



SAVVAĻAS UN MĀJAS AVEŅU LAPU TĒJAS SALĪDZINĀJUMS

**Inta Krasnova
Dalija Segliņa
Laura Vecvagare**

NACIONĀLAIS
ATTĪSTĪBAS
PLĀNS 2020



EIROPAS SAVIENĪBA
EIROPA INVESTĒ LAUKU APVIDOS
Eiropas Lauksaimniecības fonds
lauku attīstībai

Atbalsta Zemkopības ministrija un Lauku atbalsta dienests

Nr.19-00-A01612-000006 "Biotehnoloģiju kompetences
attīstība augstvērtīgu dārzkopības produktu ieguvei "

"Pavasaris 2022", 21.04.2022., Dobeļe



LAD 16.1.akt. “Biotehnoloģiju kompetences attīstība augstvērtīgu dārzkopības produktu ieguvei”



2. aktivitāte

Izstrādāt tehnoloģijas augļu, ogu **pārstrādes blakusproduktu paplašinātai** izmantošanai, nosakot: bioloģiski aktīvu vielu savienojumus ar konservantu/antioksidantu īpašībām un dabīgos pigmentus izejvielās; LV audzētās leizejas auga daļās; izstrādāt ekstraktus, sagatavot produktu tehniskos noteikumus;

- Izveidot datu kopu par smiltsērķšķu, **aveņu**, kazeņu (*Rubus* ģints), leizejas, krūmcidoniju blakusproduktu (lapu, dzinumumu, augļu serdes) ķīmisko sastāvu.





Pētījuma aktualitāte:



Sarkanās jeb meža avenes *Rubus idaeus* L. pirmo reizi minēta Plīnija Vecākā rakstos m.ē. 23.-74g.

Uzskata, ka iespējamā to izcelsmes vieta ir Idas kalns Grieķijā, bet daži autori kā izcelsmes vietu min Turciju.

Ap 1500. gadu sarkanās avenes *R. idaeus* jau tika audzētas visā Eiropā.

Terapeitiskā iedarbība, kas attiecināta uz aveņu lapu ekstraktiem, popularizēta ap 1597. gadu - Džons Džerards (J. Gerard, 1545.–1612.) angļu ārstniecības augu zinātājs;

1484 lappušu ilustrētā grāmata “Herball” jeb “General Historie of Plantes” kļuva par populāru dārzkopības un ārstniecības augu grāmatu angļu valodā 17. gadsimtā.

Pirmais zināmais zinātniskais aveņu lapu ekstraktu izmantošanas novērtējums publicēts tikai 1941. gadā.

To paveica autori Burn & Withell, aprakstot pētījumu par aveņu lapu uzlējuma jeb tējas izmantošanu, lai atvieglotu dzemdību sāpes un veicinātu sekmīgāku dzemdību norisi.



Pētījuma aktualitāte:



Tautas medicīnā aveņu lapas izmanto dažādu, ar veselību saistītu problēmu mazināšanā.

- ❖ Vecmātes savā praksē ir izmantojušas ārstniecības augus gadsimtiem ilgi, lai sievietēm palīdzētu grūtniecības laikā, dzemdībās un arī pēcdzemdību periodā.
- ❖ Veikti pētījumi, lai atdalītu un noteiktu aktīvās sastāvdaļas aveņu lapās un to iedarbību. Veikti eksperimenti un bioloģiskie izmeklējumi ar izolētiem lapu ekstraktu preparātiem uz dzīvniekiem dažādos cikla posmos.
- ❖ Paraugi ņemti no grūsnu un negrūsnu žurku dzemdes, kas salīdzināti ar cilvēka grūtnieces dzemdi (Bekets, Beltls, Fells un Lokets, 1954).
- ❖ Tradicionāli aveņu lapu uzlējumus, tējas izmantoja, lai atvieglotu dzemdību sāpes un veicinātu sekmīgāku dzemdību norisi (Pavlović et al., 2016). Fragrīns, alkoloīds (Mallory, 2018).



ORIGINAL ARTICLES

A PRINCIPLE IN RASPBERRY LEAVES WHICH RELAXES UTERINE MUSCLE

BY

J. H. BURN,

M.D., CAMB.

PROFESSOR OF PHARMACOLOGY,
OXFORD

E. R. WITHELL,

B.SC., B. PHARM. LOND. PH.C.

HEAD OF THE PHARMACY DEPARTMENT,
CENTRAL TECHNICAL COLLEGE, BIRMINGHAM

RASPBERRY-LEAF tea has been a herbalist's remedy for many years. It is said to be the best known and oldest of all the herb infusions and to be included "as a proved aid in maternity in the most ancient of herbal books." Our interest in it was stimulated by an inquiry made to one of us (E. R. W.) by Sir Beckwith Whitehouse whether anything was known of the action of raspberry leaves in the body.

The statement made by one firm of herb specialists is as follows: "Raspberry leaves are the dried leaves of *Rubus idaeus* (Rosaceae) which grow in Europe, Canada and northern United States. The leaves impart their properties to water, giving to the infusion an odour and flavour somewhat similar to that of some kinds of black tea. Raspberry leaves have astringent properties and also act as a stimulant. It is found that if the infusion is taken freely before and during confinement, parturition is easy and speedy." It is also said to be useful in painful and profuse menstruation. We have accordingly tested extracts of raspberry leaves for their action on the uterus both *in situ* and when isolated. In the course of this work we have found that a principle is present which causes relaxation of the muscle of the uterus when this is tonically contracted, and which diminishes the force and frequency of rhythmic contractions. We have also made a general survey of the action of raspberry-leaf extracts on other tissues.

PREPARATION OF EXTRACTS

Active extracts have been made in the following ways.

(a) By making an infusion of the dried leaves with boiling water, using 100 ml. of water for 10 g. leaf. This was allowed to stand for half an hour and then squeezed through muslin. The infusion was concentrated by evaporation at 40° C. under reduced pressure until the activity of 2 g. leaf was present in 1 ml.

(b) By evaporating to dryness an infusion prepared as in (a). Approximately 1 g. residue was given by 10 g. leaf. Of the residue 1 g. was taken up in 5 ml. distilled water, and 5 ml. absolute alcohol was added. This produced a precipitate of inactive material which was removed by filtration. The filtrate was taken to dryness. Of the residue 1 g. was

variable. Instead of the simple relaxant fig. 1, occasionally the relaxation was followed by traction. Sometimes there were three phases: relaxation, (b) contraction and (c) further relaxation. Often the effect seen in fig. 1 was not obtained first injection, but as successive injections were relaxation became increasingly pronounced, shown in fig. 2, in which the 2nd injection produced no more than a longer pause between contractions, as shown in fig. 2A, while the 4th injection led to complete arrest of all uterine muscle being fully relaxed.

While extracts made by the process (b) had effect on the blood-pressure, extracts prepared often caused an initial fall of blood-pressure especially in spinal cats, by a rise which was large; in one experiment the blood-pressure rose from 78 to 196 mm. Hg. The concurrence of a rise in pressure and a relaxation of the uterus at first showed that both effects might be due to the liberation of adrenaline from the suprarenal glands by the same substance in the extract resembling adrenaline. Several experiments were necessary to establish that suprarenal glands played no part in the action of the extract, and that complete relaxation with cessation of rhythmic contractions was produced in the cat by these glands.

We tested the action of extracts of raspberry not only on the uterus of the virgin cat but also on non-pregnant multiparous cat and on one cat in pregnancy. The record obtained before the injection showed large contractions at intervals of 2 minutes superimposed on a regular rhythm of smaller contractions. When the raspberry-leaf extract was injected the large contractions were abolished during the series of smaller contractions persisting.

