

The Pigeon Genetics Newsletter, News, Views & Comments.

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(Founded by Dr. Willard .F. Hollander)

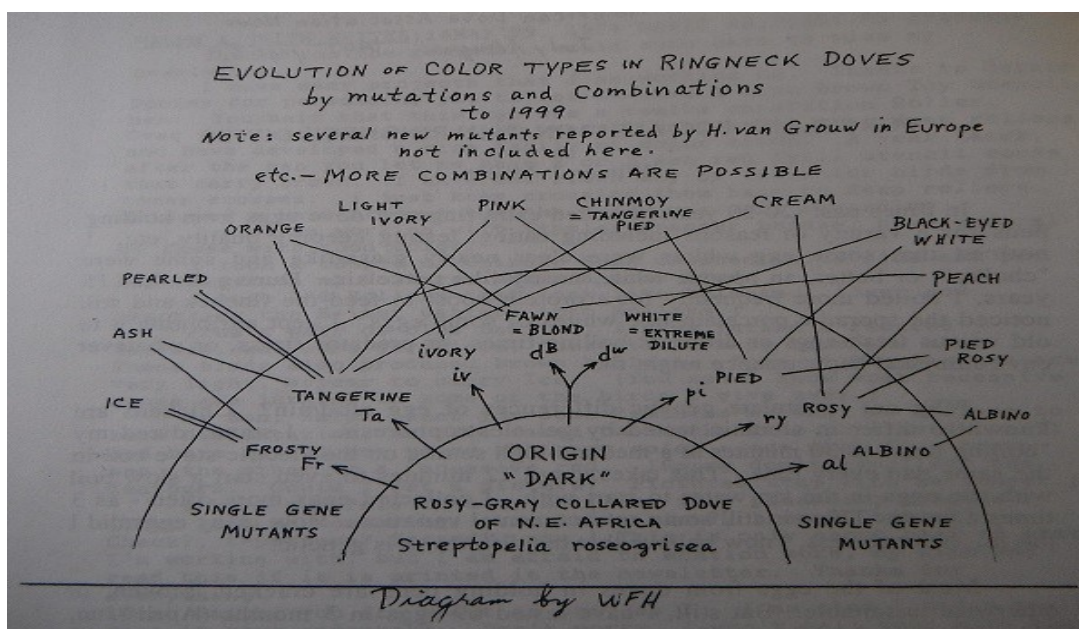
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June 2024

They say if you want something done on time and well , then ask a busy man!
That is what we did when it came to this Issue on Ringneck Dove mutant colours. I had noticed the below chart done by Hollander in an old issue and wanted to get an up-date.

The man to ask was Hein Van Grouw and he has presented us with the first of several Issues detailing the colours now being bred in *Streptopelia risoria*. Many Thanks to Hein and we hope all of you enjoy it even if you are not into the Dove Hobby. The Part 2 and maybe Part 3 will be in the New Year since we have this year's Issues planned .



The following text has been written from an European perspective, and has been published earlier in episodes in the English magazine *Cage & Aviary Birds*. The text is slightly adapted for this Newsletter, and some additional information has been added. All photos by the author.



I'm keeping Ringneck doves, known as Barbary doves in the UK, for more than 45 years now and have investigated the inheritance of all mutations available to me in those years. My interest in doves is thanks to my first dove, when I was 10, what was, in fact, an Eurasian Collared Dove.

Hein van Grouw, May 2024

DOVE GENETIC, PART 1.

Introduction

The Barbary Dove, also known as Ringed Dove, Ringneck Dove, Indian Turtle Dove or Java Dove, is the long-domesticated form of the African Collared Dove *Streptopelia risoria* (the former name *Streptopelia roseogrisea* is not valid anymore, see [Streptopelia risoria and how Linnaeus had the last laugh \(bioone.org\)](https://bioone.org)). In many other languages (Dutch, German, French, etc.), the domesticated form is referred to as 'Laughing Dove' (e.g. Lachduif, Lachtaube, Tourterelle rieuse) after the typical call it makes when excited. In contrast, Laughing Dove *Streptopelia senegalensis* does not give a laughing call at all!



