Some compounds isolated from *Perilla frutescens* harvested in Hung Yen province

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ABSTRACT

*Five compounds, including three triterpenoids: ursolic acid (**1**), maslinic acid **(2),** tormentic acid **(3)** and two phenolics: 4-hydroxybenzoic acid (**4**), rosmarinic acid (**5**), were isolated from leaves of Perilla frutescens (L.) Britton, using chromatographic methods. Structures of the isolated compounds were elucidated by NMR and MS spectral data. The isolation of these five compounds was reported for the first time from the Perilla frutescens (L.) Britton harvested in Hung Yen province.*

Keywords: *Perilla frutescens* (L.) Britton; Phenolic; Rosmarinic acid; Ursolic acid.

1. INTRODUCTION

Perilla frutescens (L.) Britton is widely cultivated in East Asia and Southeast Asia, including Vietnam. It is used both as a medicinal and culinary herb. In traditional medicine, *P. frutescens* is well known for its therapeutic properties, particularly in treating colds, dispelling coldness, aiding digestion. It has a pungent taste, warm nature, and is attributed to the lung and spleen meridians, promoting perspiration, relieving cough, dissolving phlegm, and detoxification [1]. Phytochemical studies have shown the presence of various compounds such as essential oils [2], phenolic compounds [3], flavonoids [4], terpenoids, sterols [5], alkaloids [6], and anthocyanins [7] in *P. frutescens*. The chemical compositions from *P. frutescens* were reported to exhibit diverse biological activities, for example, antioxidant [8], anti-inflammatory [9], anticancer [10], antimicrobial [11], and inhibitory activities against enzymes: α-glucosidase, aldose reductase, and xanthine oxidase [5].

In Vietnam, *P. frutescens* thrives in tropical climates and is cultivated nationwide, including Hung Yen province, where medicinal plant cultivation covers over 850 hectares. *P. frutescens* is among the province's important medicinal plants. In a study by Hoang Thi Kim Van and colleagues, the analysis of chemical compositions of essential oil from *Perilla* grown in Phu Tho province by GC/MS showed the main components are myristicin, perilla aldehyde, (*E*)-caryophyllene, limonene and α-zingiberene [12]. However, no detailed phytochemical studies on *P. frutescens* grown in Hung Yen have been reported. This study describes the isolation and structural elucidation of five compounds from the ethyl acetate (EtOAc) extract of *P. frutescens* leaves cultivated in Hung Yen, namely rosmarinic acid, ursolic acid, maslinic acid, 4-hydroxybenzoic acid, and tormentic acid.

2. MATERIALS AND METHODS

2.1. Plant material

Leaves of *P. frutescens* were collected in Van Lam, Hung Yen, in October 2024. A voucher specimen was deposited at the Institute of Chemistry, Vietnam Academy of Science and Technology (VAST).

2.2. Chemicals and instruments

Thin-layer chromatography (TLC) was performed on precoated silica gel $60F_{254}$ plates (Merck). Column chromatography utilized silica gel 60 (0.040-0.063 mm, 240-430 mesh ASTM, Merck, Germany), C_{18}-Reversed Phase Silica gel 90 (230-400 mesh, Merck, Germany), Sephadex LH20 (Merck, Germany). All solvents EtOAc, CH_2Cl_2, MeOH, n-hexane, acetone are AR grade and were purchased from Xilong, China. NMR spectra were recorded on a Bruker Avance 600 MHz spectrometer with TMS as internal standard at the Institute of Chemistry, VAST. ESI-MS spectra were also measured on a Thermo LCQ Fleet LC/MS system at the Institute of Chemistry.

2.3. Extraction and isolation

Powder of leaves was prepared according to the procedure described in [13]. 420 g powder was extracted with 80% ethanol (v/v) for 24 hours. The extract was distilled at low pressure to obtain 64.5 g of crude extract. The crude extract was partitioned sequentially with hexane and CH_2Cl_2 to remove pigments, low-polarity substances, and alkaloids. The aqueous phase was then extracted with EtOAc. The EtOAc fraction (17.0 g) was subjected to silica gel column chromatography with a gradient of n-hexane/EtOAc (20:1→1:1, v/v) followed by EtOAc/MeOH (20:1→ 4:1, v/v), yielding four fractions (E-1A to E-4A).

