

About the Mogno

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In recent years we have heard of colour canaries called "Quarzo" and "Mogno".

The term "Quarzo" comes from the mineral quartz and was used in Italy for a new colour variety of melanin canaries. In mineral systematics, the group of quartz also includes opal.

For some years, quarzos were exhibited as black opals at Italian bird shows and at world exhibitions, winning first prizes as opal birds. In the meantime, the C.O.M. decided to define the quarzos could therefore no longer be exhibited as opal birds.

Breeding activities were of course not limited to the black variety. In Spain, too, the brown opal birds, which resembled today's brown mognos, were presented as brown opals for many years. In the meantime, there are also agate mognos and isabel mognos.

The Portuguese term "Mogno" refers to South American mahogany tree species (*Swietenia ssp.*). Because of the brown colour of these precious woods, Brazilian breeders have called the "bruno quarzo" "Mogno".

The President of the Breeders' Organisation of Brazil (F.O.B.), Luiz Fernando Ferchini Beraldi, expended a lot of energy to have the new "mutation" – which did not originate in Brazil – recognised by the C.O.M. To put an end to the confusion of names, the designations Black Mogno and Brown Mogno were established. About the black variant, this is somewhat incomprehensible, because "black mahogany" probably does not exist. C.O.M. approval has been granted for both colour variants and they can be shown in their own classes from the World Show 2018 in Cesena (Italy).

There are still different opinions about the cause of the Mogno trait. On the one hand, it is assumed that it is a selection of the opal birds. It is said that black opals with high melanin content and classic black birds with equally high melanin content were repeatedly mated with each other. The fact that birds with blue factor (azul factor) also play a major role in this process has become almost a matter of course in melanin canary breeding today. One characteristic of the blue factor is that it works cumulatively. This means that every time Azul is mated with Azul, the pattern melanin of the offspring becomes darker, the melanin between the stripe lighter and thus the contrast between pattern and area greater. However, the other two traits of the opal birds – darker feather undersides and macromelanosomes – do not change because of this selection.

We know that the onyx factor is a mutation located on the same gene locus as the opal mutation. The mode of action of this onyx mutation is like the opal mutation, but not to the extreme degree seen in opal birds. While the feathers of the opal birds show a bluish shimmer, in the onyx birds the drawing melanin becomes duller, and the area melanin gets a smoky or sooty tinge. In contrast to the opalescent birds, the melanins of the onyx birds are evenly distributed on the upper and lower side the feathers. Macromelanosomes are also found, albeit in reduced quantity and size. Genetically, the opal and onyx traits are intermediate to each other. This means that the offspring from the mating of opal with onyx show the melanins in a mixed colour of both parents, as they possess both alleles (opal allele and onyx allele).

Plumage parts of Opal, Onyx and Mogno canaries.

Picture 1: Agate opal recessive white – underside of the quill of a back feather with macromelanosomes.

