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RATS ARE SWEET CUTIES AND LOVABLE SOULS

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**The South African Rat
Fan Club**

Colour variation within rat mutations

by A. Combrink (June 2007)

Have you ever bought or bred a rat thinking that he/she is a certain colour variety and then discovered after a while that the rat was in fact a completely different colour? It surely has happened to me and I guess many other fanciers too. When one visits forums or mailing lists on the internet, frequently one will find someone asking what colour is his/her ratty. So then, which factors should one consider before determining the colour of your ratty?

Well, many factors determine a rat's physical appearance and have to be considered before deciding on your rat's colour. We will look at most of them here.

Baby vs. adult ratty

The major factor one should consider is age. Young rats almost never have exactly the same shade of colour as adults; some varieties are even a completely different colour as babies. Amber rats (sometimes known as silver fawns), for instance, are not amber when young. They look like a dull washed out version of the adults. Only by around 6 months of age do they have that rich yellow orange coat one associates with this variety. This also is true for most other colour varieties. Blacks are duller in colour when young, some young champagnes can almost be mistaken for pink eyed whites, baby blues are much paler in colour when compared to adults, etc. The list is endless. Pearls and cinnamon pearls are very interesting, both colours often look whitish when more or less under 8 weeks of age, but when they reach 8 weeks the cinnamon pearls start to mould into a yellowish colour while the pearls become a greyish-white. Sadly, many breeders have already sold their kittens before this age thinking that all the kittens were pearls when some of them were in fact cinnamon pearls.

One of the most surprising colour changes occurs with a certain kind of mink rat. They are sometimes referred to as mock mink, but we will use the more well known name Australian mink in this article.

Australian minks closely resemble normal or European minks in colour, but this mutation is caused by a completely different gene. Baby Australian minks are beige when young, but by around 8 weeks old they undergo an almost miraculous transformation and start to grow mink patches. For a while they look almost like a kind “merl” or” tortoiseshell” type colour but this quickly disappears into an evenly mink coloured coat. Even this first mink coat is not its final shade yet, over the next few months the coat still darkens until they reach the colour as shown in the photographs below.



Photo 1: Aurora rats Hammy is a tailless Australian mink hooded downunder female. In the first photo (left) Hammy is still a baby of 4 weeks old, with a beige coloured coat. In the next photo (middle) she is 8 weeks old and moulding into her first adult coat. At this stage, her bottom half was mink, thus areas where the adult coat already grew out, while her top half was still beige (areas where the adult coat still had to grow out). In the last photo (right) Hammy is an adult ratty of 7 months old and a full coloured Australian mink.

All of the shaded varieties, thus including siamese, himalayan and burmese rats, also undergo huge transformations from the baby coat into their adult coats. It is widely known that the shaded group does not start of, for example, a siamese colour. Let us look at these varieties more closely. Burmese babies are a very beautiful chocolate brown when small, but as the burmese baby grows you will start to see points (darker areas) developing on the nose, tail base, ears and feet (presuming it is also a self rat). Seal point siamese babies start of as a warm beige colour which will fade into a creamy white colour whilst simultaneously developing sepia coloured points on the nose, tail base, ears and feet. Sometimes novice fanciers confuse baby siamese for other colours such as beige. The trick to identify if your baby is a siamese is first to look at his/her eye colour. In a siamese baby it is always red or black (if you have a black eyed siamese) while beige babies have dark ruby eyes. Siamese babies commonly do not have an even colour throughout. His/her back half seems to be slightly darker than his/her front half, whilst a beige baby has a very even colour. As a matter of fact the shade of “beige” between the two varieties is distinctly different, but if you have never seen the one or the other it might be more problematic to distinguish between the two. Baby seal point himalayan rats also cause a lot of confusion. They are born white and are commonly mistaken for pink eyed whites (which might also be present in the same litter). Baby himalayan ratties and pink eyed whites are unfortunately not very easy to distinguish, but it is not impossible. The trick is to look at the tail base (from above).

Pink eyed whites will be completely white while the himalayans will have very light creamy-brown hairs in that area (provided they are not marked rats, such as capped himalayans). As I mentioned before, it is very difficult to distinguish between pink eyed whites and himalayans but with experience this will become easier. Considering the genetic makeup of the parents will also help a lot.

In South Africa we have another kind of siamese we now call the sable siamese*. This is a very common variety here and is often found in petshops (note that the siamese, himalayan and burmese described above will probably not be found in petshops as yet, as these are all relatively new varieties in South Africa). Seal point sable siamese babies are a dark brownish-grey when babies and have very dark ruby eyes (very similar to the eye colour of beige and fawn rats). Burmese babies look similar to sable siamese babies, but have black eyes instead of ruby and are also much browner in colour.

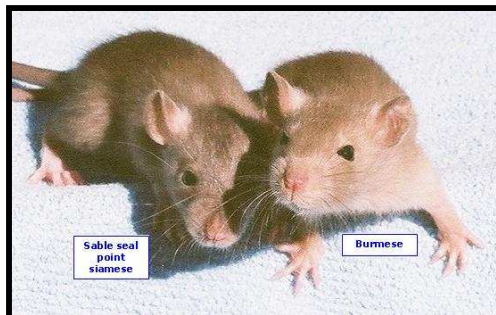
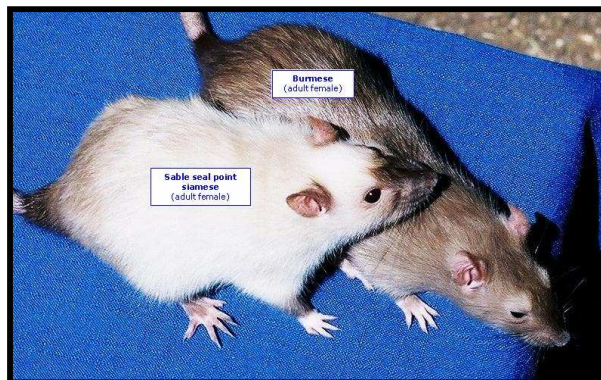


Photo 2: On the left is a seal point sable siamese baby and on the right is a burmese baby. Notice how similar these two colours look when young, with the burmese baby surprisingly being the lighter shade.

