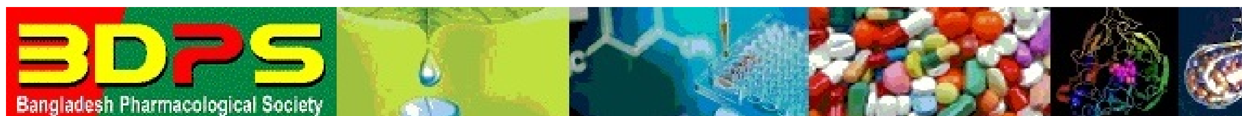

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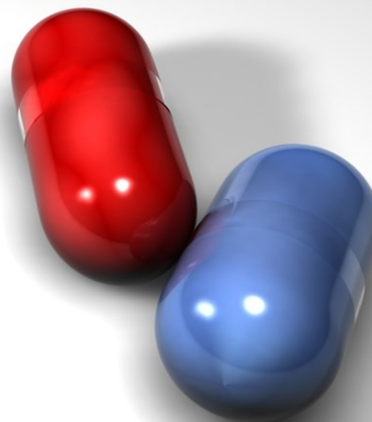

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Letter to the Editor

Cytotoxic activities of *Ganoderma lucidum* ethanol extract against HepG2 cell line

Sir,

The medicinal mushroom, *Ganoderma lucidum* (*Ganodermataceae*) is extensively used as a traditional Chinese herb to treat various human diseases like bronchitis, allergies, hepatitis, hypertension, immunological disorders and cancer (Yuen et al., 2005). This mushroom composed of huge amount of polysaccharides (β-D-glucans, heteropolysaccharides and glycoproteins), flavonoids, alkaloids, anti-oxidants, proteins, vitamins, minerals (Zjawiony, 2004). Some recent studies described ethanol extracts of *G. lucidum*, as *in vitro* inhibitors of various cancer cell lines such has melanoma, gastric carcinoma and inflammatory breast cancer (Martínez-Montemayor et al., 2011). The present study was carried out to investigate the cytotoxicity properties of *G. lucidum* against HepG2 cell lines.

G. lucidum (P. Karst) samples were collected in December 2015 from the Maruthamalai Hills region, Coimbatore, India and were authenticated by the Mycology Division of Indian Forest Genetics and Tree Breeding Institute, Coimbatore, Tamilnadu, India (Voucher No: RT-25406/9-1-2015).

Fruiting bodies of mushrooms were dried at 45–50°C for 48 hours and powdered. The powdered material (2 kg) was extracted with petroleum ether in Soxhlet apparatus for 8–10 hours. The extraction was done in four batches of 500 g each. The defatted material was then extracted with hot ethanol: water (70:30) at 70–80°C twice. Ethanol extracts were pooled, concentrated and evaporated under vacuum. The extract thus obtained (40.8 g) was used for the experiments. Human liver cancer cell lines Hep G2 were purchased from the National Centre for Cell Science (NCCS), Pune, India. The cytotoxic activity of the ethanol extracts of *G. lucidum* was investigated using the MTT assay (Lau et al, 2004). The OD value was measured at 570 nm. The IC_{50} value was the concentration of sample which reduced absorbance by 50% relative to the vehicle-treated control.

The proliferation of HepG2 cell was significantly inhibited by *G. lucidum*. The Table 1 and Figure 1 show the changes of the percentage of cell viability treated

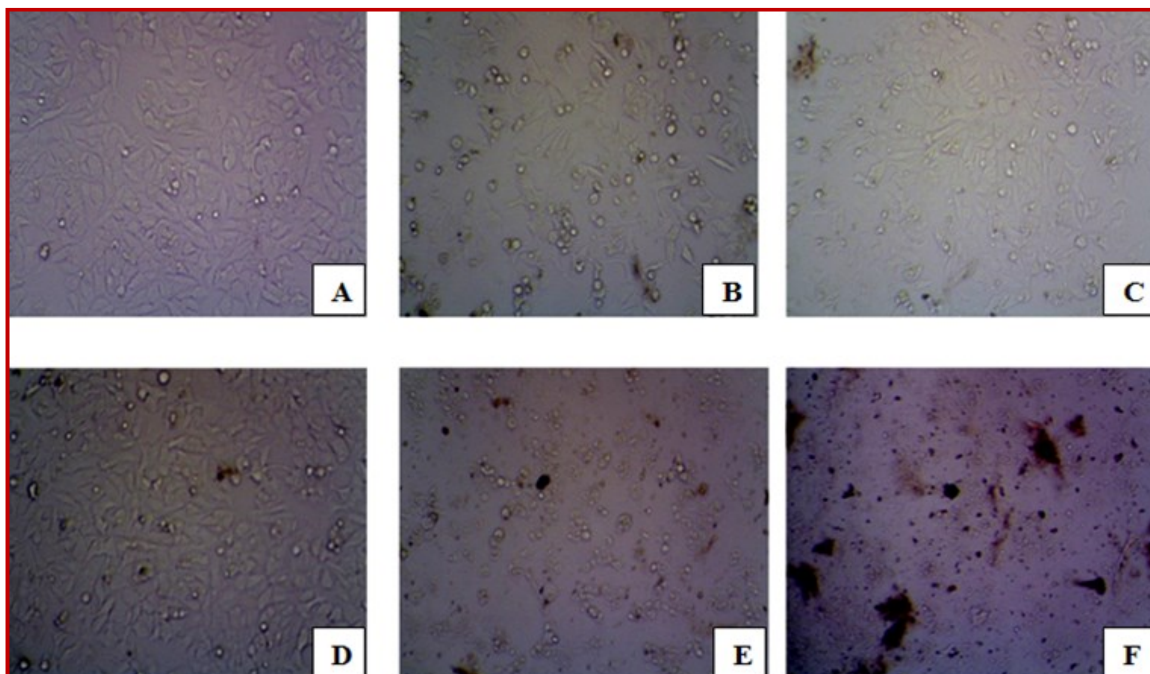

Figure 1: *In vitro* cytotoxic activity of the *G. lucidum* against $HepG_2$ cell line A) untreated HepG2 cell lines, B) 1.88 µg/mL, C) 3.75 µg/mL, D) 7.5 µg/mL, E) 15 µg/mL, F) 30 µg/mL

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with *G. lucidum* (1.88, 3.75, 7.5, 15, and 30 μg/mL) in HepG2 cell. There was 100% cell death at 30 μg/mL concentration. The inhibitory concentration 50% (IC_{50}) was fixed as 8.3 μg/mL.

Weng et al, (2009) reported that *G. lucidum* extract have been shown to inhibit the proliferation of HepG2 human hepatocelluar carcinomas. It has recently been demonstrated that polysaccharides from *Phellinus linteus* inhibit the proliferation and colony formation of HepG2 and that the growth inhibition of HepG2 cells was mediated by S-phase cell cycle arrest (Wang et al, 2011).

In vitro cytotoxicity offers quick, simple and cost sufficient. Relatively few are practical and have sufficient sensitivity and robustness to be useful for drug screening. From the present finding, it can be concluded that the *G. lucidum* extract shows high toxicity of HepG2 cells.

Table I

Effect of *G. lucidum* on $HepG_2$ cell line

Concentration (μg/mL)	%Cell inhibition
1.88	0.18
3.75	4.13
7.50	35.35
15.00	96.60
30.00	100.00

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