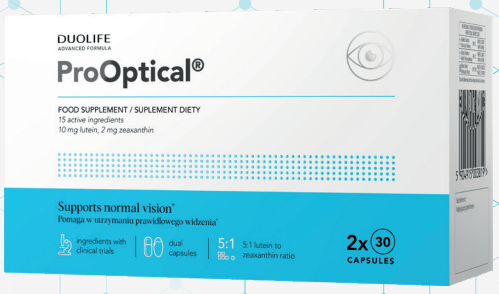
DUOLIFE

ProOptical®

Food supplement



PROOPTICAL® is a food supplement that supports vision and normal ocular microcirculation thanks to active ingredients found in it. A blend of naturally sourced ingredients was enclosed in two complementary capsules: a 'softgel' and hardshell one. The soft capsule contains carotenoids: lutein, zeaxanthin, and astaxanthin suspended in perilla (*Perilla frutescens*) oil. The hard capsule is a combination of valuable plant extracts and proprietary formula sourced from inactivated *Saccharomyces cerevisiae* yeast cells standardised for 5% zinc content.

5:1

PROOPTICAL® contains antioxidant carotenoids: lutein, zeaxanthin, and astaxanthin suspended in perilla oil, as well as valuable plant extracts standardised for, emong others, polyphenol, anthocyanins, lycopene, and schisandrin content. The food supplement also includes zinc sourced from inactivated *Saccharomyces cerevisiae* yeast cells. The preparation is a source of many active compounds, which support optimal processes of vision, help to protect retina photoreceptors against harmful UV radiation and support the functions of small blood vessels within the organ of vision.

When to use PROOPTICAL®?

Eye fatigue, microcirculation disorders of the retina, deterioration of vision acuity at dusk, are some of the effects of many hours of work at a computer or watching a TV screen or a mobile phone screen[1]. Only very young and healthy people can easily bear such overload. With age, the eye's defence mechanisms and its ability to cope with adverse factors gradually deteriorate, leading to more and more severe visual ailments. Deteriorating eye condition may also result from nutrient deficiencies. Rational supplementation can provide significant support to maintain eye health. With properly selected active ingredients, PROOPTICAL® food supplement can support people:

- wishing to support the optimal eye function;
- with a problem of bursting small vessels in the eye and frequent eye congestion;
- who can be at risk of eye disorders due to their occupation, e.g. people working at a computer screen;
- people who should particularly ensure a good condition of their eye; e.g. professional drivers;
- elderly people/seniors.

How do active ingredients found in PROOPTICAL® work and how to use the product?

Active ingredients found in PROOPTICAL® support:

- normal vision, also at night and in poor light;
- optimum function of the macula
- eye accommodation processes
- antioxidative processes;
- protecting the eyes against the harmful effects of UV radiation, helping to reduce photochemical damage;
- body detoxification processes;
- maintaining of optimum osmotic pressure of body fluids, including intraocular fluid;
- intracellular homoeostasis.

PROOPTICAL® - instructions for use
1 hard capsule and 1 soft capsule / day.
Do not exceed the recommended maximum daily dose.
Food supplements should not be a substitute for a varied diet.
A balanced diet and healthy lifestyle are essential for the proper functioning of the body.

PROOPTICAL® food supplement - composition

The 'softgel' capsule contains lutein, zeaxanthin, and astaxanthin suspended in perilla (*Perilla frutescens*) oil.

The hard capsule contains proprietary formula derived from inactivated yeast cells of *Saccharomyces cerevisiae* standardised for zinc content.

