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## Radical scavenging activity and phytochemical constituent of *Tulipa Systola* Stapf

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**Introduction:** People living on the mountains of the Kurdistan region in Northern Iraq use large amount of herbs for local traditional medicine. Among them, *T. systola*, which grows under and between rocks, is very popular as a herbal anti-inflammatory remedy and pain-relief; two or three fresh bulbs eaten by the patient particularly during inflammation and birth pain. *Tulipa systola* Stapf. was collected in April 2014 on the Korek Mountains in Rewanduz-Erbil/Kurdistan region. The materials were identified and classified from Education Salahaddin University Herbarium (ESUH) by Dr. Abdullah Sh. Sardar, at the University of Salahaddin, Erbil-Iraq. A voucher specimen was deposited with the accession number (7201).

**Experimental:** *Tulipa systola* roots, leaves and flowers (100 g each) were separately defatted with petroleum ether (500 mL), in an ultra-sonic bath for 30 min, then macerated for 3h under continuous stirring at room temperature. The procedure was repeated three times for each part. Defatted roots, leaves and flowers were subsequently separately extracted with ethanol (500 mL) in an ultra-sonic bath for 30 min, and then macerated for 3h under continuous stirring at room temperature. The procedure was repeated three times for each part. The mixtures were then filtered and the solvent was removed under “vacuum” in a rotary evaporator to afford crude ethanol extracts: TR from roots, TL from leaves and TF from flowers, respectively. The concentrated extract TR, TL and TL (1 g), each extract separately was chromatographed over (MPLC (Isolera) RC18, Methanol/Water; (20:80 – 100% methanol) gradient to afford different fractions. From further purification of these fractions, some pure bioactive compounds isolated and then identified by spectroscopic; IR, UV, NMR and MS analysis as, TRD2: (+) 1-O-feruloyl-3-O-p-coumaroyl-glycerol and TRB2: (+) 6-tuliposide A from Roots, TLW5 and F3: (-) Kaempferol-3-O-rutinoside from both Leaves and Flowers part.

**Results:** This is the first report about phytochemical constituent of *Tulipa systola* Stapf. growing in Kurdistan region Iraq. The radical scavenging and antioxidant activity of the isolated compounds were evaluated on four tests: DPPH free radical scavenging activity, ferrous ion-chelating power test, total antioxidant activity, hydrogen peroxide scavenging activity, which were carried out as described in the literatures. Compared to the reference ascorbic acid the IC<sub>50</sub> values of the most active compounds were: (DPPH; IC<sub>50</sub>, Ascorbic acid 55 µg/ml > F3 65.4 µg/ml > TRD2 77.1 µg/ml > TRB2 135.5 µg/ml), (hydrogen peroxide scavenging; IC<sub>50</sub>, F3 36.91 µg/ml > Ascorbic acid 38.37 µg/ml > TRD2 40.83 µg/ml), (TAOC; IC<sub>50</sub>, Ascorbic acid 57.53 µg/ml > TRD2 81.99 µg/ml > F3 121.08 µg/ml). The significant antioxidant and antiradical activities determined for the different compounds give scientific support to the traditional use of the plant by the Kurdish people as a popular anti-inflammatory remedy and pain-relief and a great subtend to become a starting point for *in vivo* investigation in the next steps.

**Conclusions:** To the best of our knowledge, the optical active isomer of compound TRD2 (+) 1-O-feruloyl-3-O-pcoumaroyl-glycerol for the first time had been isolated from *Tulipa systola* roots. The study of the variety of secondary metabolites occurring in *T. systola* as a potential source for natural bioactive chemicals, as well as their precise antioxidant mechanisms, is therefore worthy of being carried out, and it will be reported in due time.

### Biography

Mohammed Farhad Ibrahim is a third year PhD student in Natural Product Chemistry and Drug Discovery from medicinal plants. He was awarded MSc degree at University of Pavia, Italy. He worked as Supervisor in the department of Cosmetic and Pharmaceutical Products at Xenofarma company.

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