**Supplementary Data**

**Supplementary Figure 1.**



Effects of CoLP on serum glucose, amylase and lipase levels in HChol-induced hamsters.Hamsters fed with normal diet (control) or high cholesterol (2% HChol) diet along with different doses of *C. osmophloum* leaf powder (2% and 5 % of CoLP) or 0.25% Gemfibrozil (Gem) for 10 weeks. The levels of serum glucose (**A**), amylase (**B**) and lipase (**C**) were determined. Data are presented as mean ± SD (n = 8).

**Supplementary Figure 2**



Effects of CoLP on serum hepatic enzymes, blood urea nitrite and creatinine levels in HChol-induced hamsters.Hamsters fed with normal diet (control) or high cholesterol (2% HChol) diet along with different doses of *C. osmophloum* leaf powder (2% and 5 % of CoLP) or 0.25% Gemfibrozil (Gem) for 10 weeks. The levels of BUN (**C**) and creatinine (**D**) were determined in the blood serum. Data are presented as mean ± SD (n = 8). Mean values within each column with different labels (a and b) are significantly different (p < 0.05).

***Compound identification.*** Air-dried and powdered leaves (1.5 kg) of *C. osmophloeum* were extracted by boiling water for 1 h with 30 L hot distilled water. After filtration with cheesecloth, the filtrates were collected and concentrated by lyophilization, yielding 280 g of *C. osmophloeum* leaf extract (CoLE) (yield = 18.7%, w/dry weight of leaves). CoLE were separated by analytical high-performance liquid chromatography (HPLC) using Agilent1100 (Agilent, Germany) system with a 100 μL fixed loop, and a UV detector. A 5C18-AR-II column (4.60 mm × 250 mm, 5 μm particle size, Cosmosil, Japan) with a three solvents system, 1% phosphoric acid with deionized water (solvent A), methanol (solvent B) and acetonitrile (solvent C). The linear gradient program was as follows: 82% A, 3% B and 15% C at the first 0 min, held for 10 min; solvent system was then changed to 77% A, 3% B and 20% C over 20 min; finally changed to 100% B at 30 min, held for 5 min. The mobile phase flow rate was 0.4 mL min-1, and the detector was monitored at 254 nm. All the chromatographic operations were carried out at ambient temperature (25°C). Six major compounds from the hot-water extract were obtained at retention times of 17.54 min (**1**), 18.97 min (**2**), 20.25 min (**3**), 21.52 min (**4**), 26.96 min (**5**) and 28.60 min (**6**). The structures of major compounds were then elucidated using spectroscopic analysis. UV and IR data were acquired on a Bio-Tek μQuant MQX200 Microplate Spectrophotometer and a PerkinElmer Spectrum 100 FT-IR spectrometer, respectively. 1H-NMR and 13C-NMR spectra were obtained on a Varian Unity Inova-600 MHz spectrometer using CD3OD as solvent. ESI-MS/MS data were performed with an Orbitrap Mass Spectrometer (Thermo Fisher Scientific Inc., Waltham, MA). Compound **4** was isolated as a yellow solid. It showed UV maxima at λmax 265 and 346 nm, which are typical for flavonoid glycosides. ESI-MS of **4** had a strong peak at *m/z* 709 [M-H]- in the negative mode, which is consistent with the molar mass of 710 g/mol. ESI-MS/MS showed fragments from subsequent loss of a deoxyhexose *m/z* 563 [M-147]-, loss of two sugar units *m/z* 430 [M-280]-, loss of two deoxyhexose *m/z* 417 [M-293]-, and finally a fragment at *m/z* 284 corresponding to the [M-2H]- ion peak of kaempferol. The latter fragment as well as the UV maxima showed that **4** is a kaempferol derivative with free OH-groups at positions C-5 and C4', while those at C-3 and C-7 are substituted. 1H and 1H–1H COSY NMR data showed characteristic aromatic spin systems of rings A and B in kaempferol. Signals of an AA'BB' system at δH 8.01 (d, *J* = 8.4 Hz) and 6.94 (d, *J* = 8.4 Hz), and each integrated for two protons, which were assigned to H-2'/H-6' and H-3'/H-5', respectively. In addition, two *meta* coupled protons at δH 6.48 (d, *J* = 1.8 Hz) and 6.77 (d, *J* = 1.8 Hz) were observed and assigned to H-6 and H-8, respectively. 