

Twins in *Lacerta nairensis*

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INTRODUCTION

Twins are not uncommon, and the phenomenon is also known in reptiles. In newspapers it is usually the larger species that make headlines, thus it may be underreported in smaller forms. However, in lizards of the family Lacertidae it is much less common.

In turtles the phenomenon of twins has been reported fairly frequently. This usually pertains to Siamese twins (e.g. MÄHN (1996) for *Testudo marginata*), or to animals found dead in the egg or in which one of the two specimens is not viable (e.g. HEIMANN (1993) for *Testudo marginata*, O'CONNELL (1997) for *Chelydra serpentina* and GAD (1987) for *Sternotherus odoratus*). In twins of both snakes and iguanas there is also usually something amiss with the animals (e.g. KINKAID, 1996 and BRAUNWALDER, 1979).

TWINS

Over the years, I have incubated roughly 15,000 lizard eggs, and probably even more. Apart from the present case, I have only seen one other set of twins. This concerned *Algyroides fitzingeri*, which on May 30, 1988 produced a fairly large egg containing almost identical juveniles. They measured (head-body + tail) 18+30 mm and 18+31 mm and weighed 0.15 and 0.16 g, respectively. Compared to the normal sizes of hatchlings in this species (IN DEN BOSCH, 1987: 20+35 mm and 0.21 g) they were small, but adding both masses of the young together, yields a much higher weight than one egg usually produces. I was abroad at both the time of oviposition and of hatching so unfortunately neither the weight of the egg at laying nor the exact date of oviposition have been recorded.

LACERTA NAIRENSIS

In 1992 I received four specimens of *Lacerta nairensis* from a German acquaintance (Wickler), and the female that laid the eggs from which the twins resulted is one of the original "founding mothers". The exact geographic origin of these animals was unspecified, but most probably they hail from Armenia. The species also occurs in southern Georgia along the Kura, and in northeastern Turkey (DAREVSKII, 1978). The form *nairensis* has for a long time been regarded to be a part of *Lacerta raddei*, but BOBYN et al. (1996) finally decided that it deserved species status. With the ongoing division of the genus *Lacerta* some scientists prefer to assign the species to the newer genus *Darevskia* (Bischoff, pers. com.), but in this paper I am deliberately conservative because that name is not yet well established. In fact, only the person who proposed the change (ARRIBAS, 1997) and a few directly involved colleagues (e.g. MCCULLOCH et al., 2000) seem to use this designation.

In my vivaria a female *L. nairensis* usually oviposits once a year, rarely twice per season. The number of eggs ranges between four and seven, with an average of five. At 25°C, incubation takes 53-54 days. An average healthy hatchling measures 28+47 mm and weighs 0.44 g (n=24).

The only clutch of the wild-caught female *L. nairensis* from 1992, consisted in 1999 of four eggs weighing between 0.42-0.49 g. Remarkably, it was the lightest egg of 0.42 g that contained the twin. After fifty days both young hatched from that egg. They measured 23+32 mm and 20+27 mm and weighed 0.24 g and 0.15 g, respectively.

DISCUSSION

The *L. nairensis* twins hatched after 50 days at 25°C, three days earlier than the average of 53-54 days. The weight of the egg was slightly below that of the average *L. nairensis* egg. Commonly, a lacertid hatchling weighs just a little bit less than what the egg mass was at oviposition (IN DEN BOSCH & BOUT, 1998). Indeed, in this case the combined weight of both young (0.39 g) is slightly less than the 0.42 g immediately after laying. In this instance both young seem to have shared the egg-yolk and the twins are thus probably monozygotic. Though obviously smaller than regular hatchlings, the animals are perfectly healthy.



The *Lacerta nairensis* twins.

Photo: H.A.J. in den Bosch

The *A. fitzingeri* twins described earlier were presumably fraternal twins, because their total weight is more than one third of the mean of the species and they are just minimally smaller than what is common.

In Green Iguanas (*Iguana iguana*) the appearance of twins is fairly well-known (PADUR, 1998) and also the Dutch zoo Ouwehands Dierenpark has more than once hatched twins in this species (Boonman, pers. comm.). This frequent occurrence may point to an environmental influence, but also to a genetic cause.

In humans 1:80 births are twins (cd-rom MOSBY'S MEDICAL ENCYCLOPEDIA, 1997). Genetic factors are of overriding influence in our species. Of course, in herpetology much less is known about the phenomenon. On the other hand, a fair amount of literature exists for economically interesting animal groups, like pedigree cattle. For instance, in certain groups of cows over 13% of the deliveries involve twins (GOSZCZYNSKI & SKULMOWSKI, 1977). A striking increase occurs in another breed of cattle when transported to a warm and dry climate (in the case described, Saudi Arabia) from a base level of 1% to as high as 13% (RYAN & BOLAND, 1991).

Much rarer than reports of twins are indications of frequency of incidence. HILDEBRAND (1938, cit. in LEHMANN, 1984) found in an outdoor breeding experiment only one twin in 100,000 young of *Malaclemys terrapin centrata*, though it is stated that he may have missed some. YNTEMA (1969) reported that 1% of *Chelydra serpentina* eggs were twins. TUCKER & JANZEN (1997) found a much lower percentage for the same species (2 of the 1289 eggs: 0.16%), and they report 10 eggs with twins in 4943 eggs of *Trachemys scripta elegans* (0.2%). Though the number of twins per egg was not significantly different between the two species, it was clear that in *C. serpentina* there were more females that produced twins.

TUCKER & JANZEN (1997) suggested that the production of twins is not a good strategy in these species because, even if they survive the egg stage, they are usually much smaller and have less chance of survival.

For lizards I have been unable to find statistical relevant reviews devoted to frequency of incidence.

Considering my experience with only two twins in 15,000 lacertid eggs, the event is rare in the Lacertidae. Supposing that perhaps the odd twin was missed because the egg spoiled at an early stage of development, then 1:5000 is a rough estimate. Even if I am a factor 10 off the mark (for instance because of more embryos that died early on) even so twins – at least in my sample – occur sporadically: 0.02-0.2%.

For the moment, the extent to which vivaria conditions (keeping in mind how climate affected pedigree cattle) and genetics affect the Lacertidae, remains unidentified.

Very recently, PANNER (2000) mentioned in passing the hatching of one set of twins in *Lacerta* cf. *rudis*. One of these hatchlings showed clear signs of scoliosis and died after some time. Neither of 'my' twins has experienced any problems. The *A. fitzingeri* grew to adulthood and reproduced, while the young *L. nairensis* grow satisfactorily.

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SUMMARY

The phenomenon of twins is very rare in lacertids. This conclusion was reached by looking at a recent instance of twins hatching from a single egg in *Lacerta nairensis*, an older but comparable occurrence in *Algyroides fitzingeri*, as well as my personal experience over many years of incubating lizard eggs. It is estimated that twins occur in 1:5000 to 1:500 eggs.



An adult male *Lacerta nairensis*.

Photo: H.A.J. in den Bosch

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