Composition table

Ingredient contents in the daily serving of the product	1 capsule
Soft capsule:	
Cold-pressed perilla (*Perilla frutescens*) oil,	335 mg
Lutein extracted from Mexican marigold (*Tagetes erecta*)	10 mg
Oleoresin from *Haematococcus pluvialis* algae rich in astaxanthin including astaxanthin	20 mg 2 mg
Zeaxanthin extracted from Mexican marigold (*Tagetes erecta*)	2 mg
Hard capsule:	
Proprietary formula derived from inactivated *Saccharomyces cerevisiae* yeast cells including zinc	200 mg 10 mg (100% NRV*)
Proprietary formula of: chokeberry (*Aronia melanocarpa*) fruit extract, honeyberry (*Lonicera caerulea*) extract, European blueberry (*Vaccinium myrtillus*) extract including anthocyanins	100 mg 25 mg
Acerola (*Malpighia glabra*) fruit extract including vitamin C	82 mg 41 mg (51% NRV*)
Elderberry (*Sambucus nigra*) fruit extract including flavonoids	10 mg 1 mg
Blackcurrant (*Ribes nigrum*) leaf extract	10 mg
Chinese magnolia vine (*Schisandra chinensis*) extract including schisandrins	10 mg 1 mg
Tomato (*Solanum lycopersicum*) extract including lycopen	10 mg 0,5 mg
Grape seed (*Vitis Vinifera*) extract including proanthocyanidins	10 mg 9,5 mg
Saffron (*Crocus sativus*) stigma extract	5 mg

*NRV – nutritional reference value for an average adult (8400 kJ/2000 kcal)

Ingredients:

Soft capsule: Cold-pressed perilla (*Perilla frutescens*) oil, lutein extracted from Mexican marigold (*Tagetes erecta*) suspended in sunflower oil, Haematococcus pluvialis algae oleoresin rich in astaxanthin, thickening agent: beeswax, zeaxanthin extracted from Mexican marigold (*Tagetes erecta*) suspended in safflower (*Carthamus tinctorius*) oil. Coating ingredients – gelatin from marine fish skins, moisture retention agent: plant glycerol, water, moisture retention agent: sorbitol.

Hard capsule: proprietary formula from inactivated Saccharomyces cerevisiae yeast cells standardised for 5% zinc content, proprietary formula of: chokeberry (*Aronia melanocarpa*) extract, honeyberry (*Lonicera caerulea*) extract and European blueberry (*Vaccinium myrtillus*) extract standardised for 25% anthocyanin content, 50:1 acerola (*Malpighia glabra*) extract standardised for 50% vitamin C content, inulin from chicory (*Cichorium intybus*) root, 10:1 elderflower (*Sambucus nigra*) fruit extract standardised for 10% polyphenol content, 4:1 blackcurrant (*Ribes nigrum*) extract, 10:1 Chinese magnolia vine (*Schisandra chinensis*) extract standardised for 10% schisandrines content, 75-100:1 tomato (*Solanum lycopersicum*) extract standardised for 5% lycopen content, 15:1 grapeseed (*Vitis vinifera*) extract standardised for 95% proanthocyanine content, 5:1 saffron stigma (*Crocus sativus*) extract, anti-caking agent: silicon dioxide (from rice). Coating ingredients: hydroxypropyl methylcellulose (HPMC), gelling agent: gellan gum, colourant: copper complexes of chlorophylls and chlorophyllines.

ZThe herbal extracts contained in the preparation have **50:1, 4:1, 10:1, 75-100:1, 15:1, 5:1** ratios written next to their names - this is the so-called DER - what does it mean?

DER (*drug extract ratio*) specifies a number of milligrams of the plant material used to obtain one milligram of the extract. If a capsule contains 82 miligrams of acerola fruit extract (or any other extract) DER 50:1, it means that as much as 4,100 miligrams of fruit - the raw material - was used to obtain 82 miligrams of this extract.

What are the health-supporting properties carotenoids found in PROOPTICAL®: lutein, zeaxanthin, astaxanthin and lycopene?

