Genetics of the Ringneck dove, Streptopelia risoria

III. Description of mutants - Ivory - autosomal recessive, iv.

The ivory mutant color presumably on the blond background was described by Taibel, 1966 in Italy in Atti della Societa Italina di Scienze Naturali e del Museo Civica di Milano Vol. 105 Fasc II):158-174. We know of no importations. In tracing back to the origin of our stock, we find that the same phenotype turned up in Rayne, Louisiana. Julius Thidodeaux was described as an elderly chap who kept doves in one large pen. Thidodeaux was the source of ivory doves raised by Frank Webb in Port Arthur, Texas as well as by Ron Young of Huston. Webb was the source of ivory doves to Richard Burger of Newark, Delaware. And Burger donated 4 ivory doves (one male and three females) to us 3 May 1971.

Taibel, 1969, also published on the dark ivory as I interpret it. Taibel called it pearl ash, and got it by crossing with another species, S. decipiens and reextracting it (Natura-Soc. It. Sc. Nat. Civ. St. Nat. e Acquario Civ., Milano 60/1:32-40 15-III.)

The eyes are noticeably lighter than normal. Closer examination makes evident a rather finely mottled appearance of the iris, of the red to light or no pigment.

Juvenile ivory doves (as with rosy juveniles) closely resemble blonds. Their forehead feathers are distinctly lighter, and the tail bar centrally bleached but less noticeable than in the adult.

Ivory plumage appears to have a dilution effect similar to blond. Ivory is less "brown", or is a bit more "gray", than blond. The primaries (remiges) appear more dilute in ivory than in blond and have a more pronounced white tip to the primaries, which is barely detectable in the dark wild-type and slight in the blond. The primary coverts show a tiny stippling effect of dilute pigment versus almost no pigment as do the primaries themselves in the middle of the feather. This is especially noticeable in those primaries near the middle of the wing. The stippling is more marked on the leading edge of the feather. The secondaries appear quite free of the stippling.

The rectrices or main tail feathers have the tail "band" or pigmented area lightened centrally. The lightened area is not so much stippled as in the wings but more bleached, much as in recessive opal of pigeons. See Miller, 1976 Pigeon Science and Genetics Newsletter 2:24. Dr. W. F. Hollander and myself obtained a cross of such an opal pigeon with an ivory dove. The offspring was normal. Therefore, these mutants are non-allelic.

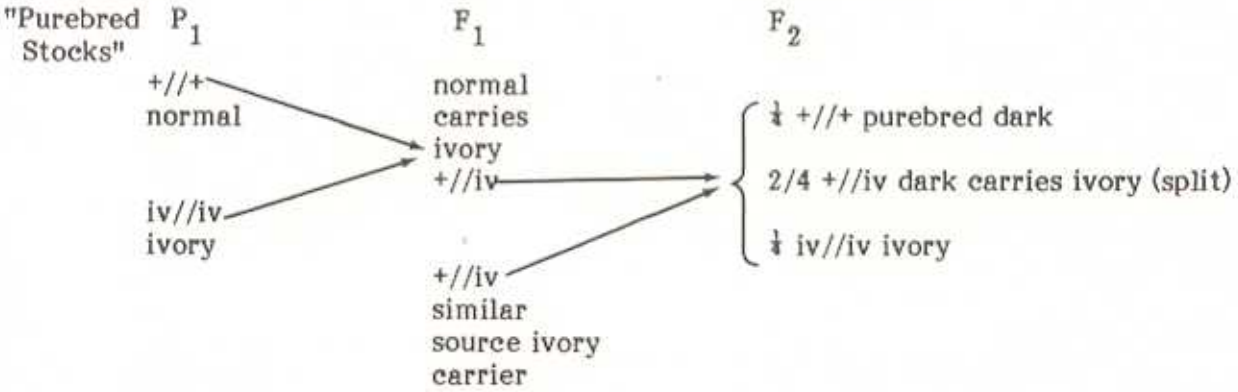
The breeding results or family data that I collected agrees with Taibel's. My demonstration of recessive inheritance for ivory involved classifying 1,063 progeny of 8 kinds of matings, table 2. The ivory class is consistently deficient in numbers although acceptable for the statistical test of chi-square. But one type of mating (P = .027) was statistically, significantly different from expected. This may be explained by misclassification as hatchings which died early preventing correction in the older squeaker. Or, perhaps, ivory homozygotes are detrimental during incubation. Or a combination of these is possible. Also chance might be involved. The reciprocal cross is as expected, and when combined yields a tolerable chi-square value ($X^2$) of 3.42.