Fraction E-1A (1.556 g) was separated on a normal phase chromatography column using silica gel 0.040-0.063 mm with n-hexane/EtOAc (9/1, v/v) as the eluting solvent to yield a fairly pure compound (**1**) (46.8 mg). This compound was then further purified by recrystallization in n-hexane/EtOAc (5/1, v/v) to give a pure compound (**1**) (11.0 mg). Fraction E-2A (1.984 g) was separated on a Sephadex LH20 chromatography column with CH_2Cl_2/MeOH (1/1, v/v) as the eluting solvent to yield three fractions: E-$2A_1$, E-$2A_2$ and E-$2A_3$. Fraction E-$2A_2$ (437.9 mg) was subjected to a normal phase gel chromatography column using silica gel 0.040-0.063 mm with eluent of n-hexane/acetone (3/1, v/v) to obtain two fractions: E-$2A_2$-1 and E-$2A_2$-2. Then, fraction E-$2A_2$-2 (119.4 mg) was run through a RP18 reversed-phase chromatography column with MeOH/H_2O (3/1, v/v) as mobile phase to obtain two compounds (**2**) (4.0 mg) and (**3**) (5.0 mg).

Fraction E-3A (2.137 g) was separated on a Sephadex LH20 chromatography column with CH_2Cl_2/MeOH (1/1, v/v) as eluent to obtain three fractions, E-$3A_1$, E-$3A_2$ and E-$3A_3$. Fraction E-$3A_1$ (484.9 mg) was passed through a normal phase chromatography column using silica gel 0.040-0.063 mm with n-hexane/acetone (2/1, v/v) as eluent to obtain a fairly pure compound (**4**) (43.4 mg). This compound was then further purified by recrystallization from n-hexane/acetone (3/1, v/v) to give a pure compound (**4**) (8.0 mg).

Fraction E-$3A_2$ (527.1 mg) was subjected to a normal phase gel chromatography column using silica gel 0.040-0.063 mm with eluting solvent system of n-hexane/acetone (1/1, v/v) to obtain a fairly pure compound (**5**) (69.1 mg). This compound was then further purified by recrystallization in n-hexane/acetone (1/1, v/v) to yield pure compound (**5**) (16.5 mg).

Ursolic acid (1): ESI-MS: *m/z* 457.32 $[M+H]^+$. ^{1}H NMR (MeOD, 600 MHz): 5.23 (t, J = 3.6 Hz, 1H, H-12); 3.15 (dd, J_1 = 4.2 Hz, J_2 = 11.4 Hz, 1H, H-3α); 2.20 (d, J = 11.4, 1H, H-18β); 2.04 (td, J_1 = 4.2 Hz, J_2 = 13.8 Hz, 2H, H-16); 1.93 (dd, J_1 = 4.2 Hz, J_2 = 8.4 Hz, 2H, H-11); 1.11 (s, 3H, H-26); 0.97 (s, 3H, H-23); 0.96 (d, J = 4.2 Hz, 3H, H-30); 0.95 (s, 3H, H-27); 0.88 (dd, J = 6 Hz, 3H, H-29); 0.85 (s, 3H, H-25); 0.77 (s, 3H, H-24). ^{13}C-NMR (150 MHz, MeOD, δ (ppm)): 181.3 (C-28); 139.6 (C-13); 126.9 (C-12); 79.7 (C-3); 56.8 (C-5); 54.4 (C-18); 49.0 (C-9); 48.9 (C-17); 43.3 (C-14); 40.1 (C-8); 40.4 (C-19); 40.0 (C-20); 39.8 (C-1, C-4); 38.1 (C-22, C-10); 34.4 (C-7); 31.8 (C-21); 29.2 (C-15); 28.8 (C-23); 27.9 (C-2); 25.3 (C-16); 24.4 (C-11); 24.1 (C-27); 21.6 (C-30); 19.5 (C-6); 17.8 (C-26); 17.6 (C-29); 16.4 (C-24); 16.0 (C-25).

