

TOXICITY OF “LIGHT STICK” WASTE

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Chemiluminescent plastic rods, called “light sticks”, are used by fishery companies and discharged on the shore. Local inhabitants use their contents as repellents, tanning oil, and medicine. Light emission arises from chemiluminescent reaction of oxalate esters with H₂O₂ in viscous solvent, catalyzed and photosensitized by a fluorescent PAH. We investigated the cellular and molecular toxicity of light sticks collected on Bahia (Brazil) beaches. The reaction of light stick content with 2'-deoxyguanosine was assessed by HPLC/UV/ESI/MS, and with albumin by MALDI/TOF/MS. HepG2 cells were incubated with 0.25–1 μL light stick solutions (16 h) and the survival was determined by MTT assay. Oxidative damage to DNA was assessed by 8-oxo-2'-deoxyguanosine analysis through HPLC/electrochemical detection. 2'-Deoxyguanosine/light stick incubations led to formation of an adduct with *m/z* 408 [M+H]⁺ (addition of 140 Da to deoxyguanosine). Albumin adducts were attested by an increase of 10,000 Da in the albumin mass. Cell survival decreased with increasing concentrations of rod content, and a 3-fold increase of 8-oxo-2'-deoxyguanosine level was found in treated cells (0.25 μL). Data obtained point to genotoxicity and cytotoxicity of light stick solutions and alert to formulation of laws to ban their uncontrolled use. Acknowledgments: FAPESP, CNPq (Universal and Milênio-Redoxoma), PRP/USP; Dr. Di Mascio, P., and Dr. Medeiros, M.H.G. for the mass spectrometer and HPLC systems; Fabiano P. Barretto for providing the light sticks.