Supporting Information

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Essential Oils of Lauraceae: Constituents and Antimicrobial Activity of *Dehaasia cuneata* (Blume) Blume and *Caryodaphnopsis tonkinensis* (Lecomte) Airy-Shaw from Vietnam

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S1. The leaves of *D. cuneata* and *C. tonkinensis*

Large quantity (2.2 kg) of the leaves of *D. cuneata* were obtained from plants cultivated in Pù Mát National Park (GPS: 19°44′32′N; 3°48′10′E), Vietnam, at elevation of 816 m, in August 2020. However, *C. tonkinensis* leaves were harvested from Bến En National Park (GPS: 19°35′31′N; 105°22′59′E) in March 2020 at elevation of 80 m. The plants were identified by Dr. Le Thi Huong. In addition, voucher specimens, HNU 910 and HNU 878, respectively, were deposited in the plant specimen room, Vinh University.

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S2. Isolation of essential oils from the leaves of *D. cuneata* **and** *C. tonkinensis*

The leaves of *D. cuneata* and *C. tonkinensis* were processed before hydrodisitllation by removing debris and unwanted materials. Thereafter, the leaves were separately pulverised into coarse particles by using a locally made grinder, to obtained 2 kg each of the sample which was subjected to separate hydrodistillation inside a Clevenger-type apparatus [1] according to established specification as described in previous studies [2-6]. Each of the leaf material was divided into three parts to ensure that hydrodistillation was repeated three times. The samples were carefully introduced into a clean and dry 5 L flask. Distilled water was added into the flask until it covered the surface of the samples completely. The procedure was maintained at normal pressure over a period of 3 h. The essential oils of *D. cuneata* and *C. tonkinensis* which distilled over water were collected separately by running through the tap in the receiver arm of the apparatus into clean and previously weighed sample bottles. The oils were kept under refrigeration (4°C) until the moment of analyses. The experiment was conducted in triplicate. The essential oil yield (%) was calculated by mass (g) of the essential oils divided by the mass (g) of the leaves of the plants.

S3. Chemical analysis of the essential oils of *D. cuneata* **and** *C. tonkinensis*

Gas chromatography (GC) analysis was performed on an Agilent Technologies HP 7890A Plus Gas chromatograph equipped with a FID and fitted with HP-5MS column (30 m x 0.25 mm, film thickness 0.25 μm, Agilent Technology). The analytical conditions were: carrier gas H_e (1 mL/min), injector temperature, 250°C; detector temperature 260°C; column temperature programmed from 40°C (held 2 min isothermally) and rise to 220°C (10 min hold) at 4°C/min. Samples were injected by splitting and the split ratio was 10:1. The volume of the oil injected was 1.0 μL. Inlet pressure was 6.1 kPa. Each analysis was performed in triplicate. The relative amounts of individual components were calculated based on the GC peak area (FID response) as described in previous studies [2-6].

An Agilent Technologies HP 7890A Plus Chromatograph fitted with a fused silica capillary HP-5 MS column (30 m x 0.25 mm, film thickness 0.25 μm) and interfaced with a mass spectrometer HP 5973 MSD was used for the GC/MS analysis, under the same conditions as those used for GC analysis. The conditions were the same as described above with He (1 mL/min) as carrier gas. The MS conditions were as follows: ionization voltage 70eV; emission current 40 mA; acquisitions scan mass range of 35-350 amu at a sampling rate of 1.0 scan/s.

S4. Identification of the constituents of the essential oils

The identification of constituents of essential oils from the GC/MS spectra of *U. hamiltonii* and *F. kwangsiense* was performed on the basis of comparison of retention indices (RI Exp.) with reference to a homologous series of *n*-alkanes (C_6-C_{40}), under identical experimental conditions. In some cases, co-injection with known compounds under the same GC conditions was employed. The

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mass spectral (MS) fragmentation patterns were checked with those of other essential oils of known composition in literature [7], as described recently [2-6].

S5. Antimicrobial activity test

The antimicrobial activity of the essential oils was evaluated using three strains of Gram-positive test bacteria, *Enterococcus faecalis* ATCC299212, *Staphylococcus aureus* ATCC25923, *Bacillus cereus* ATCC14579, three strains of Gram-negative test bacteria, *Escherichia coli* ATCC 25922, *Pseudomonas aeruginosa* ATCC27853, *Salmonella enterica* ATCC13076 and one strain of yeast, *Candida albicans* ATCC10231. The minimum inhibitory concentration (MIC) and median inhibitory concentration (IC_{50}) values were measured by the microdilution broth susceptibility assay as previously described [2-6].

