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THE IMPORTANCE OF LIGHTING FOR REPTILES

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Lighting is an important aspect in the management of reptiles, but it is often underestimated and is poorly understood. Few studies have looked at the beneficial effects of proper lighting to captive reptiles and more research is needed to produce hard evidence that proper lighting is necessary for reptiles. At the moment, the most detailed and complete source of information of lighting in reptiles is a website: www.uvguide.co.uk. On this website, all aspects of lighting are professionally evaluated.

In the wild, reptiles follow a daily and seasonal pattern that is regulated by the sunlight. Solar light is divided into visible light and ultraviolet (UV) light and reptiles are able to see both. In any indoor reptile enclosure white light using incandescent or halogen lamps and UV lamp should be provided in order to mimic the light wavelength of the sun and recreate a more natural enclosure.

UV-b light, a fraction of the ultraviolet light, is also essential for the reptile in order to produce Vitamin D3 (25-hydroxyvitamin D3) necessary to absorb calcium from the diet and prevent hypocalcaemia and many other related diseases.

Recent studies have demonstrated that plasma concentrations of vitamin D3 are higher in reptiles that are provided with supplemental UV lighting. These studies were conducted on bearded dragons (*Pogona vitticeps*) (*Oonincx et al.* 2010), corn snakes (Elaphe guttata) (*Acierno et al.* 2008) and red eared sliders (*Trachemys scripta elegans*) (Acierno et al. 2006). One study showed that captive animals kept without UV light supplementation were unable to maintain the same plasma level of vitamin D3 that wild animals have (*Oonincx et al.* 2010). The other two studies demonstrated that plasma concentration of vitamin D3 was higher in captive reptiles kept with UV light source that in the control group (*Acierno et al.* 2008; 2010).

Another study showed that marine reptiles also suffer from the lack of UV light. In 2009, Purgley *et al.* demonstrated that the plasma concentration of vitamin D3 in green sea turtles (*Chelonia mydas*), moved from an outdoor to an indoor facility with no UV light, gradually decreased over a period of six – eight years from 60-70 nmol/L to 5-15 nmol/L.

Vitamin D3 supplementation is necessary to absorb calcium from the gut and it is advisable to add to the diet. However, supplementation is not effective in raising the plasma concentration in reptiles that are not exposed to UV-b light (*Oonincx et al.* 2010).

Another important consideration is where to place the UV light source within the reptile enclosure in order to potentiate the beneficial effects of it. UV-b radiation diminishes with the distance from the source and it needs to be placed at a distance of 20-30 cm from the reptile. It should also been placed near a heating source because warm skin activates the entire process of vitamin D3 production.

Fig 1. Outside reptile enclosure (Livia Benato)

Fig 2. Measuring the UVB output from a reptile bulb (Livia Benato).

UV-b light is filtered by glass, plastic and small mesh netting. If the animal is separated from the UV-b source such as lamp or sun by these materials, it will not receive enough radiation to produce vitamin D3. To mitigate this problem a Scottish company, QD Plastics Ltd, produces and sells a plastic material that is permeable to ultraviolet light and it could be the optimal solution for safe outdoor enclosures. The limitations of these plastic sheets are that they need constant cleaning and maintenance in order to be effective and that damage to the surface and growth of algae can stop UV light.

Nowadays, many organizations and zoological collections are putting their efforts together to prove the benefits of proper lighting not only in captive reptiles kept in private and public collections but also in wild animals that after a period of rehabilitation need to be released back into the wild.

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