13C NMR spectrum exhibited the presence of three anomeric carbons at δC 107.9, 101.3 and 99.8 ppm, and their corresponding protons were detected at δH 5.73 (br s), 4.97 (br s) and 5.57 (br s), respectively, in the HMQC spectrum. Carefully analysis of 2D NMR data (COSY, HMQC, and HMBC) revealed the presence of two rhamnose- and one arabinose-sugar units, which was in agreement with the observed ESI-MS/MS fragments. The sequence of the sugar units and their attachment to the aglycone moiety in **4** were confirmed by ESI-MS/MS, chemical shifts of the anomeric carbons and their protons, and HMBC-correlations of the anomeric protons. The fragment observed at *m/z* 430 and the HMBC-correlation of the anomeric proton at δH 5.73 ppm to C-3 (δC 135.2 ppm) indicated the attachment of the arabinose sugar to C-3 of the kaempferol aglycone. The signal detected at *m/z* 563 as well as HMBC correlations of the anomeric proton at δH 5.57 ppm and the *meta*-coupled protons to C-7 (δC 163.6 ppm) indicated the attachment of the rhamnose unit to C-7. Finally, fragments observed at *m/z* 563 and 284, as well as the HMBC correlation of the anomeric proton at δH 4.97 ppm to C-2'' (δC 88.5 ppm) indicated the rhamnose-(1-2)-arabinose connection. This was confirmed by the characteristic downfield signal of C-2'' at δc 88.5 (Δδc 8 ppm) . Each sugar unit was completely assigned based on 2D NMR data analysis and comparison with previously reported data. The spin system containing the anomeric proton at δH 5.57 ppm corresponded to a rhamnopyranosyl unit. This was corroborated by the characteristic 13C NMR data, which are in agreement with those reported for α-L-rhamnopyranoside . The pentose was identified as arabinofuranose based on the characteristic 1H and 13C NMR signals, which are in accordance with the literature­ and **2**. The observed broad singlet of the anomeric proton at 5.73 ppm is indicative of its equatorial orientation. The furanose nature of the α-L-arabinosyl unit was further confirmed by the observed downfield signal of C-4'' at δC 87.7 (Δδc 7 ppm) and the upfield signal of C-5" at δC 62.4 (Δδc 5 ppm) compared with reported data for arabinopyranosides as well as by the 3*J*-HMBC correlation of its anomeric proton to C-4" (δC 87.7 ppm). Finally, the rhamnopyranosyl unit was deduced from the characteristic 13C NMR signals, which are in agreement with data of **3**. The chemical shift of the anomeric proton of the rhamnopyranosyl unit appearing at δH 4.97 ppm is typical for a terminal rhamnosyl unit. Base on those spectroscopic data confirmed the structure of **4** as kaempferol 3-*α*-L-rhamnopyranosyl-(1→2)-*α*-L-arabinofuranosyl-7-*O*-*α*-L-rhamnopyranoside, which was a new compound.

Compound **5** was isolated as a yellow solid. It showed UV maxima at λmax 265 and 347 nm. ESI-MS of **5** exhibited a strong peak at *m/z* 549 [M-H]- in the negative mode, which is consistent with the molar mass of 550 g/mol. ESI-MS/MS showed fragments from subsequent loss of a pentose *m/z* 417 [M-132]-, and finally a fragment at *m/z* 285 ([M-H]-) corresponding to the ion peak of kaempferol. Careful comparison of NMR data as well as ESI-MS/MS data of **5** with those of **2** showed that **5** is almost the same with **2**, including kaempferol aglycone, arabinosyl and apiosyl sugur units. The only difference is the loss of a rhamnopyranoside subunit of **5**. Furthermore, the HMBC correlations of the anomeric proton at δH 5.19 ppm to C-2" (δC 88.0 ppm) confirmed the apiose-(1-2)-arabinose connection. As well as the HMBC correlation of the anomeric proton (5.54 ppm) to C-3 (δC 134.8 ppm) established the attachment of arabinose sugar to C-3. Based on those evidences, a new compound, kaempferol-3-*O*-*β-*D-apiofuranosyl-(1→2)-*α*-L-arabinofuranoside (**5**), was confirmed.