Action on uterus of rabbit in situ.—When preparations of the uterus *in situ* were made from rabbit, using urethane as an anaesthetic, relaxation was not observed to follow the injection of raspberry extract. Instead a contraction of short duration was seen. Since the rabbit's uterus also contracts in response to adrenaline is injected, we at first thought that the contraction was further evidence that the effect of the raspberry-leaf extract was due to the liberation of adrenaline. We do not think that this is so, but the rabbit the phase of contraction which is observed in the cat is the main effect.

rabbits we used were thicker than cats. It may be that a much larger quantity of extract is needed to produce the same effect. That the effect is not due to a

A History of Red Raspberry Leaf:

The use of red raspberry leaf dates back for centuries (some resources go as far as to say 10000 years ago). The

therapeutic use of raspberry leaf was first described in 1597 in a book called "The Herbal," or "A General History of Plants" written by British herbalist John Gerard (1545–1611 or 12) While the exact origin of its herbal use hasn't been entirely confirmed,

red raspberry leaf has a rich history of being used to treat a wide variety of ailments. Early Roman use of the raspberry leaf included relief of uterine contractions during childbirth, as a remedy for stomach and throat ailments, and as a poultice for wounds and sores. Various American Indian tribes were also aware of the leaves' astringent properties, and made use of raspberry leaf tea as an eyewash, to cleanse wounds, and to relieve diarrhea, dysentery, uterine hemorrhage, menstrual cramps, and runny noses. The most popular use of red raspberry leaf today is by far during pregnancy, though that is definitely not its only use.

During Pregnancy

Many of the complications that arise during pregnancy can be traced back to the mother's diet, which is typically lacking in vital nutrients and minerals. For thousands of years, wise-women have recommended herbal tonics during the childbearing years to help both mother and baby experience a healthy, normal pregnancy, labor, and birth. Herbal tonics are generally considered to be both safe and effective as they help improve mom's overall health and prevent any major problems. Tonics also boost the supply of vital vitamins and minerals, help increase energy, and improve uterine tonicity. Herbal tonics should be used on a regular basis in order to gain the most benefit from them.



THE ACTIVE CONSTITUENTS OF RASPBERRY LEAVES

A PRELIMINARY INVESTIGATION

BY A. H. BECKETT, F. W. BELTHLE and K. R. FELL

Chelsea School of Pharmacy

and

M. F. LOCKETT

Department of Physiology, Chelsea Polytechnic, London, S.W.3

Received July 12, 1954

PARTS of the raspberry plant (*Rubus idaeus* Linn., Family *Rosaceae*) have been used medicinally for centuries—certainly as early as the sixth century A.D. Dioscorides¹ devoted a monograph to certain *Rubus* species. Raspberry leaf "tea" is a herbal medicine in Britain, but is apparently little used in the U.S.A.² In herbals, it is stated that parturition becomes easier and speedier if the warm "tea" is taken freely before and during confinement. It is claimed to be an efficient substitute for ergot,³ and has also been employed empirically in cases of severe dysmenorrhœa.

Despite the traditional uses and claims for its pharmacological activity, nothing appears to have been published concerning the pharmacological or clinical evaluation of the drug until 1941, when two preliminary reports, by Burn and Withell,⁴ and by Whitehouse,⁵ appeared. The former prepared infusions of the dried leaves, and concentrated them by evaporation under reduced pressure subsequent to various treatments with ethanol, basic lead subacetate, or charcoal. The resultant extracts were tested upon isolated uteri of the cat, dog, rabbit and guinea-pig, and upon cat and rabbit uteri *in situ*. The actions on intestine, spleen, heart and blood-vessels were also investigated.

It was concluded that a principle was present which relaxed the smooth muscle of the cat uterus and intestine *in situ*, although the effect on the uterus was variable. Relaxation was also produced in isolated preparations of cat uterus and intestine. The same principle, or another, caused contraction of the rabbit uterus *in situ* and of the isolated cat, rabbit and guinea-pig uteri when these were *not in tone*.

The principle causing relaxation was concluded to be the probable

www.delfi.lv

DELFI

Delfi Plus: Piedalījies p

Intervija ar Krievijas TV

Jaunināšan

Pētījuma aktualitāte

Bowman et al. *BMC Complementary Medicine and Therapies* (2021) 21:56
<https://doi.org/10.1186/s12906-021-03230-4>

BMC Complementary
Medicine and Therapies

RESEARCH ARTICLE

Biophysical effects, safety and efficacy of raspberry leaf use in pregnancy: a systematic integrative review

Rebekah Bowman¹, Jan Taylor¹, Sally Muggleton¹ and Deborah Davis^{1,2*}

Abstract


Background: Childbearing women have been using various herbs to assist with pregnancy for centuries. One of the most common is raspberry leaf. The evidence base for the use of raspberry leaf is under-developed. It is incumbent on midwives and other maternity care providers to provide evidence-based information so they can make informed choices. The aim of this study was to review the literature to identify the evidence base on the biophysical effects, safety and efficacy of raspberry leaf use in pregnancy.

Methods: A systematic, integrative review was undertaken. Six databases were searched to identify research papers published in peer reviewed journals including in vitro, in vivo, human and animal studies. Search included the databases CINAHL, MEDLINE, Cochrane Library, Scopus and Web of Science and AMED. Identified studies were appraised independently by two reviewers using the Modified Jadad instrument. An integrative approach was taken to analysis.

Results: Thirteen studies were included. Five were laboratory studies using animal and human experiments using animals, and six were human studies. Included studies were published between 1998 and 2019. Raspberry leaf has been shown to have biophysical effects on animal and human smooth muscle and uterus. Toxicity was demonstrated when high doses were administered intravenously or intraperitoneally in animal studies. Human studies have not shown any harm or benefit though one study demonstrated a meaningful (though non-statistically significant) reduction in length of second stage and time to delivery in women taking raspberry leaf.

Conclusions: Many women use raspberry leaf in pregnancy to facilitate labour and birth. The evidence supporting the use of raspberry leaf in pregnancy is weak and further research is needed to evaluate the effectiveness of raspberry leaf's effectiveness.

Keywords: Pregnancy, Herbal, Complementary medicine, midwifery, Evidence-based practice

 World Journal of Gastroenterology

Submit a Manuscript: <https://www.f6publishing.com> World J Gastroenterol 2020 February 14; 26(6): 562-597
DOI: 10.3748/wjg.v26.i6.562 ISSN 1007-9327 (print) ISSN 2219-2840 (online)

REVIEW

Tea polyphenols and their chemopreventive and therapeutic effects on colorectal cancer

Shi-Tong Wang, Wen-Qi Cui, Dan Pan, Min Jiang, Bing Chang, Li-Xuan Sang

ORCID number: Shi-Tong Wang (0000-0002-4575-0396); Wen-Qi Cui (0000-0003-3499-7817); Dan Pan (0000-0003-3293-0037); Min Jiang (0000-0001-5148-5149); Bing Chang (0000-0003-1965-5827); Li-Xuan Sang (0000-0002-4562-0022).

Author contributions: Wang ST and Sang LX designed the structure of the manuscript; Wang ST, Cui WQ, Pan D, Chang B and Sang LX drafted the manuscript; Wang ST, Cui WQ and Sang LX reviewed the literature; Pan D, Jiang M and Sang LX critically revised the manuscript.

Supported by the Innovative Talents Support Program of Institution of Higher Learning of Liaoning Province, No. 2018-478; and Innovative Talents of Science and Technology Support Program of Young and Middle Aged People of Shenyang, No. RC170446.

Conflict-of-interest statement: We declare no conflicts of interest.

Open-Access: This article is an

Shi-Tong Wang, Department of Cardiovascular Ultrasound, First Affiliated Hospital of China Medical University, Shenyang 110001, Liaoning Province, China

Wen-Qi Cui, Department of Neurology, Shengjing Hospital, Affiliated Hospital of China Medical University, Shenyang 110004, Liaoning Province, China

Dan Pan, Li-Xuan Sang, Department of Geriatrics, First Affiliated Hospital of China Medical University, Shenyang 110001, Liaoning Province, China

Min Jiang, Bing Chang, Department of Gastroenterology, First Affiliated Hospital of China Medical University, Shenyang 110001, Liaoning Province, China

Corresponding author: Li-Xuan Sang, MD, PhD, Chief Doctor, Department of Geriatrics, First Affiliated Hospital of China Medical University, 155 Nanjing North Street, Heping District, Shenyang 110001, Liaoning Province, China. sanglixuan2008@163.com

Abstract

Colorectal cancer (CRC), a multifactorial disease, is usually induced and developed through complex mechanisms, including impact of diet and lifestyle, genetic abnormalities, change of signaling pathways, inflammatory response, oxidative stress, dysbiosis, and so on. As natural polyphenolic phytochemicals that exist primarily in tea, tea polyphenols (TPs) have been shown to have clinical applications, especially as anticancer agents. Most animal studies and epidemiological studies have demonstrated that TPs can prevent and treat CRC. TPs can inhibit the growth and metastasis of CRC by exerting the anti-inflammatory, anti-oxidative or pro-oxidative, and pro-apoptotic effects.

