bird carefully (should be done by experienced person). The next step is to measure the length of the body (from the beak to the tail). After the measurement done, a digital camera was used to take photos from the bird. The camera should be had a high definition quality to ensure the sharpness of the photo. Gradually, the photos of the back, rump, right shoulder, left shoulder and chest has to be taken. A full body image of left and right side of the body is also needed to observe the flank, the wings need to be opened. Each photo is needed to be named based on the identity of the bird. The data collection process is needed to be done as quickly as possible. The data collection process should be conducted in the morning, around 07.00 until 09.00 AM should be good to retain the bird from stress. The bird is very sensitive to the increasing temperature from the sun

2.3 Data Analysis

The data obtained is the result of the observation on the morphological characteristics of the black-winged myna. The collected photographs were observed to obtain important morphological characteristics from the bird. It is hard to obtain all the characteristics while doing the measurement to the bird because it will stress out from it. Each part of the bird's body is also observed to obtain more detailed characters. The average data from the measurement of body length, body width, body circumference and wing span will then be taken. The average obtained is a general description of the size of the black-winged myna in CCBC.

3 Results and Discussion

3.1 Result

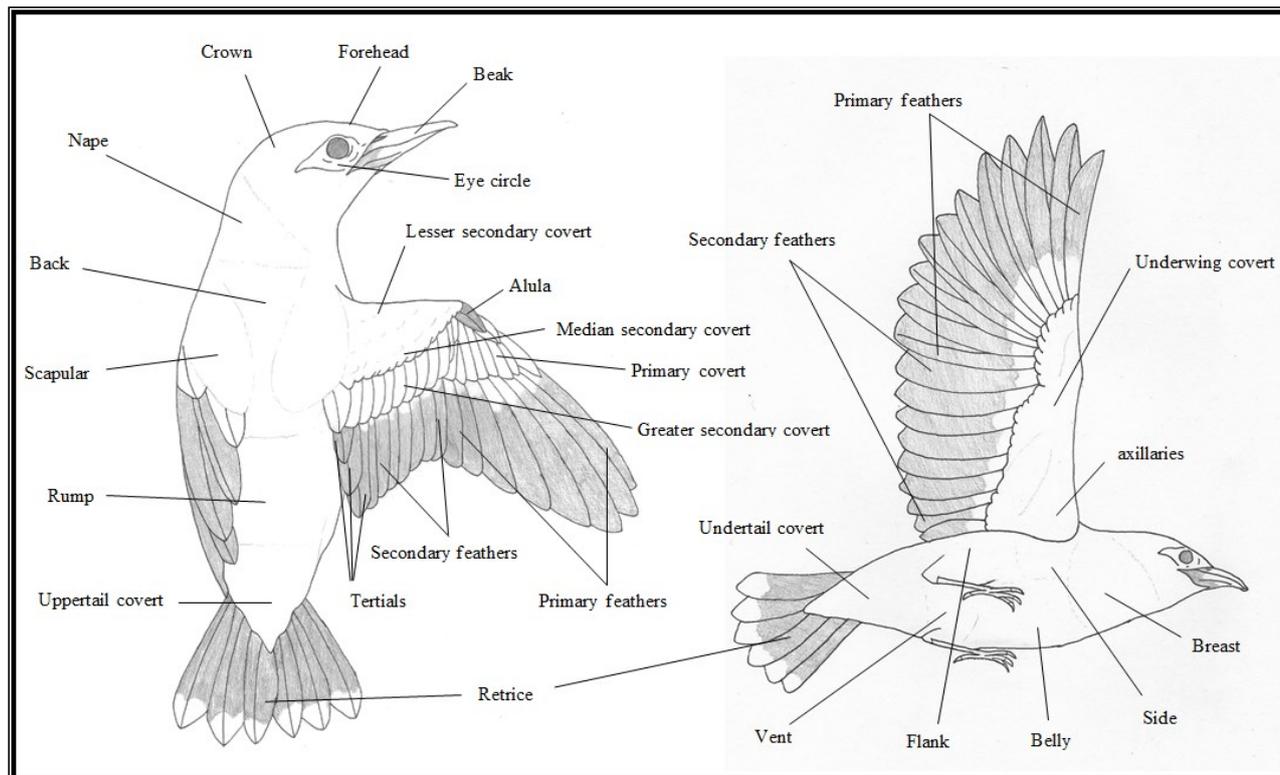


Fig. 3. Morphology detail of black-winged myna.

