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The “mosaic” phase of the eastern kingsnake (*Lampropeltis getula getula*) is a naturally occurring phenotype that has been found in the coastal plain of South Carolina but may occur elsewhere. The name “mosaic” refers to the dorsal pattern of solid black rectangles surrounded by white; the name was coined by John Cherry (Cherryville Farms, Texas). John obtained a pair of kingsnakes from Craig Trumbower, who had obtained them from Ricky Walters. Ricky collected the young female of the pair from near Cross, Berkeley County, South Carolina, and the male also came from South Carolina. According to Craig, the female resembled most closely resembled the snake in Picture 19. John produced at least one clutch from this pair, but I do not know the present disposition of the original pair or their offspring.

In 1997, Heyward Clamp (Edisto Island Serpentarium) collected a mosaic female (Picture 1) on Edisto Island, Charleston County, South Carolina. The snake was captured under a sheet of tin in a field adjacent to a tidal marsh (Picture 2). Ricky Walters acquired this snake, and in August 2000, he gave it to me on breeding loan. In 2001, I bred the female with a 6-foot male eastern king from Echols County, Georgia (Picture 3), and she laid 13 eggs. All the babies exhibited normal phenotypes, although three had some pattern anomalies, such as a circular dorsal spot instead of a crossband near the head and black donuts in some crossbands (Picture 4). The white banding of their mother was replaced with yellow banding typical of southern Georgia snakes.
In 2002, Ricky provided me with a male (Picture 5) that probably came from near Cottageville, Colleton County, South Carolina. The male had wide crossbands and an aberrant pattern, but it did not have the classic mosaic pattern of the female. I bred this male with the mosaic female, producing 12 babies from 13 eggs. Five babies had normal patterns with narrow crossbands (Picture 6), and seven babies exhibited mosaicism. The five normal-looking babies did not have wide bands like their father.

Two of the females had white-tipped scales over most of their bodies and a wide, black dorsal stripe (Picture 7), similar to a juvenile, black-striped Apalachicola Lowland kingsnakes (*meansi*). The striped pattern is apparently the ultimate degree of mosaicism, just like patternless and striped morphs are for Apalachicola kings. Unlike Apalachicola kings, however, mosaic kings do not undergo ontogenetic lightening of the black scales, and the bellies tend to be black (sometimes with a few light checks on the sides). Also, both sexes are equally likely to exhibit extreme mosaicism, whereas male Apalachicola kings are more prone to be patternless or striped than are females. Like Apalachicola kings, mosaic kings have bi-colored light scales, with the rearward tip of the scale being dark. One male resembled its mother, with white speckling over most of the body and rectangular or oval black markings down the back (Picture 8). Three of the babies were partially speckled on the sides (white or orange) and had a row of black spots partially fused into a stripe down the back (Picture 9). The irregular blotches of another baby meandered across the back and were bordered with intense lighter coloration (Picture 10). One female had wide orange bands that faded with age (Picture 11). Hereafter, I will refer to mosaics from this breeding as Type 1.
Mosaicism is a variable trait that has four basic pattern permutations (listed in order from most to least extreme):

1) “striped” = black dorsal stripe (usually broken) on a light background with small, black blotches or dashes the side of the body (occasionally the dorsal pattern is extremely jumbled);
2) “oval-blotched” = black ovals or rectangles on a light background that essentially consists of a black dorsal stripe divided by wide, light bands that typically connect on the lower sides of the body (the dorsal markings may be arranged regularly or meander across the centerline);
3) “wide-banded” = wide, light bands (often with irregular borders) that are often connected on the lower sides, with the bands sometimes containing dark donuts or having short extensions of narrow dorsolateral stripes;
4) “narrow-banded” = typical narrow light bands, but a light neck stripe is usually present and sometimes band abnormalities.

