

NOTES ON NATURAL HYBRIDIZATION

BETWEEN *Natrix natrix* AND *Natrix tessellata*

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EUROPEAN WATER SNAKES

In Italy there are three different species of the genus *Natrix*, the European water snakes. The grass snake (*Natrix natrix*), dice snake (*Natrix tessellata*) and viperine snake (*Natrix maura*). All are associated with aquatic habitats. *Natrix maura* and *Natrix tessellata* are better adapted to an aquatic lifestyle, whilst *Natrix natrix* is also found away from water.

Natrix natrix is polytypic with many subspecies. In Italy there are three: *Natrix natrix cetti* (Sardinia), *Natrix natrix helvetica* (Central and North-western Italy) and *Natrix natrix natrix* (North-eastern Italy). Some herpetologists add two other subspecies, *Natrix natrix sicula* (Sicily) and *Natrix natrix calabra* (Calabria). *Natrix maura* and *Natrix tessellata* are both monotypic.

Their prey consists of frogs, toads, tadpoles, fish, salamanders and newts, occasionally lizards and mice are consumed. European water snakes are oviparous and are very prolific. *Natrix natrix* can lay up to 70 eggs. It is well known that these three water snake species can interbreed in captivity. Their hybridization has not been reported in the wild, therefore, this event could be the first case in Italy which has been documented.



Natrix tessellata. Photo by: Dr. Stefano Pavan.





A NATURAL OCCURRENCE

In June 1996 we found a male *Natrix natrix* mating with a (female) *Natrix tessellata* near the Tagliamento River (Udine, Italy). When the mating ceased, we captured the female *Natrix tessellata* and maintained the snake in captivity, in a terrarium, where it ate goldfish and frogs. After one month the snake laid 11 eggs. We put them in an incubator ("au bain marie"), and released the female in the same place where we found her.

After an incubation period of 36 days, all eggs hatched. The breeding data are shown in

Table 1. The neonates had two different phenotypes. One was termed "tessellata-like" because it was similar in appearance to *Natrix tessellata*, (6 neonates had this phenotype). The other was termed "intermediate" because the other 5 neonates shared similarities with both *Natrix natrix* and *Natrix tessellata*. They had the typical "collar" of *Natrix natrix* and some external characteristics of *Natrix tessellata*. We measured length, weight, collar and number of upper labial and preocular scales, and noted some interesting differences between the hybrids and wild-type *Natrix natrix* and *Natrix tessellata*. Table 2 shows the results of the analysis of phenotype.



Hybride, after 2 hours. Photo by: dr. Stefano Pavan.

	Date	Temperature(°C)	Humidity(%)
Mating	June 1996		
Egg-laying	3 rd July 1996		
Number of eggs	11		
Incubation		28-30	100
Born	Augustus 1996		
Death	10 after a few months; 1 after one year		

Table 1: Data of hybridization between *Natrix natrix* and *Natrix tessellata*

	Phenotype "tessellata-like"						Phenotype "intermediate"					<i>Natrix natrix</i>	<i>Natrix tessellata</i>
Hybride number	1	2	3	4	5	6	7	8	9	10	11		
Total length (cm)	23	22.5	21	23	21	22.5	23.5	24	22.5	24.5	23.7	11/21	15/22
Weight (gr.)	4	3.5	3.5	3.5	3	3.5	3.5	3	3	4	3.5	4/5	4/5
Collar	-	-	-	-	-	-	+	+	+	+	+	+	-
Upper lab. scales right	7	8	8	8	8	8	7	8	8	8	7	7	8
Upper lab. scales left	8	8	8	8	8	6	7	8	7	8	7	7	8
Preocular right	2	2	2	2	2	2	2	2	2	2	2	1	2
Preocular left	2	2	2	2	2	2	2	2	2	2	2	1	2

Table 2: Phenotypic comparison of hybrids *Natrix natrix* x *Natrix tessellata*

All neonates ate tadpoles and small goldfish, and appeared healthy. Despite this they died after a few months, except one "intermediate" form which lived for a year. The causes of death were unknown. The snakes showed no morphological or physiological abnormality. It is probable they had some metabolic or hor-

monal deficiency which retarded their growth, however it is very difficult to identify specific reasons for this high mortality.

Translation: *Gijs van Aken*
Corrections: *Lawrence Smith*

