RECOMMENDED

BREEDING POLICY

FOR

THE ASIAN GROUP OF CATS

Photo Alan Robinson

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ASIAN BREEDING POLICY

Introduction

This breeding policy accompanies and supplements the Asian Registration Policy and should be read in conjunction with that document.

The aim of the breeding policy is to give advice and guidance to ensure breeders observe what is considered "best practice" in breeding Asians. The over-riding objective is to improve the Asian cat, working to meet all aspects of the Asian Standard of Points, which describes the ideal for each of the five recognised varieties in the Asian Group.

The origins of the Asian are well documented and can be traced from a mating of a Chinchilla (Jemari Sanquist) and a Burmese (Bambino Lilac Faberge) in 1981. During the 1980s and '90s other matings between these two breeds took place, along with some matings between Burmese and domestic (non-pedigree) cats; the descendents from these matings form the basis of the Asian Group of cats we now recognise and admire.

The Asian is now well established in the UK, and over 25 years of breeding has developed and fixed good phenotype in the breed along with a wide and diverse gene-pool. The Asian breed has one of the largest numbers of gene variations of any breed of pedigree cat recognised by GCCF. The combination of genes which affect colour, pattern and coat length makes it possible for a total of 816 permutations that we recognise in the Asian Standard.

Having successfully "fixed" the type and specific appearance of the Asian, breeders need to pay more regard to further improving other aspects of the breed such as colour, coat and notably pattern.

The only permitted outcross is to a Burmese (but see Registration Policy)

Genetic Make-up

As stated the Asian Group holds a wide and varied group of both dominant and recessive genes; one can not make sense of the Asian breed without a basic understanding of the genetic make-up.

All domestic cats are descended from a wild ancestor (probably either Felis silvestris or Felis lybica) a mackerel tabby patterned animal, and thus all domestic cats are of an underlying genetic tabby pattern. All cats have 19

pairs of chromosomes upon which there are many thousands of genes that govern the eventual shape, size, sex, colour, pattern and hair length of the individual animal. Over the generations a number of mutations have occurred and selective breeding has been used to isolate these to produce the various pedigree breeds we see today. In the case of the Asian the key genes influencing the colours, coat length and patterns within the breed are:

Agouti (A) - the natural "wild" gene that is the basis of the tabby cat. The base agouti pattern is bands of black on a yellow background; in the cat this is overlaid with one of the tabby patterns.

Non- agouti or "hypermelanistic" (a) - a recessive gene mutation that turns the original "wild" tabby cat into a self black by overlaying the agouti base colour with melanic pigment, making the whole animal appear black, although often in certain light the underlying tabby pattern may still just be discernible. Other genes work to change this black pigment to other colours (see below).

Inhibitor (I) – a dominant gene that suppresses the development of pigment in the hair of the coat, typically producing hairs that are fully coloured only at the tip and have a silvery white base. It has greater effect on the lighter pigment in an agouti cat, removing the yellow colour and turning the base colour white or "silver". In the case of a non-agouti cat the inhibitor removes colour from the base of the hair-shaft to produce a silvery white hair with a coloured tip, i.e a Smoke. This allele appears to interact with other genes to produce various degrees of tipping, ranging from deeply tipped silver tabby to lightly tipped silver shaded tabby.

Tabby patterning genes – Traditionally it had been believed that the three forms of tabby pattern were inherited as an allelic series; however it now appears as if at least two, and probably three, different loci are responsible for the various tabby patterns (Lorimer, 1995). At one locus are the alleles for mackerel and blotched (classic) tabby patterns with mackerel dominant to classic; at another locus is the Abyssinian or ticked pattern, which is epistatic (masking) to both mackerel and blotched; and at the third locus there appears to be a modifying gene for either the classic or mackerel patterns resulting in the spotted tabby pattern. The patterns can be summarised as follows:

Mackerel (Mc) – the basic striped tabby pattern that overlays the agouti base (ie "wild" form)

Ticked (T) – an incompletely dominant gene which removes most of the stripe pattern leaving the ticked agouti base pattern on the body with minimal overlaying stripes on legs, chest (necklace) and face.

Spotted (Sp) – current thinking is that it is likely that a specific single gene causes the spotted tabby pattern, breaking up the mackerel or classic pattern into elongated or rounder spots respectively.

Classic (mc) – a mutation of the mackerel allele recessive to all other tabby patterns which gives a blotched pattern with the characteristic "butterfly" motif across the shoulders and "oysters" on flanks.

Wide-banding (Wb) – this has been hypothesized either as a gene (Robinson) or more probably a group of genes (Joan Wasselhuber, who coined the term "wide-banding genes"): increasing evidence for their existence has led to wide acceptance. Undercoat width genes determine the width of the undercoat whether or not the cat has a silver inhibitor gene. The term "undercoat" used here refers to part of the hair shaft closest to the body, and includes both guard hairs and the shorter hairs often referred to as "undercoat" hairs. The variability seen in the undercoat widths in cats points to the polygenetic nature of wide-banding genes. If a single gene it is likely an incompletely dominant gene mutation, the effect serving to push the darker, pattern colour in the cat up away from the hair base towards the tip, turning the normal tabby patterns into a Shaded or Tipped cat. Precisely how the agouti, inhibitor and wide-banding genes interact on a molecular level is not clear - one possibility is that the wide-banding genes influence the agouti protein production to remain high so that eumelanin pigment remains inhibited or down-regulated; another possibility is that the wide-banding gene encodes for a second inhibitory protein that also down-regulates eumelanin.

Long-hair (l) – a recessive gene mutation which produces a semi-long haired cat.