The mottling of the eye can be called a pleiotrophic effect of the ivory gene. Genetically, pleiotrophy is the action of a single gene that results in more than one kind of detectable effect, often without obvious causal reasons. For example, blue eyed, white furred cats are usually deaf. The deafness has no obvious relation to the white fur or blue

eyes, but one gene controls the total difference from normal cats. Similarly the ivory gene also controls mottling of the eye. Originally I thought ivory also controlled a very light color down (about white) on newly hatched squabs. I found that white down separated alone which is not possible with pleiotrophic genes. Therefore, I am dubious that ivory always must have whitish down in the squab.

Interactions: Ivory on a blond background yields a blackish collared very light colored bird. The black half collar is diluted a bit more in blond-ivory birds than in ivory or blonds, but not noticeably so with a superficial glance. This light ivory also may be called show-ivory, since fanciers prefer it somewhat to the ivory on a dark background (the single mutant form). Ivory combined with rosy yields a "heavy cream" or light tan bird. If blond is included it is a light cream. Cream is a very attractive, even beautiful color. Pied ivory is as most would expect. Perhaps we should leave fuller descriptions of interactions to a later section.

Genetic diagramming: Genetic symbol manipulation is practically identical to that for albino. By the way, the slash mark in the albino diagrams stands for the chromosome which is then tagged by the + or al gene. You may wish to reduce the al symbol to a in diagramming. The slash may be omitted also, if you remember that there are always two chromosomes, therefore, two genes in the individual for any one simple character. Similarly the ivory gene iv may be reduced to just i to save a little clutter.




The $P_1$ stands for parental stocks, usually purebred.
$F_1$ stands for the first filial (brothers and sisters) generation, hybrid generation.
$F_2$ stands for the second filial generation from $F_1$ parents or equivalent.

Testcross (with the chromosome slash mark omitted)

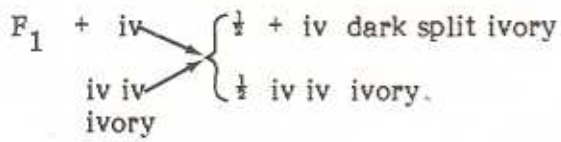



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Table 2. Breeding results of the ivory plumage color mutant in various mating systems in the ringneck dove, Streptopelia risoria.

| Type of mating | Expected ratio | Number of matings | Sex that is ivory | Sex segregating | Number of offspring normal = non-ivory | Ivory | Total | $X^2$ | P |
|---|---|---|---|---|---|---|---|---|---|
| First outcrosses | 1:0 | 7 | ♂ | - | 78 | · | 78 | - | - |
| | 1:0 | 7 | ♀ | - | 86 | · | 86 | | |
| | | | | | | | 164 | | |
| $F_1 x F_1$ $F_2$ | 3:1 | 13 | - | both | 174 | 49 | 223 | 1.09 | .30 |
| Testcross | 1:1 | 9 | ♀ | ♂ | 66 | 64 | 130 | 0.03 | .92 |
| | 1:1 | 16 | ♂ | ♀ | 120 | 88 | 208 | 4.92 | .028 |
| | 1:1 | | | | 186 | 152 | 338 | 3.42 | .066 |
| From inter se matings of backcross hybrids of S. humilis with S. risoria | 1:1 | 8 | ♀ | ♂ | 31 | 25 | 56 | 0.64 | .42 |
| | 1:1 | 14 | ♂ | ♀ | 85 | 78 | 163 | 0.30 | .60 |
| | | | | | 116 | 103 | 219 | 0.78 | .38 |
| Purebred from extracted ivory | 0:1 | 12 | | | · | 119 | 119 | - | - |

1063 total progeny in experiments with ivory