The Barbary Dove was already known in Europe in the 16th Century but details concerning its domestication are unclear. Its early domestication may have happened in Arabia and / or Egypt. At least since the 16th century, Barbary Doves occurred in two varieties: a pale fawn-coloured form and a nearly white one, both recessive and sex-linked mutations of the original wild colour. The original dark wild colour of the ancestral species was not then known to exist in captivity.

Photo 1: White Barbary Doves, often referred to as 'Java Doves', are one of the oldest mutations in the species. Although being near-white, they still have some melanin pigment so therefore are not Albino's.

Long before the wild form was known to science, the Barbary Dove had been described by Linnaeus (1758) as *Columba risoria* (Latin *risoris* = a laugher), presumably for its 'giggling' call. Linnaeus described



the dove as '*Columba supra lutescens, lunula cervicali nigraon*' (dove with yellowish upperparts and black neck-ring), which is a good colour description of the fawn-coloured Barbary Dove. Linnaeus further stated that it came from India, what was incorrect, and that the bird was 'our common Turtle Dove' (*nobis communis Turtur*), which may suggest that it was commonly kept in Europe.

Photo 2: Blond Barbary Dove, hen. Blond was probably the first mutation, and that was Linnaeus' *Columba risoria*, the 'dove with yellowish upperparts and black neck-ring'.

How commonly it was kept in Linnaeus' time I do not know, but certainly around 1900 in the UK the species was not considered to be a rarity. Rosie Alderson, in 1911, wrote in her book *My Foreign Doves and Pigeons* 'Barbarys are not worth breeding from a financial point of view; there is little demand for them, and you may think yourself fortunate if you can get 2/- for a pair. ... If they were rarer one should value Barbary doves more, but to a true bird lover mere rarity does not matter and these doves are so pretty and confiding—flying readily on your hand for crumbs of biscuit, and letting you stroke them—that they are a pleasure to keep as pets.' And indeed, the Barbary Dove was certainly appreciated, due to its tameness and confiding nature towards people, as being a wonderful pet. The below, a letter written by a Mr. Phillipps to Avicultural Magazine in December 1900 (Vol.VII:2, p. 44), is a good example of that: *SIR, —The following case has just come under my notice, and is, I think, worthy of being recorded in our Magazine. An old lady has a tame Dove, a friendly and constant companion. She is in the habit of taking a nap in her arm chair of an afternoon; and the Dove sits on the back of the chair close by; as the old lady dozes off, so does the Dove. But the other day the Dove, instead of taking its seat on its accustomed chair, perched on the lady's head, and, as the lady snoozed off, comfortably nestled itself in her cap. In due course the lady awoke, and tried to remove the Dove; but the Dove declined to allow itself to be removed. A female relative came to her assistance; and then it was found that the Dove had laid an egg—a beautiful instance of trust and confidence in a dumb creature.*



Barbary Doves can live a long life, and ages of over 20 years are no rarity. I have had birds which reached the age of 25, 27 and 31. Their long life-expectancy should certainly increase their value as pets.

Photo 3: me with an elderly Phaeo Laced (Tangerine pearled) silkie-feathered Barbary Dove, which I had bred in 1994. When the photo was taken the dove was 24 years old.

The early domestication of Barbary Doves may have begun by keeping their wild ancestors in cages for their call and as sacrificial animals, later becoming appreciated as pets, and in the 19th century in some European countries like the Netherlands and Germany, Barbary Doves were kept for superstitious



reasons. The cooing doves would keep diseases and other misfortune away! The cages they were kept were often made and painted to resemble miniature houses. Although the craftsmanship was often exceptionally beautiful, the dark conditions inside these little 'homes' meant that they were not desirable residences from an animal welfare point of view! Nevertheless, doves often survived for 20 years or longer in the semi-darkness.

Photo 4: Barbary Doves are often kept for their pleasant call. In this case a Phaeo Laced (Tangerine pearled) cock.