Occasionally, offspring from mosaic parents will appear completely normal with no pattern anomalies. Using this pattern classification, Pictures 1, 8, and 10 are oval-blotched; Picture 5 is wide-banded; Picture 6 is narrow-banded; and Pictures 7 and 9 are striped. The classic mosaic pattern (i.e., oval-blotched) is essentially formed by light dorsolateral stripes connecting the wide crossbands. In individuals displaying only a slight degree of mosaicism, a single, one-scale-wide dorsolateral stripe may extend from a crossband, or a wide crossband may connect to the next crossband in a straight line high on the body. Another good indicator of mosaicism is a short dorsal stripe behind the head.

In 2003, I bred the same pair of mosaic kings, but only six of 11 eggs appeared fertile. None of these eggs hatched, however. I bred a heterozygous female from the 2001 breeding (Georgia male X mosaic female) (Picture 12) with the wild-caught mosaic male, producing fertile-looking eggs. Only one of these eggs hatched, and the wide-banded female displayed minor mosaicism (Picture 13). In August 2003,
Heyward Clamp gave me a pair of wild-caught kings on breeding loan from South Carolina (unknown localities) that displayed a minor degree of mosaicism (Pictures 14 and 15). Heyward also gave me a clutch of eight babies from another Edisto Island female (Picture 16). All eight babies had wide crossbands, and some displayed minor mosaicism (Picture 17); one female, however, had an oval-blotched pattern (Pictures 18 and 19), similar to John Cherry’s animals. Hereafter, I will refer to these as Type 2 mosaics, which differ from Type 1 mosaics from the Edisto Island female (Picture 1) in having a more discrete pattern on the lower sides (instead of a diffuse pattern with a lot of speckling), usually lacking a neck stripe, having narrow dorsolateral stripes when present, and apparently lacking a striped morph. The wide, often asymmetrical markings are varied and attractive. Although Types 1 and 2 have slight differences in pattern, I suspect both strains are genetically compatible.

Picture 13 – Female (opaque) produced in 2003 from a GA X mosaic female with her Type 1 mosaic father (2005 photo).

Picture 14 – Wild-caught female from SC that may be a Type 2 wide-banded mosaic.

Picture 15 – Wild-caught male from SC that may be a wide-banded Type 2 mosaic.

Picture 16 – Wild-caught female from Edisto Island, SC, that is a wide-banded Type 2 mosaic (2004 photo).

Picture 17 – Type 2 wide-banded mosaic male produced in 2003 from wild female from Edisto Island, SC (2004 photo).

Picture 18 – Type 2 oval-blotched mosaic female produced from wild female from Edisto Island, SC (2003 photo).
In 2004, I bred the original pair of wild-caught mosaic kings, producing 13 fertile-looking eggs. Only three of the eggs hatched. One male was narrow-banded, but a pair was mosaics, although the crossbands were dark orange, and the light dorsolateral stripes were missing or only one scale wide. (Picture 20). The young wild-caught female I obtained from Heyward in 2003 (Picture 14) did not produce eggs. I bred one of the 2001 Georgia X mosaic females with the mosaic male, producing fertile-looking eggs, of which only one hatched into a female with narrow, orange bands in a zig-zag pattern that did not resemble any previous offspring (Picture 21). In December 2004, Heyward gave me on breeding loan the Type 1 mosaic female from Edisto Island (Picture 16) that produced the oval-blotched baby in 2003 (Pictures 18 and 19).

On 11 April 2005, I bred an F1 2002 striped mosaic female with her striped brother (Picture 22), and she laid 10 eggs that hatched into three striped (Pictures 23 and 25), three oval-blotched (Pictures 24 and 26), one wide-banded, and three narrow-banded offspring. The normal-looking offspring had a thin dorsolateral stripe extending from at least one crossband, however. Because some of the babies did not have mosaic patterns, I concluded that mosaicism is not a recessive genetic trait displayed by homozygous recessive individuals. Therefore, their grandfather (Picture 5) was not heterozygous for mosaicism; instead, he was a wide-banded mosaic. All three wild-caught mosaic females (Pictures 1, 14, and 16) laid 14–15 eggs (total of 43), of which five appeared fertile from each female. However, only one egg hatched. The wild-caught mosaic male (Picture 5) was the primary male used, but he apparently had fertility problems. The other wild-caught mosaic male (Picture 15) was used as a backup for breeding.