Photo 3: These are two adult female rats, as babies they looked like those ratties shown in photo 2 (above). The seal point sable siamese female (left) is now a lighter shade than her burmese friend (right).



There is also a sable himalayan variety which is born a grey-tan colour. They have dark red eyes (darker than in siamese rats). Sable siamese and sable himalayans also develop points when older, but the fading of the body colour into the adult colour takes longer than in siamese or himalayan rats.

Old age

Older rats also sometimes undergo slight changes in their colour. The most common change seen is patchiness of colour.

Blacks, blues and russian blues are very prone to this. For instance, older black ratties might not be so evenly black anymore. They develop brownish patches, especially on the flanks and lower back. Agouti based varieties also change when older, agoutis and cinnamons become slightly yellower in colour, but can still be identified as agoutis or cinnamons when older. This change is only obvious when they are compared to younger rats of the same colour.



Photo 4: An old black Berkshire female. Notice the brown patches on her rump. This is as a result of old age and not a new mutation.



Photo 5: An old seal point sable siamese male showing extensive patchiness of the coat colour.

Siamese and sable siamese varieties must be mentioned again. Both varieties grow darker when older, which actually look very attractive in siamese rats, but sable siamese can grow so dark that they almost look like a brownish-grey burmese. Added to this is the fact that siamese and especially sable siamese can also develop patchy coats like blacks, etc (see photo 5).

Husky rats also change significantly as they get older, they tend to become greyer and greyer as they age. Some individuals might even turn almost completely white when old.

** Note: Experimental breeding tests have been conducted between the sable siamese and the siamese varieties and the results will be published in a later article.*

Mutations which affect colour

All these mutations are used to breed certain markings, but which also affect the coloured areas on the rat. The first mutation is the "essex gene" (H^{f0}) which causes markings like essex and baldie, but also dilutes the coat colour as well. A black essex isn't black at all, the black areas on the rat are diluted to a charcoal grey colour varying in shade from top to bottom. This results in a rather attractive coloured rat.



Photo 6: A black irish girl (bottom) and her black based variegated essex sibling (top). One can clearly see that the essex girl's black coat colour is diluted to a charcoal grey. This is because she has one essex gene (H^o) in her genetic makeup, a gene which causes a slight dilution in coat colour.

The roan gene (ro) which are used to breed our husky rats, also affects the coloured areas on the coat. Black based huskies' black areas look grey with a mixture of different shades of grey hairs (roaning). Even as babies huskies will have charcoal coloured areas and not black as expected. The roan effect only appears later.

We also have another gene causing extensive white spotting in rats. Some markings that have been bred by this gene include spotted, dalmation and variegated. The coloured areas on the coat becomes heavily silvered (thus white hairs grow in between the coloured hairs) from a very early age. The silvering is so extensive that it changes the original colour completely. The black areas on black based spotted, for instance, look grey causing confusion in that fanciers sometimes think they have blue spotted rats.

Variation within the same colour

When comparing many unrelated and in some cases even closely related rats of the same colour, one will see that they are not all exactly the same shade. The reason for this is genetic factors, not simple single genes as discussed above but many genes working together altering minor aspects such as shade. This is sometimes known as polygenetic factors.

In most colours the variation of shade is not very great. But take the colour champagne, for instance. If you have ever seen a good champagne bred by a fancier and compared it to a too pale champagne not selectively bred for colour you might have noticed a difference in shade of colouring between the two rats. The fancier's champagne will be a lovely pinkish-cream colour while the other champagne might look washed out (almost like a dirty pink eyed white).



Photo 7: Two champagne females. The champagne self female (left) is a rescued ratty, her colour is so pale she can almost be mistaken for a pink eyed white. The champagne hooded female on the right is a girl I bred. She has a good champagne colour and one can see that her coloured areas (on the head and back (remember she is a hooded)) are darker than the other girl's colour.

In some colours the difference in shading is very obvious between individuals. Blues and Australian minks can vary greatly in shade. With blues, fanciers overseas have started giving some shades different names, such as slate blue, American blue, English blue, etc. which can result in some confusion. Australian minks are just as variable, some minks might be so dark they almost look like chocolates while others are so light they look greyish in colour. Husky rats also seem to vary greatly in shade between individuals of the same age, in black based huskies some are more "black" and others more grey (roaned).



Photo 8: Four Australian mink hooded downunder siblings. Notice the tailless male at the top is a bit lighter than the other three. The tailless female in the bottom right-hand corner is also a bit darker than her siblings.

Other factors

The rat's sex can also slightly influence coat colour. Agouti males are sometimes slightly yellower than agouti females. With silvered blacks, males also tend to be more silvered than the females. Siamese males are well known for their better shading when compared to the females.

Other factors that might affect colour include temperature and even diet (especially with siamese varieties) but this is still very speculative.



Photo 9: A male and a female dumbo eared seal point siameses. They are brother and sister, the male is at the bottom.

I would like to thank L. Hattingh and J.C. Combrink for reviewing and proofreading this article. If you have any questions about this article, varieties or anything relating to genetics, you are welcome to contact me at aurora@rattyrascals.co.za or by posting questions on the S.A. Rat Fan Club forum at <http://www.rattyrascals.co.za/chatrat/>

In the next article, I will try to explain the basics of genetics before tackling the task of discussing each variety in more detail in the following articles.

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