- **Lutein and zeaxanthin** are natural compounds of purely plant origin (and therefore must be supplied with food), found in the macula of human retina, helping to protect the retinal photoreceptors (rod cells and cone cells) from the harmful effects of UV light. Both of the carotenoids have strong antioxidant properties, inactivating free oxygen radicals produced under exposure to light[2,3]. Moreover, as ingredients supporting optimal functioning of the organ of vision, they were the subject of dozens of clinical trial[4-7].
- **The quantitative ratio of lutein to zeaxanthin in the whole preparation is 5:1**; this is the optimal ratio, considered in clinical trials and recommended worldwide[8-10].
- **Astaxanthin** is a strong natural antioxidant, neutralising free oxygen radicals. Astaxanthin's antioxidant properties help protect cells against the destructive influence of oxidative stress, contributing to the optimal functioning of the eyes. Antioxidant action includes also extra support for eye protection against harmful impact of UV radiation[11]. The material has a clinically proven efficacy supporting alleviation of asthenopia (eye strain) symptoms and processes of eye accommodation[12].
- **Lycopene** is a natural carotenoid found in large quantities in the tomato fruit; it has strong antioxidative properties, protecting retinal photoreceptors against the harmful influence of sunlight and oxidative stress. It also has beneficial influence on blood circulation supporting blood vessel function[13].

Why are lutein, zeaxanthin, and astaxanthin suspended in Perilla oil?

Oily environment (the presence of fatty acids found in Perilla oil) enhances the bioavailability of lutein and zeaxanthin[14]. It was found that crystal lutein, used in food supplements, is absorbed by the body more easily than that of food[15]. After being absorbed into the bloodstream, carotenoids, lutein and zeaxanthin, accumulate mainly in the lens of the eye and the central part of the retina - macula[16].

What is the effect on sight of α-linolenic acid found in perilla seed oil?

Perilla is an oil plant rich in essential unsaturated fatty acids, especially the very important, rare in plants, acid from the omega-3 series: α-linolenic (ALA)[17]. ALA derivatives are the main building blocks of cell membranes of rod and stem cells of the eye, responsible for night vision and colour vision; they are particularly valuable for the elderly[18,19].

Perilla oil is also a biological background, improving absorption of active ingredients contained in the inner capsule of PROOPTICAL® (lutein, zeaxanthin, and astaxanthin).

How does zinc found in the proprietary formula derived from inactivated *Saccharomyces cerevisiaeyeast* cells work?

Zinc is one of main body microelements involved in catalytic, structural, and regulatory functions. Zinc supply with food products is usually insufficient; as many as one out of three people in the world may suffer from zinc deficiency. Therefore, its supplementation is recommended. Zinc is a structural component of 10% of the body's enzymes and proteins, minimises the toxic effects of heavy metals on the functions of systems and organs, protects the retina of the eye, contributing to maintaining good eyesight. Zinc is also a valuable antioxidant protecting retinal cells against oxidative stress. Of all trace metals essential for humans, only iron has a more important role than zinc[20-22].

Antioxidants found in the formulation sourced from chokeberry fruit extract, honeyberry extract, European blueberry extract and plant extracts from Chinese magnolia vine, grapeseed, elderflower, synergically support each other's action.

