Phytochemical Analysis, Antioxidant Potential and Radical Scavenging Activity of *Lomatium dissectum*: An Ancient Plant of North America.

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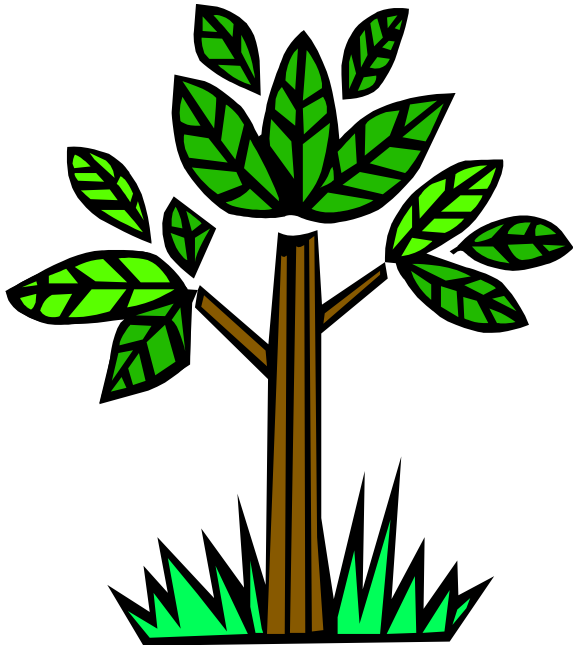
Oxygen paradox

- Oxygen is a necessity for aerobic organism.
- Oxygen is also dangerous for living form.
- It is weak oxidant itself & on univalent reduction give rise to “Reactive Oxygen Species“ (ROS).
- Accumulation of ROS leads to Oxidative Stress.

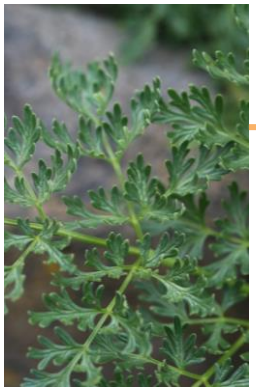


Unlocking the Potential of Natural Products in Drug Discovery

Natural products are secondary metabolites synthesized by living organism.

High structural diversity and unique pharmacological or biological activities.

Thriving source for the discovery of new drugs



Lomatium dissectum

Family : Apiaceae
Genus: *Lomatium*
Species: *L. dissectum*
Common name: fernleaf biscuitroot
fernleaf desert parsley

Lomatium dissectum is a species of flowering plant in the carrot family [1]. It is native to much of western North America. It is a perennial herb reaching up to 1.4 meters tall, growing from a thick taproot.

Traditional uses

Available commercially as whole root or as a tincture.

- Lomatium has been used historically by Native Americans for a wide variety of ailments [2].
- Used as an inhalant, tea, and poultice to treat respiratory illness, skin ailments, and wounds.
- Oily broth of roots was used for treating rheumatism, soar throat, tuberculosis, asthma, and other lung diseases.
- Used topically for gum and mouth inflammations and as a douche for vaginal infections.
- During the influenza pandemic of 1917, it was used with reportedly good results, especially in the southwestern US.

Lomantium dissectum root

Dried and cut roots

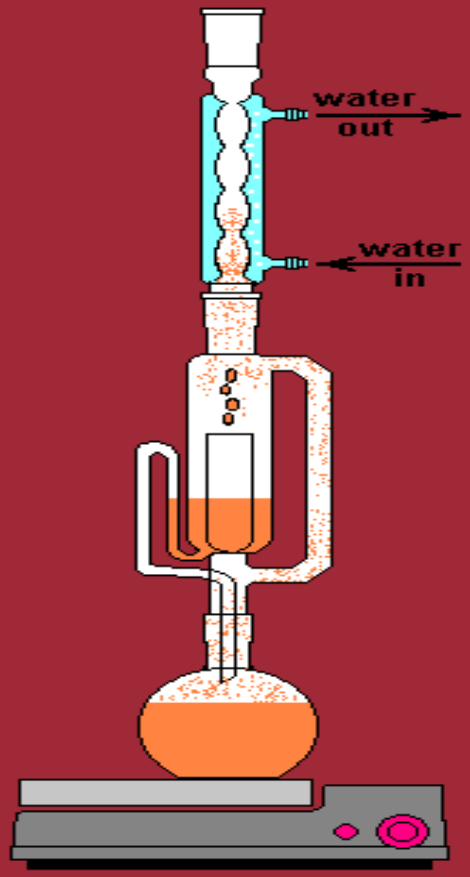
Pharmacological Research

- *L. dissectum* root extract completely inhibited the cytopathic effects of rotavirus [3].
- Exhibited antibiotic activity against *M. tuberculosis* and *M. avium* [4].
- The herb is also known for boosting the immune system and reducing inflammation.