Burmese Colour Restriction (cb) – a mutation on the albino allele one step up from the Siamese (Himalayan) gene. This reduces the amount of pigment produced in the coat but, because it is thermo-sensitive, the pigment is darker at the points and (slightly) lighter on the body; the action of the Burmese gene causing a genetically black cat to turn sepia brown, a red cat to turn pale tangerine.

Chocolate (b) and Cinnamon (b1) – two mutations of the basic black non-agouti gene which modifies black into dark brown or medium brown respectively

Orange (O) – this is a mutation on the X chromosome and is thus sex-linked. The gene eliminates all melanin pigment (black and brown) from the hair fibres, replacing it with phaenomelanin, a lighter compound appearing yellow or orange depending on the density of pigment granules. The O allele is also epistatic over the non agouti genotype; that is, the agouti to non-agouti mutation does not have a discernible effect on red or cream coloured cats, resulting in these self-coloured cats displaying tabby striping independent of their genotype at this locus. This explains why you can usually see some tabby pattern on red, cream and apricot coloured non-agouti cats, even if only on the head/face. Rufus polygenes, as yet unidentified, affect the richness of the orange gene's expression.

Dilute (d) – a recessive gene which reduces and spreads out the pigment granules along the hair-shaft and turns a black to blue, chocolate to lilac, cinnamon to fawn and red to cream.

Dilute modifier (Dm) – a dominant gene which serves to modify the action of the dilute gene (it has no effect on undiluted colours), it lightens and "caramelises" the colour turning blue into brownish-grey, lilac and fawn into pale taupe (in all three cases known as Caramel) and cream into a warmer pinkish-cream tone (Apricot)

Polygenes – these are collections of genes which modify the effect of the main dominant and recessive genes above. A build up of polygenes creates a bigger effect, for example a collection of certain polygenes increases the length and density of the long-hair gene to create the Persian, and a build-up of polygenes serves to enhance the effect of the main colour genes, turning the effect of the orange gene from the sandy colour of the ginger domestic tom to the rich vibrant red of the Red Persian, British or Asian Self. It is likely that a group of polygenes is the reason for variation in the degree of tipping in the Shaded Tabby/Burmilla, the polygenes working to create the band-width in interaction with the inhibitor gene (when present) resulting in the range of pattern from tipped to heavily shaded.

So, in summary, the genetics involved in the ideal tabby, shaded or smoke cat are complex. Not only are there many interacting genes, but genes sometimes do not express themselves fully, or conflict with one another. For example, the melanin inhibitor sometimes does a poor job blocking pigment, resulting in an excessively gray undercoat, or in tarnishing. Likewise, poorly-expressed non-agouti or over-expression of melanin inhibitor will cause a pale, washed out black smoke. Various polygenes, epigenetic factors, or modifier genes, as yet unidentified, are believed to result in different phenotypes of colouration, some deemed more desirable than others.

Breeding System

Listed above are the main genes that help define the Asian cat through the expression of pattern, colour and coat, but of course there are a large number of other genes that together create the distinctive physical shape and confirmation which is the essence of Asian breed type.

In order to ensure the maintenance of the good Asian breed type already achieved, while allowing scope to further improve aspects of type, coat, pattern and colour, to meet the ideal described in the Standard, breeders need to have a clear, definite and well understood ***breeding system***. This means the development and management of a breeding programme in which certain cats are affirmatively selected to be bred to others, for predetermined reasons. Equally important, it also means that breeders allow no matings until they have given careful consideration to the outcome. In particular three key rules must be followed:

- **Health must be the overriding consideration in any Asian breeding programme.**

- **The good and bad features of the individual cats should be assessed and weighed against each other before any mating.**

- **When planning a breeding programme, breeders must realise that doubling of the good traits in a cat also results in doubling the defects; the breeding of cats with similar faults should be avoided at all costs otherwise there is a danger of fixation.**

The prime motive is to perpetuate the Asian as a recognisable breed; to improve the quality of the breed as measured against the Standard; and also to gain success on the show bench.

The skill in breeding lies in the choice of the individual cats and how these cats may be mated with each other – these two acts should be regarded as completely separate, although interconnected.

Selection

The phenotype of the individual cat is made up of a large number of genetic characteristics of varying expression. The ideal Asian cat is one in which the expression of each of these characteristics is just right in the eyes of the breeder – this means that an intermediate expression will be required for

some characteristics, but a more extreme expression required for others. This expression is controlled by selective breeding. However, selection by itself is not very efficient in eliminating heterozygous genotypes (the producers of variation and diversity) – it is one of the tools available, but has its limitations.

Inbreeding

Inbreeding is an inclusive term covering many different breeding combinations and degrees of relationship – including the more distant, less intense. It is consistently more efficient in eliminating heterozygeous (varying and diverse) genotypes and increasing homozygous (same) genotype, thereby ensuring a greater likelihood that kittens will closely resemble their parents. Used here, the term does not mean close, purposeful, inbreeding of closely related cats (brother/sister, father daughter), but rather the moderate form that results from the mating of not too distantly related (but not directly related) cats (first cousins, half brother/half sister, second cousins, etc). Some in-breeding is essential to stabilise conformation around a definite type. In-breeding is the act of mating individuals of various degrees of kinship, and if continued it produces ever increasing homogeneity in the offspring.

It is important to monitor the percentage intensity of inbreeding for any mating – use this consideration as a key part of the decision making process when considering any mating, and remember: ***"The more intense the in-breeding, the more careful must be the selection". "Loss of innate genetic variability must not be too great".***

The overall approach should be one of balance and moderation in the degree of in-breeding coupled with consistent selective breeding with a clear objective in mind – i.e improvement of key aspect and/or the elimination of weak traits or defective genes.