Article

Phenolics and Carotenoid Contents in the Leaves of Different Organic and Conventional Raspberry (*Rubus idaeus* L.) Cultivars and Their In Vitro Activity

allmann^{*}

Organic Food, Institute of Human Nutrition, Warsaw University of Life Sciences, Warsaw, Poland; alicja_ponder@sggw.pl; mann@sggw.pl; Tel.: +48-22-593-7036

Received: 4 October 2019; Published: 7 October 2019



Raspberries are a source of carotenoids and polyphenols, including ellagic acid and quercetin. Scientific research suggests that they have potential pro-health properties. The aim of this study was to determine the polyphenolic and carotenoid contents of selected raspberry cultivars and their in vitro activity. The second part of the study compared organic and conventional farm management on the polyphenolic and carotenoid contents in different raspberry cultivars: 'Polana', 'Polka', 'Tulameen'. Organic raspberries leaves had a significantly higher content of dry matter, total polyphenols, total phenolic acid, salicylic acid and quercetin-3-O-rutinoside; moreover, the organic raspberries had a higher antioxidant activity. Among examined cultivars, 'Polka' had the highest antioxidant status. However, raspberry leaves from conventional farms had significantly higher contents of violaxanthin, alpha-carotene, beta-carotene, total chlorophyll and total carotenoids.

Keywords: phenolics; carotenoids; antioxidant activity; organic; conventional

Raspberries are recognized by consumers as a tasty and healthy fruit. Recent research has shown that berry plants, such as strawberries, raspberries, blueberries and blackcurrants, produce various compounds with strong pro-health, anticancer and anti-inflammatory properties. These compounds are by-products of berry plant cultivation. Their traditional therapeutic applications include the common cold, inflammation, diabetes, and ocular inflammation. Raspberry leaves contain high amounts of polyphenols and can serve as natural antioxidants for medicinal and commercial uses. Raspberry leaves contain chlorogenic, gallic, ferulic, caffeic acids, as well as flavonoids, including quercetin-3-O-glucoside [6]. However, two chemical compounds deserve special attention [7,8]. These compounds show strong biological effects in vitro that include antioxidant, pharmacological and nutritional effects [9]. They are mainly related to the

Pētījuma aktualitāte

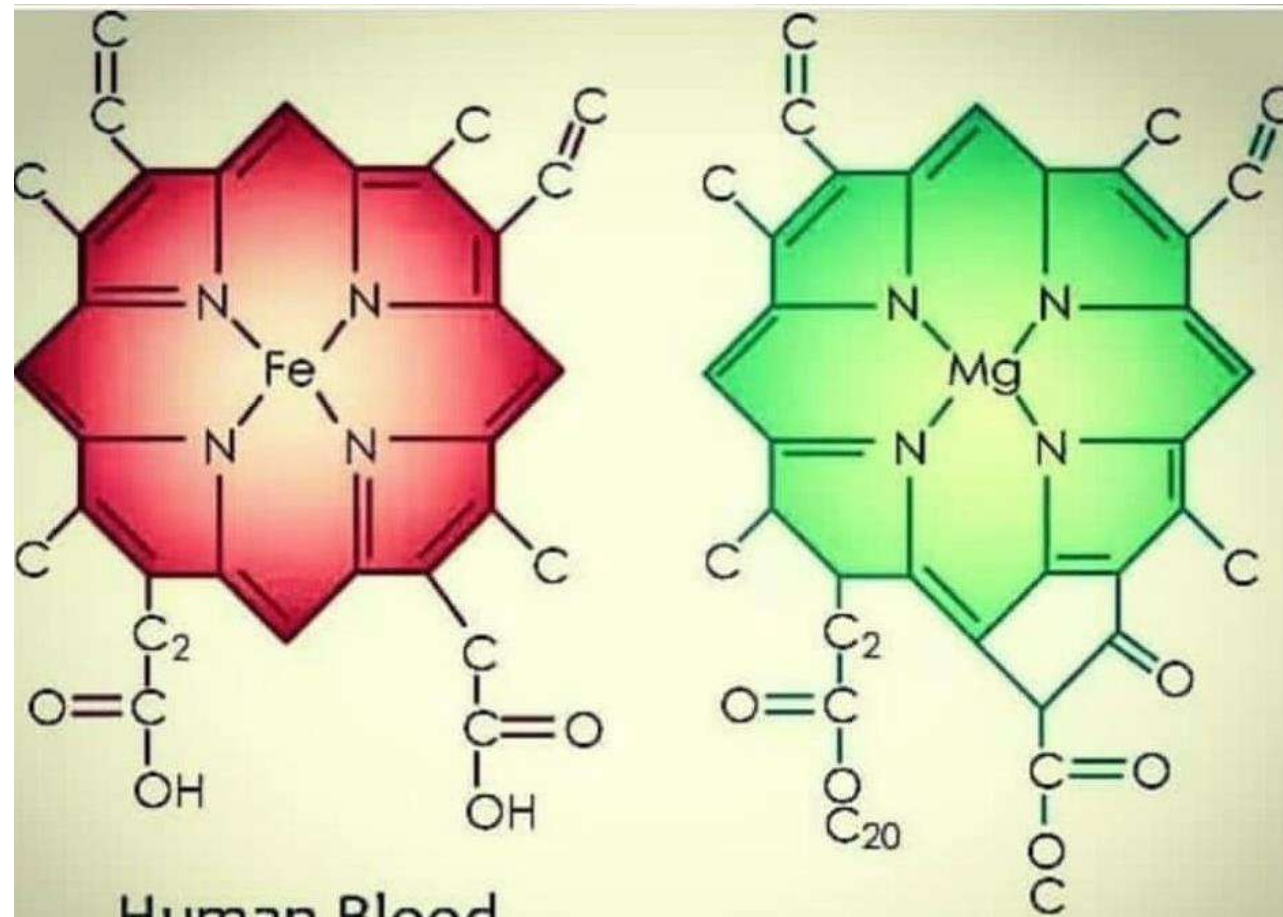
Hlorofils ir fotosintētisko organismu primārais - zaļās krāsas pigments, kas spēj uztvert gaismas enerģiju no saules gaismas. Augu pigmenti hlorofils **a** un **b** ir atbildīgi par **fotoķīmiskām reakcijām**, kas nepieciešamas **fotosintēzei**. Hlorofila molekulu veido elementi **C, H, N** un **O** ap centrālo metāla jonu **Mg**. Hlorofils absorbē dzeltenās un zilās krāsas viļņu garumus no elektromagnētiskā starojuma un atstaro zaļu. Tādējādi tie ir redzami zaļā krāsā.

Hlorofilu sauc arī par augu “zaļajām asinīm”.

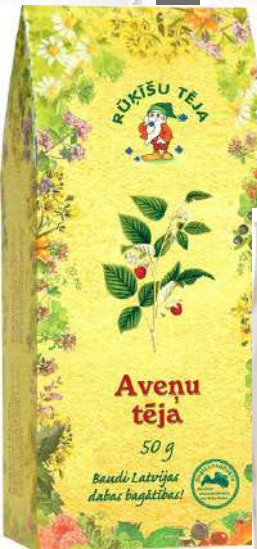
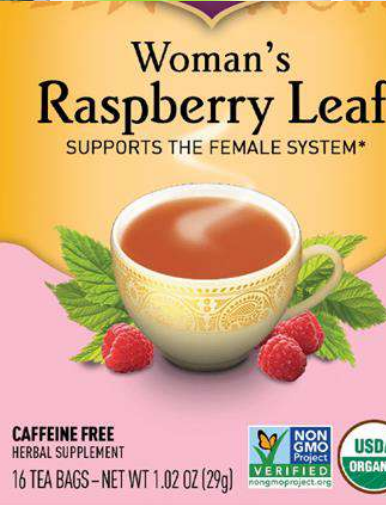
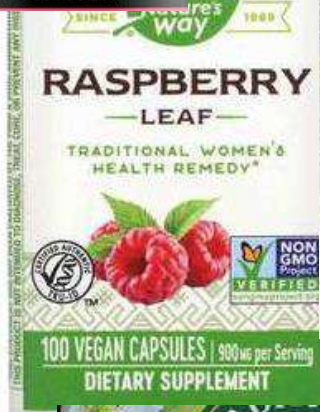
Hemoglobīns ir **Fe** saturošs pigments mugurkaulnieku sarkanajās asinīs, kas transportē **O₂** no plaušām uz citām ķermeņa daļām. Hemoglobīns ir sarkanās krāsas pigments, kurš ir uzskatīts par elpošanas pigmentu.

