European Scholar Journal (ESJ)
Available Online at: https://www.scholarzest.com
Vol. 6 No. 03 March 2025
ISSN: 2660-5562

ANALYZING THE ANTIOXIDANT QUALITIES OF INULA HELENIUM AND CALENDULA OFFICINALIS

Ibragim R. Askarov
Andijan State University, Professor of the Department of Chemistry, Doctor of Chemistry, Honored Inventor of Uzbekistan, Chairman of the TABOBAT Academy of Uzbekistan
https://orcid.org/0000-0003-1625-0330
Khabibullo N. Kodirov
Andijan State Medical Institute, Department of propedeutics of internal diseases, assistant
https://orcid.org/0000-0001-6574-7576
E-mail:kodirovkhabibullo6@gmail.com

Article history:

Received: 20th January 2025
Accepted: 11th February 2025

Abstract:

The significance of dietary supplements in traditional medicine is covered in this article along with details on their antioxidant qualities, the chemical makeup of supplements for internal illnesses, and the medicinal plants—Calendula officinalis and Inula helenium—that are used to treat them.

Keywords: Calendula officinalis, inula helenium, antioxidants, coumarins, flavonoids.

The function and significance of medicinal plants in the toolbox of medicines is always growing, even in the face of the abundance of extremely efficient synthetic medications. This is because a lot of synthetic medications cause adverse effects on the body, including severe allergic responses, in addition to frequent side effects. Consequently, it is particularly important to increase the number of infusions made from medicinal plants because, in addition to broadening the range of action of herbal medicines currently used in medicine, it is crucial to find and investigate the pharmacological activity of biologically active substances that have not received enough attention.

Since their necessary quantity is linked to hormones, vitamins, amino acids, enzymes, and physiological processes that ensure normal passage, and their deficiency can be a factor causing various pathological processes in the human body, much attention has recently been paid to the study of the composition of biologically active substances of medicinal plants in Uzbekistan and Central Asia.

Numerous Inula helenium species have medicinal and traditional uses. Calendula officinalis and Inula helenium are two examples of them. Elecampane grows to a height of 150 cm and is a perennial herbaceous plant. Mountainous regions, foothills, plains, meadows, deserts, shrubs, lakes, and other moist environments are among the places where it flourishes. Mostly subsurface components are employed in medicine. Worms are expelled from the body by calendula officinalis and inula helenium, which both have antibacterial and anti-inflammatory properties.

Since ancient times, inula helenium has been utilized in medicine. Avicenna previously employed it for its antiulcer qualities, which included its ability to cleanse and expectorate. In traditional medicine, a rootstock and root decoction is still used as an antipyretic, an anthelmintic, a diuretic, and an expectorant for lung TB and respiratory disorders. A decoction made from their rootstocks and roots is applied to a wet gauze wound to treat wounds, injuries, eczema, scabies, and other skin conditions. In medicine, gastrointestinal disorders are treated with rootstock and a root decoction.

A member of the marigold family, calendula officinalis is an annual herbaceous plant. The stem is multifarious, upright, branching from the base, and grows to a height of 75 cm. Carotenoids (up to 3%, carotene 7.6-7.8% in lingual flowers), essential oil 0.02-0.67%, flavonoids 0.33-0.88% (quercetin, isorhamnetin, isoquercitrin, etc.), coumarins (esculetin, scopoletin, umbelliferone), organic acids (6.8% malic acid, a very small amount of salicylate, etc.), triterpene saponins, up to 4% mucus, 10.4-11.2% astringents, and other substances are present in inflorescences-baskets. Iron, manganese, copper, zinc, chromium, aluminum, barium, vanadium, selenium, nickel, lead, strontium, iodine, boron, potassium, calcium, magnesium, and other elements are all found in cloves.

In traditional medicine, calendula officinalis was used to treat disorders of the liver and gall bladder, gastrointestinal system, spleen, wounds, oral mucosa, trichomonas colpitis, inflammation, rickets, cough, and other skin conditions. Ulcerative colitis, stomach ulcers, and illnesses of the twelve duodenal intestines are all treated with

calendula. Additionally, calendula is commonly utilized as an anti-inflammatory, antibacterial, and wound-healing agent in scientific medicine.

The combination of elecampane and calendula's sesquiterpenes makes up the medicinal decoction, which is beneficial in treating peptic ulcers and has anti-inflammatory, antibacterial, vasoconstrictive, and immunosuppressive properties. speeds up the healing of wounds. Possibly the most significant characteristic in the management of inflammatory bowel disorders, as it inhibits the intestinal wall's cyclooxygenase and lipoxygenase, preventing the production of prostaglandins, leukotrienes, and other inflammatory mediators. It also likely binds oxygen free radicals.