Breeding systems and practices need to operate so as to ensure the Asian gene pool contains enough variation to give scope to continue improving the breed and avoid the danger of either fixing type too quickly (before the ideal of the standard is reached) or deleterious genes being expressed and fixed in the breed. Breeders need to use inbreeding to gain sufficient homogeneity to fix recognisable Asian type and all key aspects that determine each of the Asian varieties, but with sufficient variation to both enable improvement, and maintain health and vigour, avoiding fixation of defective genes or unwanted traits (and to ensure the elimination of anomalies).

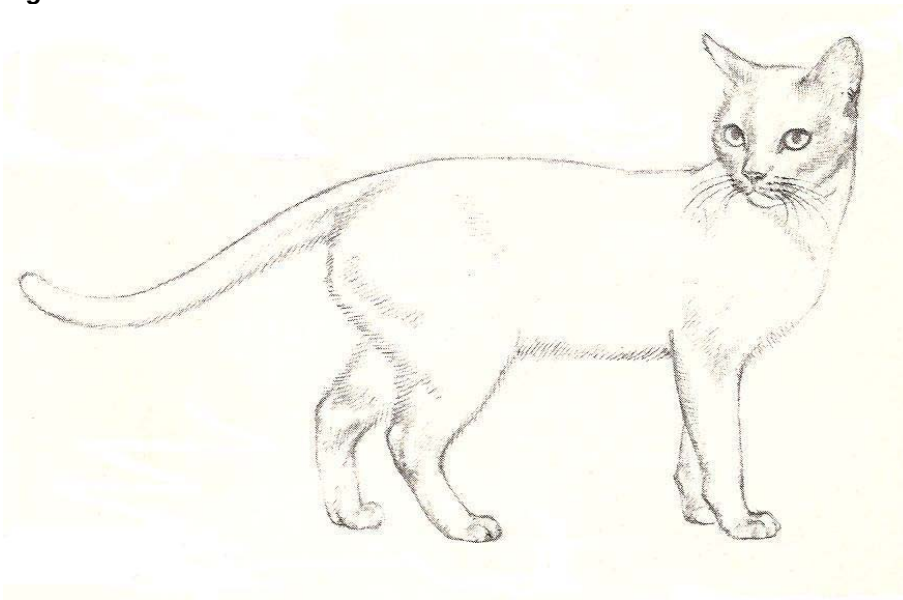
Anomalies – the problem of the genetic anomaly is something of which all breeders should be aware – this is not to suggest that such anomalies are common but the cat must be expected to have its quota of defects just as are found in other animals. (See Page 21: Genetic Defects).

The golden rule is that health is paramount and must be constantly and consistently monitored; any evidence of weakness or the emergence of lack of vigour must be dealt with immediately through modification of the breeding system. No cat with any evidence of health problems or lack of vigour should be used for breeding.

For further reading on cat genetics and breeding practices refer to:
"Robinson's Genetics for Cat Breeders& Veterinarians" by Vella, Shelton, McGonagle and Stanglein, published byButterworth & Heinemann.

Type

When the Asian breed was first established the decision was taken to adopt the Burmese type as the desired phenotype for the breed. Breeders have worked hard since the early 1980's to improve the type of Asians to match the best examples of the Burmese breed. Continuing out-crossing to Burmese should be considered in order to maintain and expand the diversity of the Asian gene-pool and to improve type where necessary.
Fig 1



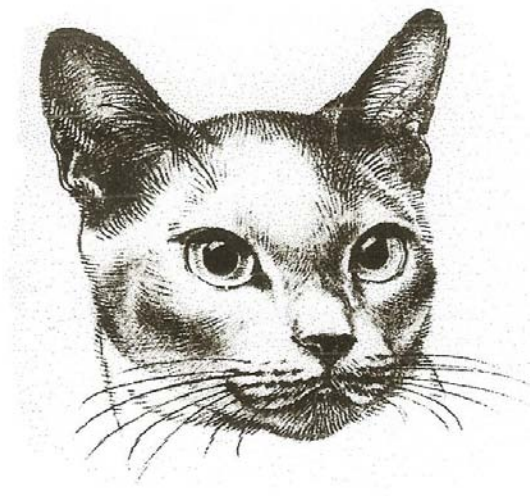


Fig 2

Coat

Regular out-crossing to Burmese has also improved coat length and texture, eliminating the overlong and somewhat thick coats of early Asian shorthairs to produce the fine, relatively short, close-lying coat we see on the show bench today. However, breeders are encouraged to continue to pay close attention to coat texture since over-long and thicker coats still do appear. This is best done by mating to the best available cat with correct coat length/texture and avoiding matings to Tiffanies or shorthair Asians carrying the longhair gene – unless of course the main objective is specifically to improve the Tiffanie rather than a shorthair Asian variety (see page 20).

Eye Colour

Eye colour may range from pale green through shades of green and yellow chartreuse to clear yellow, golden yellow and amber. Blue and orange are incorrect; the eyes should not be so lacking in yellow tone that they are more blue than green at one end of the spectrum, nor so rich an amber that they are more orange than yellow at the other end of the spectrum.

Fig 3

1. Orange (incorrect)
2. Gold
3. Yellow
4. Green
5. Blue (incorrect)

Colour & Pattern

More work is necessary to improve aspects of colour and pattern in all five varieties of the Asian breed. It is recommended that breeders should have a clear aim in mind and pursue one objective at a time, while looking to avoid losing what has already been achieved. Suggested best practice for each Asian breed is outlined below:

Self

Breeders aspire to produce a Self Asian with a solid even coat colour free from any evidence of ghost tabby markings and with colour which ideally would be sound in colour to the roots of the hairs, although the SOP demands only good colour to the roots, i.e. a good degree of colour to the roots of the hairs so that the shade/tone of colour at the roots should be only a little lighter than that at the tip of the hair. It is possible that constant out-crossing to Burmese over the years has contributed to the difficulty breeders experience in attaining good colour to the roots.

