PSITTACULA SIGHTINGS

A Color Mutation For All Reasons

by Fred Perry, Norco, CA

Never has a color mutation offered so much and been so little understood by so many. With all it has to offer, very few breeders of the Indian Ring-necked Parakeet understand the genetic workings of the turquoise variety of the blue Ringneck. They may memorize what offspring will be produced, but will not understand why.

Turquoise has been called by many other names such as par-blue, marine-blue, and ocean blue. In our opinion, turquoise is the perfect descriptive name. It is not quite blue and not quite green. More a combination of both at the same time much like the gemstone turquoise.

The color blue in ringnecks is an illusion caused by the feather structure creating a prism effect which is called Tyndall light scattering. There is no blue pigment, only blue light which gives the appearance of being blue.

When the blue refraction is removed genetically, the bird appears yellow (lutino). When the lutino is removed genetically, leaving only the blue refraction, the bird appears blue.

The turquoise mutation is in the blue series and is dominant to all other blue color. For this reason, it has the special classification, a dominant/recessive. It is dominant over blue, and recessive to green.

The turquoise mutation is extremely variable in intensity of shade and hue. Youngsters from the same clutch can be very blue or very green and not look like each other at all. This unpredictability is one of the fun parts of working with turquoise. You never quite know what you will get and some very interesting things can happen.

Photo by Fred Perry

This male is an excellent example of the turquoise mutation. Notice the beautiful golden-green wing markings and brilliant head coloration, typical of the P.k. borealis subspecies.

The *P. k. borealis* subspecies also affects the color intensity to a large degree. Colors tend to be more intense and varied than in the more common *P. k. manillensis* subspecies.

Of necessity, we must all learn a little basic genetics to progress into the more complex mutations and comprehend what is taking place. This is a good place to begin as turquoise is really not very difficult. Each characteristic, color, size, shape, etc., is controlled by a pair of chromosomes which carry the genetic code that is basically the directions to build the

Computation of RECESSIVE and DOMINANT combinations

1. BLUE BIRD (top) × TURQUOISE BIRD (side)

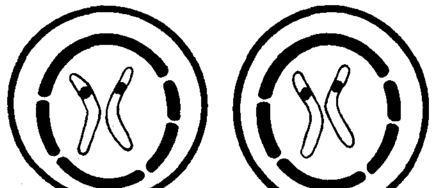
	b Chromosome	b Chromosome
TURQUOISE BIRD B Chromosome	B b Turquoise	B b Turquoise
b Chromosome	b b Blue	b b Blue

2. TURQUOISE BIRD (top) × TURQUOISE BIRD (side)

	B Chromosome	b Chromosome
TURQUOISE BIRD B Chromosome	B B Heterozyg.Turq.	B b Heterozyg.Turq.
b Chromosome	B b Heterozyg.Turq.	b b Blue

3. BLUE BIRD (top) × HOMOZYGOUS TURQUOISE BIRD (side)

	b Chromosome	b Chromosome
HOMOZYGOUS TURQUOISE BIRD B Chromosome	B b Heterozyg.Turq.	B b Heterozyg.Turq.
B Chromosome	B b Heterozyg.Turq.	B b Heterozyg.Turq.



In turquoise birds, when one allele (half of the pair) carries a turquoise gene and the other allele (the other half of the pair) carries the blue gene, it is said to be heterozygous for turquoise (Bb - single factor).
When both alleles carry the turquoise gene, (or any other dominant gene) it is said to be homozygous for turquoise (BB - double factor)."

next generation. All parent birds carry chromosomes in pairs. These are mostly identical, but differences can exist.

Turquoise is an allele of blue and is classified as an autosomal recessive. This means simply that both parent birds must carry the blue gene or its turquoise allele in order to produce blue or turquoise young. When one parent bird contributes a turquoise gene and the other a blue gene, the resulting offspring will be visually turquoise, because turquoise is dominant to blue. In this example we are talking about a bird that is *heterozygous* for turquoise, because the alleles are NOT the same, (Bb).

If each parent bird contributes a turquoise gene the offspring will still be visually turquoise, and in this instance the offspring are *homozygous* for turquoise because BOTH alleles are the same, (BB).

When a parent bird is heterozygous for turquoise (one blue gene and one turquoise gene, Bb) and the other parent is homozygous for blue (bb), approximately half of the offspring will be blue and half will be turquoise.

Whenever a turquoise gene matches up to a corresponding blue gene (Bb), the offspring will ALWAYS be visually turquoise.

A blue ringneck cannot be split to turquoise, because if even one allele possessed a turquoise gene matched to a blue gene, the bird will be visually turquoise. It is only possible to have split to turquoise birds when breeding to green or lutino (or any other non-blue series mutation).

The green or lutino offspring must be test mated to prove whether they are split to blue or turquoise, unless you know you have a homozygous turquoise parent(s).

If any blue offspring are produced from a turquoise parent bird, that parent is heterozygous (Bb - single factor). If a parent bird is homozygous (BB - double factor), only turquoise offspring will be produced when it is mated to a blue or another turquoise.

There is no way to visually identify a homozygous bird. The diversity in coloration is due to other factors already covered. A darker or lighter color does not necessarily mean a bird is homozygous or heterozygous although it could coincidentally be.

Some punnett squares illustrating how turquoise and blue interact and their theoretical expectations are provided for your information.

In this example the capital B stands for turquoise because it is dominant to blue. Blue is designated by the lower case letter b. Anytime a B appears in combination with another B, or b the resulting offspring will ALWAYS be turquoise.

Turquoise is undoubtedly the most useful and exciting color mutation we have today. It forms the basis of so many beautiful mutation combinations, and is a most valuable addition to any mutation breeding program.

The beautiful cream albino (creamino) is a combination of the turquoise and lutino mutations. Several breeders in the USA are perfecting the cream-headed blue using the turquoise.

Turquoise-grays and cinnamon-turquoise are beautiful mutations. The dominant-cinnamon turquoise-grays and the cinnamon turquoise-grays (either of these is sometimes called silver turquoise-gray) are breathtaking.

The versatility of the turquoise mutation really makes it a mutation for all reasons.