Since the early 20th Century, the Barbary Dove has frequently been used and valued as reliable foster parents for more delicate and expensive dove species, though it has never attained the popularity of



budgies or canaries as a show bird in the UK. Perhaps this is due to the comparative lack of colour varieties which was, for a long time, restricted to just White and Blond. Having said that, from the 1950s onwards many new colour mutations occurred in the Barbary Dove, both in North America and in Europe, which may explain its popularity as an exhibition bird in the USA and in several European countries (e.g., France and the Netherlands).

Photo 5: Barbary Doves are reliable foster parents, in this case a silkie wild-colour hen with Jacobin squab.

When I was a young boy growing up in the Netherlands in the late 1970s and early 1980s it was possible to buy Barbary Doves from every pet shop or bird market for next to nothing. The supply was higher than the demand. Even for the rarer colours and varieties unavailable in pet shops—like the silkie feathered Barbaries—one could easily find breeders to acquire birds. Today, despite the large diversity in colours and feather varieties (including crested and silkie-feathered) available outside the UK, the Barbary Dove still seems to have little appeal to fanciers in Britain.

THE ORIGIN OF THE BARBARY DOVE

The dove known as *Streptopelia risoria*, named by Linnaeus in 1758 in his book **Systema Naturae**, has long confused ornithologists. Linnaeus described a domestic variety of a dove (= Barbary Dove) whose wild form (= African Collared Dove) was then still unknown. Pre-Linnaeus, the name used for Barbary Dove was *Turtur indicus* which was introduced by the Italian naturalist Ulisse Aldrovandi in his book **Ornithologiae** in 1600. Following Aldrovandi, the English naturalists Francis Willughby (1678), John Ray (1713) and Eleazar Albin (1738) mentioned *Turtur Indicus*, the 'Indian Turtle' or 'the Turtle dove from the East Indies' in their works, but their descriptions were based on Aldrovandi's without adding



anything significant. Presumably based on Aldrovandi's name *Indicus*, Linnaeus also stated—incorrectly—that it came from India. Believing that the Barbary Dove came from India, ornithologists then assumed that the Eurasian Collared Dove—whose distribution was then still restricted to India—was the wild ancestor of the domesticated dove. Nowadays the Barbary Dove is widely considered to be the long-domesticated form of the African Collared Dove, although there are still some ornithologists of the opinion that this remains to be proven.

Photo 6: 'The Turtle Dove from the East Indies' [= Barbary Dove], pl. 45 in Albin's book *A natural history of birds*, vol. 3 (1738). The pale fawn colour of the dove confirms that Albin did indeed portray a Barbary Dove.

Based on my own observations over more than forty years, I've learned that the Eurasian Collared Dove and Barbary Dove readily hybridise and produce fertile offspring and, in places where both species occur, e.g. the Canary Islands and North America, hybrid characters are recorded in both the feral Barbary Dove and the Eurasian Collared Dove populations (see for further info [The colourful journey of the Eurasian Collared Dove *Streptopelia decaocto* \(bioone.org\)](https://bioone.org/The-colourful-journey-of-the-Eurasian-Collared-Dove-Streptopelia-decaocto)). However, for many reasons, e.g. voice, behaviour, range and colour, the Eurasian Collared Dove was unlikely to have contributed to the domestication of the Barbary Dove, and recent DNA research initiated by me has confirmed this.

DNA evidence suggests that the Arabian population, and not the African population, of African Collared Dove is the ancestor of the domestic form. Although the genomic data provided strong evidence that the African Collared Dove is the principal ancestor of the Barbary Dove, some admixture with Eurasian Collared Doves was observed.



Photo 7: Fawn-coloured (Blond) Eurasian Collared Dove hen and normal coloured cock, La Gomara, Canary Islands, 2 April 2013. The pigment in this mutation (*Ino*) is very light sensitive and the plumage of this hen is heavily bleached further by the light. The Canary Islands had an established population of feral Blond Barbary Doves before the Eurasian Collared Doves around 1989 arrived. The Barbary Dove still breeds locally on all islands except El Hierro but their numbers have gone down, presumably due to outcompeting for suitable territory by the larger and more aggressive Eurasian Collared Doves. The two species did hybridise on the islands, resulting in that the number of pale fawn-coloured (Blond) Eurasian Collared Doves on the Canaries is remarkably high.