- **Anthocyanins** are pigments that are widely found in the plant world. They belong to polyphenolic organic compounds: flavonoids. The highest concentrations of these pigments can be found in flowers, fruits, and leaves. Grapes, chokeberry, blackcurrant and berries are richest in anthocyanins.
- **Formula sourced from chokeberry fruit extract**, honeyberry extract, European blueberry extract contains various, yet mutually complementary and synergistic fractions of polyphenols and iridoids. The most important active ingredients of **chokeberry fruit** are also polyphenols. The material helps to protect the retina from degeneration caused by oxidative stress (also caused by UV radiation) and helps support the condition of blood vessels within the eye[23]. **Honeyberry fruit**, with its significant content of polyphenols, including anthocyanins, phenolic acids, and flavonoids, is characterised by high antioxidative potential[24]. Anthocyanins from both honeyberry and European blueberry fruit contribute to the maintenace of optimal functioning of capillaries in the eye, help reduce the brittleness of blood vessels and stimulate microcirculation. They support normal night vision and eye adaptation to night vision, they also help to prevent congestion and inflammatory conditions associated with eye strain. Raw ingredients have extensive clinical documentation[25-30]
- The most important ingredients of **Chinese magnolia vine** fruit are lignans, including schisandrin. These compounds have a hepatoprotective, adaptogenic, and antioxidant effect[31,32]. In addition, clinical trials have shown the supportive effect of Chinese magnolia vine on visual acuity and adaptation to dark vision[31].
- Among the polyphenols found in **grape seeds**, proanthocyanidins and resveratrol are the most important. These compounds are strong antioxidants with free radical neutralising properties that can protect the retina and its photoreceptors (rod and cone cells) from damage caused by solar radiation. They also have a protective effect on blood vessels, including ocular microcirculation, and maintain optimal intraocular pressure[33,34]. This way they contribute to prevention of cataract and diabetic retinopathy, they also support alleviation of eye redness and inflammatory conditions[35]. Proanthocyanidins also have a protective action for vitamin C found in the supplement[33].
- Polyphenols (anthocyanins and flavonoles) contained in **elderberries** have a strong antioxidant effect - they contribute to maintaining normal functions of the retina and blood vessels, they also support the removal of harmful metabolites from the body[36].

Why can vitamin C from acerola fruit extract support vision processes?

Acerola fruits contain a very high dose of vitamin C[37]; this vitamin is essential for the synthesis of collagen in connective tissue (collagen occurs, among others, in the cornea and vitreous body of the eye[38]); as a strong antioxidant it provides natural protection for the eyes against the harmful effects of UV[39]. The raw material also contains minerals such as potassium and phosphorus to help maintain an optimal osmotic pressure of the intraocular fluid[37].

Why can blackcurrant leaf extract support ocular microcirculation?

Blackcurrant leaves are a valuable source of bioactive compounds with antioxidant properties; they include quercetin, myricotin and rutin. Rutin reduces the permeability of blood vessels, helps prevent microhaemorrhages in the eye, prevents bursting of blood vessels and eye congestion associated with eye strain. The compound also prevents the degradation of vitamin C and increases its bioavailability[40,41]. Blackcurrant leaves also contain significant amounts of macro-, microelements and trace elements that affect the body's mineral balance, help maintain optimal osmotic pressure of body fluids, including ocular fluid, and ensure the acid-base balance of these fluids (maintaining a physiological pH)[42].

How does the saffron rods extract found in the preparation work?

Saffron has been known as a health-supporting plant for thousands of years. The active ingredients of the plant include glycosides: crocithin, crocin and safranal. Thanks to these active compounds saffron supports eye condition by helping prevent corneal opacity or inflammation[43]. The material has a clinically proven efficacy: it supports metabolic processes in the eye tissues, supports vision[44], helps maintain optimal macular function[45].

What makes DUOLIFE ADVANCED Formula ProOptical® stand out?

- **Active ingredients enclosed in two types of capsules: a 'softgel' and hard one.** The soft capsule contains carotenoids: lutein, zeaxanthin, and astaxanthin suspended in perilla (*Perilla frutescens*) oil. The hard capsule is a combination of valuable plant extracts and proprietary formula sourced from inactivated Saccharomyces cerevisiae yeast cells standardised for 5% content. The process of absorption of active substances found in the liquid phase begins already in the stomach, while the active substances contained in the solid phase are released only in the small intestine. The two-stage process of active substance absorption fosters their bioavailability. Lutein, zeaxanthin, and astaxanthin, ingredients that are best absorbed in the presence of fats, are dissolved in the oil phase obtained from natural vegetable oils forming liquid content of the soft capsule. These ingredients are absorbed in the stomach and the initial section of the small intestine. The plant extracts, which are poorly soluble in fats, and compounds sensitive to hydrochloric acid are solid ingredients of the inner capsule. They are not exposed to the stomach environment and are released at further sections of the intestine, where a pH favouring their absorption can be found.
- **100% ingredients of natural origin,** including standardised extracts and numerous ingredients based on clinical trials.
- **Complete ingredients, with their biological background maintained**, improving their bioavailability. Oily environment (the presence of fatty acids found in Perilla oil) enhances the bioavailability of lutein, zeaxanthin, and astaxanthin. **The lutein to zeaxanthin ratio in the complete formulation is 5:1**; this is an optimum ratio taken into account in clinical studies and recommended globally.
- **A formulation taking into account the principles of synergy and antagonism.**
- **The product DOES NOT CONTAIN preservatives and artificial fillers, and IS GMO-FREE** - raw materials used to develop the supplement ARE NOT DERIVED from genetically modified plants.
- **The product IS GLUTEN-FREE** - can be used by people with gluten intolerance.
- **Concentrated formula** – making the supplement easy to use: one soft and hard capsule once a day.