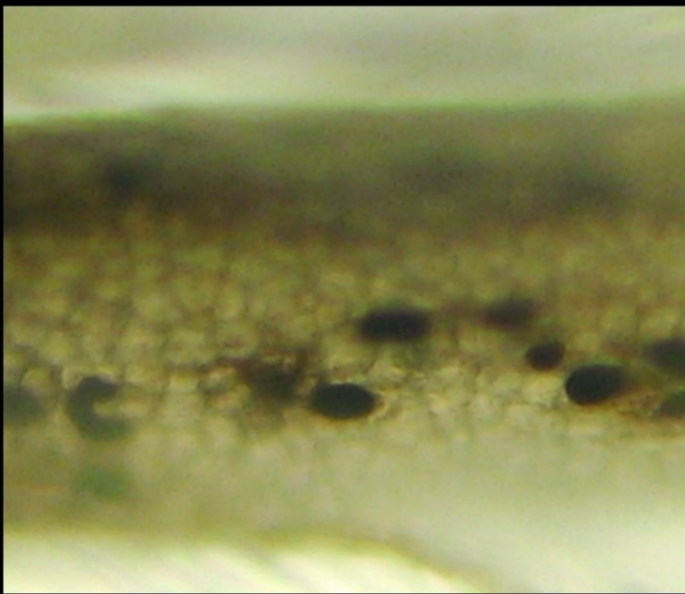
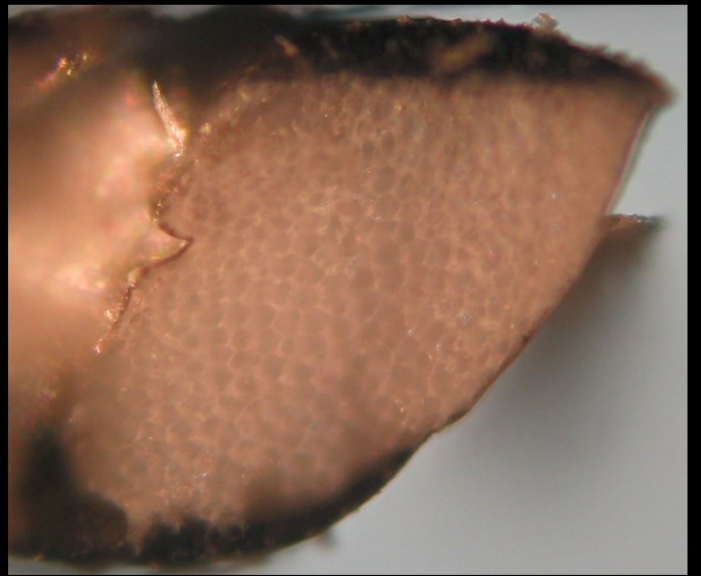
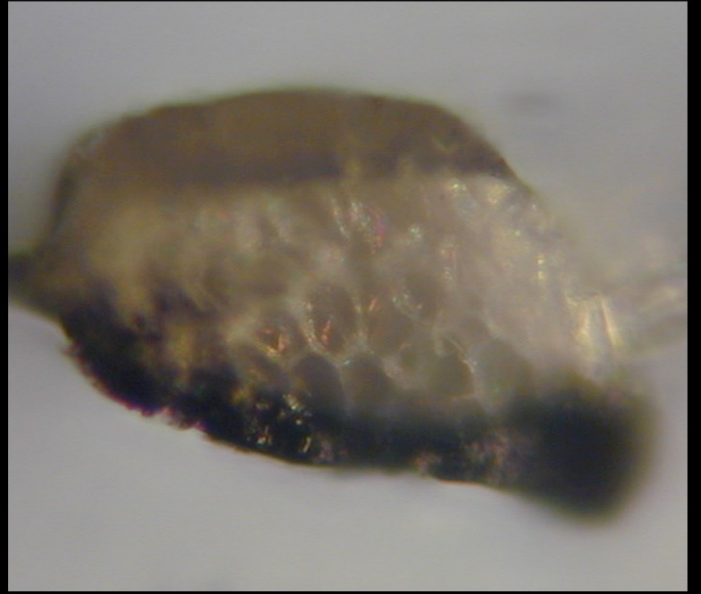
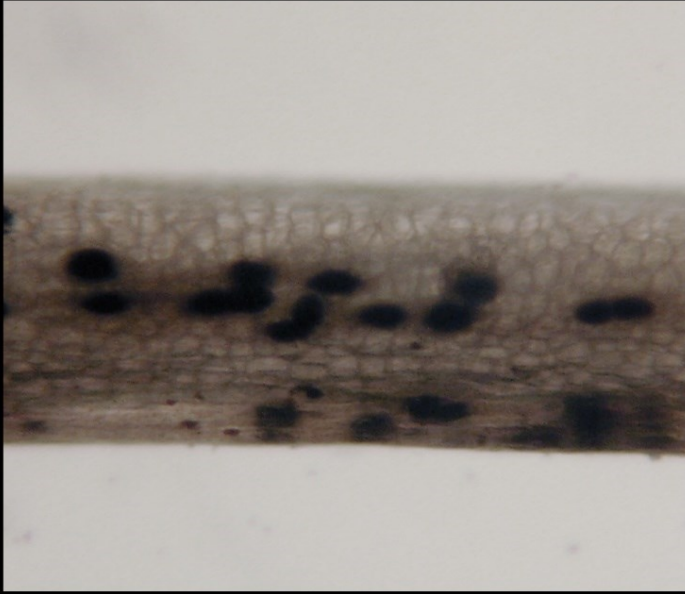
Picture 2: Black opal yellow – cross section through the quill of a back feather; the upper sides of the feathers are interspersed with much less melanin than the lower sides.

