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Study of harmful UV radiation emissions from compact fluorescent lamps (CFL) retailing in Sri Lanka

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There is an increased usage of CFL bulbs in Sri Lanka as a measure for saving electricity. Generation of visible light from CFL bulbs is a result of UV light interaction with phosphorus coating on the bulb wall. Ultra violet light is harmful to the human body and long exposure of UV radiations cause illnesses including erythema, cataracts and skin cancer. Thus, it is very important to know whether CFL bulbs retailed in Sri Lanka do emit ultraviolet radiation too in addition to the visible white light and if so to find out the "safety distance" for their use.

The level of UV radiation leak in residential CFL light sources retailed in Sri Lanka were compared in five different brands: O, P, M, B and C bulbs. The spectral emissions of these bulbs were measured under controlled conditions using AMINCO-Bowman spectrofluorometer. Emissions at UVA (365 nm) and UVB (312 nm) were observed and analyzed. According to the present study most of the brands of CFL bulbs selling in Sri Lanka do emit UV radiation. The C brand (5 W) lamp showed significantly high emission from UVA and UVB compared to the other brands. The least UVA is observed from M brand (5 W) lamp, and the least UVB-emission was observed from P brand. Although the irradiance of the studied CFLs is very low, when the possible exposure time is relatively long it could result in significant cumulative damage.

The impact of UVA (365 nm) emission according to the different wattages was also analyzed using data collected from NERD (National Engineering Research and Development) Center in Sri Lanka. Higher wattage bulbs proved to have more UVA emission compared to the lower wattage bulbs. The results indicate that when using sub-standard CFL bulbs (particularly in close by table lamps) the public should take care to keep the lamps at more than a 20 cm distance.

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