Barbary Dove has all the morphological and behavioural characteristics of African Collared Dove and therefore the latter species is considered to be the principal ancestral species. The admixture with Eurasian Collared Dove happened very early in the domestication of Barbary Dove, and most likely even before as the admixture is also found in the wild African Collared Dove population from the Arabian Peninsula. The admixture signal is similar in all historic Domesticated Barbary Doves samples analysed (samples from mid-19th century), regardless of geographic origin so, Barbary Dove had maintained similar genetic proportions of Eurasian Collared dove through time. Modern samples, however, showed a much stronger admixture. This is not unexpected and can be explained by the fact that these samples derive from after the invasion of Eurasian Collared Dove into Western Europe. Since then, knowingly and unknowingly, breeders have crossed Barbary Doves with the then commonly present Eurasian Collared Doves (see for further info [The Founding Feathers: the true ancestry of the domestic Barbary Dove \(bioone.org\)](http://The_Founding_Feathers:_the_true_ancestry_of_the_domestic_Barbary_Dove_(bioone.org))).



The original wild colour of the African collared dove and the Eurasian collared dove is roughly the same except for a few minor but clear differences e.g. in the colour of the belly and undertail coverts. Their size too is different, with the Eurasian Collared Dove being larger overall and having a longer tail. Many Barbary Doves nowadays still show some features of Eurasian Collared Dove, both in colour and size, and especially in tail length.

Photo 8 (left): skins of African Collared Dove (left) and Eurasian Collared Dove to demonstrate differences in size and colour. **Photo 9 (right):** Outer tail feathers of Barbary dove (left and right) and its wild ancestor African collared dove (middle). Due to earlier crosses with Eurasian collared dove, the tails of many modern Barbary doves are now much longer.



Photo 10: Characteristics of Eurasian Collared Dove sometimes re-occur in apparently pure Barbary Doves, like the grey undertail coverts in this Rosy Pied Barbary Dove, cock.

THE EARLIEST COLOUR MUTATIONS IN THE BARBARY DOVE

Apart from its ancestry, nothing appears to be known of the early history of the domestic Barbary Dove. Despite old common names like Indian Turtledove and, for the 'white' colour form, Java Dove (see below), it is probable that the first domestication occurred in Egypt. Aldrovandi (1600) mentioned that



he kept a pair of Barbary Doves himself which came from Alexandria in Egypt, and he stated that males are fawn-coloured and females white. On this basis, it is clear that he was discussing the only two occurring colour mutations of Barbary Dove which occurred at that time (see below). The original dark colour of the ancestral species was not then known in the Barbary Dove.

Photo 11: *Wild Coloured Barbary Dove, hen.*

These two mutations are both a form of Ino, a qualitative reduction of melanin in which the quantity of melanin granules in the plumage is unchanged but, due to incomplete melanin synthesis, the pigment granules themselves are lighter in colour, resulting in paler plumage. In the fawn-coloured form (Blond), the overall hue is paler, and the original grey / black parts are more brownish.



Photo 12 and 13: *Open wings of wild-coloured (left) and fawn-coloured (Blond) Barbary Dove to compare the change in pigment colour; due to the Ino mutation the original blackish and greyish colours are paler, with a brownish hue, and the original dark brown is pale brown.*

Due to the original high concentration of black melanin in the neck-ring, the change in colour in this area in the fawn form is invisible to the naked eye. In the 'white' form the melanin is hardly coloured at all, resulting in a very soft, near-white plumage. Again due to the high concentration of melanin, in the 'white' form the neck-ring remains visible and appears a very pale brown.



Photos 14, 15 and 16: Fawn-coloured (Blond) Barbary Dove, hen (14). Due to the original high concentration of black melanin in the neck ring, the change of colour due to the Ino mutation does not result in a visible effect in this track. White Barbary Dove, hen (15 and 16). Although called 'white', Doves with this Ino mutation are very pale cream-coloured. Due to the original high concentration of black melanin in the neck ring and tail pattern, even in this nearly white form these remain visible as a very pale brown.

