Repti-Lighting: The Automated Solution to Prevent Calcium Deficiency in Reptiles

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The number of reptiles kept as pets in the United States alone currently stands at 9.4 million and all of them are susceptible to lack of proper UVB exposure. UVB light is required for vitamin D synthesis, allowing calcium absorption from food. Insufficient UVB exposure leads to serious health issues affecting bone and muscle strength. Excessive UVB exposure results in damage to the skin and eyes. UVB light allows the synthesis of vitamin D not just in reptiles but also in humans. An automated UVB light fixture would ensure reptiles receive proper UVB lighting in virtually any environment, at a fraction of the cost. The same technology can also be applied to humans as an alternative to expensive phototherapy units for prevention and treatment of vitamin D deficiency. The automated UVB light fixture mimics traditional fixtures available on the market. However, the side flaps of the fixture have the ability to rotate on a single axis while being adjusted by servo motors. The angle of the side flaps are adjusted based on inputs from UVB sensors. The fixture automation utilizes an arduino microcontroller to implement a corrective algorithm to ensure consistent ideal UVB intensity levels throughout the tank. This research explores different algorithms and fixture materials to fabricate an automated UVB fixture that ensures the correct UVB intensity levels within 95% accuracy with sensors at only 2.4% of the cost of UVB meters. This smart UVB fixture provides unparalleled performance--accurate UVB measurements, automatic, and easy to keep any pet reptile healthy.

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