LIMITED SCIENTIFIC RESEARCH

This is the first attempt at researching the antioxidant potential of Lomatium dissectum root extract.

Materials and Methods



- *Plant Material Studied: Roots*
- *Extraction Preparation:* Soxhlet extraction with 95% ethanol at 60-80°C for 12 hours [5]
- *Qualitative Phytochemical Analysis: S*aponins, phlobatannins, phenols, tannins, terpenoids, cardiac glycosides, steroids, and flavonoids were measured as per the standard tests [6].
- *Quantification of Total Phenolic Content:* The Folin-Ciocalteu method was used to determine total phenolic content using gallic acid as standard [5].
- *Quantification of Total Flavonoid Content:* Aluminum chloride method was used to determine flavonoid content using quercetin as standard [5].
- Antioxidant potential of *L. dissectum root* extract was investigated employing by various established *in vitro* systems [5-7]
  - Ferric reducing antioxidant power (FRAP) assay
  - 1, 1-diphenyl-2-picrylhydrazyl (DPPH) assay,
  - superoxide radical scavenging assay
  - Hydrogen peroxide decomposing assay
  - Hydroxyl radical scavenging assay


RESULTS

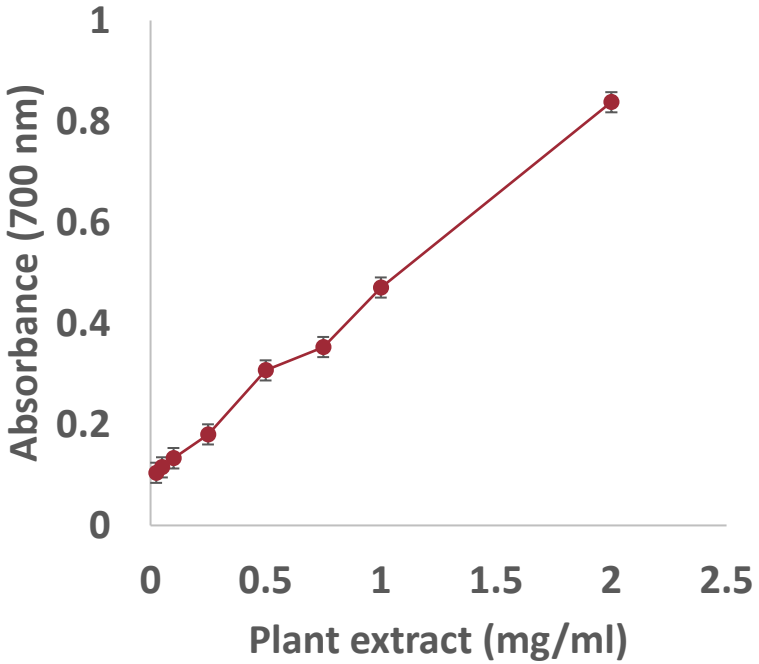
Phenol and Flavonoid Content

Table 1. Polyphenol contents of the ethanolic extracts of the roots of *L. dissectum*

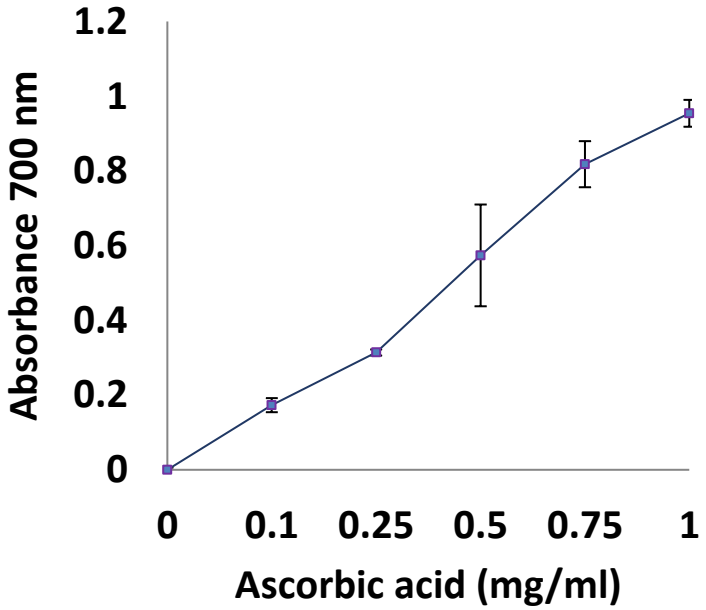
Phenolics	*L. dissectum* root extract
Total phenol	20.80 ± 5.76 mg GAE/g plant material
Flavonoids	65.5 ± 15.8 mg QE/g plant material

Data given are mean of three replicates ± SD

Ferric Reducing Antioxidant Assay



(a)



(b)

Figure 1. The reducing power ability of (a) ethanol extract of *L. dissectum,* and (b) ascorbic acid.