The term 'Ino' (from the Greek or Latin *Ine* = 'belonging to' or 'like') is used in European aviculture for the near-white form (sometimes also referred to as Sex-linked Imperfect Albinism) of captive birds such as finches and parrots. In parrots the recessive sex-linked yellow birds are often named *Lutino* and these are, in fact, the near-white form of Ino, but due to the remaining yellow (or red or orange) psittacine pigment these birds are yellow. So, although Ino mutations can be categorised as a form of albinism (Albinism are mutations affecting the melanin synthesis like Albino, Brown and Ino), they are not Albino, and many are far from white. Or, in other words, Ino belongs to albinism but is not Albino.

The Ino mutations are caused by two different recessive alleles of the same gene known as *Slc45a2*, and their inheritance is known among breeders as 'sex-linked' because the gene that harbours the mutation is located on the sex chromosome (*Slc45a2* codes for the protein 'solute carrier family 45 member 2' in the melanin cells. Although the exact function of *SLC45A2* is unknown, it probably transports molecules necessary for normal melanin synthesis). In birds, males have two sex chromosomes but females just one, so only males can be heterozygous (i.e. possess two different alleles) for a sex-linked mutation. The fawn-coloured form (Blond) is dominant in inheritance over the 'white' form, but both mutations are recessive to the wild colour. Therefore, from a pair of wild-coloured doves, it is possible only to breed Blond or White offspring if the male is heterozygous for the mutation. The Blond or White offspring, however, are always female. To breed a Blond or White male, it's necessary to pair a female with the mutation to a heterozygous male. From paired Blond and / or White doves, however, one can never breed a wild-coloured bird again. This may explain why, in the past, the wild colour was lost in Barbary Dove as paler colours were probably favoured for breeding.