Atšķirība hemoglobīna molekulai no hlorofila ir tā, ka hlorofila helātu kompleksa centrā ir Mg atoms, bet hemoglobīnā - Fe.

Hlorofils un **hemoglobīns** ir būtiski nepieciešami augu un cilvēku, dzīvnieku dzīves procesiem.









Pētījuma mērķis:

Salīdzināt savvaļas un mājas aveņu lapu tējas ķīmisko sastāvu un novērtēt fermentēšanas ietekmi uz bioloģiski aktīvo savienojumu saturu lapās un tējā



RSU, Laura Vecvagare

Pētījuma uzdevumi



1. Ievākt savvaļas un mājas aveņu lapu paraugus;
2. Veikt paraugu fermentēšanu un kaltēšanu;
3. Analizēt aveņu lapu paraugu ķīmisko sastāvu:
 - ❖ hlorofila saturu;
 - ❖ noteikt kopējo polifenolu saturu;
 - ❖ flavonoīdu saturu;
 - ❖ tanīnu daudzumu;
4. Noteikt antioksidantu aktivitāti (DPPH) aveņu lapu paraugos;
5. Pagatavot aveņu lapu tēju paraugus:
 - ❖ veikt ķīmiskā sastāva un antioksidantu aktivitātes novērtēšanu;
 - ❖ sensoro vērtēšanu.