Stock solutions of the oil were prepared in dimethylsulfoxide. The choice of investigated concentrations was based on our previous reports on similar investigations where essential oils have been found to be active within specific concentration range [2-6]. Dilution series were prepared from 16,384 to 2 µg/mL (2^{14}, 2^{13}, 2^{12}, 2^{11}, 2^{10}, 2^{9}, 2^{7}, 2^{5}, 2^{3} and 2^{1} µg/ mL) in sterile distilled water in micro-test tubes from where they were transferred to 96-well microtiter plates. Bacteria were grown in double-strength Mueller-Hinton broth or double-strength tryptic soy broth, and fungi grown in double-strength Sabouraud dextrose broth were standardized to 5×10^5 and 1×10^3 CFU/mL, respectively. The last row, containing only the serial dilutions of the sample without microorganisms, was used as a positive (no growth) control. Sterile distilled water and medium served as a negative (no antimicrobial agent) control. Streptomycin was used as the antibacterial standard, while nystatin and cycloheximide were used as anticandidal standards. After incubation at 37 °C for 24 h, the MIC values were determined to be well with the lowest concentration of agents completely inhibiting the growth of microorganisms. The IC_{50} values were determined by the percentage of microorganisms that inhibited growth based on the turbidity measurement data of EPOCH2C spectrophotometer (BioTeK Instruments, Inc Highland Park Winooski, VT, USA) and Rawdata computer software (Brussels, Belgium) according to the following equations:

$$\% \text{ Inhibition} = \frac{OD_{control(-)} - OD_{test\ agent}}{OD_{control(-)} - OD_{control(+)}} \text{ x } 100\%$$

$$IC_{50} = High_{conc} - \frac{(High_{inh\%} - 50\%) \text{ x } (High_{conc} - Low_{conc})}{(High_{inh\%} - Low_{inh\%})}$$

where OD is the optical density, control(–) are the cells with medium but without antimicrobial agent, test agent corresponds to a known concentration of antimicrobial agent, control(+) is the culture medium without cells, $High_{conc}/Low_{conc}$ is the concentration of test agent at high concentration/low concentration, and $High_{inh\%}/Low_{inh\%}$ is the % inhibition at high concentration/% inhibition at low concentration).

S6. Statistical analysis

Statistical analysis (ANOVA) of the differences between mean values obtained for experimental groups were calculated as a mean of standard deviation (SD) of three independent measurements using Microsoft Excel program 2003.

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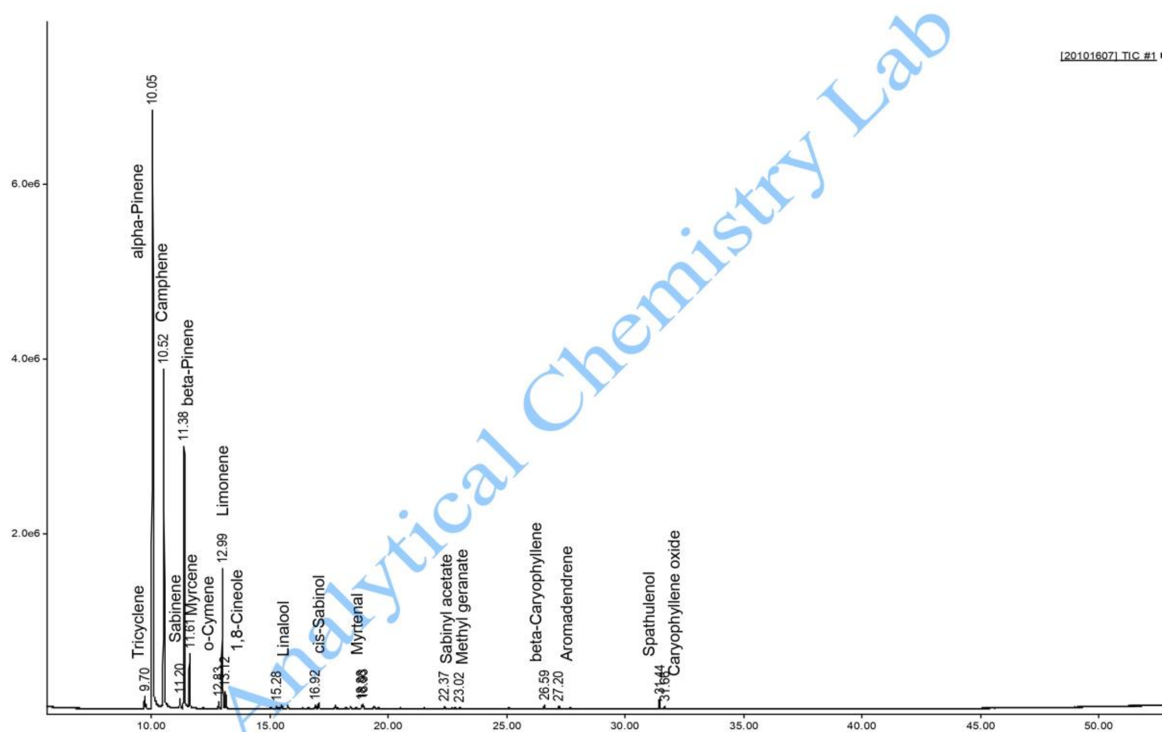