For this reason best breeding practice would be to breed Self to Self. However, the relative lack of Bombay and other Self coloured cats makes this as yet impractical as a general rule; therefore, a mating to Burmese could be considered as the next best option. Mating to (ideally a full expression) Ticked Standard Tabby might also be considered for good reasons eg. to improve colour or type. If this is done a Ticked Tabby with minimal leg barring should be selected where possible. Mating to any other tabby patterns is not recommended since this might introduce ghost barring to the self coloured progeny. Mating to a Shaded/Burmilla is not recommended as the introduction of wide-banding genes (or further build up of the concentration of polygenes which enhance its effect) will accentuate the problem of unsoundness by pushing the colour molecules up from the roots to the tips of the hair-shaft and reducing the colour density at the hair-base. One might also consider using a Smoke carrying a non-silver gene but only where the silver expression is fairly minimal (i.e. under one-third).

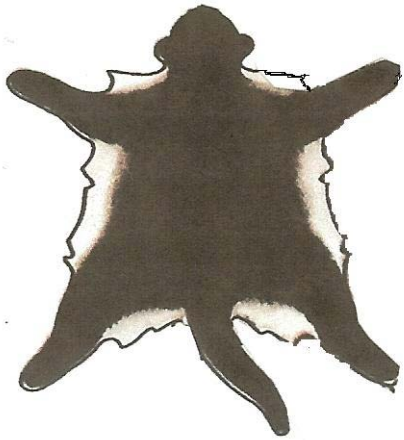
Smoke

The Smoke has the appearance when in repose of being a Self or Burmese coloured cat, but with a silver base to the hairs giving the “smoke” effect when the cat moves and the silver base shows through areas of the top colour. The silver base is caused by the action of the Inhibitor gene working in conjunction with the non-agouti gene, and in Burmese Colour Restriction (BCR) coloured cats the Burmese gene. The ideal Smoke has silver extending one-third of the way, and certainly no more than half-way, up the hair shaft from the root, and is clear of any ghost tabby markings.

The Inhibitor gene can be quite volatile in its expression and breeders should select for the correct amount of silver when mating two cats to ensure the desired “Smoke” effect in the offspring. Ideally mate Smoke to Smoke selecting for cats with the correct amount of silver. At present there is a limited number of Smoke Asians and so where this is not possible or desirable, mate to Self, Burmese or Ticked Tabby and aim to avoid reinforcing and building the effect of the wide-banding genes, as this will serve to push the top colour towards the hair tip and expose too much silver base. For this reason mating to medium and lightly Shaded cats should be avoided, although using a heavily shaded cat with minimal silver expression may be desirable.

A clear top colour is highly desirable, so avoid mating to other tabby patterns which will increase the likelihood of ghost tabby markings.

Fig 4



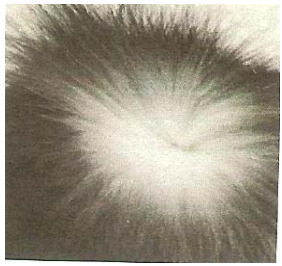


Fig 5

Shaded (Burmilla)

The Shaded is an agouti (tabby patterned) cat, the pattern originating from the Chinchilla, one of the foundation breeds. Virtually all Chinchillas are Classic Tabby based; it is the action of the inhibitor gene and wide-banding gene(s), coupled with a range of (other) polygenes which serves to push the pattern colour up the hair-shaft towards the tip, thus creating the Shaded effect. The best definition of a shaded pattern is one in which the hairs are tipped with colour and the overall appearance is of a cat without striping, slightly darker along the top midline and shading to untipped (silvery white on a silver shaded, pale golden brown on a black non-silver) on the under-parts. The presence of the silver Inhibitor gene does not define a shaded cat, nor is it necessary for a shaded. The ideal to aim for in a Shaded Asian (shorthair or Tiffanie) is a cat that has black, brown, blue, etc, tipped hairs with the base colour extending at least half the way to the tip, minimal or no barring on legs and tail, a well broken necklace, and non-tipped hairs on the underbelly and inside of the legs (fig 6).

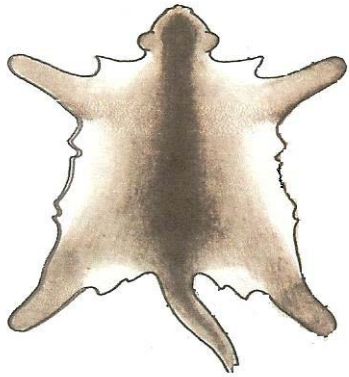


Fig 6

The ticked (see below) and shaded patterns are closely related. The pattern in both cases is defined by the overall appearance of the cat, not by the tipping of the hair. The hairs may be tipped or multiply banded in both cases. Generally in the case of the Ticked Tabby the hair banding frequency is even, the banding frequency is short giving the hairs multiple bands, and/or the colour banding travels well down the hair shaft.

The genetics of the mackerel and classic patterns are relatively simple and, as stated above largely involve a single gene, Mc.

The genetics of the Shaded are considerably more complicated, as the pattern is composed of many genes working in concert. The minimal requirements to produce a Shaded are the following attributes: agouti gene, silver inhibitor gene (in the case of a silver), the undercoat width genes (wide-banding genes) and a number of other polygenes that affect the number of bands of colour on each hair and act in clearing the residual striping on both the torso and extremities. Genetically the unpatterned cats carry either classic or mackerel "masked" by the unpatterned tabby "pattern". In the case of the ticked tabby this is caused by the T (Abyssinian) gene which contrary to popular belief probably does not determine the banding frequency on the hairs (for example determine whether the hairs are "ticked" versus "tipped"), but rather determines whether there is striping on the main part of the body, the torso.

