

# A Note on Longevity in the Quince Monitor in a European Zoo and Potential Needs for Maintaining a Sustainable Population Under Human Care

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**Abstract** – We report on a large male Quince Monitor (*Varanus melinus*) that had been held at Cologne Zoo for 12 years and reached 20 years in age. We further describe the *V. melinus* group held at Cologne Zoo, which includes another very large male that hatched at the zoo in 2009 and measures 152 cm in total length. The importance of long-term collection planning is discussed as being crucial for managing monitor lizard species in zoological parks. According to the Zoological Information Management System, the current European zoo population of *V. melinus* consists of 14.5.9 individuals (male.female.unsexed) that are held in nine institutions; however, five institutions keep single animals and only three zoos currently keep females. To sustainably manage the ex situ population of *V. melinus* in the future, it will be important to develop a network of institutions with sufficient keeping capacities. As a first step, a Mon-P (monitoring program) for the species was established within the European Association of Zoos and Aquaria (EAZA) four years ago. Centrally coordinated and regulated cooperation with private keepers, as already successfully practiced in Europe by “Citizen Conservation” for amphibians, could be an additional promising approach to maximize available space and combine forces. *Varanus melinus* is a comparatively easy to keep member of the *V. indicus* complex with usually calm behavior and a high exhibition value.

On 24 December 2019, a large male Quince Monitor (*Varanus melinus*) died at Cologne Zoo. This individual had been kept in Cologne Zoo’s terrarium section since January 2007 and was hatched in 1999 according to its previous owner. When we measured the male in 2010, it was one of the largest known individuals at that time with a snout-vent length (SVL) of 51 cm and a total length (TL) of 118 cm, together with our former breeding male which had a TL of 128 cm (see Ziegler *et al.*, 2010). Unfortunately, this male did not produce offspring at Cologne Zoo; the female it was paired with laid eggs at least twice but without signs of fertility, and died in October 2008 from bacterial sepsis. Nevertheless, with its impressive body size and bright yellow color pattern it served as a valuable ambassador for its species right at

the entrance to the zoo’s terrarium section, where it was housed in a large exhibit (300 x 180 x 250 cm [l x w x h]) for several years. Here, the *V. melinus* was the starting point for many guided tours that highlighted recently discovered monitor lizard diversity and the threats and conservation needs of island endemic monitor species, while our breeding pair and offspring were kept behind the scenes.

In 2015, the male was moved behind the scenes as it began to show signs of aging (*i.e.*, decreased activity and impaired vision). Although we assume that it was nearly blind during the last few years, it never had problems navigating its enclosure besides sometimes needing several attempts to find moving prey items such as locusts.



Fig. 1. *Varanus melinus* male which reached an age of 20 years and died in December 2019 at Cologne Zoo. Photographed by **Thomas Ziegler**.

In August 2019, it underwent surgical treatment due to a small wound on the back. Thereafter, a bacterial skin infection developed on the head and back, which was treated with antibiotics. In December, the animal's general condition suddenly worsened and it died rather unexpectedly within a few days. The cause of death remains unclear, as necropsy revealed no signs of organ damage or abnormalities except for blood congestion in the liver; the skin was in a state of healing. Sepsis initially caused by the bacterial infection seems to be the most likely underlying cause of death. At the time of its

death, at the age of 20 years, the male was still in a good nutritional condition and had a weight of 3,795 g, with the abdominal fat bodies weighing 445 g. SVL was 53.5 cm and TL was 129 cm.

Our current *V. melinus* stock at Cologne Zoo consists of one very large (152 cm TL) male that hatched at the zoo in 2009 which is currently kept on public display, and 2.2 individuals maintained behind the scenes, of which 1.1 were acquired from two different confiscations and 1.1 are captive bred offspring from a private collection. As our breeding female, which produced several offspring, unfortunately died in 2011, we decided to purchase four captive-bred juveniles in 2014. Of these four individuals, only one turned out to be female. Being around six years old, our two females are approaching reproductive size and we hope to continue breeding the species in the near future.

