

# MERLE SMALL DOGS IN AUSTRALIA?

## by Dr Leith Bungey

"Genetics, whether of the dog or Homo sapiens, is never a simple subject that can be simply explained." (Onstott 1978;ix)

Even a cursory examination of the substantial body of research reported in the literature would indicate, however, that the decision to not introduce the merle modifier into the chihuahua gene pool in Australia **was** a simple one. That is, merle small dogs are not purebred chihuahuas, they are cross-breeds, mongrels, and cannot be registered with the state canine associations.

### **GENETICALLY MODIFIED CHIHUAHUAS**

The merle gene is in fact a modifying gene (Whitney 1971;192), that is, it genetically alters and lightens dark coloured coats as well as the pigment in the iris of the eye and the middle ear (Lambert 2004).

GM chihuahuas! While there is considerable uncertainty about the ramifications of genetically modifying foods, there is ample scientific evidence of the dire consequences of the merle gene in dogs.

### **MERLE**

Whitney (1971;194) states that to his knowledge, there is no solid white in dogs. Whites include the albino white, the dark-eyed white and the common white associated with spotting. Whitney (ibid;204) continues "There is one other white which is definitely different from the others so far discussed. It is found in Norwegian harriers and in collies, both rough and smooth, and in shetland sheepdogs. This is a white of a **semi-lethal** nature. When one of these is crossed with a black-and-tan or tricolour, a curious colour called 'merle' is produced. This white, which almost invariably weakens the possessor, is a very undesirable character ..."

### **DEAFNESS**

Willis (1989;275) reports that the association of merle colouration and deafness is well established. In the homozygous state, the M allele causes rough and smooth collies to be almost white and research has shown that such dogs are usually deaf and have eye defects.

Dr George Strain, Professor of Neuroscience Comparative Biomedical Sciences, Louisiana State University of Veterinary Medicine (2004) states that dogs with blue eyes are 50% more likely to be deaf than are dogs with brown or black eyes.

### **EYE DEFECTS**

In the dachshund breed, the M allele leads to dappling. The Hanover Veterinary School has maintained a kennel of dapple dachshunds since 1971. The eyes of eighteen were examined of which nine were MM, five Mm and four mm. All the normal mm dogs were devoid of eye anomalies while all the MM animals had a series of eye defects. These included the absence of the Tapetum lucidum, lack of retinal pigment, a rudimentary lens, microphthalmia, microcornea, microcoria and other more minor conditions. Mm cases also had similar eye problems although less severe in most instances. These researchers consider that breeding with the merle factor should be restricted to scientific purposes where it might be useful in examining depigmentary disorders in man such as the Klein-Waardenburg syndrome associated with eye and ear defects (Willis 1989;228/9).

### **STERILITY**

As well as identifying eye and ear problems, the Hanover research revealed impairment of sperm production in both MM and Mm dogs (ibid;275).

### **MERLE TO MERLE**

Onstott (1978;237) found that "Merle to merle yields 50% of the progeny merle, 25% black and 25% white. The whites will be both deaf and blind."

Some breeders claim that as long as merle is not bred to merle, no genetic problems can occur.

Willis, quoted above, is quite categorical, however, in stating that Mm cases DO suffer ear and eye defects similar to those in the merle to merle (MM) matings. So where a dominant M is mated to a recessive m (Mm), which recessive we might not even know about, problems DO occur.

A further complication is that Whitney (1971;139) found coat colour modifiers (such as merle) can be dominant but not show. Willis (1989;70) agrees that some dogs may not even be identified as merles even though genetically they are.

Thus, it is not possible to be absolutely certain that one is NOT breeding merle to merle.

### **WHERE DID THIS MERLE PATTERNING IN THE CHIHUAHUA ORIGINATE?**

Lambert (2004) established that the rapidity with which merle chihuahuas appeared is highly unlikely to be due to a single mutation. On ascertaining that the breeders of the first merle chihuahuas also had dachshunds, her group emailed those breeders. They received not one response.

Dr Strain (2004) confirms "It seems highly unlikely that a NEW spontaneous mutation in the recessive allele in your breed would produce the same phenotype of the dominant allele. I could not say this as an absolute but in my opinion the merle has to have been introduced from another breed. Because the merle pattern is dominant, it could not have lain 'silent' for many generations only to reappear fairly recently."

Yes, the merle chihuahua has to be a cross-breed. So in addition to the still-experienced pomeranian small erect-carried ears, slightly oval eyes, slightly flat skull and harsh coat, or papillon colouring, nose, eyes and butterfly ears, chihuahua breeders would have dachshund-like or sheltie-like features with which to contend. Certainly, some of the small merle dogs appearing on various websites have decidedly dachshund-ish or sheltie-ish heads with long noses and almond shaped eyes.

A local veterinarian has recently brought to my notice that a larger merle dog such as a dachshund, sheltie or Aussie shepherd crossed with the chihuahua will result in heavier bone. He believes that this additional weight is highly likely to be detrimental to the stability of particularly patellae, but also other joints, in our breed.

A further issue is the possible appearance of blue (light) eyes in dark coloured chihuahuas which is not permitted by the breed standard.

### **GETTING RID OF DEFECTS - AND UNDESIRABLE CHARACTERISTICS**

Willis (1989;298) concludes that we can never totally eliminate defects. The rarer an allele becomes, the more difficult it is to reduce it still further

so that a breeder's very success early in his breeding programme makes progress harder and slower in later years.

He further states "Very rare defects, like some lethals, will be hidden for years, may not even be known about, and then will come to the surface under an inbreeding programme." (ibid;327)

Even with the most judicious of breeding, most of us have witnessed the sudden and unwelcome appearance of defects and undesirable characteristics we thought we had eliminated - or, indeed, we didn't even know about.

Do chihuahua breeders in Australia want to expand this pool of defects and undesirable characteristics by bringing in the merle modifier and its various inherent problems?

Certainly, the Germans do not and have banned the merle chihuahua (Lambert 2004) while Italy has banned both the merle cardigan corgi and the merle collie.

The opinion of the Hanover Veterinary School researchers that breeding with the merle factor should be restricted to scientific purposes has already been cited above.

Harmer (1975;9) agrees "... it would be better for merle to be a disqualified colour in all breeds."

Australian chihuahua breeders can do no better than to heed Stockman's (1990;44) advice, "Dog breeding is a tremendous challenge and can be enormously rewarding as a hobby. But there is no place for the irresponsible ... think before you mate ...".

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