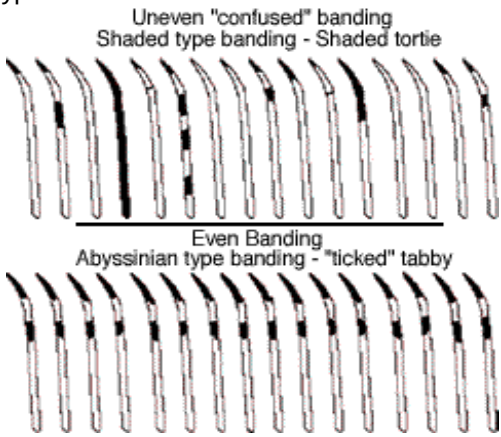
The unstriped tabby pattern of a Shaded appears to be genetically similar to or the same as the Abyssinian-type tabby (T), although whether they are identical is a matter of debate. If it is a different gene cause, it too appears to be incompletely dominant over both the mackerel and classic patterns in the same way as T. While this is the simplest view of unpatterned inheritance, the genetics of the shaded cat are more complex: a shaded is more than a homozygous unpatterned cat – it must have a wide undercoat width and proper banding of the hair so that it appears tipped with colour.

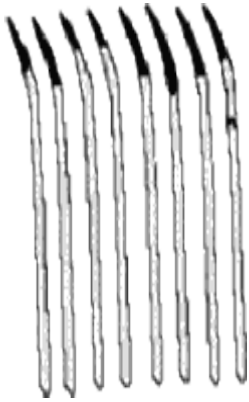
The homozygous unpatterned gene may be the most important attribute for removing striping, but other minor unpatterned genes are important in removing the residual striping and giving the final appearance of shaded. There are at least two attributes that are associated with the shading on the torso and main body of a Shaded, and these genes have been named "Chaos" and "Confusion" (Carol Johnson). A third gene has been proposed (Cathy Galfo) called "Erase" and appears to remove some of the residual barring on the extremities. These are explained further in the next paragraph.

In a good Shaded Asian the tipping on the ends of the hair may appear on quick inspection to be even, but close inspection reveals that, like snowflakes, nearly every hair is different from each other – one has a short banded tip, the next may have 2 dark bands, the next may have a medium tip, and so on (see fig 7 overleaf). Thorough inspection reveals that some hairs are even solid colours or non-tipped, and this loss of co-ordination from hair to hair has been attributed to Confusion genes – this is in sharp contrast to Abyssinian (ticked) type banding that tends to be very even. Chaos also disrupts the striped pattern and appears to be inherited independently of Confusion; it serves to eradicate residual striping that "breaks through" on the torso. In a classic tabby it is probably responsible for many cases of what is generally called "ticking" or "agouti invasion" on the pattern. Residual striping on the extremities (necklace, legs bars and tail rings) may persist even in the presence of homozygous T, Chaos and Confusion. Other clean-up genes are necessary to remove the residual stripes, and an Erase gene has been proposed as performing this function; Cathy Galfo's observations in her work with Shaded Orientals proposes that it appears to be inherited discretely to erase the residual markings.

Fig 7

Typical variation in Shaded hairs





A significant number of Shaded Asian (Burmilla) cats appearing on the show bench are exhibiting a noticeable amount of ticking (bands of colour) on hairs mixed in with shaded (tipped) hairs. This is undesirable and is leading to judges regularly questioning the registration of both Shaded and Ticked Tabby cats. It is highly necessary to address this growing problem through development of a breeding programme to improve the pattern. As shown above it is not possible to remove ticked hairs from among the tipped, but it is possible to select for the overall appearance of a Shaded pattern by working to achieve the appropriate combination of genes to build up the number of shaded/tipped hairs. This is why such attention is paid above to explaining the supposed genetic basis of a good Shaded Asian.

The Asian SOP currently allows for any amount of shading as long as it is evenly distributed; however the BAC recommend the ideal shaded pattern to be light to medium (but note that tipping so slight as to be barely discernible is undesirable). Breeders should aim to avoid a heavily shaded pattern as the visibility of ticked hairs invading the shaded is greater when the shading is heavy.

To improve the quality of the Shaded pattern breeders should select for medium to light shading (ie a build-up of the wide-banding effect so that it is strongly expressed) and choose cats for breeding that appear (ie. visually look like) Shaded (all other things, such as good type and colour, being equal). The ideal mating is Shaded to Shaded (preferably using cats with as little visible ticking in their pattern as possible) with the aim of maximising

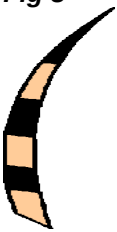
the build up of positive polygenetic effect of Widebanding, Chaos and Confusion genes. Breeders should avoid matings to cats which have minimal expression of these genes. Alternatively mating to a Smoke, particularly one exhibiting too much silver for a good Smoke would be sensible.

Ticked Tabby

This is most numerous and by far the best quality of the Asian Tabby patterns, probably because virtually all Burmese are now Ticked Tabby based (due to extensive work of Burmese breeders over a number of years to eliminate barring in the breed). However a few Ticked Tabbies are beginning to suffer the invasion of shaded hairs mingling with the ticked, also there is work to do to eliminate the effects of wide-banding genes (and of the Chaos and Confusion genes), which reduce the number of bands of ticking on the hair shaft by pushing the pattern towards the hair tip. The causes of these two problems may well be interrelated. Breeders of Ticked Tabbies should address this by avoiding mating to Shaded, Smoke or noticeably poor quality Ticked Tabby Asians. The ideal mating is Ticked Tabby to Ticked Tabby with the aim of increasing the banding towards the base of the hair shaft. Research has revealed the existence of a group of polygenes termed Banding Frequency genes – the agouti gene permits the hairs to have banded colours (Fig 8), but these other genes influence the number of bands that actually occur on the hairs. At a molecular level banding frequency probably translates to the time interval in which an agouti protein turns on and off. Breeders should select to increase the build-up of the effect of such genes.