Image 3: Black onyx yellow – underside of a large quill with smaller macromelanosomes than in opal birds.

Image 4: Black onyx yellow – cross-section of a quill; the upper and lower sides of the feathers are evenly interspersed with melanin.

Image 5: Brown mogno – underside of the quill of a back feather with macromelanosomes like those of opal birds.

Picture 6: Black mogno – cross-section of a large quill; the upper side of the feather is more interspersed with melanin than the underside.





(Black)Quarzo yellow intensive aka Black mogno yellow intensive (Photo: Alessandro and Mauro Montanaro)



Black mogno red mosaic type 2 (Photo: Antonio Javier Sanz)



Brown mogno yellow intensive (Photo: Johan Van der Maelen)



Brown mogno yellow mosaic type 2 (Photo: Frans Begijn)

Due to the actual or suspected proximity of the mognos to the opal birds (and consequently also to the onyx birds?), it was suspected that the mogno trait could be another allele of the opal-onyx factor. The mode of inheritance of the mogno trait is – as with opal and onyx – free and recessive to the classical melanin colours. There are contradictory statements and experiences concerning the melanin pattern and colour of the offspring of a mating between Opal and Mogno. Some breeders found no intermediate expression,¹ other breeders saw a similar intermediate effect as observed between Opal and Onyx.²

It is thanks to the initiative of the Italian breeder Gianmaria Bertarini that a genetic study could be carried out to answer the unsolved questions about the genetics of the Mognos. Bertarini sent feathers from Opal, Onyx, Mogno/Quarzo birds and feathers from intermediate Opal-Onyx birds to the University of Bologna. Professor Luca

¹ Constant van Santen: Kleurkanaries Mogno en Azul. Under: <https://kanarioloog.skyrock.com/3291723206-Kleurkanaries-Mogno-en-Azul-door-Constant-van-Santen.html>

² Gianmaria Bertarini: Onice e Opale. Italia Ornitologica 1/2022.

Fontanesi and his team of collaborators, consisting of Dr Samuele Bovo, Dr Anisa Ribani, Dr Giuseppina Schiavo and Dr Valerio Joe Utzeri, studied the genome of these feathers. The assumption that the opal mutation is a mutation of the melanophilin gene (MLPH) was confirmed. Two allele variants of the gene were identified. A drastic one (frameshift) causing opal and a less severe variant (missense) corresponding to onyx. Both are allelic, i.e. they are located on the same gene locus, so they are alternatives to each other. In mognos, the same allelic variant as in opal was found!³ It can therefore be concluded that mognos are merely expressive opal birds that have evolved through the deliberate use of melanin-rich birds and appropriate selection.

These findings coincide with my light microscopic investigations (see series of pictures). These show that mognos also form macromelanosomes, as they occur in opal birds. However, the melanins do not accumulate exclusively on the underside of the feathers. The effects of the allele are therefore more pronounced than in onyx and weaker than in opal.

