

Hypochaeris & Leontodon: Natural products and pharmacological perspectives

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Background

Leontodon tenuiflorus (Gaudin) Rchb.

Hypochaeris genus is part of the Cichorieae tribe and plants have spread widely due to its adaptability, especially in temperate and subtropical climates. Some well-known species include H. radicata L. (flatweed or cat's-ear) and H. glabra L., H. laevigata L. all are occurring in grasslands,

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Hypochaeris L. Includes 64 Accepted Species

lawns, and disturbed soils.

Hypochaeris achyrophorus L

Leontodon genus is a part of the tribe Lactuceae, consists of species commonly known as hawkbits. The both genera are widely distributed across Europe. Leontodon species often thrive in dry, rocky areas and grasslands. L. hispidus and L. autumnalis are notable species frequently seen in wildflower meadows across Europe. L. tenuiflorus (Gaudin) Rchb. is primarily native to France, Italy, Switzerland, and parts of the Balkans.

This species typically grows in temperate climates and has a relatively modest appearance with small, yellow flowers that bloom in early spring through late summer. It has adapted well to Mediterranean-type climates, showing resilience in various habitats, including grasslands and rocky, dry soils. Both genera play essential roles in their ecosystems by attracting pollinators and contributing to plant biodiversity in grassland habitats. Their phytochemical profiles make them valuable for both ecological and medicinal studies.



Hypochaeridinae Subtribe, Asteraceae Family

Chemical composition



- Sesquiterpene lactones, e.g. Ixerisoside D and sonchuside A, 4,6-O-Dihypocretenoyl-D-glucopyranoside; \bullet
 - hypochoeroside C; hypochoerosidic acid C, hypochoeroside D, hypochoerosidic acid D, et.;
 - Lignans, e.g. 4-(3,4-dihydroxybenzyl)-2-(3,4-dihydroxyphenyl)tetrahydrofuran-3-carboxy-O- β -Dglucopyranoside; 4-(3,4-dihydroxybenzyl)-2-(3,4-dihydroxyphenyl)tetrahydrofuran-3-carboxy-O-β-Dglucopyranosyl-2'-O-methacrylate, et.;
- Phenolic compounds, e.g. caffeoyl tartaric acid; chlorogenic acid; cichoric acid; luteolin 7-O-b-Dglucoside; luteolin 7-O- β -D-glucuronide; 3,5-dicaffeoyl quinic acid; 4,5-dicaffeoyl quinic acid;

Fig.1. HPLC of acetone crude extract of *H. glabra* roots. Measured at 245 nm, flow rate 300 ml/min, column: Phenomenex Luna Omega C18, 1.6 µm, 100×2.1 mm; mobile phase: 1% formic acid in H2O (A); 1.00% formic acid in acetonitrile (B). Shimadzu Nexera X2 system.

Leontodon / Hypochaeris	Voucher Nr.
L. tenuiflorus, roots	CZ-20170814-D1
L. tenuiflorus, herb	CZ-20170812-D1
H. glabra, roots	CZ-20230804-PI Kiel
<i>H. glabra</i> , herb	CZ-20230804-PI Kiel

Pharmacological activity

> Antioxidant > Anti-inflammatory Anti-cancer

These medicinal properties of the Hypochaeris genus have made some species valuable in traditional medicine, and their compounds are being studied for therapeutic use (2). In traditional medicines plants are used to cure jaundice, dyspepsia, constipation, rheumatism, and hypoglycaemia (3). Although the medicinal properties of Leontodon species are not as well documented (4) as those of Hypochaeris, studies have shown that some species exhibit anti-inflammatory and antioxidant effects. This makes Leontodon species an area of interest for future research in natural product chemistry and herbal medicine.



Fig. 2. HPLC of methanol-acetone-water (3:1:1) crude extract of L. tenuiflorus herb (CZ-20170812-D1); Measured at 360 nm, flow rate 300 ml/min, column: Phenomenex Luna Omega C18, 1.6 μm, 100×2.1 mm; mobile phase: 1% formic acid in H₂O (A); 1.00% formic acid in acetonitrile (B). Shimadzu Nexera X2 system.

➢ Cardioprotective > Cytoprotective

The Hypochaeris and Leontodon genus represents a promising source of bioactive compounds with significant pharmacological potential. Continued research into these species could lead to the development of new treatments for inflammation, oxidative stress, cancer, and microbial infections



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Reference:

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