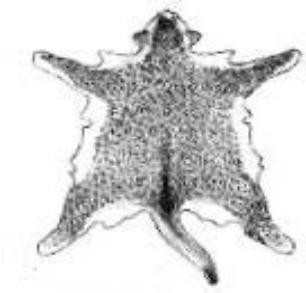
Work could also usefully be undertaken to improve the richness of the base colour in some Ticked Tabbies, by selecting the best coloured cats for use in a breeding programme (thereby maximising the number of rufus polygenes - see Fig 10). Dilute colours have a more subtle pattern the clarity of which will be improved by maximising visibility through regular ticked to ticked matings, increasing the Banding Frequency genes, coupled with the removal of the wide-bandings genes

Fig 8



A ticked patterned hair showing the desired multiple banding to be aimed for

Fig 9



TICKED TABBY

Two or three bands of colour extending well down the hair shaft. “M” on forehead; skull cap on kittens. Necklaces may be broken or unbroken; may have belly spots, may have tail rings or continuation of the spine line.

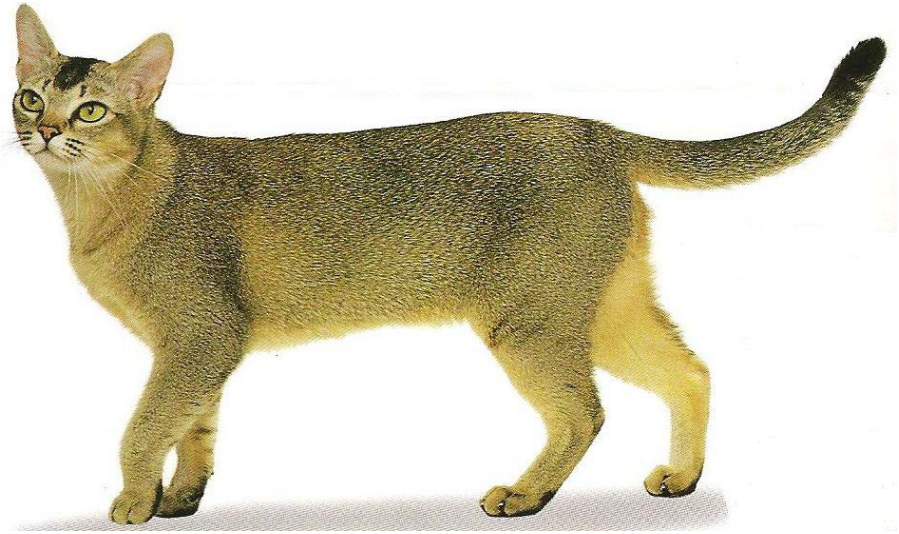


Fig 10

There is some evidence from other breeds eg. Egyptian Mau, that mating silver to standard increases the likelihood of tarnishing in silver and tends to produce standard tabbies with a cool, duller tone to the agouti base colour. Therefore breeders may consider that the ideal mating for all Asian tabby patterns is to mate silver to silver and standard to standard wherever possible.

Spotted Tabby; Classic Tabby; Mackerel Tabby

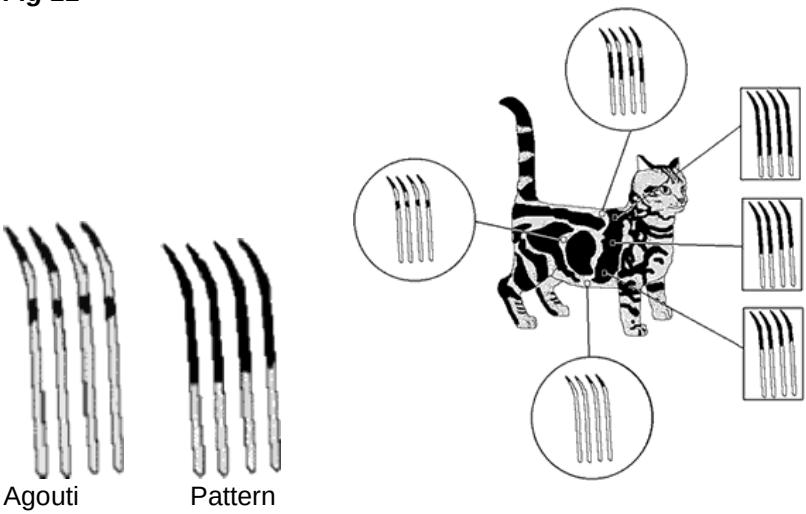
For all other Tabby patterns breeders should where possible avoid mating Spotted, Classic or Mackerel Tabbies to Ticked Tabby or Shaded (Burmilla)

as this increases the likelihood of reducing the clarity and depth of the pattern, promotes agouti invasion of the pattern, making it less distinct, and will introduce or increase the effect of the wide banding genes. The aim must be to create a clearly defined pattern with good contrast against a warm rich agouti base, or clear silver base in the case of silver tabbies, with no tarnishing. Therefore, the recommended ideal is to mate like to like (Classic to Classic, Spotted to Spotted, Mackerel to Mackerel). This does present difficulties currently because of the very small numbers, so mating to any other patterned tabby is the best alternative or, where that is not possible, a Self Asian or Burmese is a better choice than mating to a Ticked Tabby or Shaded.

