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Everyone keeps asking me about Merle poodles, so I am summarizing literature research I did below. I am making this post public so it can be shared. I am a professor of Molecular Biology at Colgate University, have a PhD in Biochemistry from Harvard University and do molecular genetics research in dog body size and some coat colours in dogs. In addition I am a breeder of toy poodles.

Merle poodles have only been observed for the last two decades. Merle poodles must have resulted from the introduction of the dominant Merle mutation from a Merle containing breed, probably a herding breed or breeds. Merle does not occur in purebred poodles naturally. The arguments for natural Merle in poodles don't hold up in the light of what we know about Merle and are discussed below.

False claim 1. "Merle has been present forever, but was hidden in white dogs." Yes, Merle can be "hidden" in white and cream dogs. However, extensive crossing of white and coloured poodles since 1900 has occurred--this would have "unmasked" hidden Merle early in breed history, since it is a dominant mutation (see reference 1). This was not observed.

False claim 2. "The Merle mutation simply arose spontaneously in poodles recently." No. The Merle mutation is very unusual at the DNA level, and the Merle found in poodles is identical to that found in herding breeds. It is not possible that the exact same unusual mutation occurred more than once in different breeds of dogs (see reference 2).

False claim 3. "Merle poodles arose from 'cryptic Merles' present in the breed." No. Although "cryptic Merles" that do not show Merle colouring exists in Merle containing breeds, this cannot explain the sudden appearance of Merle Poodles. Active Merle can produce "cryptic Merle", due to the unusual nature of the mutation, but the reverse has NEVER been observed (see reference 3). In addition this would predict a lot of cryptic Merles in non-Merle poodles, which are not observed.

Since these arguments are not supported scientifically, the most reasonable conclusion is that Merle must have been introduced from a different Merle containing breed, which means that Merle poodles have pedigrees that were falsified at some point.

Why is Merle "bad"? Well in addition to falsified pedigrees, Merle carries with it health risks. Merle dogs have a higher risk of deafness than non-Merle dogs when

there is loss of pigment on the head, and dogs containing two copies of the Merle mutation (“double Merles”) not only have an even higher risk for deafness but a risk of improper eye development and blindness (see reference 4).

This is bad for poodles, where a lot of dogs are white and cream, where Merle can be “hidden”. Breeding a “hidden Merle” to a Merle dog will result in the production of “double Merles”, which will have a significant risk for hearing and vision loss. Genetic testing to detect the presence or absence of Merle in colours where Merle would be hidden would be required to prevent this unfortunate result.

- 1 Mackey J. Irick, Jr. “The New Poodle 6th Edition”, Chapter Howell Book House, New York, NY 1986
- 2 Clark, L.A., Wahl, J.M., Rees, C.A. and K. E. Murphy (2006). Retrotransposon insertion in SILV is responsible for merle patterning of the domestic dog. *Proc Natl Aca Sci USA* 103(5):1376-1381.
- 3 Langevin, M., Synkova, H., Jancuskova, T., and S. Pekova. (2018). Merle phenotypes in dogs—SILV SINE insertions from Mc to Mh. *PLoS One* 13(9):e0198536
- 4 Strain, G.M., Clark, L.A., Wahl, J.M., Turner, A. E. and K.E. Murphy (2009). Prevalence of deafness in dogs heterozygous or homozygous for the merle allele. *J. Vet. Intern. Med.* 23:282-286.