Figure S1 : GC Chromatogram of *D. cuneata*

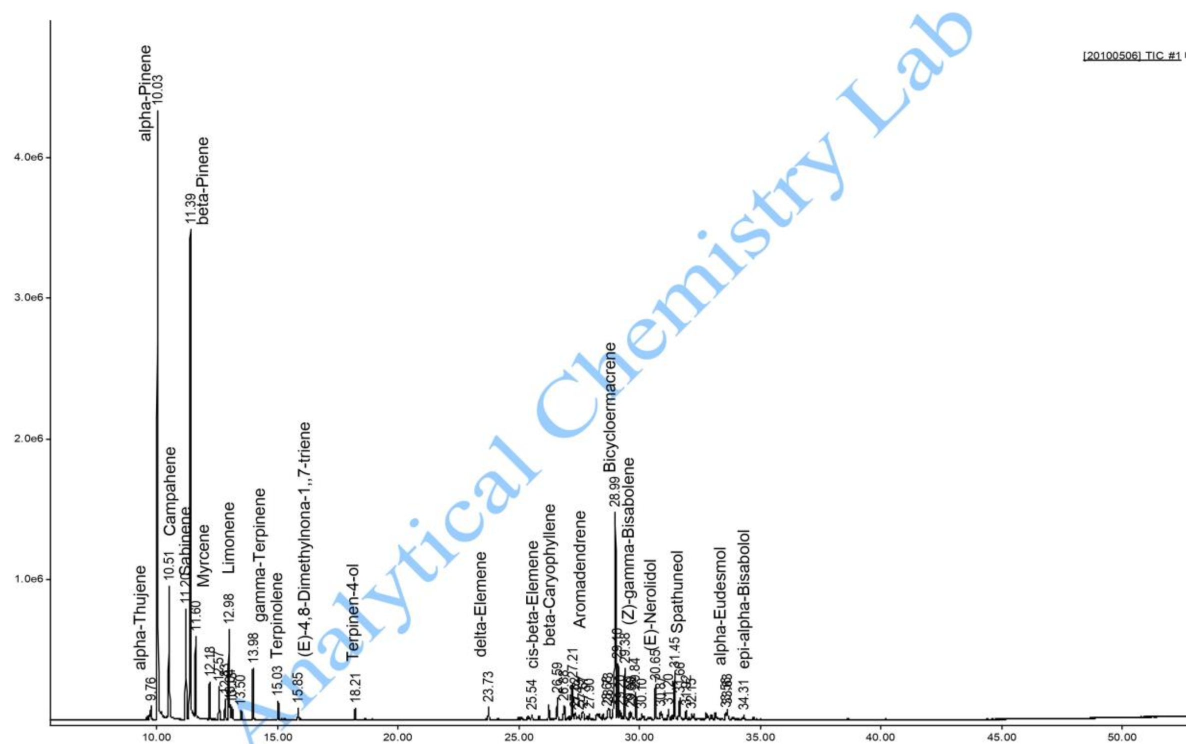

Figure S2 : GC Chromatogram of *C. tonkinensis*

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