A Promising Nutraceutical *Eriodictyon californicum*, a "Holy Herb," with its Healing Abilities Against Oxidative Stress

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Eriodictyon californicum

Family : Boraginaceae

Genus: *Eriodictyon*

Species: *E. californicum*

Common name: Yerba santa, Holy herb

Native Region: California, Oregon, USA

Description: *Eriodictyon californicum* is an evergreen aromatic shrub with woody rhizomes. The dark green, leathery leaves are narrow, oblong to lanceolate, and up to 15 centimeters in length.

Traditional uses

- Native Americans and Spanish settlers: brewed in tea, eaten as an herb
- Treat respiratory illness including coughs, colds, asthma, upper respiratory illness, allergic rhinitis
- Used as a poultice for wounds, insect bites, broken bones and sores
- Used in steam bath to treat hemorrhoids [1].

Yerba santa leaves

Dried and cut leaves

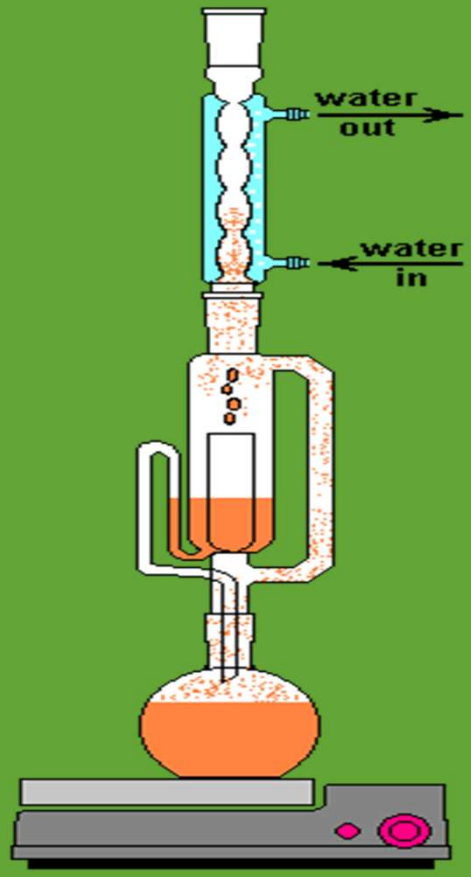
Medical research

Bioactive components: Flavonoid sterubin is neuroprotective against multiple toxicities of the aging brain, including possibly Alzheimer's disease [2].

Food and Pharmaceutical Industry

Flavonones: Eriodictyol, homoeriodictyol, its sodium salt and sterubin have potential uses in food and pharmaceutical industry to mask bitter taste[3].

Materials and Methods



- *Plant Material Studied:* Leaves
- *Extraction Preparation:* Soxhlet extraction with 95% ethanol at 60-80°C for 12 hours [4]
- *Qualitative Phytochemical Analysis: S*aponins, phlobatannins, phenols, tannins, terpenoids, cardiac glycosides, steroids, and flavonoids were measured as per the standard tests [5].
- *Quantification of Total Phenolic Content:* The Folin-Ciocalteu method was used to determine total phenolic content using gallic acid as standard [4].
- *Quantification of Total Flavonoid Content:* Aluminum chloride method was used to determine flavonoid content using quercetin as standard [4].
- Antioxidant potential of *E. californicum* leaf extract was investigated employing by various established *in vitro* systems [4-6]
  - Ferric reducing antioxidant power (FRAP) assay
  - 1, 1-diphenyl-2-picrylhydrazyl (DPPH) assay,
  - superoxide radical scavenging assay
  - Hydroxyl radical scavenging assay

RESULTS

Phenol and Flavonoid Content

Table 1. Polyphenol contents of the ethanolic extracts of the leaf of *E. californicum*

Phenolics	*E. californicum* leaf extract
Total phenol	78.58 ± 0.016 µg GAE/mg plant material
Flavonoids	6.76 ± 0.003 µg QE/mg plant material