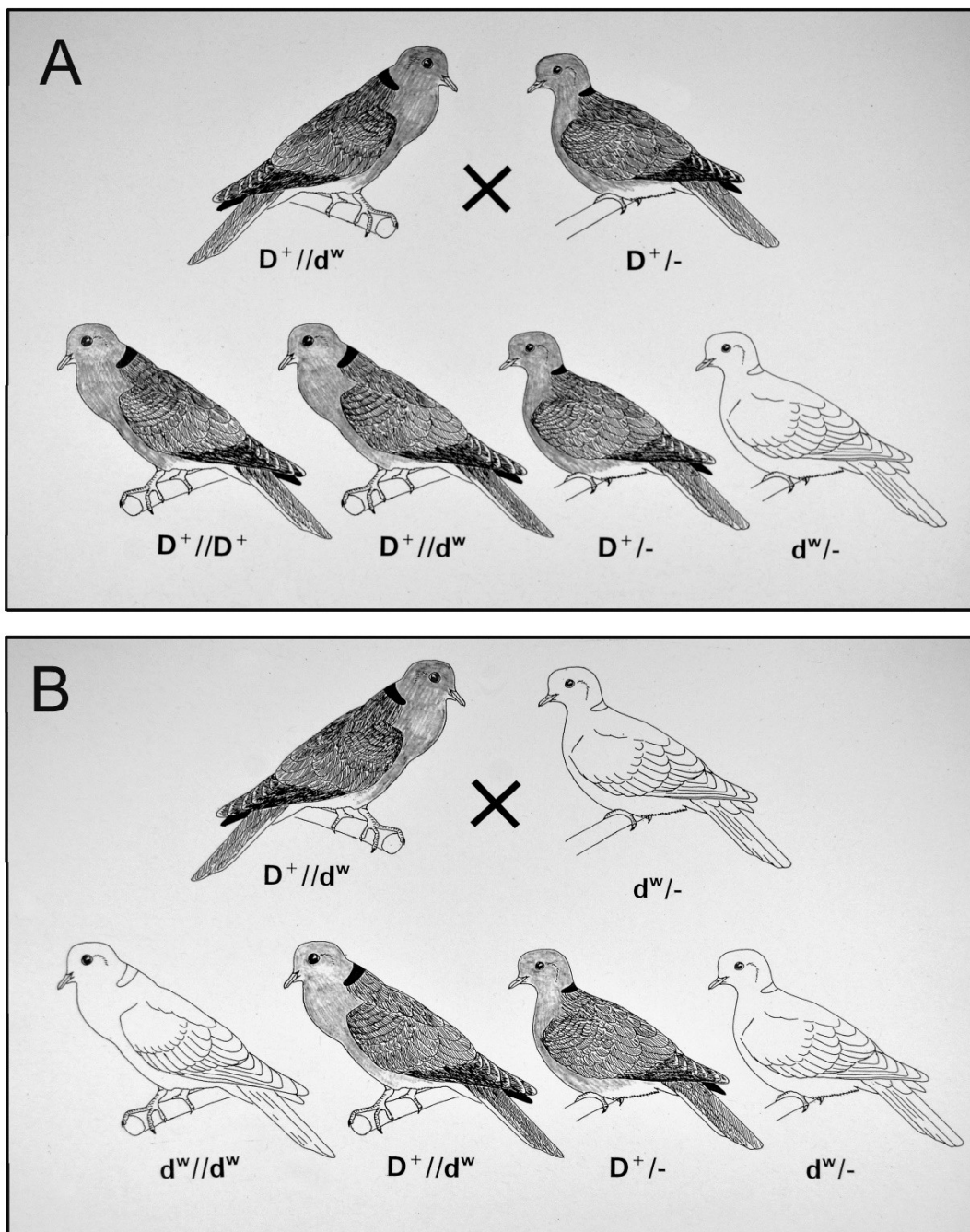


Photo 17: Crossing schemes to demonstrate the inheritance of the Ino mutation in Barbary Dove. D^+ = wild colour and d^w = near-white mutation (the Blond mutation = d^b). **Scheme A** shows that if both parents are wild-coloured but the male is heterozygous for White ($D^+//d^w$), 25% of the offspring will be White, all of which will be females. The same applies for wild-coloured parents and Blond offspring (replace d^w for d^b). **Scheme B** demonstrates that to breed a White (or Blond) male, it is necessary to pair a White (or Blond) female with a cock heterozygous for the mutation.

Both colour mutations were known in Aldrovandi's time, but it was the Blond form that was described by Linnaeus (1758) as *Columba risoria*, despite the White also being widespread. Already in the early 17th Century the Dutch had brought Barbary Doves to Java and, from there, to the Pescadores (Taiwan) during the Dutch possession of these islands (1624–62). In those days white Barbary Doves were known as 'Java Doves' or 'White Pescadore Doves' by Europeans resident in Taiwan and China, and were often considered to be a distinct species. Robert Swinhoe (1866), an English diplomat and naturalist who worked as a Consul in Formosa (Taiwan), however, knew better, stating, '*They seem to me to be simply albinos of the Domestic Dove, which is usually referred to Turtur risorius.*' Although he was mistaken as to their being 'albinos', Swinhoe was otherwise correct. The Dutch ornithologist Coenraad Jacob Temminck (1808) also knew that the white form was a variety of *Columba risoria*, but he nevertheless gave it a separate name, *Colombe Blanche* *Columba alba*, in his famous pigeon book **Histoire Naturelle Générale des Pigeons**. For centuries only these two mutations were present in Barbary Dove, and it was only in the second half of the 20th century that suddenly many more have occurred. Currently over 15 distinct mutations are known, giving rise to numerous colour varieties.



Photo 18 (left): *Colombe Blonde* *Columba risoria* [= fawn-coloured (Blond) Barbary Dove], pl. 44 in Temminck's book *Histoire naturelle générale des pigeons* (1808). **Photo 19 (right):** *Colombe Blanche* *Columba alba* (= White Barbary Dove), pl. 46 in Temminck's book *Histoire naturelle générale des pigeons* (1808).

As the fawn-coloured Blond was always the main colour in Barbary Doves—it was even considered by some to be the ‘wild colour’ of the species—many of the new mutations occurred first as a combination with Blond.