Breeders should be pragmatic in the short-term and recognise the limitations of the gene pool exhibiting these patterns; it may be necessary to sacrifice some quality of type and/or coat texture in the short term in order to improve and fix the desired tabby pattern. Breeders should look to the long term objective in their breeding programme and seek to balance improving pattern and enhancing/maintaining good type.

The drawing below (Fig 11) shows the desired clear pattern to be aimed for in breeding, in this case that of a Classic Tabby and shows the variation in top colouration on hairs at different places on the body.

Fig 11



All three breeds would benefit hugely from dedicated breeding programmes. There are potentially enough cats within the Asian gene pool to develop and implement such a programme, but it needs to happen soon.

Fig 12

Fig 13

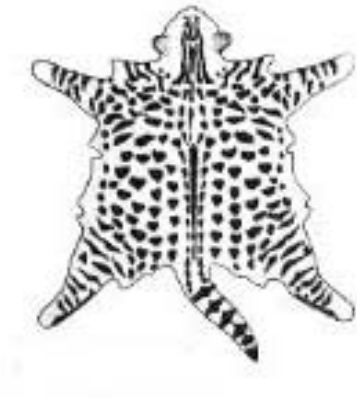
CLASSIC TABBY

"M"; Lines over head; Butterfly; Parallel spine lines; Oysters; Markings symmetrical; Broken necklaces; Blotched, spotted or barred belly; Tail banded

MACKEREL TABBY

Narrow unbroken line from head to base of tail with narrow broken line either side. Narrow vertical lines run down body. Necklaces (may be broken); spotted or barred belly; leg bars; narrow tail rings.

Fig 14



SPOTTED TABBY

Clearly defined spotting. Round and evenly distributed. Lines over head breaking on shoulders. Bars or spots on legs. Necklaces (may be broken); belly spots. Complete or broken tail rings.

There may be merit in giving consideration to the benefits of out-crossing to another recognised breed to improve pattern (eg Ocicat, Egyptian Mau), but breeders would then need to follow Asian registration policy to achieve recognition as full Asian in the 4th generation.

Tiffanie

The Tiffanie was pretty much ignored for the 1980s and only began to win some support from a few breeders from the 1990s onwards – the breed suffered in the early years from the desire to eliminate the long-hair gene from the breeding programmes of other (shorthair) Asian varieties. Much work has been undertaken since then and the Tiffanie has improved markedly in the past 15 years. It is worth restating here that the Tiffanie should exhibit exactly the same phenotype as the shorthair Asian and Burmese breeds, and because of the semi-long coat any hint of ancestral Chinchilla type (smallish ears, slightly thick limbs) tends to be accentuated and exaggerated by the longer coat. The Tiffanie will benefit from the continuation of current work to improve and fix correct type by regular outcrosses to Burmese and good quality Asian Shorthairs.

There is work still to do to improve coat length and texture and minimise if not virtually eliminate any undercoat – the coat should ideally be single and lie flat to the body. It should not "lift" away from the body as is desirable in some other semi-long hair breeds such as the Birman or Ragdoll. The Tiffanie coat tends to lengthen and thicken with age with the ruff and plume not fully evident until a cat is two or three years old (or more); breeders should be mindful of this fact when selecting cats for breeding in a Tiffanie breeding programme – a young cat that may seem to be lacking in coat length may well achieve the desired coat at full maturity and be a better breeding queen or stud than one that appears to have the "ideal" coat at a year or eighteen months old, but may well have too much coat when fully mature.

Successive Tiffanie to Tiffanie matings are as yet not desirable and out-crossing to shorthair Asians (particularly long hair carriers) and Burmese is necessary every second or third generation. Breeders are working towards a situation where the gene pool in the Tiffanie is so stable and of sufficient quality that regular Tiffanie to Tiffanie matings become the norm as is the case with, for example, the Somali.

Self, Burmese colours, Smoke, Shaded and Ticked work best in a Tiffanie; other Tabby patterns tend to be even more blurred and less distinct than the shorthair Asian and therefore need a lot more work to clear the pattern.

Fig 15 Photo Tetsu Yamazaki

Genetic Defects

It is worth commenting here on a limited number of serious genetic defects which have manifested in the Asian's ancestral breeds, however it is important to stress that to date there is little or no evidence of confirmed incidents of these genetic disorders in the Asian. Breeders should watch for symptoms and be mindful when selecting out-cross matings to Burmese

Polycystic Kidney Disease - The Chinchilla, as with all Persian breeds has suffered from PKD, a deleterious gene mutation which causes enlarged kidneys composed of dilated cystic channels, resulting in early kidney failure and death. A test is available.

Hypokalaemic Polymyopathy - a disorder which severely reduces potassium retention in the cat causing severe muscle weakness characterised by collapse of limbs and hanging of the head. The Burmese is known to suffer from this disorder. Believed to be a simple recessive gene it can "hide" for a number of generations and then appear, and in severe cases can contribute to early death. A blood sampling study is underway, but there is no general test available as yet.

Flat-chest syndrome - there is good evidence that this is caused by a simple recessive gene, but it may also have a more complex genetic cause; the disorder results in a kitten with a compressed flattened rib-cage that has difficulty in breathing, etc. It can be fatal in a number of cases, depending on degree of severity. No test is available.

Orofacial Pain Syndrome – the clinical signs are characterised by exaggerated licking and chewing movements, and pawing at the mouth. In kittens the problem resolves when teething does, but may reoccur when the cat is adult. The cause is unknown, but the condition shows similarities to trigeminal neuralgia in humans. Many of the affected cats have been closely related, but the mode of inheritance has not been determined

Pyruvate Kinase Deficiency (PK Def) and Progressive Retinal Atrophy PRA - both of which have been identified in the Somali and Abyssinian, these breeds have been used in breeding programmes abroad, to introduce the Cinnamon gene to the Asian. A DNA test is available in both cases.