Maslinic acid (2): ESI-MS: *m/z* 473.37 $[M+H]^+$. ^{1}H NMR (MeOD, 600 MHz): 0.83 – 2.06 (21H); 2.88 (dd, J_1 = 4.2 Hz, J_2 = 13.8 Hz, 1H, H-18); 2.93 (d, J = 9.6 Hz, 1H, H-3β); 3.64 (ddd, J_1 = 4.8

Hz, J_2 = 10.8 Hz, J_3 =9.8 Hz, 1H, H-2); 5.14 (t, J = 8.8 Hz, 1H, H-12). ^{13}C-NMR (150 MHz, MeOD, δ (ppm)): 181.9 (C-28); 145.4 (C-13); 123.4 (C-12); 84.5 (C-3); 69.5 (C-2); 56.7 (C-5); 49.0 (C-9); 48.1 (C-1); 47.7 (C-17); 47.3 (C-19); 43.0 (C-18); 42.8 (C-14); 40.5 (C-4); 39.3 (C-8, C-10); 34.9 (C-21); 33.9 (C-7); 33.8 (C-22); 33.6 (C-29); 31.6 (C-20) ; 29.3 (C-23); 28.8 (C-15); 26.4 (C-30); 24.6 (C-11); 24.1 (C-16); 24.0 (C-27); 19.6 (C-6); 17.8 (C-26); 17.4 (C-25); 17.1 (C-24).

Tormentic acid (3): ESI-MS: *m/z* 489.35 $[M+H]^+$. ^{1}H NMR (MeOD, 600 MHz, δ (ppm)): 0.83 – 2.61 (21H); 2.88 (dd, J_1 = 4.2 Hz, J_2 = 13.8 Hz, 1H, H-18); 3.30 (m, 1H, H-3); 3.95 (ddd, J_1 = 4.8 Hz, J_2 = 10.8 Hz, J_3 =9.8 Hz, 1H, H-2); 5.32 (t, J = 5.8 Hz, 1H, H-12).^{13}C-NMR (150 MHz, MeOD, δ (ppm)) 140.2 (C-13); 129.3 (C-12); 80.1 (C-3); 77.7 (C-2); 64.3 (C-5); 55.1 (C-18); 48.2 (C-17); 43.1 (C-9); 42.8 (C-1); 42.5 (C-14); 9.5 (C-8); 39.4 (C-19); 39.1 (C-4); 34.1 (C-10) ; 29.6 (C-7); 29.2 (C-21), 27.4 (C-15), 27.1 (C-23); 26.7 (C-28); 24.9 (C-16); 24.7 (C-29); 22.4 (C-30); 19.3 (C-6); 17.8 (C-26); 17.6 (C-25); 16.9 (C-24), 16.6 (C-11).

4-Hydroxybenzoic acid (4): ESI-MS: *m/z* 139.05 $[M+H]^+$. ^{1}H NMR (DMSO-d_6, 600 MHz, δ (ppm)): 7.05 (d, J = 8.4, 2H, H-3, H5); 7.81 (d, J = 8.4, 2H, H-2, H6); ^{13}C-NMR (150 MHz, DMSO-d_6, δ (ppm)): 114.3 (C3, C5), 126.5 (C1), 129.9 (C2, C6), 160.4 (C4), 161.6 (C=O).

