

## THE PHENOTYPIC AND GENOTYPIC CHARACTER OF MOSAIC GREEN YELLOW FEATHERED OF CANARY (*SERINUS CANARIA*)

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### ABSTRACT

The aim of the research is to know the phenotypic and genotypic character of green and yellow *mosaic* plumage color. The result from this study may be utilized as important information in relating with the strategic planning of cross-breeding efforts to increase the probability to have desired plumage color and valuable birds. The main phenotypic plumage color of the green and yellow *mosaic* is combination color between green and yellow could observed in the part of body like head, neck, pectoral, abdominal, dorsum, wings and tail. The genotypic character of green and yellow *mosaic* plumage color are included: 1) the plumage color of the green and yellow *mosaic* canary are controlled by the combination of two pairs autosom allelic sb and sb, Y and y; 2) DNA fragment is 527 bp.

*Keywords: Genotypic, Phenotypic, Canary, Green Yellow Mosaic*

### INTRODUCTION

Canary is one of singing bird that well known and favorites in Indonesia. The attractions of canary are variety to their quality of voice and performance. In General, the preference and the price of canary depend also on their color plumage. Up to now, traditional genetic method using try and error has been practically utilized by canary farmer in regulating the plumage color pattern desired. There is no exact information yet or fixed method adopted in relation to the probability of offspring plumage color. Meanwhile, the prize level and preference of consumer of this bird based on the color plumage relatively varied among the different area or a group of farmers.

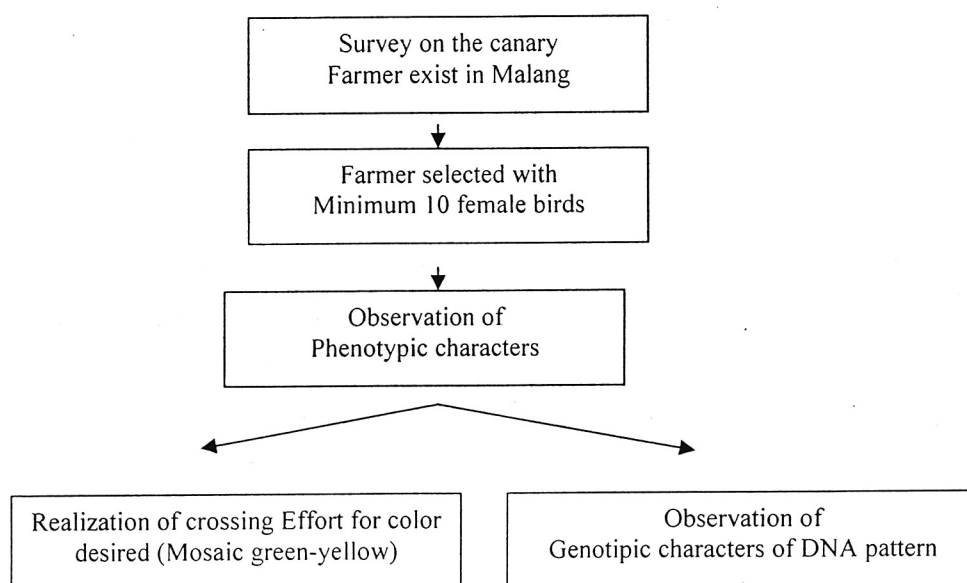
Since 1994, Canary bird have been improved to produce with certain purposed to fulfill the demand of the market, especially in the area of Malang Regency. Recently, market and consumer prefer to rear the mosaic color that resulted from combination of the color exists like the mosaic of green-yellow.

So far, there are no researches yet on the study of phenotypic and genotypic characters in relation to this color of mosaic green-yellow through the estimation of heredity pattern and DNA profile analysis. This result of this research may be used as information to realize the crossing strategy to have desired color of canary bird.

### MATERIALS AND METHODS

Materials used are the local canary of green; yellow and mosaic of green-yellow from several areas exist in Malang.

Method of research used was observation of phenotypic characters and experiment methods for genotypic characters. Data of phenotypic and DNA fragment were analyzed descriptively, meanwhile the heredity pattern of feathered color were tested using chi-square ( $X^2$ ). Variable observed are phenotypic character of feathered color expressed from hatching time, day 10 and adults of age. Characters genotypic variable are genotypic estimated from DNA analysis. The steps of the research are presented below.