Pētāmie materiāli – lapas, tēja



Meža aveņu lapas

Mājas aveņu lapas

Fermentētas meža aveņu lapas

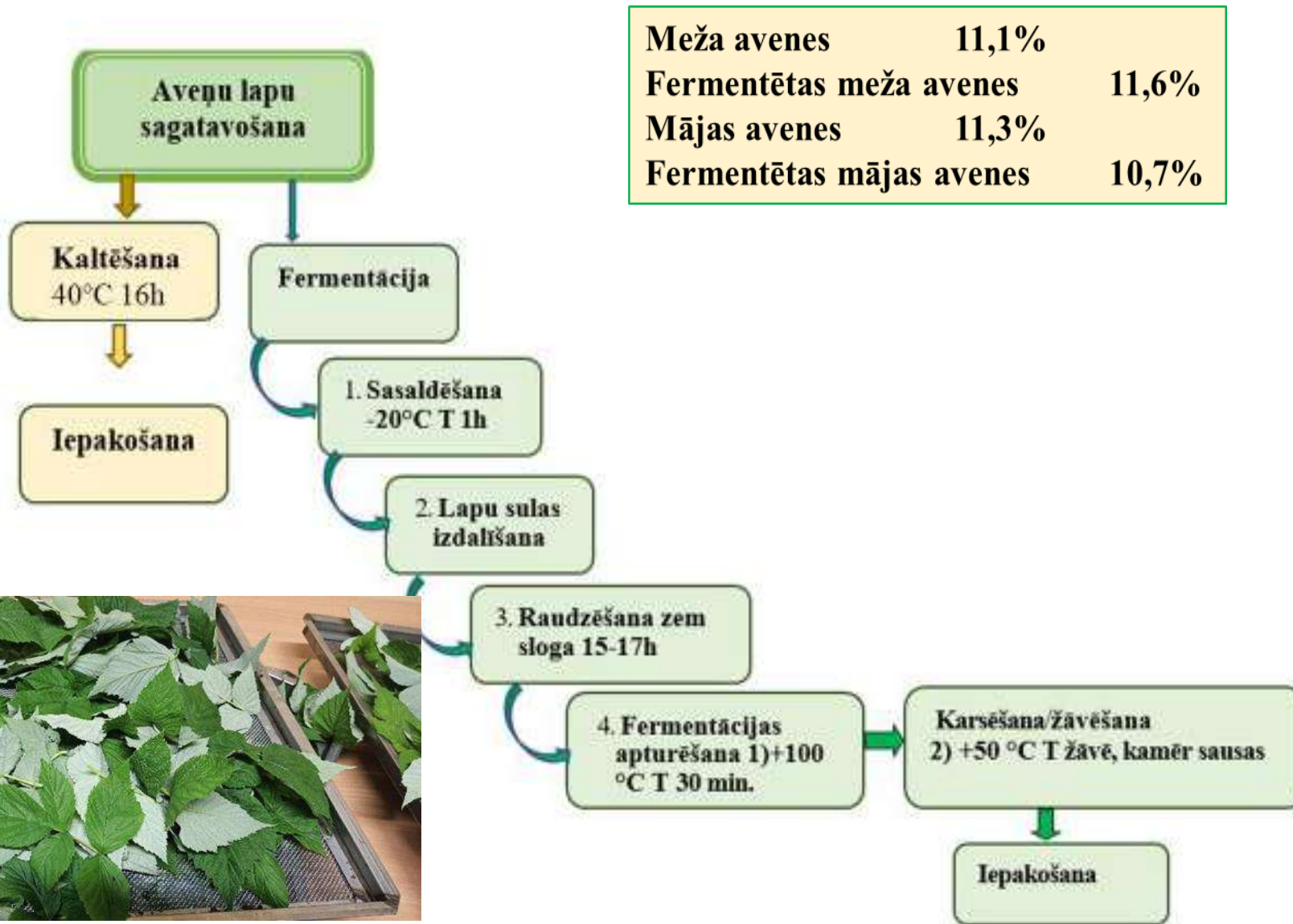
Fermentētas mājas aveņu lapas

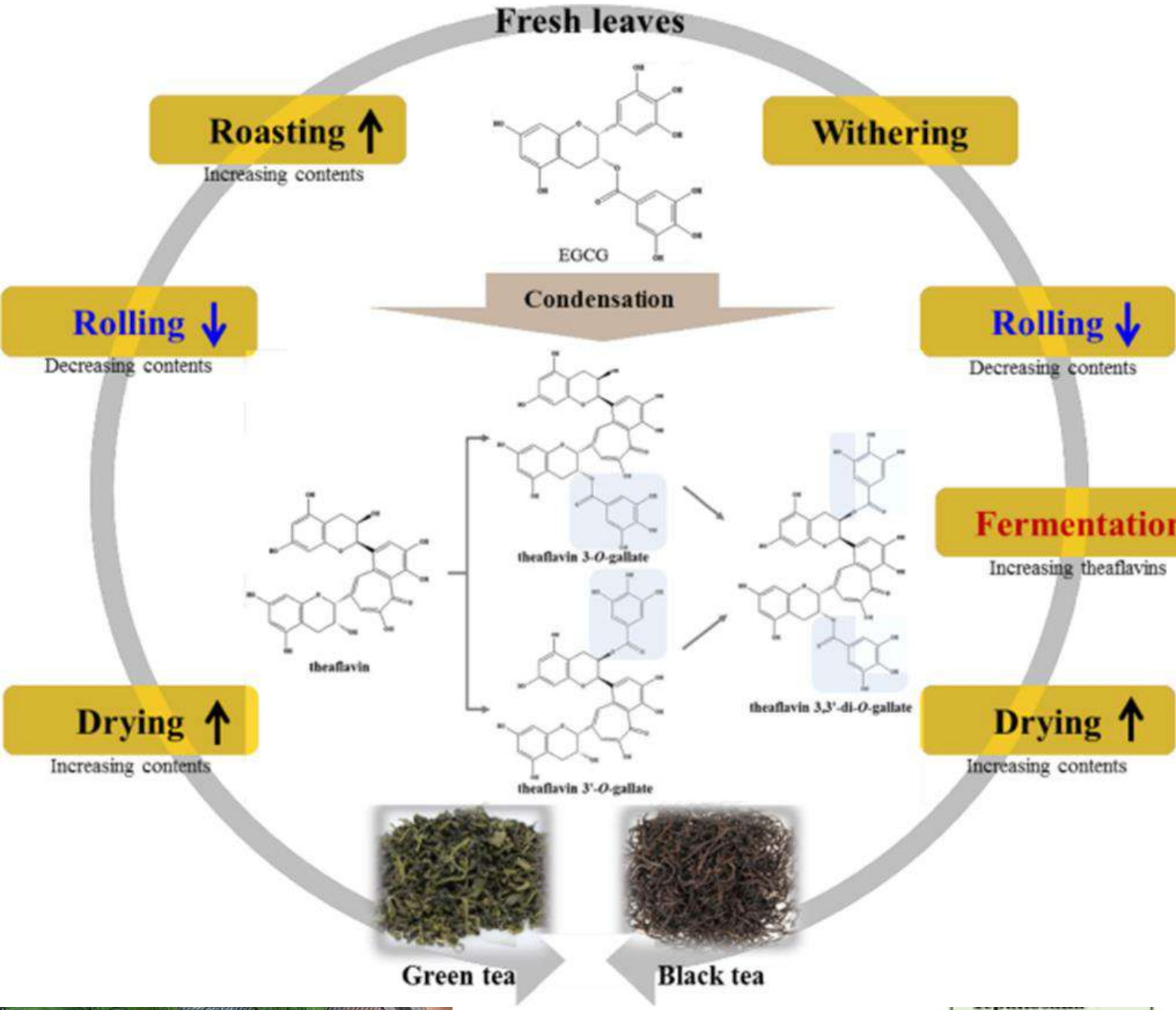
Un tējas





Aveņu lapu sagatavošanas shēma







Pētījuma materiāli un analīžu metodes

Materiāli- lapu drogas (ūdens, 40% un 80% etanola ekstrakti), tējas.

Tējas pagatavošana: ieber glāzē vienu tējkaroti smalcinātas aveņu lapas, uzlej 200 ml verdoša ūdens (~90 °C), iztur 10 minūtes.

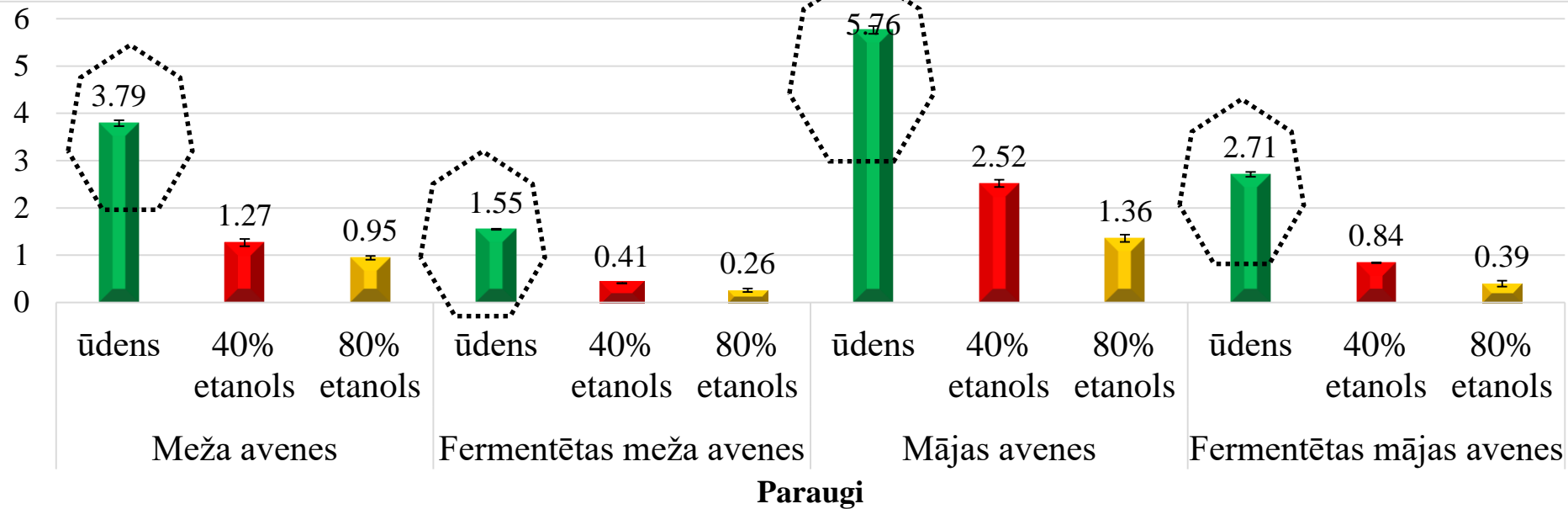
Aveņu lapu un tējas **ķīmiskā sastāva**: hlorofila, kopējo fenolu, flavonoīdu, tanīnu, antioksidantu aktivitātes (DPPH) noteikšanai izmantotas spektrofotometriskās metodes.

Tējai noteikta krāsa, izmantojot kolorimetru CM 2500 c (CIE $a^*(D 65)$ $b^*(D65)L^*(D65)$ un sensorās vērtēšana veikta pēc Hedoniskās skalas un raksturojošās Līniskālas metodes.