Elecampane and calendula have very different maximal blood concentrations; slow acetylators have substantially greater levels, which are linked to more frequent adverse effects. This medication is used to treat duodenal and stomach ulcers three to four times a day. tincture, a medicinal preparation.

portion that is experimental.

After crushing the dried leaves in a blender, the 0.75 g plant sample was boiled for 10 minutes in 50 ml of water in a sieve with a 0.1–0.2 mm size fraction. Watery extract was received, allowed to cool, and then measured with a syringe to be 0.45 µm in diameter from the filter that was utilized and examined.

Ferghana Valley Plantago and Hypericum linariifolium antioxidant activity in the field of leaves and stems as an AA indication of mixes evaluated for adrenaline It is assessed in vitro using the autoxidation reaction inhibition technique, which measures adrenaline's capacity to both inhibit the autoxidation reaction and stop the production of reactive oxygen species (ROS). is articulated

Two methods were used to produce the extract samples of calendula officinalis and inula helenium.

1. A flask with a condenser was used to boil 0.75 g of sample in 50 mL of water for 10 minutes in order to perform reflux. After passing through a 0.45 µm syringe filter, the extracted material was utilized for examination.
2. was extracted by ultrasonography for 20 minutes at 60 degrees Celsius in 25 milliliters of 96% ethanol. After passing through a 0.45 µm syringe filter, the extracted material was utilized for examination.

Table 1.

Adrenaline and measured optical densities of samples.

extract the juicy					alcohol to extract			
time, sec	adrenaline (D_1)	calendula officinalis, inula helenium 1.1 (D_2)	calendula officinalis, inula helenium 3.1 (D_2)	calendula officinalis, inula helenium 1.3(D_2)	Adrenaline (D_1)	calendula officinalis, inula helenium 1.1 (D_2)	calendula officinalis, inula helenium 3.1 (D_2)	calendula officinalis, inula helenium 1.3(D_2)
0	0.056	0.118	0.06	0.085	0.083	0.045	0.038	0.036
30	0.109	0.226	0.105	0.163	0.134	0.083	0,071	0,071
60	0.161	0.326	0.155	0.237	0.186	0.121	0.107	0.107
90	0.212	0.417	0.202	0.308	0.235	0.158	0.14	0.143
120	0.263	0.497	0.247	0.374	0.282	0.195	0.175	0.177
150	0.31	0.566	0.287	0.435	0.326	0.229	0.206	0.209
180	0.355	0.623	0.326	0.491	0.368	0.262	0.234	0.239
210	0.398	0.67	0.362	0.54	0.407	0.294	0.262	0.268
240	0.438	0.707	0.392	0.583	0.442	0.323	0.288	0.295
270	0.476	0.735	0.421	0.621	0.473	0.351	0.312	0.32
300	0.512	0.758	0.446	0.653	0.501	0.376	0.333	0.343
330	0.544	0.774	0.469	0.68	0.525	0.399	0.353	0.365
360	0.574	0.785	0.49	0.702	0.547	0.421	0.372	0.385
390	0.602	0.793	0.506	0.72	0.565	0.44	0.388	0.402
420	0.627	0.795	0.522	0.735	0.583	0.458	0.404	0.418
450	0.649	0.795	0.534	0.746	0.597	0.474	0.417	0.433
480	0.669	0.792	0.545	0.755	0.61	0.489	0.429	0.446
510	0.686	0.787	0.555	0.761	0.623	0.502	0.44	0.458
540	0.702	0.778	0.564	0.765	0.632	0.513	0.45	0.469
570	0.715	0.763	0.571	0.767	0.639	0.524	0.459	0.479
600	0.727	0.746	0.577	0.769	0.647	0.533	0.467	0.487

analysis using spectrophotometry of 0.15 ml of 0.18% adrenaline tartrate solution and 0.2 M carbonate (Na 2 CO 3-NaHCO 3, pH=10.65) buffer, mix rapidly, and in a cuvette 10 mm thick, K7000 (YOKE, China), optical density D 1 at a

wavelength of 347 nm every 30 seconds for 10 minutes was measured in a spectrophotometer. The optical density at a wavelength of 347 nm was determined after 0.045 ml of the plant extract under investigation, 3 ml of the buffer solution, and 0.15 ml of the 0.18% solution of adrenaline tartrate were collected and combined as described above (D 2).