Data given are mean of three replicates ± SD

Free Radical Scavenging Activity

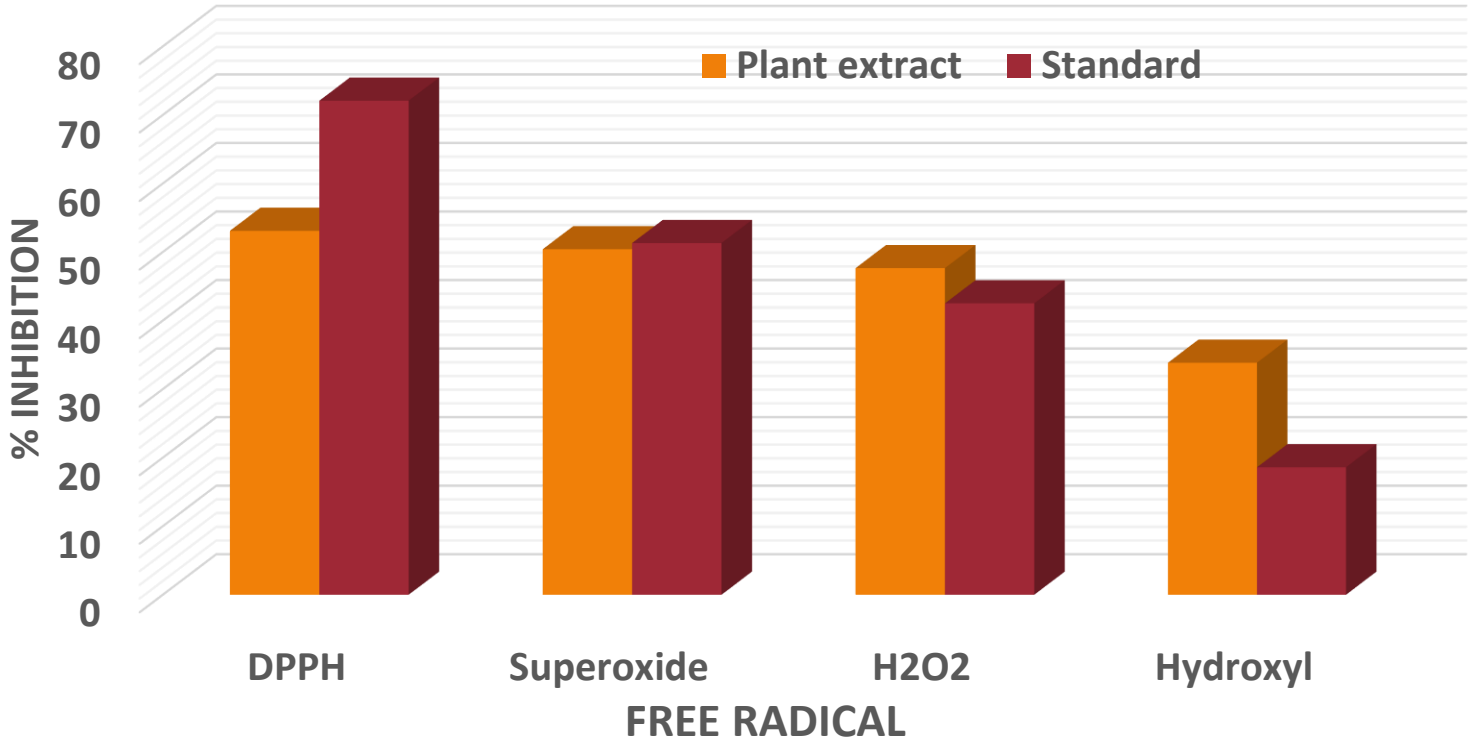


Figure 2. Free radical scavenging activity of *L. dissectum,* ascorbic acid as a standard on DPPH, H_2O_2, and superoxide radicals, and mannitol on hydroxyl radicals.

Data given are mean of three replicates ± SD

CONCLUSION

- *L. dissectum (fernleaf biscuitroot* possess significant antioxidant property.
- Roots extract showed presence phenols, flavonoids, saponins, terpenoids and steroids.
- Lomatium extract showed significant reducing ability comparable to ascorbic acid.
- Significantly scavenged DPPH, superoxide and hydroxyl radical in a concentration dependent manner.
- Decomposed H2O2 in a concentration dependent manner.
- *L. dissectum* roots possess antioxidant-rich nutrients that may help prevent oxidative stress borne diseases.
- This study also supports the traditional use of Lomatium roots to treat various ailments and paves the path for further discoveries.

A long way to go…

References

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Thanks For Watching!

Got Questions???

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