The references for PROOPTICAL® can be found on a separate binder sheet.

ProOptical®

References

1. Piątkowska, E., Kopeć, A., & Leszczyńska, T. (2011). Antocyjany–charakterystyka, występowanie i oddziaływanie na organizm człowieka. *Żywność. Nauka. Technologia. Jakość, 4*(77), 24-35.
2. Szostak, W. B., & i Żywienia, I. Ż. (2008). Żywienie w profilaktyce zwyrodnienia plamki żółtej. *Przegląd Lekarski, 65*(6).
3. Zuorro, A., & Lavecchia, R. (2010). New functional food products containing lutein and zeaxanthin from marigold (Tagetes erecta L.) flowers. *Journal Of Biotechnology, 150,* 296.
4. Liu, X. H., Yu, R. B., Liu, R., Hao, Z. X., Han, C. C., Zhu, Z. H., & Ma, L. (2014). Association between lutein and zeaxanthin status and the risk of cataract: a meta-analysis. *Nutrients, 6*(1), 452-465.
5. Wang, X., Jiang, C., Zhang, Y., Gong, Y., Chen, X., & Zhang, M. (2014). Role of lutein supplementation in the management of age-related macular degeneration: meta-analysis of randomized controlled trials. *Ophthalmic research, 52*(4), 198-205.
6. Ma, L., Hao, Z. X., Liu, R. R., Yu, R. B., Shi, Q., & Pan, J. P. (2014). A dose–response meta-analysis of dietary lutein and zeaxanthin intake in relation to risk of age-related cataract. *Graefe's Archive for Clinical and Experimental Ophthalmology, 252*(1), 63-70.
7. Ma, L., Dou, H. L., Wu, Y. Q., Huang, Y. M., Huang, Y. B., Xu, X. R., ... & Lin, X. M. (2012). Lutein and zeaxanthin intake and the risk of age-related macular degeneration: a systematic review and meta-analysis. *British Journal of Nutrition, 107*(3), 350-359.
8. Thürmann, P. A., Schalch, W., Aebischer, J. C., Tenter, U., & Cohn, W. (2005). Plasma kinetics of lutein, zeaxanthin, and 3-dehydro-lutein after multiple oral doses of a lutein supplement–. *The American journal of clinical nutrition, 82*(1), 88-97.
9. Thurnham, D. I. (2007). Macular zeaxanthins and lutein–a review of dietary sources and bioavailability and some relationships with macular pigment optical density and age-related macular disease. *Nutrition research reviews, 20*(2), 163-179.
10. Hartmann, D., Thürmann, P. A., Spitzer, V., Schalch, W., Manner, B., & Cohn, W. (2004). Plasma kinetics of zeaxanthin and 3'-dehydro-lutein after multiple oral doses of synthetic zeaxanthin. *The American journal of clinical nutrition, 79*(3), 410-417.
11. Guerin, M., Huntley, M. E., & Olaizola, M. (2003). Haematococcus astaxanthin: applications for human health and nutrition. *TRENDS in Biotechnology, 21*(5), 210-216.