Black-winged myna is a bird from *Sturnidae* family which means that the bird is a song bird. It has the ability to produce a lot of sound as part of their bioacoustics system. The birds at CCBC has a medium size of body with The average body length is 22.5 cm, weight 89.02 g, width 5.98 cm, body circumference 14.36 cm and wingspan 38.49 cm. Black-winged myna didn't have sexual dimorphism between male and female, both of them also singing similarly well.

The observation is aimed to collect the morphological characteristics of black-winged myna. The morphological detail of black-winged myna can be found on **Figure 3**. From the observation, the body of the bird is covered by white feather except for the tertial, primary, secondary, rectrice and the alula feathers. The primary and secondary feathers are dominated by black color with some white part near the scalp. The rectrice is also consisted of black feathers with a little white part at the tip of the feather. The primary, greater secondary, median secondary and lesser secondary covert are white. The eye of the bird is black and surrounded by yellow eye circle. The beak is yellow with blackish part near the eye and the nose hole. The legs are pale yellow with three front fingers and one at the back. The rest of the body parts are covered by white feather.

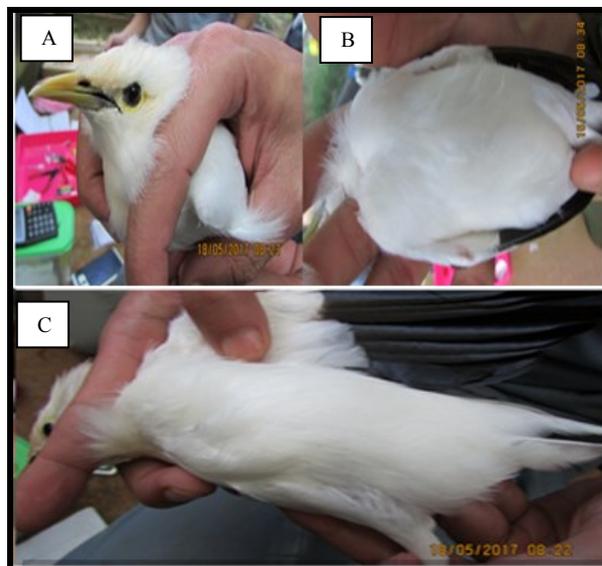


Fig.4. (A) Head, (B) below part and (C) side part of black-winged myna at CCBC.

As showed on the image above (**Figure 4**), black-winged myna's body is almost completely covered by white feathers. The yellow eye circle is the most standout characteristics while everything else are white and black. In fact, some anomalies of the morphological characteristics can be found when doing observation. It is related to the hybrid individual that are mostly can be found at the captivity because of the hybridization. Such

phenomenon usually occurred at the commercial captivity without genetics management. In the end, the hybrid individual has been produced intentionally or unintentionally. Knowing the characteristics of pure black-winged myna is becoming very essential for the captivity especially the one with conservation purposes. The image below (**figure 5**) will show how the hybrid and the pure bird can be distinguished.