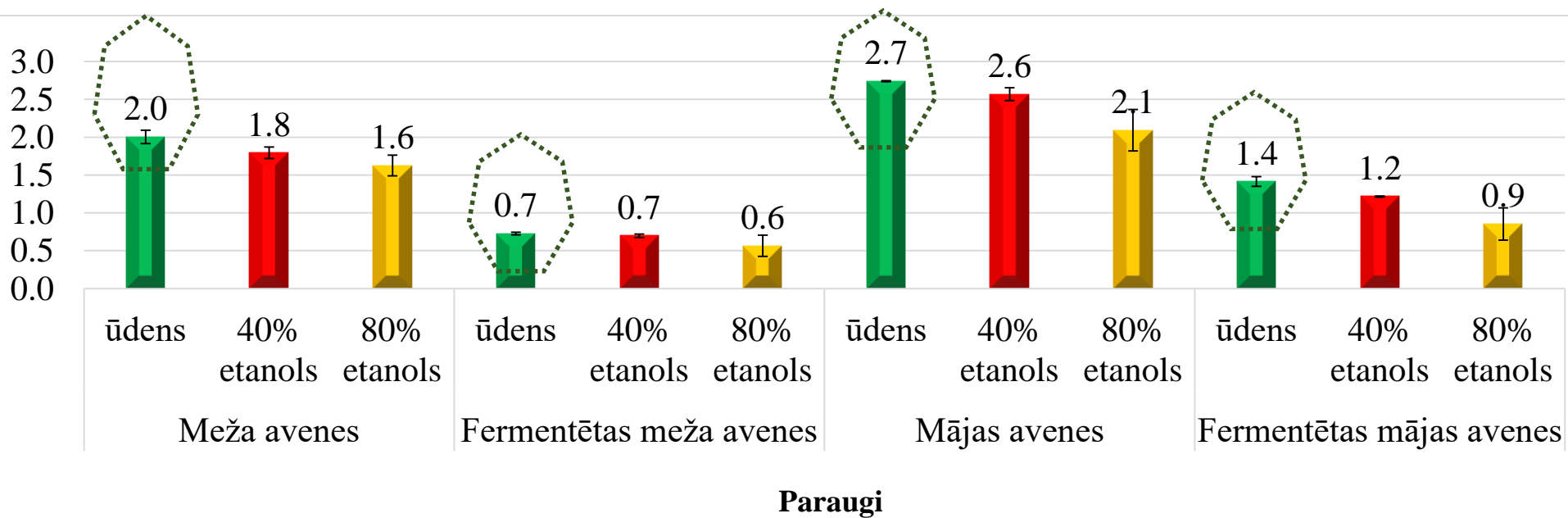


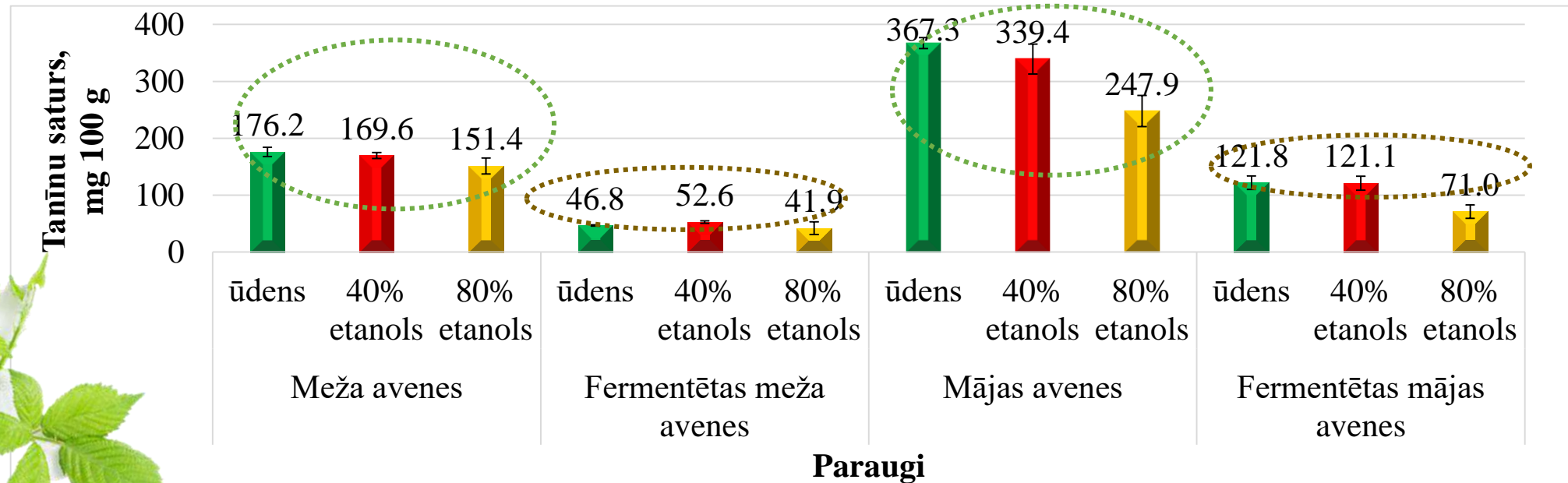
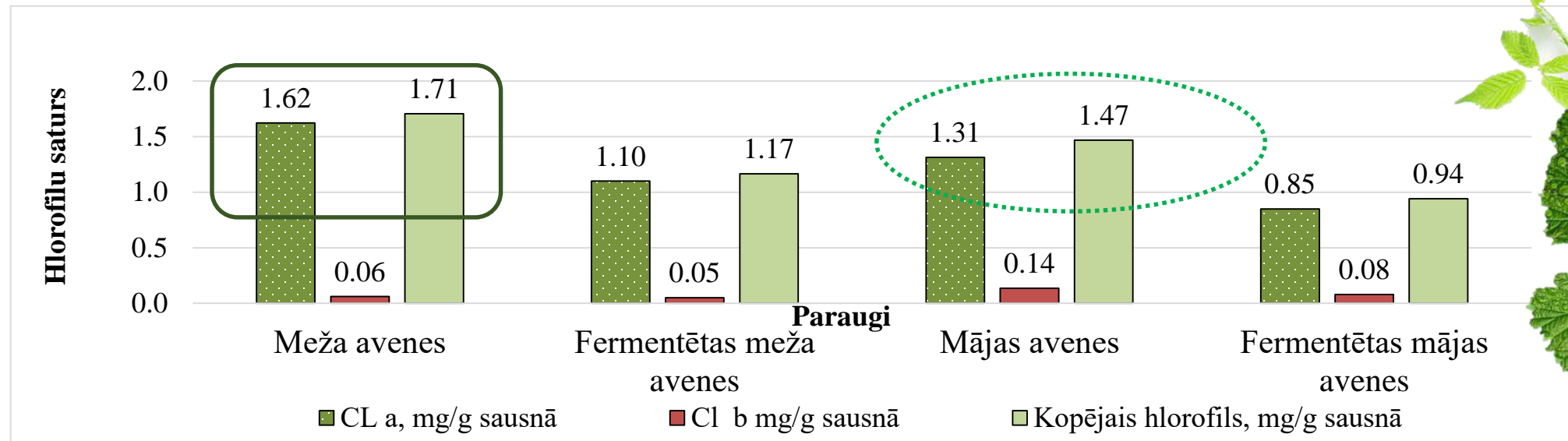
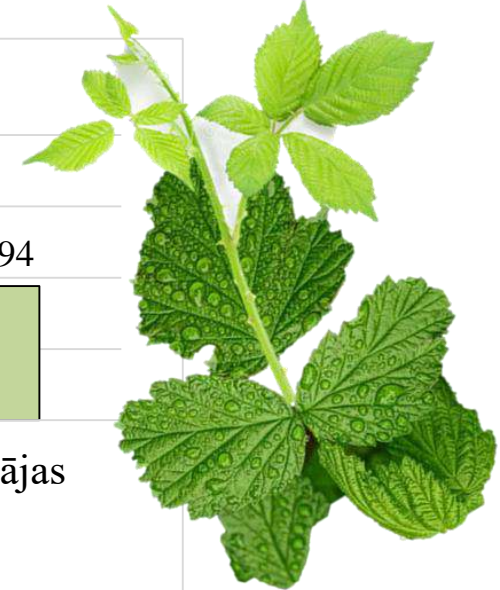