12. Nagaki, Y., Tsukahara, H., Yoshimoto, T., & Masuda, K. (2010). Effect of astaxanthin on accommodation and asthenopia. *Folia Ophthalomogica Japonica., 5*, 461-468.
13. Belter, A., Giel-Pietraszuk, M., Oziewicz, S., Chomczyński, P., & Barciszewski, J. (2011). Likopen–występowanie, właściwości oraz potencjalne zastosowanie. *Postępy Biochemii, 57*(4), 372-380.
14. Guerra-Santos, L. H., & Greenbury, D. K. (2005). U.S. Patent No. 6,936,279. Washington, DC: U.S. Patent and Trademark Office.
15. Castenmiller JJ, West CE, Linssen JP i wsp. The food matrix of spinach is a limiting factor in determining the bioavailability of beta-carotene and to a lesser extent of lutein in humans. *J Nutr* 1999; 129:394-455.
16. Kwiatkowska, E. (2010). Luteina–źródła w diecie i potencjalna rola prozdrowotna. *Postępy Fitoterapii, 2*.
17. Szeleszczuk, Ł., Zielińska-Pisklak, M., & Młodzianka, A. Perilla frutescens—niezwykłe właściwości.
18. Materac, E., Marczyński, Z., & Bodek, K. H. (2013). Rola kwasów tłuszczowych omega-3 i omega-6 w organizmie człowieka. Bromatologia i *Chemia Toksykologiczna, 2*(46).
19. Achremowicz, K., & Szary-Sworst, K. (2005). Wielonienasycone kwasy tłuszczowe czynnikiem poprawy stanu zdrowia człowieka. *Żywność. Nauka. Technologia. Jakość, 3*(44), 23-35.
20. Berger, A. (2002). What does zinc do?. *Bmj, 325*(7372), 1062.
21. Stefanidou M., Maravelias C., Dona A., Spiliopoulou C. Zinc: a multipurpose trace element. *Arch. Toxicol. 2006; 80*(1): 1–9.
22. Mońka, I., & Wiechuła, D. (2017). Znaczenie cynku dla organizmu ludzkiego w aspekcie suplementacji tego pierwiastka. *In Annales Academiae Medicae Silesiensis* (Vol. 71, pp. 314-325).
23. Kalt, W., Hanneken, A., Milbury, P., & Tremblay, F. (2010). Recent research on polyphenolics in vision and eye health. *Journal of Agricultural and Food Chemistry, 58*(7), 4001-4007
24. Jurikova, T.; Rop, O.; Mlcek, J.; Sochor, J.; Balla, S.; Szekeres, L.; Hegedusova, A.; Hubalek, J.; Adam, V.; Kizek, R. Phenolic Profile of Edible Honeysuckle Berries (Genus Lonicera) and Their Biological Effects. *Molecules 2012*, 17, 61-79.
25. Piątkowska, E., Kopeć, A., & Leszczyńska, T. (2011). Antocyjany–charakterystyka, występowanie i oddziaływanie na organizm człowieka. *Żywność. Nauka. Technologia. Jakość, 4*(77), 24-35.
26. Canter, P. H., & Ernst, E. (2004). Anthocyanosides of Vaccinium myrtillus (bilberry) for night vision—a systematic review of placebo-controlled trials. *Survey of ophthalmology, 49*(1), 38-50.