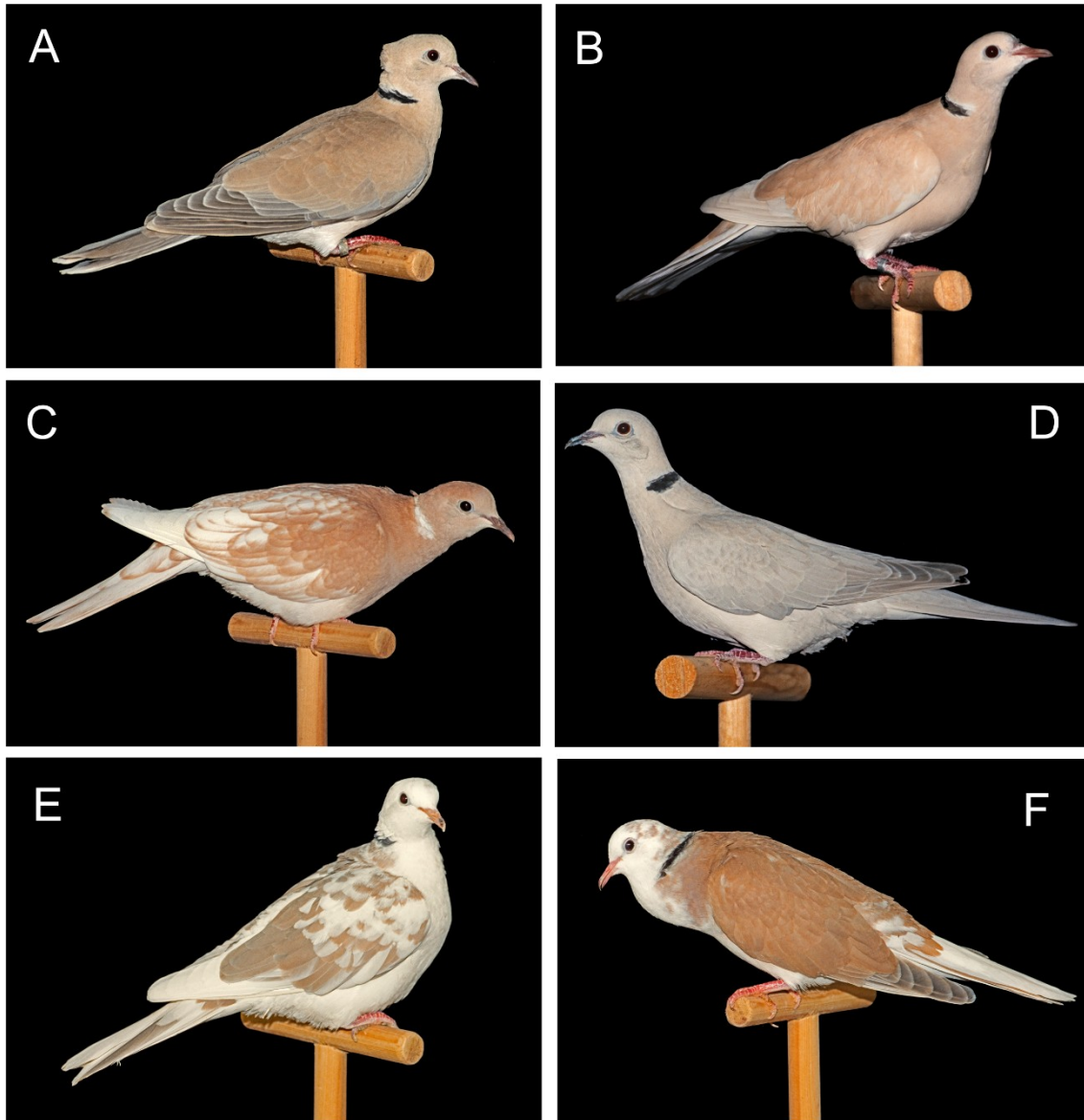


Photo 20: Different mutations, all but one in combination with Blond. A. Blond Crested; B. Isabella (Rosy + Blond = Peach); C. Blond Phaeo (Tangerine pearled + Blond = Orange pearled); D. Blond Gray (Gray + Blond = ??); E. Blond Pied; F. Californian in combination with Rosy.

To be continued.