Data given are mean of three replicates ± SD

Ferric Reducing Antioxidant Assay

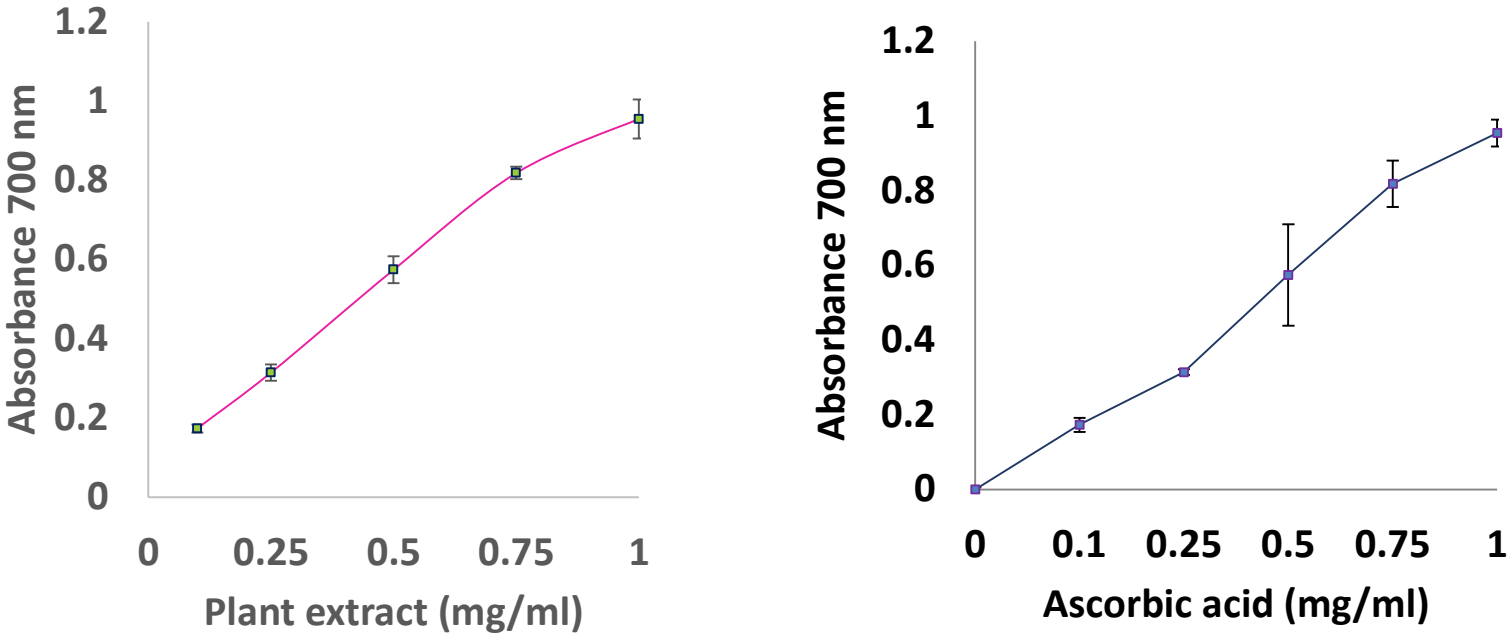


Figure 1. The reducing power ability of (a) ethanol extract of *E. californicum,* and (b) ascorbic acid.