Bites - Incorrect bites are an issue in the Asian; although not a serious fault in the breed, there are enough incidents to necessitate breeders monitoring their cats and kittens regularly and carefully to ensure this anomaly does not become endemic. Generally bites that are misaligned tend to be undershot, but occasionally overshot bites are seen (Figs 16 & 17)

Fig 16

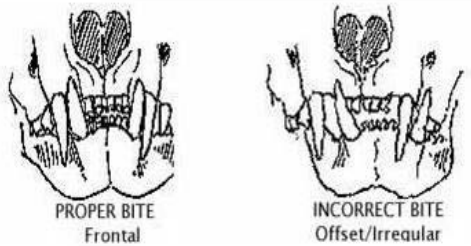
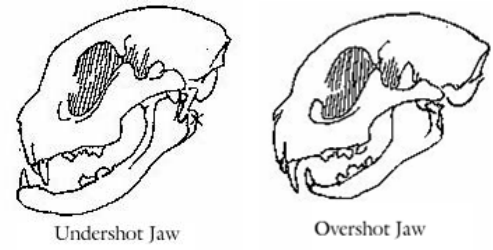


Fig 17



BAC recommendation

Asian breeders with a particular interest in a specific Asian variety are encouraged to work closely with other like-minded breeders to devise and implement a planned breeding programme aimed at improving the variety in question. The Asian BAC and the GCCF Genetics Committee are keen to offer advice and guidance to promote and support such breeding programmes.

Steve Crow, May 2009

How breed numbers work

72-- Basic breed number for the Asian shorthair (Bombay)
68-- Basic breed number of the Tiffanie (Black Self)

Colours:		Patterns:	
a	Blue	38	Spotted Tabby
b	Chocolate	41	Classic Tabby
c	Lilac	42	Smoke
d	Red	43	Shaded
e	Black Tortie	44	Mackerel Tabby
f	Cream	45	Ticked Tabby
g	Blue Tortie		
h	Chocolate Tortie		
j	Lilac Tortie		
k	Cinnamon		
m	Cinnamon Tortie		
n	Caramel		
fn	Apricot		
p	Caramel Tortie		
r	Fawn		
y	Fawn Tortie		

s Silver (Inhibitor gene)
q Burmese Colour Restriction (BCR gene)
v Variant

Examples:

72b *Asian Chocolate Self*

72 41asq *Asian Blue Silver Classic Tabby with Burmese Colour Restriction*

72 45d *Asian Red Ticked Tabby*

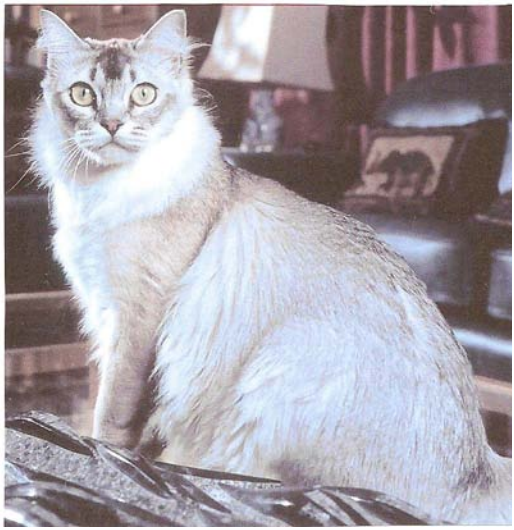
68 43ps *Caramel Tortie Silver Shaded Tiffanie*

72v *Brown Asian Variant (i.e. Brown Burmese lookalike from Asian parent/s, not eligible to be shown, but can be used for breeding)*

Brown Ticked Tabby Photo Robert Fox

Chocolate Silver Spotted Tabby(BCR) Jennifer Willis

Brown Shaded Silver Tiffanie Photo Tetsu Yamazaki



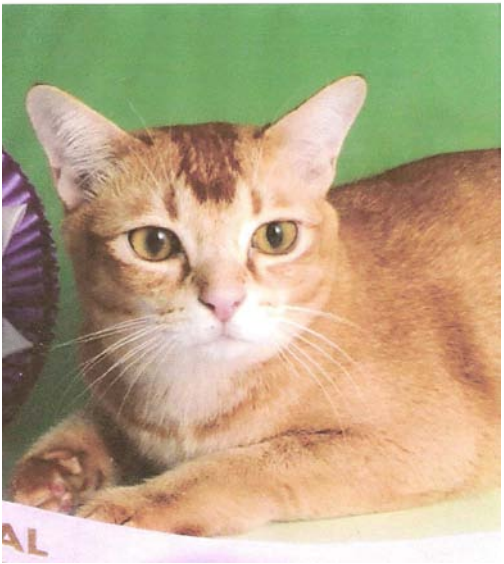
Chocolate Smoke with BCR Photo Alan Robinson

Black Mackerel Tabby Tiffanie Photo Tetsu Yamazaki

Caramel Ticked Tabby with BCR

Blue Shaded Silver Tiffanie with BCR

Photo Tetsu Yamazaki



Red Ticked Tabby Photo Alan Robinson

Photo Bruce Lauchlan

Caramel Shaded with BCR

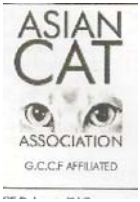
Photo Sarah Sellman

Classic Tabby Kittens

Bombay

Photo Robert Fox

Caramel Tortie Silver Shaded with BCR



 Price: £1