Among oviparous reptiles, twinning has been reported for several taxa: chelonians (Lehmann, 1984; Cohen, 1986; Eckert, 1990; Stumpel, 2007), crocodilians (Platt et al., 2001), and squamates (Curtis, 1950; Carpenter and Yoshida, 1967; Marion, 1980; Kinkaid, 1996; Wallach, 2007). However, the appearance of a triplet from a single egg has only been reported by Krauss and Horn (2004) for the Lace Monitor *Varanus varius* (White 1790). I hereby report an instance of a triplet in the Panther Chameleon *Furcifer pardalis* (Cuvier 1829).

Both parents were captive bred and unrelated specimens from the colour, - or local morph “Ambilobe” (e.g. in Müller and Lutzmann, 2016). The male was approximately one year of age. The female was approximately two years of age and copulated for the first time. After the first observed mating on the 19th of March in 2017, animals were separated due to the subsequent aggressive behaviour of the female. Hereafter, the female produced one clutch deposited on the 7th of April (19 days after mating) containing 24 eggs. This clutch showed 14 eggs that were notably smaller and started to mould after several days. The remaining 10 eggs showed normal development and were equally sized. They were incubated at 26°C for 75 days, followed by a cooler period of 23°C for 60 days and then 26°C until the last hatchling emerged. Incubation took place on vermiculite in an incubator of the model “Lucky Reptile Herp Nursery II”. The first hatchling appeared on the 6th of November (7 months of incubation), showed relatively lethargic behaviour and died after 20 days. From the residual nine eggs, hatchlings were noted protruding from all but one egg between the 6th and 9th of December (8 months of incubation). However, the remaining egg showed slashes in the shell, but no hatchling emerged for three days (until the 9th of December). After having been manually opened, the egg contained two live hatchlings and one dead, malformed offspring (see Fig. 1). The malformed embryo had clearly died some days before the egg was opened as the skin had begun to deteriorate. Remarkably, the malformed embryo did not exhibit functional eyes or a mouth (Fig. 2). The two living individuals were smaller (SVL) and lighter (2.2 cm, 0.2 g and 2.3 cm, 0.2 g respectively) than the remaining siblings from the same clutch (*n*=8, 3.03 ± 0.05 cm; 0.69 ± 0.04 g; mean ± SD). Both were kept together and were separated from their bigger siblings in one enclosure. Food (Drosophila, micro crickets) were offered and water was provided by spraying daily. Both were
drinking, but no feeding attempt was ever observed. After eight days, both individuals died. Throughout their lifetime, both showed very lethargic behaviour. The other eight juveniles showed normal development without any case of death. Interestingly, the same female laid an additional clutch containing 28 fertile eggs at the 8th of June, which must have been fertilized from the stored sperm during the first mating.

In the literature, a case of triplets in reptiles was only mentioned once (Krauss and Horn, 2004). This is the second description of a one-egg triplet in reptiles and the first in chameleons. The offspring from the triplet of Lace Monitors were vital (Krauss and Horn, 2004), whereas the triplet in the Panther Chameleon contained two weak individuals and a deformed dead one. However, even twin embryos of reptiles rarely survive or hatch successfully (Schmidt, 1995), indicating that the probability of survival for triplets is possibly by far exacerbated.

Besides the triplet, this clutch was remarkable in additional aspects. First, the comparatively early hatching of one individual that appeared one month earlier than the remaining siblings did. Despite differences in incubation temperature in the nest, numerous reptile species show synchronous hatching (Furguson, 1985; Vitt, 1991; Doody et al., 2001), which facilitates the digging to the surface and improves the survivorship of neonates (Carr and Hirth, 1961). Thus, the early hatching of this individual is rather exceptional. Although the inside temperature of the incubator appears homogenous at the position of the box, any small temperature gradient in the incubator might have possibly accelerated the development and lead to the early hatching of this specimen. This is supported by the fact that this egg had a slight outer position in the box. Moreover, the first clutch, resulting relatively fast after mating, contained only 41.7% of fertilized eggs whereas the second one, which was fertilized by sperm that was stored for several weeks, contained 100% fertilized eggs. This clutch containing 28 eggs showed a rate of 100% hatching of agile juveniles with an average SVL of 2.95 ± 0.06 cm, and weight of 0.69 ± 0.04 g.

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References


**Triplet from a single egg in the Panther Chameleon**

*Accepted by Werner Conradie*