## RESULT AND DISCUSSION

### Phenotypic character

The phenotypic characters of the canary green yellow mosaic color were presented in table 1. It was observed that the green-yellow mosaic color possible to distinguish well in the age of day 10, but sometimes still problem with some mistakes occurred in detail color observed. In the age of Day-O- Canary may not possible to looking the different pattern of feathered color. Specific color of feathered canary in the age of days 10 showed in the part of their head, neck and breast that dominated by green brown and yellow-white, meanwhile in the part body of stomach nor fat from breast was colored by green-yellow and yellow to white. This bird is also characterized by green to brown and yellow to white feathered in the part body of wing, back as well as in the tail part. The color of mosaic green-yellow could be well and clearly observed on the age of two months, expressed by the color combination of green and yellow. In conclusion, phenotypic characters of mosaic color green-yellow laid on the expression of yellow and green color on the feathered bird (Table 1.)

### Genotypic characters

Genotypic character observed in this research consists of the estimation heredity color pattern of feathered and DNA fragment.

### Estimation of Heredity pattern of mosaic color of Green-Yellow

Estimation of this mosaic color heredity pattern was obtained from filial (7 individual birds) derived from 3 times hatching. Neither statistic analyzing using chi-square showed that crossing bird between green and yellow color was nor significant different ( $P > 0.05$ ), so it was conclude that the expression of mosaic color pattern influenced by Y and y Genes. In the homozygote recessive (y/y) would expressed in green color, meanwhile in the heterozygote (Y/y) resulted in mosaic color of green-yellow. The homozygote dominance (Y/Y) was dominated by yellow.

The role of Y and y Gen is assumed as hypostatic (Chikamune and Kanai (1976, 1979) and Mudawamah (1991). Because of Green have sb/sb genes (Mudawamah, 2002), meanwhile Mudawamah et al, (2002) reported also that mosaic color pattern of green always supported by Yellow, so that this pattern should be supported by Y gene, because in the absence of this gene Y then yellow was nor appeared. Finally, it was assumed that genotypic formula of mosaic was sb/sb, Y/y.

### The DNA Fragment

Electrophoresis gel 1 % agarose of DNA fragment showed in Figure 2. Result showed that mosaic color pattern was expressed in on 527 bp of DNA. It means that number of base pair or the combination among A-T and G-C were about 527.

*Table 1. The phenotypic character of mosaic feather Green-Yellow of canary birds.*

Part of the body	Character in the age of		
	0 days	10 days	60 days
Head	White*	Green-brown and or yellow-white	Dark Green and or yellow
Neck	-	Green-brown and or yellow-white	Clear green and or yellow
Breast	-	Green -brown or Yellow-white	Yellow-green and or yellow
Stomach	-	Yellow-green or yellow-white	Dark yellow and or yellow
Back	White*	Brown -green and or Yellow white	Dark green and or yellow
Wing	-	Brown-Green and or Yellow-white	Green- black and or yellow
Tail	-	Brown -green and or yellow- white	Green-black and or yellow
Shank	Clear or dark red	Dark red	Dark red
Eyes	**	Black	Black
Peck	Clear or Dark Red	Dark red	Dark white

Note: \* soft feathered  
 \*\* closed eyes.



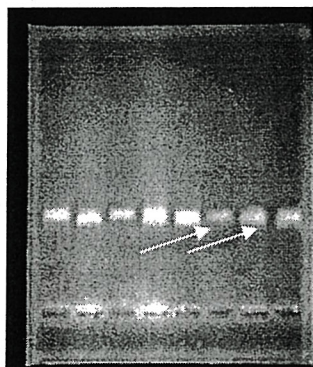


Figure 2. DNA pattern of Canary with *Mosaic* color between Green-Yellow.  
: Fragemen of DNA Canary with *Mosaic* Green-Yellow

## CONCLUSION

Phenotypic characters of green- yellow mosaic color pattern of feather canary mainly expressed by the variation of the color combination of green and yellow in several part of body which is head, neck, stomach, back, wing and tail of canary. Meanwhile, the genotypic characters were estimated by the role of 2 genes Y and y, also characterized by DNA fragment of 527 bp. It was suggested that to obtain these type of mosaic color, could be done by doing cross between the canary with pure color of yellow and green.

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