RESULTS ARE DISCUSSED.

The following formula was used to determine the antioxidant activity of the samples under examination, which is expressed as a percentage (AA%) by the suppression of adrenaline autoxidation:

$$AA = \frac{(D_1 - D_2) \cdot 100}{\mathrm{D}_1}$$

In this case, buffer D 1 received the optical density of the adrenaline tartrate solution, buffer D 2 received the sample extract, and buffer D 2 received the optical density of the adrenaline tartrate. The results obtained demonstrate the antioxidant properties of the examined materials. In summary, it can be concluded that the antioxidant capabilities of calendula and elecampane extracts in a 1:1 and 3:1 ratio are higher than those of other samples.

The alcohol extract results demonstrate the antioxidant qualities of the examined samples. 3:1 (35.06%) in extracts of calendula and elecampane. It is clear that the alcohol sample made from calendula and elecampane in a 3:1 ratio (35.06%) has the highest antioxidant content.

Pour a liter (or glass) of water into a covered jar, add 100 g of a crushed rhizome and root mixture (20 g per glass of water), boil a little, and let it brew for four hours to make a decoction from the calendula and elecampane rhizome and root. Next, give it a gauze rinse. Three to four times a day, a tablespoon of the decoction is taken twenty minutes before meals.

We gathered samples from the rhizomes and seeds of Chufa and White Sorghum, crushed them, and performed laboratory analysis in various ratios (3:1, 1:3, and 1:1) across several time periods in order to ascertain the antioxidant activity of the plant extracts. Our ratio of 1:3 is water extract 29.71%, alcohol extract 33.45%, while the typical ratio of 3:1 is water extract 11.35%, alcohol extract 35.06%, according to the data. In our most recent 1:1 ratio, the alcohol extract is 26.58% and the water extract is -57.16%.

CONCLUSION:

An autooxidation method for evaluating the antioxidant activity of adrenaline was presented in vitro, along with general information about calendula officinalis and inula helenium, the chemical composition and nutritional value of calendula growing in Uzbekistan's natural climate, and samples of calendula flowers and literary data. Calendula's floral component has been demonstrated to have more antioxidant capabilities than other portions. Considering that it is somewhat comparable to elecampane and can heal gastrointestinal tract disorders. Compared to Inula helenium, Calendula officinalis leaves have a higher concentration of antioxidants. Therefore, it is recommended that future study use these medicinal herbs to develop new food additives.

REFERENCES:

1. Asqarov. I.R. "Tabobat qomusi".// T: Mumtoz so'z. Toshkent. 2019 y, B. 382.
2. Asqarov I.R."Sirli tabobat".// T: Fan va texnologiyalar nashriyot-matbaa uyi. Toshkent. 2021y. B. 821.
3. Asqarov. I.R. "Dalillarga asoslangan xalq tabobati usullari". Toshkent-2023 y. 260-263 b.
4. Gross V., Bar-Meir S., Lavy A. et al. Budesonide foam versus budesonide enema in active ul- cerative proctitis and proctosigmoiditis. Aliment Pharmacol Ther. 2006;23(2):303–312. doi: 10.1111/j.1365-2036.2006.02743.x.
5. Gisbert J.P., Linares P.M., McNicholl A.G. et al. Meta-analysis: the efficacy of azathioprine and mercaptopurine in ulcerative colitis. Aliment Pharmacol Ther. 2009;30(2):126–137. doi: 10.1111/j.1365-2036.2009.04023.x.
6. Mak W.Y., Zhao M., Ng S.C., Burisch J. The epidemiology of inflammatory bowel disease: East meets west. J Gastroenterol Hepatol. 2020;35(3):380–389. doi: 10.1111/jgh.14872.
7. Shivananda S., Lennard-Jones J., Logan R. et al. Incidence of inflammatory bowel disease across Europe: is there a difference between north and south? Results of the European Collaborative Study on Inflammatory Bowel Disease (EC-IBD). Gut. 1996;39(5):690–697. doi: 10.1136/gut.39.5.690.
8. Truelove S.C., Witts L.J. Cortisone in ulcerative colitis; final report on a therapeutic trial. Br Med J. 1955;2(4947):1041–1048. doi: 10.1136/bmj.2.4947.1041.
9. Seah D., De Cruz P. Review article: the practical management of acute severe ulcerative colitis. Aliment Pharmacol Ther. 2016;43(4):482–513. doi: 10.1111/apt.13491.