27. Ghosh, D., & Konishi, T. (2007). Anthocyanins and anthocyanin-rich extracts: role in diabetes and eye function. *Asia Pacific journal of clinical nutrition, 16*(2).
28. Svarcova, I., Heinrich, J., & Valentova, K. (2007). Berry fruits as a source of biologically active compounds: the case of Lonicera caerulea. *Biomedical papers of the Medical Faculty of the University Palacky, Olomouc, Czechoslovakia, 151*(2), 163–174.
29. Park, E., Kum, S., Wang, C., Park, S. Y., Kim, B. S., & Schuller-Levis, G. (2005). Anti-inflammatory activity of herbal medicines: inhibition of nitric oxide production and tumor necrosis factor-alpha secretion in an activated macrophage-like cell line. *The American journal of Chinese medicine, 33*(3), 415–424.
30. Jin, X. H., Ohgami, K., Shiratori, K., Suzuki, Y., Koyama, Y., Yoshida, K., Ilieva, I., Tanaka, T., Onoe, K., & Ohno, S. (2006). Effects of blue honeysuckle (Lonicera caerulea L.) extract on lipopolysaccharide-induced inflammation in vitro and in vivo. *Experimental eye research, 82*(5), 860–867.
31. Szopa, A., Ekiert, R., & Ekiert, H. (2012). Cytryniec chiński (Schisandra chinensis)–nowy farmakopealny gatunek: badania chemiczne, biolo-giczna aktywność, znaczenie lecznicze, walory kosmetyczne, meto-dy analityczne oraz badania biotechnologiczne. *Farmacja Pol, 68*, 832-834.
32. Ikeya, Y., Taguchi, H., Mitsuhashi, H., Takeda, S., Kase, Y., & Aburada, M. (1988). A lignan from Schizandra chinensis. *Phytochemistry, 27*(2), 569-573.
33. Kołodziejczyk, J., & Olas, B. (2011). Pestki winogron jako cenne źródło związków chroniących układ krążenia. *Postępy Fitoterapii, 1*, 52-57.
34. Zülli, F., Belser, E., Neuenschwander, M., & Muggli, R. (2001). Antioxidants from grape seeds protect hair against reactive oxygen species. PersonalCare, October, 65-67.
35. Natarajan, S. B., Hwang, J. W., Kim, Y. S., Kim, E. K., & Park, P. J. (2017). Ocular promoting activity of grape polyphenols--A review. *Environmental toxicology and pharmacology, 50*, 83-90.
36. Sidor, A., & Gramza-Michałowska, A. (2015). Advanced research on the antioxidant and health benefit of elderberry (Sambucus nigra) in food–a review. *Journal of functional foods, 18*, 941-958.
37. Majewski, J., Orylski, M., Całkosiński, A., & Majewski, M. (2018). Acerola–tropikalny owoc z ogromną dawką witaminy C.
38. Janda, K., Kasprzak, M., & Wolska, J. (2015). Witamina C–budowa, właściwości, funkcje i występowanie.
39. Boyera, N., Galey, I., & Bernard, B. A. (1998). Effect of vitamin C and its derivatives on collagen synthesis and cross-linking by normal human fibroblasts. *International Journal of Cosmetic Science, 20*(3), 151-158.
40. Tabart, J., Franck, T., Kevers, C., Pincemail, J., Serteyn, D., Defraigne, J. O., & Dommes, J. (2012). Antioxidant and anti-inflammatory activities of Ribes nigrum extracts. *Food Chemistry, 131*(4), 1116-1122.
41. Kupcewicz, B., Michalska, E., & Budzisz, E. (2011). Ocena zawartości witaminy C i rutyny w wybranych suplementach diety. *Bromatologia i Chemia Toksykologiczna, 44*(1), 72-75.
42. Krzepilko, A., Prazak, R., Skwarylo-Bednarz, B., & Swiecilo, A. (2018). Pąki, liście i nasiona porzeczki czarnej-źródło substancji bioaktywnych o prozdrowotnych właściwościach. *Żywność Nauka Technologia Jakość, 25*(2).
43. Hosseinzadeh, H. (2014). Saffron: a herbal medicine of third millennium. *Jundishapur journal of natural pharmaceutical products, 9*(1), 1.
44. Shukurova, P., & Babaev, R. (2010). A study into the effectiveness of the application of saffron extract in ocular pathologies in experiment. *Georgian Med News, 182*, 38-42.
45. Bisti, S., Maccarone, R., & Falsini, B. (2014). Saffron and retina: Neuroprotection and pharmacokinetics. *Visual neuroscience, 31*(4-5), 355-361.