Data given are mean of three replicates ± SD

Free Radical Scavenging Activity

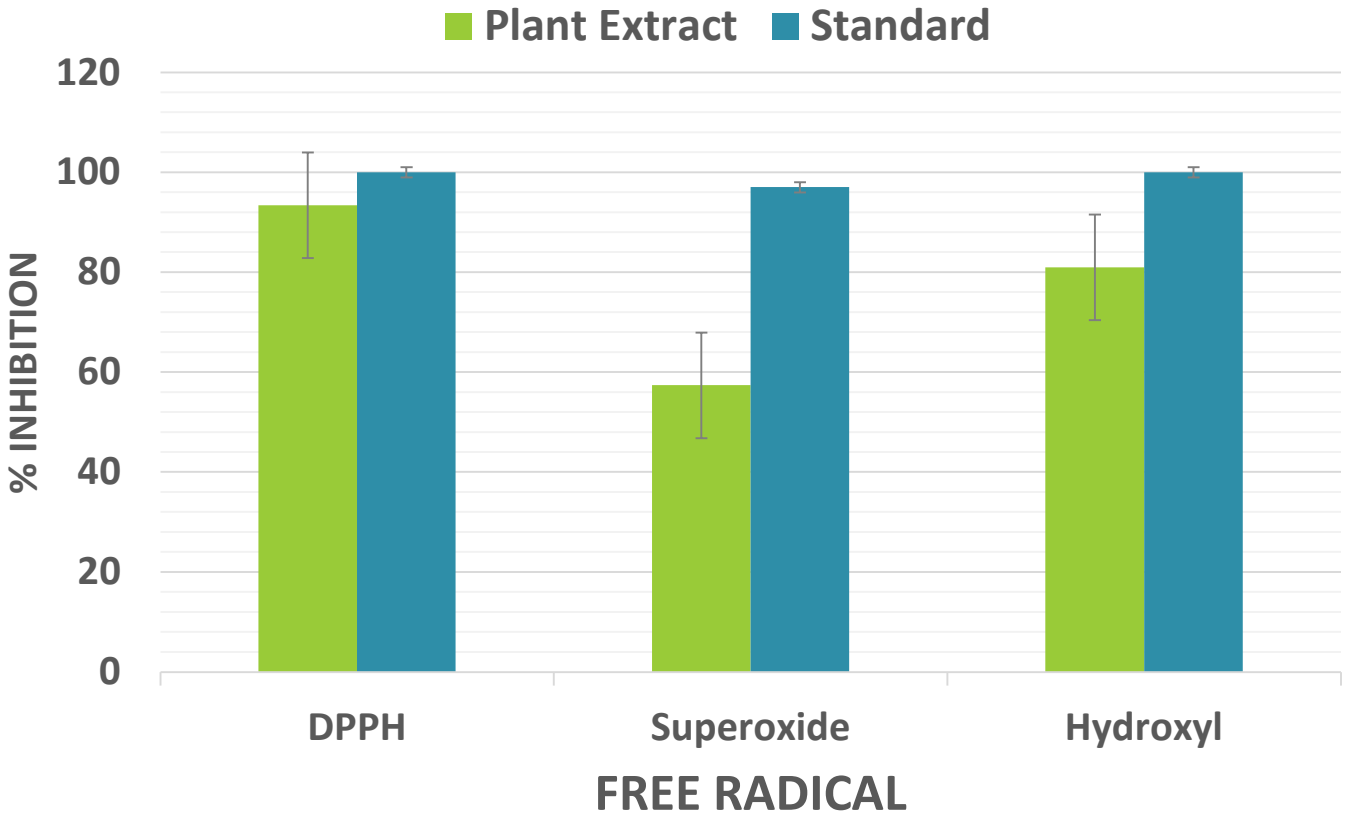


Figure 2. Free radical scavenging activity of *E. californicum,* ascorbic acid as a standard on DPPH and superoxide radicals, and mannitol on hydroxyl radicals.

Data given are mean of three replicates ± SD

CONCLUSION

- *E. californicum (yerba santa)* possess significant antioxidant property.
- Leaves are rich in phenol and flavonoid content.
- Yerba santa showed significant reducing ability comparable to ascorbic acid.
- Significantly scavenged DPPH, superoxide and hydroxyl radical in a concentration dependent manner.
- *E. californicum* leaves with considerable antioxidant properties may be a promising nutraceutical that can help combat oxidative stress induced diseases.
- It can also be used as an additive to preserve food products by reducing or inhibiting oxidative damage.
- This study also supports the traditional use of *E. californicum* leaf extract as a flavoring agent in food and beverages.

References

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Thanks For Watching!

Got Questions???

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