Rosmarinic acid (5): ESI-MS: *m/z* 361.49 $[M+H]^+$. ^{1}H-NMR (600 MHz, MeOD, δ (ppm)): 8.02 (d, J = 8.1 Hz, 1H, H-5); 7.60 (d, J = 8.1 Hz, 1H, H-8); 7.51 (s, 1H, H-4); 7.36 (m, 3H, H-7, H-5", H-6"); 7.11 (m, 3H, H-6, H-4", H-7"); 6.82 (s, 1H, H-2); 4.77 (dd, J_1 = 4.8 Hz, J_2 = 14.4 Hz, 1H, H-1'a); 4.51 (dd, J_1 = 7.8 Hz, J_2 = 14.4 Hz, 1H, H-1'b); 4.29 (m, 1H, H-2'); 3.89 (s, 3H, 1-OCH_3); 3.52 (dd, J_1 = 4.8 Hz, J_2 = 13.4 Hz, 1H, H-3'a); 3.39 (dd, J_1 = 7.2 Hz, J_2 = 13.4 Hz, 1H, H-3'b); 2.44 (s, 3H, 3-CH_3). ^{13}C-NMR (150 MHz, MeOD, δ (ppm)): 150.5 (C-2"); 146.2 (C-1); 141.2 (C-13); 128.5 (C-3); 127.5 (C-10); 125.2 (C-7); 124.2 (C-12); 122.1 (C-11); 121.3 (C-5",C-6"); 119.8 (C-5); 118.4 (C-6); 112.3 (C-4); 110.2 (C-8); 109.0 (C-2); 70.0 (C-2'); 55.5 (1-OCH_3); 50.1 (C-1'); 36.2 (C-3'); 21.3 (3-CH_3).

3. RESULTS AND DISCUSSION

Compound (**1**) was obtained as a white crystal. The ESI-MS spectrum showed a signal $[M+H]^+$ with m/z 457.32, allowing to determine of the molecular weight of this compound to be 456 Da. The given ^{1}H-NMR and ^{13}C-NMR spectral data of this compound indicated that it was a triterpene belonging to the ursan framework. First of all, the ^{1}H-NMR spectrum of (**1**) showed a signal of an olefin proton H-12 with δ_H 5.23 ppm (1H, J = 3.6 Hz), the signal of proton H-3 (hydroxy methine) appeared at 3.15 ppm (dd, J_1 = 11.4 Hz, J_2 = 4.2 Hz), with a large interaction constant (J = 11.4 Hz) showing that this proton is in the axial form and the hydroxy group has a beta configuration (3β-OH). Another doublet signal of the methine proton characteristic of the ursan skeleton, H-18β, appeared at 2.20 ppm (d, J = 11.4 Hz) due to interaction with the H-19 proton. Next, seven methyl groups, including five appearing in singlet form with δ_H of 0.78; 0.85; 0.95; 0.97 and 1.12 ppm, were attributed to the protons H-23, H-24, H-35, H-26 and H-27, respectively. The remaining two methyl groups with doublet signals, H-29 appeared at 0.88 ppm (d, J = 6.0 Hz), and H-30 was found at 0.96 ppm (d, J = 4.2 Hz). ^{13}C-NMR spectrum of (**1**) showed that this compound has 30 carbon atoms including one signal at 181.6 ppm characteristic of the carboxylic acid carbon signal (C-28, determined by HMBC spectrum), seven methine groups including C-3, C-5, C-9, C-12, C-18, C-19 and C-20 with δ_C of: 79.7; 56.8; 49.0; 126.9; 54.4; 40.4 and 40.0 ppm, respectively. Nine signals of methylene groups were recognized by HSQC spectrum and were assigned to their δ_C positions (ppm) as follows: 39.8 (C-1); 27.9 (C-2); 19.5 (C-6); 34.4 (C-7); 24.4 (C-11); 29.2 (C-15); 25.3 (C-16); 31.8 (C-21) and 38.1 (C-22). Seven carbon atoms of seven methyl groups were also identified and assigned by HSQC spectrum, including signals at δ_C (ppm) positions, including 28.8 (C-23); 16.4 (C-24); 16.0 (C-25); 17.8 (C-26); 24.1 (C-27); 17.6 (C-29) and 21.6 (C-30). Six quaternary carbon atom signals including C-4, C-8, C-10, C-13, C-14 and C-17 appeared at positions with corresponding δ_C: 39.8; 40.8; 38.1; 139.6; 43.3 and 48.9 ppm. Important interactions

