

Antidiabetic, antioxidant and *in silico* studies of bacterial endosymbiont inhabiting *Nephelium lappaceum* L.

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Abstract. Endophytes, notably obtaining attention, have been abided by potential origins of bioactive metabolites. In the acquaint study, endophyte was isolated from the leaves of *Nephelium lappaceum* L. The chosen endosymbiont was identified by 16s rRNA partial genome sequencing and investigated for their antioxidant and antidiabetic activities. A preliminary phytochemical test was comported for the affirmation of phytoconstituents in endophytic crude extract (NLM). Antioxidant activities were conducted by using 2-diphenyl-1-picrylhydrazyl (DPPH) method and 2,2'-azino-bis-3-ethylbenzthiazoline-6-sulphonic acid (ABTS) method to screen the radical scavenging potential. The evaluation of antidiabetic activities was done by using α -amylase and α -glucosidase inhibition assay. Qualitative phytochemical test on NLM affirmed the presence of phenols, carbohydrates, alkaloids, flavonoids, steroids, mucilage and glycosides. *In silico* parameters were also specified for antidiabetic activities. The antioxidant assay of NLM expressed proficient antioxidant activity of $IC_{50} \pm SEM$ 1.35 \pm 0.03 μ g/mL and $IC_{50} \pm SEM$ 1.47 \pm 0.03 μ g/mL, for ABTS and DPPH respectively. Antidiabetic assay results evidenced dose dependent percentage inhibition of the enzyme. The results testified estimable inhibition of α -amylase ($IC_{50} \pm SEM$ 2.549 \pm 0.08 μ g/mL) and α -glucosidase inhibition ($IC_{50} \pm SEM$ 2.29 \pm 0.03 μ g/mL) compared to the standard drug (Acarbose). *In silico* study divulged that the ellagic acid component present in the plant was responsible for antidiabetic activity. Thus, the study shows that NLM has a wellspring of natural source of antioxidants and antidiabetic agents and furtherance of studies on its mechanism is recommended to know detailed facts.

Keywords: *Nephelium lappaceum*, antioxidant, α -amylase, α -glucosidase, endophyte, *Escherichia coli*.

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