**Supplementary data**

**Plant material**

LP seeds (2 Kg) were defatted with *n*-hexane (Sigma Aldrich, Munich, Germany), extracted using 75% ethanol-water, vacuum filtered using #4 Whatman type filters and the supernatant was completely rotavaporated under reduced pressure at 40°C (Buchi, R-210, Switzerland), till dryness (yield 7.5% w/w). Fresh leaves of green tea (2Kg) were macerated for 72 h followed by filtration using vacuum and rotavaporated till complete dryness (yield 13.36% w/w) with 45 % major component (-) epigallocatechin-3-gallate (EGCG) (Lombardo Bedran et al., 2014).

**HPLC/ESI/PDA/MS-MS analysis**

The samples were dissolved in methanol (Sigma Aldrich, Germany), in concentration of 1mg/ml then filtered through a micropore filter of 0.2µm pore size. Zobrox C18 column of dimensions (4.6mm×250mm, 5µm) was obtained from Agilent Technologies (USA) and used to separate the analytes. The composition of the mobile phase was 0.01% formic acid(A), and acetonitrile(B) with an elution gradient as follows: 0–4 min, 15% B; 4-5 min, 20% B; 5–10 min, 30% B; 10–11 min, 45% B; 11–33 min, 45% B; 33–35 min, 70% B; 35–40 min, 90% B; 40–45 min, 15% B. The flow rate was 1ml/min and injection volume was 10μl. The analytics were detected at mass ranges (100-1000*m/z*). MS scan was carried out at capillary voltage, 3.5kV; detection at cone voltages, (20V-95V); radio frequency (RF) lens voltage, 2.5V; source temperature, 150°C; and desolvation gas temperature, 500°C. Nitrogen was used as desolvation and cone gas at flow rate of 1000 and 20L/h, respectively. System operation and data acquisition were measured using Mass Lynx 4.1 software (Waters).

**Western blot analysis**

Liver adipose tissues were homogenized and lysed with RIBA protein extraction buffer PL005 (Marhham Ontario L3R8T4 Canada), incubated with ice for 30 min, centrifugated at 16,000g for 30 min at 4°C, and cell debris removal was done. Quantitative protein analysis was done using the Bradford Protein Assay Kit (SK3041) BIO BASIC INC. (Markham, Ontario, Canada). The chemiluminescent substrate (ClarityTM Western ECL substrate-BIO-RAD, USA cat#170-5060) was applied to the blot; a CCD camera-based imager was used to capture the chemiluminescent signals, Image analysis software was used on the Chemi Doc MP imager to read the band intensity of the target proteins against the control sample after normalization with β-actin.

**RT-qPCR gene analysis**

The purity (A260/A280 ratio), RNA concentration was obtained using spectrophotometry (Dual-wavelength Beckman, Spectrophotometer, USA). The total RNA (0.5–2μg) was used for complementary DNA (cDNA) conversion using a high-capacity cDNA reverse transcription kit (Fermentas, USA) cat#4375575 to assess FFAs and SREBP-1c expression. Real-time PCR amplification and analysis were performed using SYBR Green PCR Master Mix (Qiagen, Germany), and Applied Biosystem software version 3.1 (StepOne™, USA). The primer sequences of FFAs was (Forward :5-GCTTTGCTGCCGTGTCCTTCT-3, Reverse :5-GTGTCTGCTGGGGTCCTCGTT-3), SREBP-1c was (Forward :5-TCCCAGAGTAGCCCCTTGTCC -3, Reverse :5-CCAGTCCCCATCCACGAATG-3)and housekeeping gene β-actin was (Forward: 5′-TGTTTGAGACCTTCAACACC-3′**,** Reverse: 5′-CGCTCATTGCCGATAGTGAT-3′).