in the HMBC spectrum of (**1**) include those of proton H-3 (3.15 ppm) with carbon atoms C-24 (16.4 ppm), C-23 (28.8 ppm), and C-1 (39.8 ppm); H-12 (5.23 ppm) with C-27 (24.1 ppm), C-14 (43.3 ppm), C-9 (49.0 ppm), and C-18 (54.4 ppm); H-18β (2.20 ppm) with C-12 (126.9 ppm), C-13 (139.6 ppm), C-28 (181.6 ppm), C-17 (48.9 ppm), and C-19 (40.4 ppm). In addition, interactions of H-23, H-24 with C-5; H-25 with C-5 and C-9; H-26 with C-8, C-9 and C-14; H-27 with C-14, C-13, C-8 and C-15; H-29 with C-18, C-19 and C-20; and the terminal methyl groups H-30, C-19, C-18 and C-21 were also observed to confirm the correctness of the given attributions. Therefore, the combination of ESI-MS, 1D- and 2D-NMR spectra allowed us to predict the compound (**1**) as ursolic acid. The obtained spectral data were in complete agreement with the MS, ^{1}H-NMR and ^{13}C-NMR spectra of the reference [14].

Compound (**2**) was obtained as a white amorphous powder. The ^{1}H- and ^{13}C-NMR spectra showed that this compound was still a triterpene. ^{1}H-NMR spectrum showed that besides other overlapping signals in the range δ 1.21-2.05; seven signals of the methyl group all appeared in singlet form without any signals of the methyl group in doublet form, these signals were found at δ_H 1.19 (H-27); 1.04 (H-23); 1.03 (H-25); 0.96 (H-30); 0.93 (H-29); 0.84 (H-24) and 0.83 (H-26) as well as two signals attributed to hydroxymethine at δ 3.64 (m, H-2) and 2.93 (d, J = 9.6 Hz, H-3). This data, combined with a triplet at δ 5.27 (J = 3.3 Hz, H-12), indicated an oleanane triterpene derivative. The 13C-NMR spectrum showed 30 signals of (2) identified including seven methyl groups, nine methylene groups, six methine groups, hydroxy-bearing carbons at δ_C 84.5 (C-3) and 69.5 (C-2) as well as two sp^2 carbons at δ_C 123.4 (C-12) and 145.4 (C-13) and eight quaternary carbons and a signal appearing at 181.9 (C-28) of the carboxylic acid. Comparison of the obtained data with those reported in the literature [15] allowed the identification of maslinic acid.