Kopējais fenolu saturs,
g 100 g⁻¹



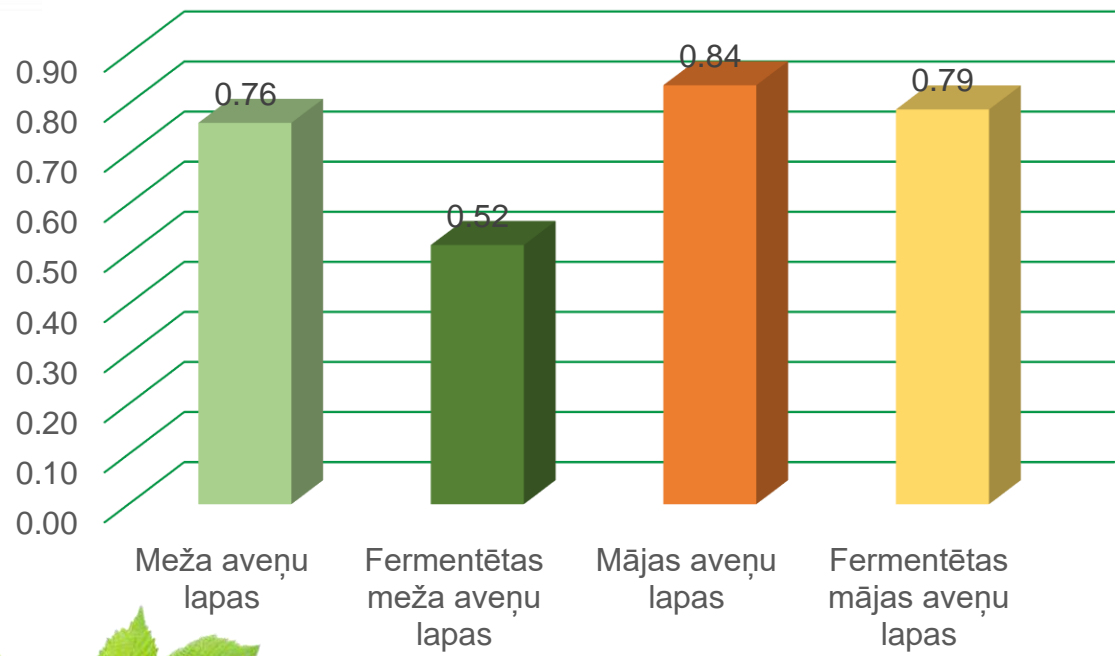
Flavonoīdu saturs,
g 100 g⁻¹



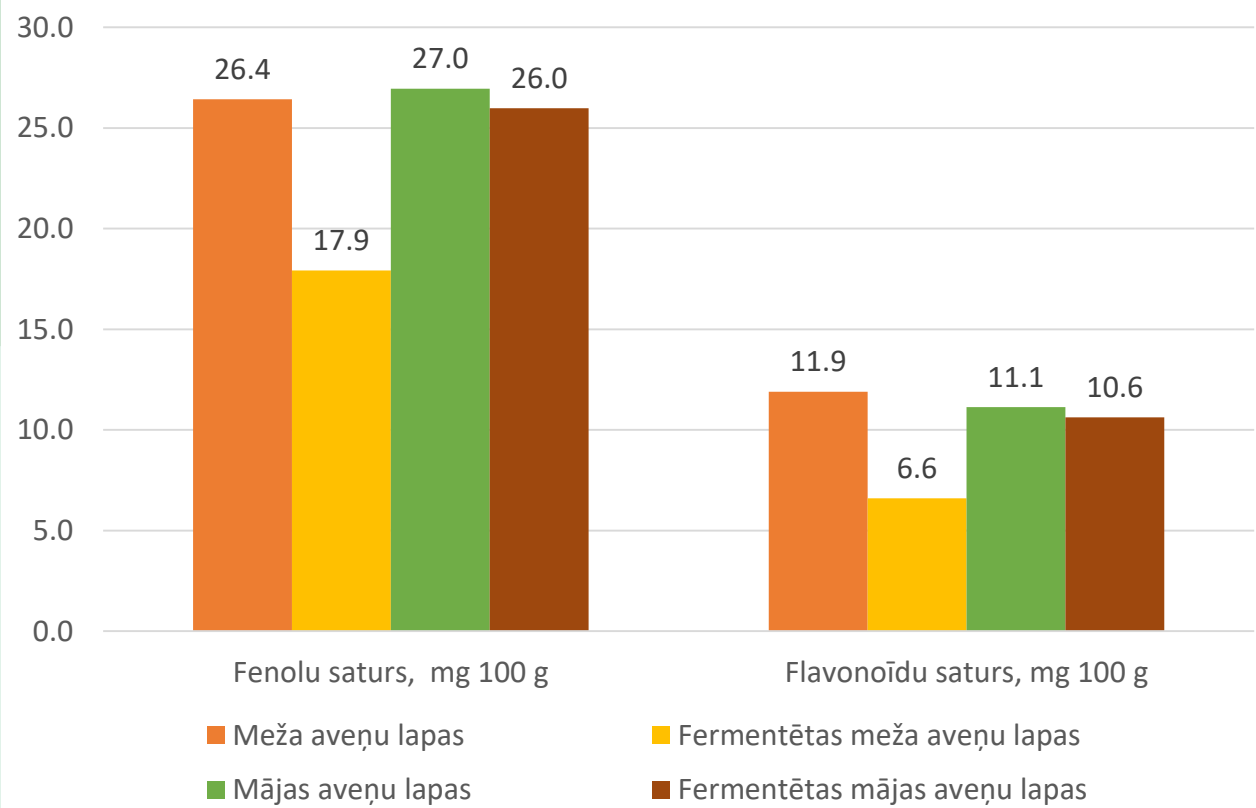


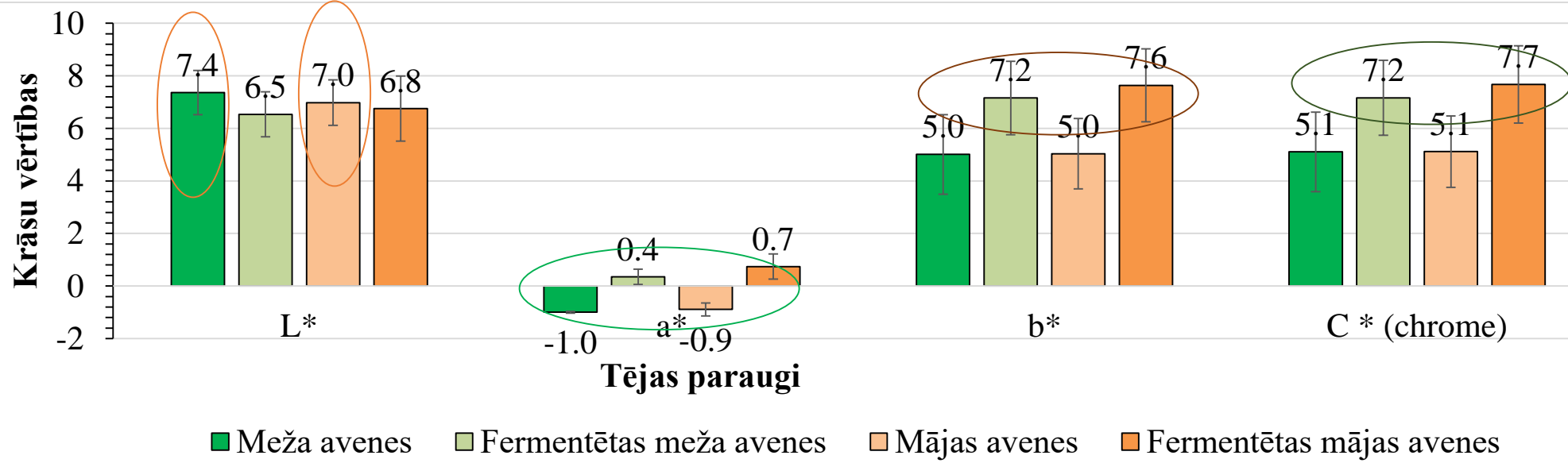


Tanīnu saturs tējā, mg /100g

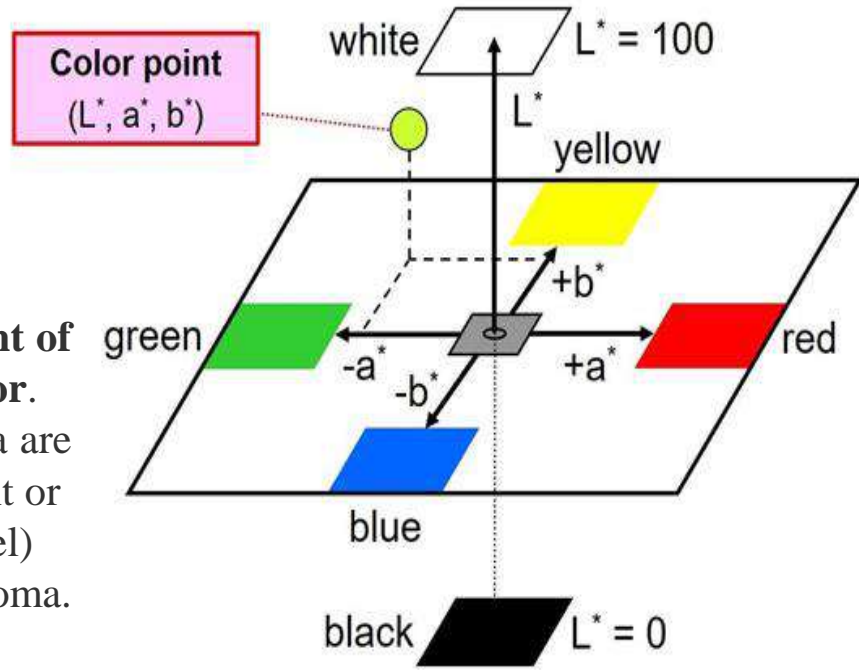


Fenolu un flavonoīdu saturs tējā, mg / 100g

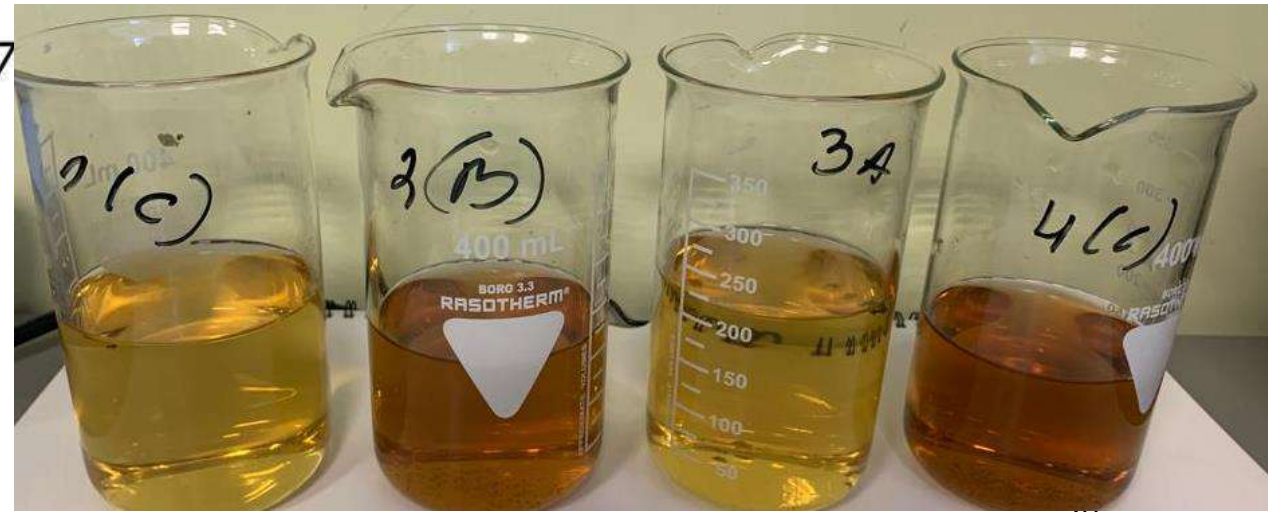




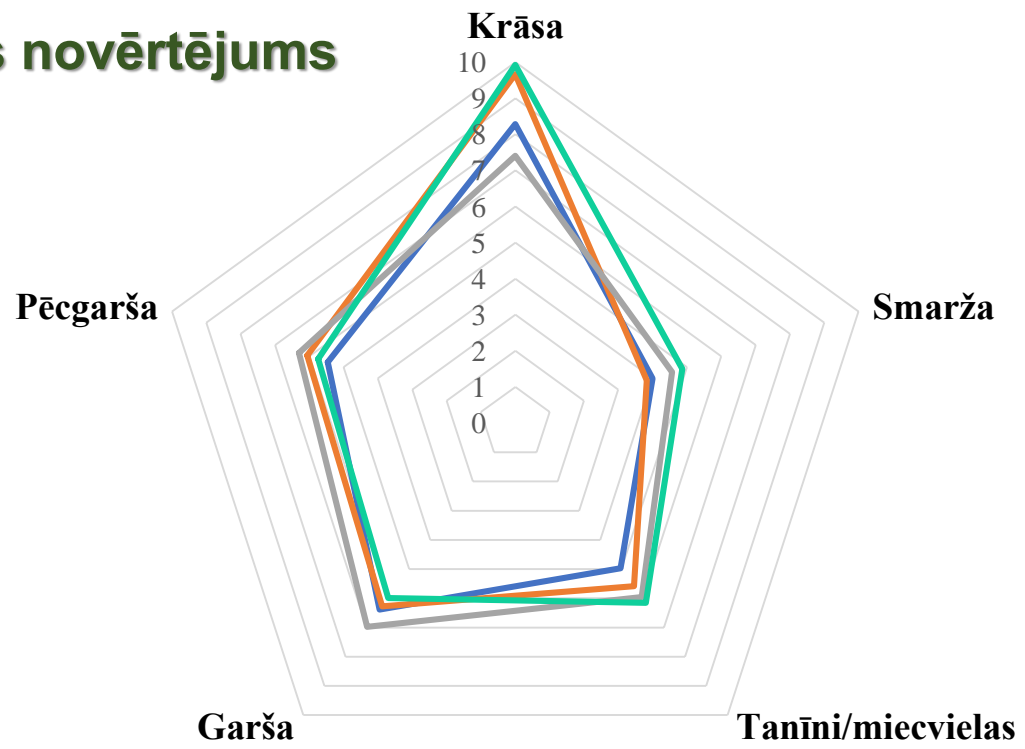
Chroma is the amount of saturation of a color. Colors of high chroma are said to be clear, bright or brilliant. Dull (pastel) colors have a low chroma.



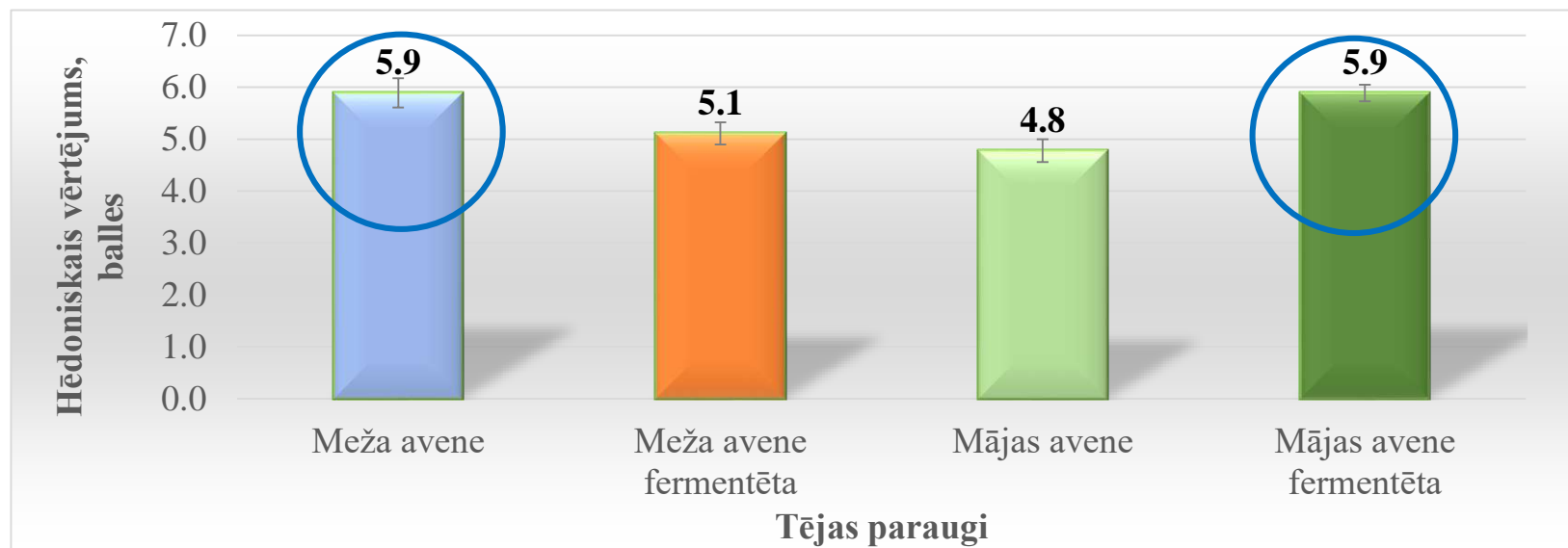
Krāsa



Sensorais novērtējums



- Meža avenē
- Meža avenē, fermentēta
- Mājas avenē
- Mājas avenē, fermentēta

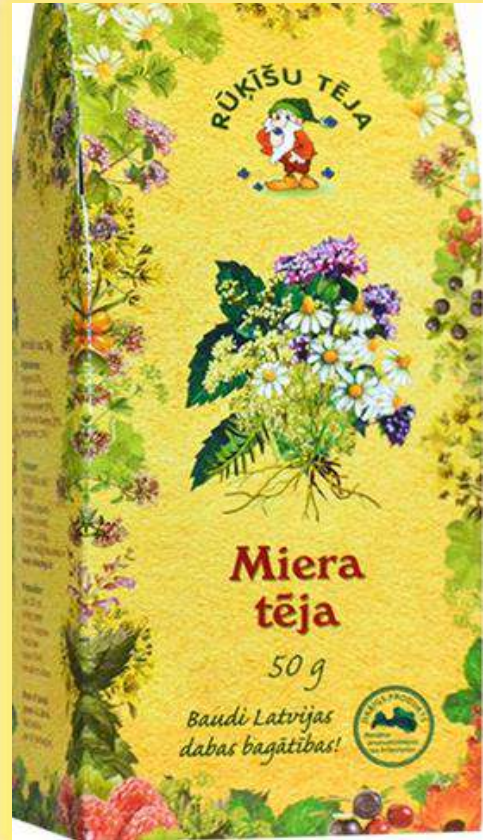


Secinājumi



Pētījumā iegūti praktiski nozīmīgi rezultāti:

- ✓ **Tēja**, kas pagatavota no **kaltētām mājas aveņu lapām**, satur līdzīgu un pat nedaudz lielāku kopējo fenolu, flavonoīdu un tanīnu saturu kā **meža aveņu lapu tēja**.
- ✓ Lielāka atšķirība novērota starp tējas paraugiem ar **fermentētām lapām** - visi rādītāji bija augstāki tieši **tējai no mājas aveņu lapām**. Augu attīstības stadijas ietekme.
- ✓ Veicot tējas degustāciju, ar vienādu punktu skaitu par labākām atzītas **nefermentētu meža un fermentētu mājas aveņu lapu tējas**.
- ✓ Audzējot rudens avenēs ogu ieguvei, to kopšanas laikā **retinātos dzinumus** var vēl **pilnvērtīgi izmantot** lapu tējas iegūšanai.
- ✓ Papildu lapu **fermentēšana** ļaus dažādot tējas kvalitatīvos rādītājus, kā arī iegūt vērtīgu sastāvdaļu tēju maisījumiem.



Paldies par uzmanību!