

**Title** Efficacy of chemically characterized *Piper betle* L. essential oil against fungal and aflatoxin contamination of some edible commodities and its antioxidant activity

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### Abstract

The study investigates fungal contamination in some dry fruits, spices and areca nut and evaluation of the essential oil (EO) of *Piper betle* var. *magahi* for its antifungal, antiaflatoxic and antioxidant properties. A total of 1651 fungal isolates belonging to 14 species were isolated from the samples and *Aspergillus* was recorded as the dominant genus with 6 species. Eleven aflatoxin B<sub>1</sub> (AFB<sub>1</sub>) producing strains of *A. flavus* were recorded from the samples. Eugenol (63.39%) and acetyleneugenol (14.05%) were the major components of 32 constituents identified from the *Piper betle* EO through GC and GC–MS analysis. The minimum inhibitory concentration (MIC) of *P. betle* EO was found 0.7 µl/ml against *A. flavus*. The EO reduced AFB<sub>1</sub> production in a dose dependent manner and completely inhibited at 0.6 µl/ml. This is the first report on efficacy of *P. betle* EO as aflatoxin suppressor. EO also exhibited strong antioxidant potential as its IC<sub>50</sub> value (3.6 µg/ml) was close to that of ascorbic acid (3.2 µg/ml) and lower than that of the synthetic antioxidants such as butylated hydroxytoluene (BHT) (7.4 µg/ml) and butylated hydroxyanisole (BHA) (4.5 µg/ml). *P. betle* EO thus exhibited special merits possessing antifungal, aflatoxin suppressive and antioxidant characters which are desirable for an ideal preservative. Hence, its application as a plant based food additive in protection and enhancement of shelf life of edible commodities during storage and processing is strongly recommended in view of the toxicological implications by synthetic preservatives.