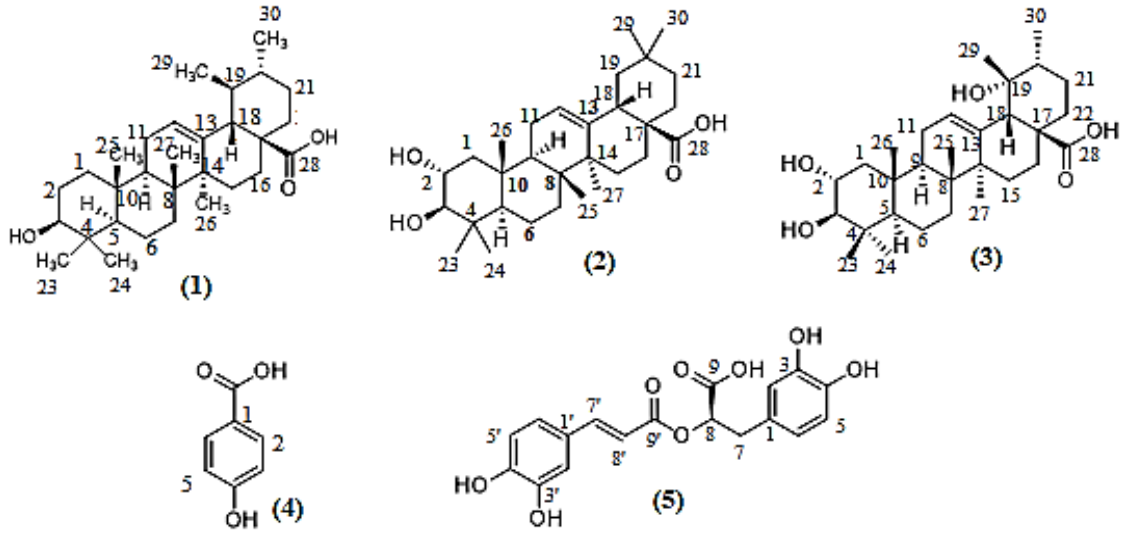

Figure 1. *Structures of the isolated compounds* ***(1) - (5)****.*

Compound (**3**) was obtained as a white amorphous powder. The ESI-MS spectrum had [M+H]$^+$ m/z of 489.35, indicating that this compound had M = 488. The ^{1}H-NMR spectrum of this compound showed that compound (**3**) had seven methyl groups, of which six methyl groups appeared in singlet with δ_H 0.82 (H-23); 0.89 (H-25); 1.00 (H-24, H-26); 1.22 (H-29); 1.37 (H-27) and one methyl group appeared as a doublet signal at 0.95 (d, J = 6.6 Hz, H-30). Next, a triplet at 5.32 ppm (J = 3.3 Hz) of olefin proton H-12. A multiplet at 3.95 ppm of H-2. Another multiplet was observed at 2.58 ppm of H-3. The H-18 proton appeared as a singlet signal (br) attributed to H-18. The remaining protons of (3) appeared from 1.24-2.08 ppm. The ^{13}C-NMR spectrum of (**3**) showed that this compound has 30 carbon atoms with seven methyl groups, including C-23, C-24,

C-25, C-26, C-27, C-29 and C-30 with δ_C of: 29.2; 16.9; 17.6; 24.7; 22.5; 27.4 and 16.6 ppm, respectively. The three carbons bearing hydroxy groups, including C-2, C-3 and C-19 had δ_C of: 67.2; 80.1 and 73.7 ppm, respectively. Two signals of double-bonded carbons, including C-12 and C-13 were observed at 129.3 and 140.2 ppm. The attributions were supported by the HSQC spectrum of (**3**). Eight methylene groups of (**3**) were identified by HSQC spectrum, including 48.2 (C-1); 19.3 (C-6); 34.1 (C-7); 24.9 (C-11); 29.6 (C-15); 26.7 (C-16); 39.4 (C-22) and 27.1 (C-21). Seven quaternary carbons including C-4, C-8, C-10, C-13, C-14, C-17 and C-19 had δ_C of: 39.5; 41.3; 39.1; 140.2; 42.3; 43.1 and 73.7. The ^{13}C-NMR spectrum of (**3**) did not show the presence of carbon in the carboxylic group at about 181 ppm due to the small amount of sample. The NMR spectral data of (**3**) were completely consistent with the spectral data of tormentic acid reported in the literature [16]. Thus, compound (**3**) was identified as tormentic acid.

Compound (**4**) was isolated as a white powder. The ESI-MS spectrum gave the molecular ion pick of the form $[M+H]^+$: 139.05. The ^{1}H-NMR spectrum gave two unique doublet peaks at 7.81 (J = 8.7 Hz) and 7.05 (J = 8.7 Hz) corresponding to four protons, which allowed us to predict that compound (**4**) has a 1,4-substitution aromatic ring. The ^{13}C-NMR spectrum of (**4**) gave five signals, in which the corresponding carbon pairs appeared at 114.3 ppm and 129.9 ppm. The two carbon signals at 161.6 and 160.4 ppm showed that this compound contained an acid group and a hydroxy group attached at the remaining position. Comparing with the previous reference [17], we concluded that compound (**4**) is 4-hydroxybenzoic acid with the formula as shown in Figure 1.