The case of *V. melinus* at Cologne Zoo shows that long-term collection planning is crucial for managing monitor lizard species in zoological parks, as it can take several years until individuals can be sexed and reach sexual maturity. Additionally, as shown by our male, individuals can reach old ages. Although the species has been successfully reproduced several times in zoos (e.g., in Prague Zoo), the zoo population remains unstable, in part due to the limited number of institutions keeping the species and a general lack of space in zoos. On the one hand, there is limited availability, particularly of females; on the other hand as we have experienced, it can be difficult to place surplus individuals (male or unsexed juvenile) in zoos. The limited availability of adult breeding females may lead zoos to acquire other



Figs. 2 & 3. Large *V. melinus* male on exhibit in the public facility at Cologne Zoo's terrarium section. This individual was bred at Cologne Zoo in 2009 and measures 152 cm in total length. Photographed by **Anna Rauhaus**.

species. Thus, some individuals might disperse outside of the zoo community's reach, as there are faster ways to transfer surplus individuals to private collections. According to the Zoological Information Management System (ZIMS, 2020), the current European zoo population of *V. melinus* consists of 14.5.9 individuals (male.female.unsexed) that are held in nine institutions; however, five institutions keep single animals and only three zoos currently keep females. The loss of just one of the few reproductively active females can set back breeding efforts for the species several years, as was the case at Cologne Zoo, where we first had to raise females from juveniles in order to start over when our breeding female died. Prague Zoo recently experienced breeding success with its own offspring, but also reported to have surplus males (P. Velensky, pers. comm.).

To sustainably manage the ex situ *V. melinus* population in the future, it will be important to develop a network of institutions with sufficient keeping capacities. As a first step, a Mon-P (monitoring program) for the species was established within the European Association of Zoos and Aquaria (EAZA) four years ago. Besides breeding, which requires multiple spacious facilities for males and females, keeping single males for exhibition purposes could be an important contribution to maintaining the population and would be a feasible option for zoological institutions that can only provide one enclosure.

Perhaps centrally coordinated and regulated cooperation with private keepers, as already successfully practiced in Europe by "Citizen Conservation" for amphibians (<https://citizen-conservation.org/?lang=en>), could be an additional promising approach to maximize available space and combine forces. *Varanus melinus* seems to be bred quite regularly in private hands in Europe; however, data on wild population numbers are still lacking and it is assumed that there has been a severe decline due to over collecting for the live reptile trade (Koch *et al.* 2013). Increasing the number of captive-

bred individuals and building up a stable captive breeding stock could also help to take pressure off the wild population. Of course, *V. melinus* is just one of several geographically restricted monitor species which are underrepresented in zoos (Ziegler *et al.* 2016), but as there is already a considerable number of individuals kept in Europe both in zoos and private collections it would certainly make sense to continue efforts for this species - especially since *V. melinus* is a comparatively easy to keep member of the *V. indicus* complex with usually calm behavior and a high exhibition value.

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## References

- Koch, A., T. Ziegler, W. Böhme, E. Arida & M. Auliya. 2013. Pressing problems: Distribution, threats, and conservation status of the monitor lizards (Varanidae: *Varanus* spp.) of Southeast Asia and the Indo-Australian Archipelago. *Herpetological Conservation and Biology* 8: 1–62.
- Ziegler, T., A. Rauhaus & I. Gill. 2016. A preliminary review of monitor lizards in zoological gardens. *Biawak* 10(1): 26–35.
- Ziegler, T., N. Rütz, J. Oberreuter & S. Holst. 2010. First F2 breeding of the quince monitor lizard *Varanus melinus* Böhme & Ziegler, 1997 at the Cologne Zoo Aquarium. *Biawak* 4(3): 82–92
- ZIMS. 2020. Zoological Information Management System, Species 360. <http://zims.species360.org/>. Accessed: 20 January 2020.