**Chromatographic analysis of *n*-hexane layer**

Using Shimadzu GCMS-QP2010 (Koyoto, Japan) equipped with Rtx-5MS fused bonded column (30m x 0.25mm i.d. x 0.25μm film thickness) (Restek, USA) fitted with a split-spitless injector, mass spectra were registered. The initial column temperature was sustained for 3min (isothermal) at 50°C and programmed to 300°C at 5°C/min and kept constant for 10min (isothermal) at 300°C. The injector temperature was 280°C. The helium carrier gas flow rate was 1.37ml/min. All the mass spectra were recorded applying the following condition: filament emission current, 60mA; ionization voltage, 70eV; ion source, 220°C. Diluted samples (1%v/v) were injected with split mode (split ratio 1:15).

GC-MS analysis was used to investigate the n-hexane layer of LPas shown in (Fig. 1S) and Table (1S), where 11 compounds were identified by comparing the fragmentation pattern and retention time of the compounds to reference compounds analyzed by similar conditions according to NIST mass spectral library (Abd El-Ghffar et al., 2017).

**Toxicity test**

A toxicity test was performed where three doses of LP extract were assessed for their toxicity profile including 100 mg/kg b.w. which is corresponding to the study lowest treatment LP dose, 600 mg/kg b.w. which is six folds the initial LP dose used and 250 mg/kg b.w. which is the approximate geometric mean of both doses used in the toxicity evaluation. No mortality was detected in test subjects after five oral administrations of LP extract, the test rats was examined weekly for the 6 weeks duration of the study, no analytical and anatomopathological changes was detected in the three doses used, based on these findings the dose 600 mg/kg b.w. is the no observed adverse effect level (NOAEL).

References

Abd El-Ghffar, E. A., El-Nashar, H. A. S., Eldahshan, O. A., & Singab, A. N. B. (2017). GC-MS analysis and hepatoprotective activity of the n-hexane extract of Acrocarpus fraxinifolius leaves against paracetamol-induced hepatotoxicity in male albino rats. *Pharmaceutical Biology*, *55*(1), 444–449. https://doi.org/10.1080/13880209.2016.1246575

Lombardo Bedran, T. B., Feghali, K., Zhao, L., Palomari Spolidorio, D. M., & Grenier, D. (2014). Green tea extract and its major constituent, epigallocatechin-3-gallate, induce epithelial beta-defensin secretion and prevent beta-defensin degradation by Porphyromonas gingivalis. *Journal of Periodontal Research*, *49*(5), 615–623. https://doi.org/10.1111/jre.12142

**Supplementary Figures:**



**Fig. (1S):** GC-MS chromatogram of n-hexane layer of *Lepidium sativum, L.*

**Supplementary Tables:**

**Table 1S:** Identification of the compounds of n-hexane layer of *Lepidium sativum, L.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Peak number | R.Time  (min) | Area | Area %a | Compoundb | Base m/z |
| 1 | 40.603 | 61733 | 2.78 | Glycidyl palmitate | 43.05 |
| 2 | 43.575 | 167285 | 7.52 | Bicyclo [10.1.0] tridec-1-ene | 67.00 |
| 3 | 43.633 | 204387 | 9.19 | Glycidyl (Z)-9-Heptadecenoate | 55.05 |
| 4 | 43.725 | 107804 | 4.85 | Methyl (Z)-5,11,14,17-eicosatetraenoate | 79.00 |
| 5 | 49.785 | 210317 | 9.46 | 3,7,11,15-Tetramethyl-2-hexadecen-1-ol | 41.05 |
| 6 | 50.785 | 299389 | 13.46 | 2-Hexadecen-1-ol, 3,7,11,15-tetramethyl-, acetate | 43.00 |
| 7 | 52.235 | 257401 | 11.57 | Gamma. -Tocopherol | 151.10 |
| 8 | 52.967 | 87794 | 3.95 | Stigmast-5-en-3-ol, oleate | 43.05 |
| 9 | 54.917 | 99569 | 4.48 | Campesterol | 43.00 |
| 10 | 56.406 | 578083 | 26.00 | Gamma. -Sitosterol | 43.05 |
| 11 | 56.726 | 150056 | 6.75 | Fucosterol | 55.00 |

a Average of 3 areas analysis.

b Compounds are listed according to their elutionorder.