Compound (**5**) was obtained as a white solid. The ESI-MS spectrum had $[M+H]^+$ m/z of 361.49, indicating that this compound has M = 360. The ^{1}H-NMR spectrum of compound (**5**) had signals mainly concentrated in the aromatic proton region. The number of protons showed that molecule (**5**) had two aromatic rings in its structure. In addition, the two doublet signals at δ_H: 7.55 ppm and 6.26 ppm both had a coupling constant J = 16.2 Hz, indicating that these two protons belong to the same double bond and they exist in the trans form with each other. It is interesting to observe that the remaining 6 signal clusters in this region appear to be identical in pairwise signal multiplicity and coupling constant, cinnamic acid. The remaining aromatic ring has the same 1,3,4- substitution pattern and the outer chain contains methine -CH- and methylene -CH_2- groups. The ^{13}C- NMR spectrum of (**5**) has two peaks appearing at δ_C: 173.5 ppm and 168.5 ppm, suggesting that compound (**5**) has two -COOH groups, one of them is a free acid and the other has the structure of an ester. The free acid group has δ_C: 173.5 ppm and the other belongs to the ester group with δ_C: 168.5 ppm. The carbon atoms have chemical shifts at 149.7 ppm; 145.3 ppm; 146.8 ppm and 146.1 ppm, allowing us to predict that these carbon elements belong to two aromatic rings and are attached to the -OH group. The carbon signals at 116.5 and 116.3 ppm are assigned to the carbon atoms of the two aromatic rings adjacent to the carbon atoms attached to the -OH, the remaining two carbon atoms adjacent to the -OH group are located at 117.6 ppm and 114.4 ppm. The two carbon atoms in the CH groups of the ring furthest from the -OH group are present at chemical shifts of 123.1 and 121.8 ppm. The remaining carbon atoms attached to the -CH=CH- and -CH_2-CH- groups of the outer chain have chemical shifts of 127.7 and 129.3 ppm, respectively. Thus, compound (**5**) is predicted to be an ester of two organic acids containing one ester group and one free acid group and both have the same skeleton as caffeic acid. Referencing the previous reports [18] the structure of (**5**) is rosmarinic acid.

To sum up, from the EtOAc extract of *Perilla frutescens*, we isolated five compounds including three triterpenoids: ursolic acid (1), maslinic acid (2), tormentic acid (3) and two phenolics: 4-hydroxybenzoic acid (4), rosmarinic acid (5). These compounds have been previously reported to possess biological activities such as anti-inflammatory [19], anti-cancer [20], inhibition of xanthine oxidase and tyrosinase enzymes [21]. In particular, rosmarinic acid possesses a wide spectrum of biological activities, including anti-inflammatory, antioxidant, antiviral, antibacterial, anticancer and neuroprotective activities [22]. Recent studies have also shown that this compound has the

ability to reduce uric acid in the treatment of gout [23]. This study, therefore, enriches information on the chemical composition of perilla herbs grown in Hung Yen, creating a scientific basis for the further application of this medicinal herb locally in the fields of medicine and pharmacy.

4. CONCLUSIONS

From the EtOAc extract of *P. frutescens* (L.) Britton leaves cultivated in Hung Yen, Vietnam, three triterpenoids: ursolic acid, maslinic acid, and tormentic acid and two phenolic compounds: 4-hydroxybenzoic acid and rosmarinic acid were isolated and structurally characterized. This is the first phytochemical report on *Perilla frutescens* from Hung Yen province, enriching the chemical profile of this locally important medicinal and culinary plant and providing a scientific basis for its further development in health-related applications.

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TÓM TẮT

Phân lập một số hợp chất từ cây tía tô *Perilla frutescens* (L.) Britton trồng tại Hưng Yên

*Sử dụng các phương pháp sắc ký khác nhau, chúng tôi đã phân lập được năm hợp chất bao gồm ba hợp chất triterpenoid: ursolic acid **(1)**, maslinic acid **(2)**, tormentic acid **(3)** và hai hợp chất phenolic: 4-hydroxybenzoic acid **(4)**, rosmarinic acid **(5)** từ cây tía tô Perilla frutescens (L.) Britton. Cấu trúc của các hợp chất được xác định dựa vào các dữ liệu phổ cộng hưởng từ hạt nhân (NMR) và khối phổ (MS). Đây là lần đầu tiên, các hợp chất này được báo cáo phân lập từ cây tía tô (Perilla frutescens (L.) Britton) trồng tại tỉnh Hưng Yên.*

Từ khoá: Tía tô; Phenolic; Acid rosmarinic; Acid ursolic.