In 2006, all mosaic clutches were infertile except from an F1 Type 2 oval-blotched female (Picture 19) bred with her wide-banded brother. Two of the offspring were oval-blotched and four were wide-banded, but none was striped or narrow-banded.
In 2007, the wild-caught Type 1 oval-blotched female (Picture 1) was bred with her striped son (Picture 9) and produced 17 eggs that hatched into eight striped (Pictures 27–30), four oval-blotched (Picture 31 and 32), two wide-banded (Picture 33), and two narrow-banded offspring. Four babies had all-black bellies, and three had mostly black bellies. The F1 Type 1 striped female (Picture 7) bred with her striped brother (Picture 9) laid 11 fertile and five infertile eggs that hatched into two oval-blotched (Picture 34), three wide-banded, and one narrow-banded offspring. She laid a second clutch of 12 eggs that failed to hatch. A GA X Type 1 mosaic female (Picture 12) bred with her brother produced one oval-blotched mosaic (Picture 35), one wide-banded mosaic, one narrow-banded mosaic (Picture 36), and four normal-looking narrow-banded offspring. A normal-looking, wild-caught female from South Carolina bred with a striped mosaic male produced two wide-banded babies, including one mosaic that is dissimilar to any previously produced offspring (Picture 37), indicating that the mosaic trait can express itself even when one of the parents is not a mosaic. A wild-caught, Type 2 wide-banded mosaic female (Picture 16) bred with her son (Picture 17) produced 12 wide-banded mosaic offspring (Picture 38).
Picture 27 – Type 1 striped mosaic male (2007 photo).

Picture 28 – Type 1 striped mosaic female (2007 photo).

Picture 29 – Type 1 striped mosaic female (2007 photo).

Picture 30 – Type 1 striped mosaic female (2007 photo).

Picture 31 – Type 1 oval-blotched mosaic male (2007).

Picture 32 – Type 1 oval-blotched mosaic female (2007).

Picture 33 – Type 1 wide-banded mosaic female (2007).

Picture 34 – Type 1 oval-blotched mosaic male (2007).
Picture 35 – Oval-blotched mosaic female produced by a GA X Type 1 mosaic female bred with brother (2007 photo).

Picture 36 – Narrow-banded mosaic female produced by a GA X Type 1 mosaic female bred with brother (2007 photo).

Picture 37 – Wide-banded mosaic female produced by a normal SC female bred with a Type 1 mosaic male (2007).

Picture 38 – Type 2 wide-banded mosaic female produced by a wild-caught female bred with her son (2007 photo).

The interest in this new pattern phase is extremely high, but only experienced herpetoculturists should attempt to keep mosaic kings. The babies tend to be reluctant feeders on mice, preferring to eat lizards or snakes. This preference for reptiles probably reflects their South Carolina origin, because F1 and F2 mosaic offspring from the Georgia male are voracious rodent feeders.

I am indebted to Ricky for entrusting me with my first pair of mosaic kings and to Heyward for providing me with additional specimens on breeding loan. I had poor breeding success (male fertility problem?) in 2003–2006, but 2007 was finally a good year. I am not aware of other striped or oval-blotched mosaic kings being produced by other breeders, although wide-banded mosaics are occasionally captured and bred. The last time I communicated with John Cherry, he said that he had given his mosaic kings to someone else, and he no longer mentions them on his price list. Some weird-looking kings that Will Still produces (Picture 39) from southern Georgia stock of mine may be mosaics, and I occasionally produce wide-banded, aberrant-looking F2 kings from Georgia stock (but not like Will’s).

Picture 39 – Possible F2 mosaic produced by Will Still from my Georgia stock (photo by Will Still).