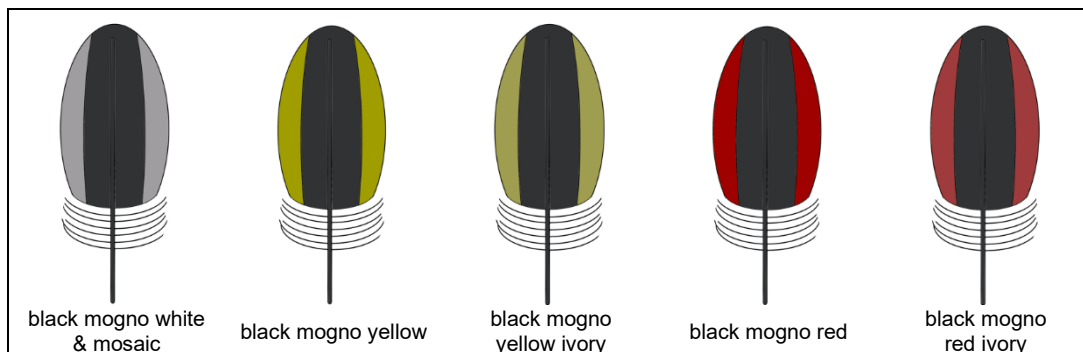
The characteristics of mognos:

Mogno canaries are characterised by a change in the black and brown pattern melanins (eumelanin) and a reduction in the area melanin (phaeomelanin). There is a shift of the black and brown eumelanins, but with a lower concentration in the lower part of the feathers. Thus, in mognos, the upper side of the feathers can be just as dark or even darker than the underside of the feathers.

Black mogno

The Mogno trait significantly reduces the brown melanin between the stripes and changes the colour of the pattern melanin, but does not affect the beak, the tarsi and the claws, which must be as black as possible, as in the classic black birds.

Due to the characteristics described above, these birds have a broad, unbroken, black-grey drawing (~RAL 7021) on a lead-grey area. Lead grey is a subjective colour designation because there is a considerable difference in colour between lead that has developed patina and pure lead without patina. Photographs must therefore be used to determine the colour of the area. To stay with the RAL colours: the area should be platinum grey (RAL 7036).



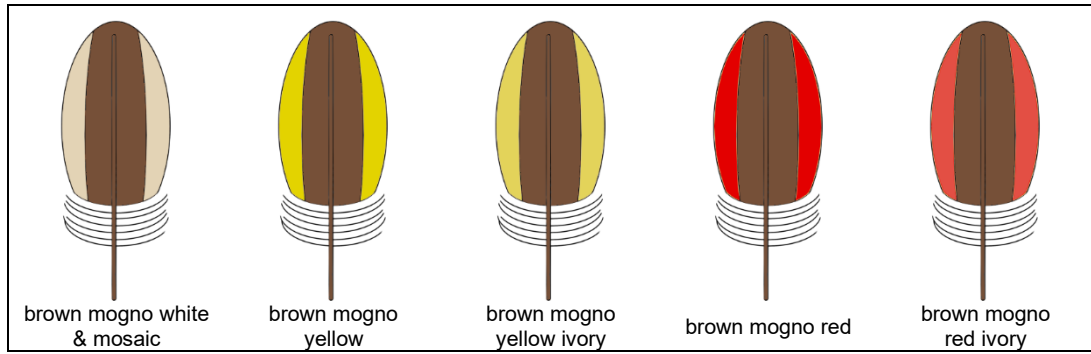
Good specimens show a distinct melanin pattern on the head. Brown melanin is completely absent. The large plumage has the same colouration as the markings and a very narrow fringe of lipochrome colour or white. A bluish sheen on the plumage is considered a glaring defect.

Brown mogno

The Mogno trait reduces the brown of the area and changes the colour of the pattern melanin, but does not affect the bill, the tarsi and the claws, which remain brownish, as in the classic brown birds.

Based on the characteristics described above, these birds have a broad, unbroken, dark grey-brown pattern (~RAL 8024 beige-brown) and a light brown-grey area (~RAL 1015 light ivory). Light brown colours resembling those of Eumo or Isabell birds, reddish-brown colours resembling Satinette, or a bluish sheen on the plumage are glaring faults.

³ Melanophilin is a transport protein that serves to transport the melanin granules to the tips of the cell extensions, where it is incorporated into the keratin during feather growth. Melanophilin is encoded by the MLPH gene of the same name. The number of melanosomes is normal, but they clump together in such a way that the melanin colour is lightened as a result.



Good specimens show a distinct melanin pattern on the head. The large plumage has the same colouration as the pattern and a very narrow fringe in the lipochrome colour or white.