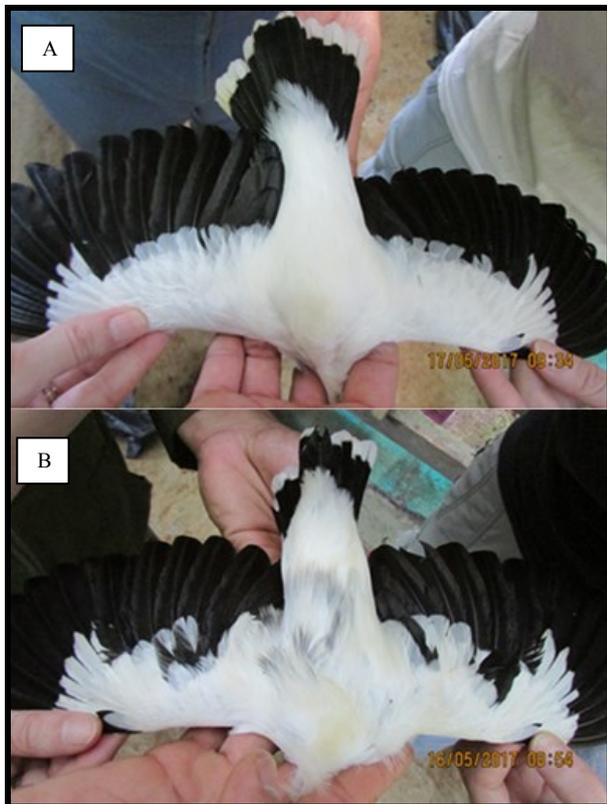


Fig. 5. (A) pure and (B) hybrid black-winged myna.

3.2 Discussion

Black-winged myna is a bird with medium body length of approximately 23cm as adults. His body is dominated by white feather with black feather in some parts of the tail and wings. The young White Starlings have gray feathers on the head, neck, back and wing covers, this is true for the three subspecies. There is a yellow skin with no hair around the eyes, gray at a young age [1,9,10]. From the research, more detail information about the morphological characteristics of the bird has been obtained. The tail or retrice is consisted of black feather. The feather is not completely black, the tip of it is white. The wing is also not completely black, only some parts of it. The primary covert and so with the all the secondary coverts are white. The hybridization itself is a dangerous phenomenon to the bird population [11-13]. It can bring the population into extinction [2,14,15]. The black feather can only be found on the alula, primary and secondary feathers. The primary and secondary feathers are not completely black, both of them are having white part near the root or scalp. Primary feathers are having more white part than the secondary feathers. The tertials

are also consisted of black feathers, three tertials each wings.

There are some anomalies can be found while doing the observation of morphological characteristics from black-winged myna. The most common anomalies can be found on the back and the wings. Sometimes, black or grey feather can be found on the back and the wing coverts of the bird. At the moment, it is indicating that the individual is hybrid if the age is more than two years old. The bird will not have any morphological change when it is mature, two years old is the age when the bird is mature both sexually and physically. It will be hard to identify the hybrid when the bird is juvenile, the hybrid and juvenile are sharing similar characteristics of morphology [16].

The anomalies are not always determined as hybrid characteristics. In some cases, black-winged myna in molting phase is also confusing. The image below (**Figure 6**) shows how the bird in molting phase can be confusing. The greater secondary covert of the wings is look like consisted of black feather where the normal one is should be white. It is because most of the greater secondary covert's feathers are falling due the molting process. When the feathers are falling, the secondary feathers are exposed and it is making the coverts look like black and not scattered well. In fact, the bird is pure and having a normal morphological characteristic of pure black-winged myna. The molting phase is making the feather somehow different. There are a lot of factors that has to be noticed when doing the observation of it, thorough observation needed to get a good morphological data.



Fig. 6. Black-winged myna on molting phase.

The research about morphological characteristics is not very popular because it is out of date and not up to date. Recently, more genetic researches are conducted to distinguish and discovering species. The advance technology is allowing human to discover things beyond imagination, but it is still costly. Study on morphology is still important as the basic of discovering biodiversity. Conservation effort should be engaging people from many level and also easy to understand. In the future, the research about how to morphologically distinguish the hybrid black-winged myna from the pure one is very important. Not every people will understand about genetics, but they will understand about something simple as morphology. The result is important to prevent

both commercial and conservation breeders doing the hybridization.

4 Conclusion

The black-winged myna having a yellow beak, eye circle and leg's skin. It is dominated by white feather that can be found all over the body except for the primary feather, alula and the retrice. In general, it is around 22.5 cm in length, 89.02 g in weight, 5.98 cm for width, 14.36 cm of body circumference and 38.49 cm of wingspan. There is no dimorphism between the male and female which mean there is no differences between the two of it in term of morphology. The morphological characteristics of black-winged myna are important related to the practical and easy way to differentiate the three species of the myna. DNA analysis can provide us more reliable data to differ the species, however the procedure is and the result are very limited [3,4,17]. Remembering the fact that not all people that working on the field would understand it.

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