

USE OF FULL SPECTRUM ULTRA-VIOLET LIGHTING AT THE ARIZONA-SONORA DESERT MUSEUM

Ultra-violet radiation derived in nature from sunlight has long been recognized as essential for the synthesis of vitamin D₃ in many organisms. Vitamin D₃ is essential for the assimilation of calcium and phosphorus from the diet.

At the Arizona-Sonora Desert Museum we utilize artificial full spectrum lighting in constructing suitable indoor environments for many reptiles. Our standard lighting arrangement incorporates a 24" or 48" fluorescent shop light fixture in which we install one Vita-Lite bulb and one BL type blacklight bulb. It is critical that the latter be the BL type and not of the BLB type blacklight. This lighting unit is situated from 8" to 20" above the substrate or basking spot for the animal(s). A ceramic clip-on incandescent lighting fixture is generally used in tandem with the fluorescent fixture to spot-heat an area beneath the full spectrum lighting. This provides the natural combination of bright UV-rich light and warmth which many ectothermic (cold-blooded) animals seek and require. The wattage of the heating lamp is determined by the size of the enclosure and specific needs of the species. A hiding area which allows the animals to retreat from the light and heat source is essential. The thermal tolerance and comfort limits for the animal must be considered at all times. We install both lighting units on an electrical timer which we change throughout the year according to the natural photoperiod for the locality from which the specimens were collected. Generally speaking, most reptiles and arthropods benefit from an 8-12 hour light cycle, followed by darkness. Under no circumstances should the lighting be left on 24 hours a day. There is an approximately 50% loss in UV efficiency for every foot the lights are raised above the substrate. Also, the full spectrum bulbs become progressively weaker in UV output with time. We therefore change our bulbs every 2 years even though the light output may appear to be the same. The blacklights used at ASDM are manufactured by General Electric, models F20T12-BL

(20 watts) and F40 BL (40 watts). Westinghouse also manufactures a BL type blacklight, models 20T-12 BL (20 watts) and F40 BL (40 watts). The Vita-Lite is manufactured only by DuroTest, North Bergen, New Jersey. Other full spectrum lighting of comparable quality are the Westinghouse "Colortone 50," the General Electric "Chroma 50," and the "Verilux" tube by Verilux, Inc. The lighting should be described as "full spectrum", which is distinctly different from "broad spectrum," and should have a Color Rendering Index (C.R.I.) between 90 and 100.

This lighting arrangement is particularly beneficial for lizards and turtles, especially rapidly developing young. Nutritional diseases associated with Vitamin D₂-D₃ conversion seem to be prevented by the use of this lighting system in conjunction with a proper and varied diet.

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