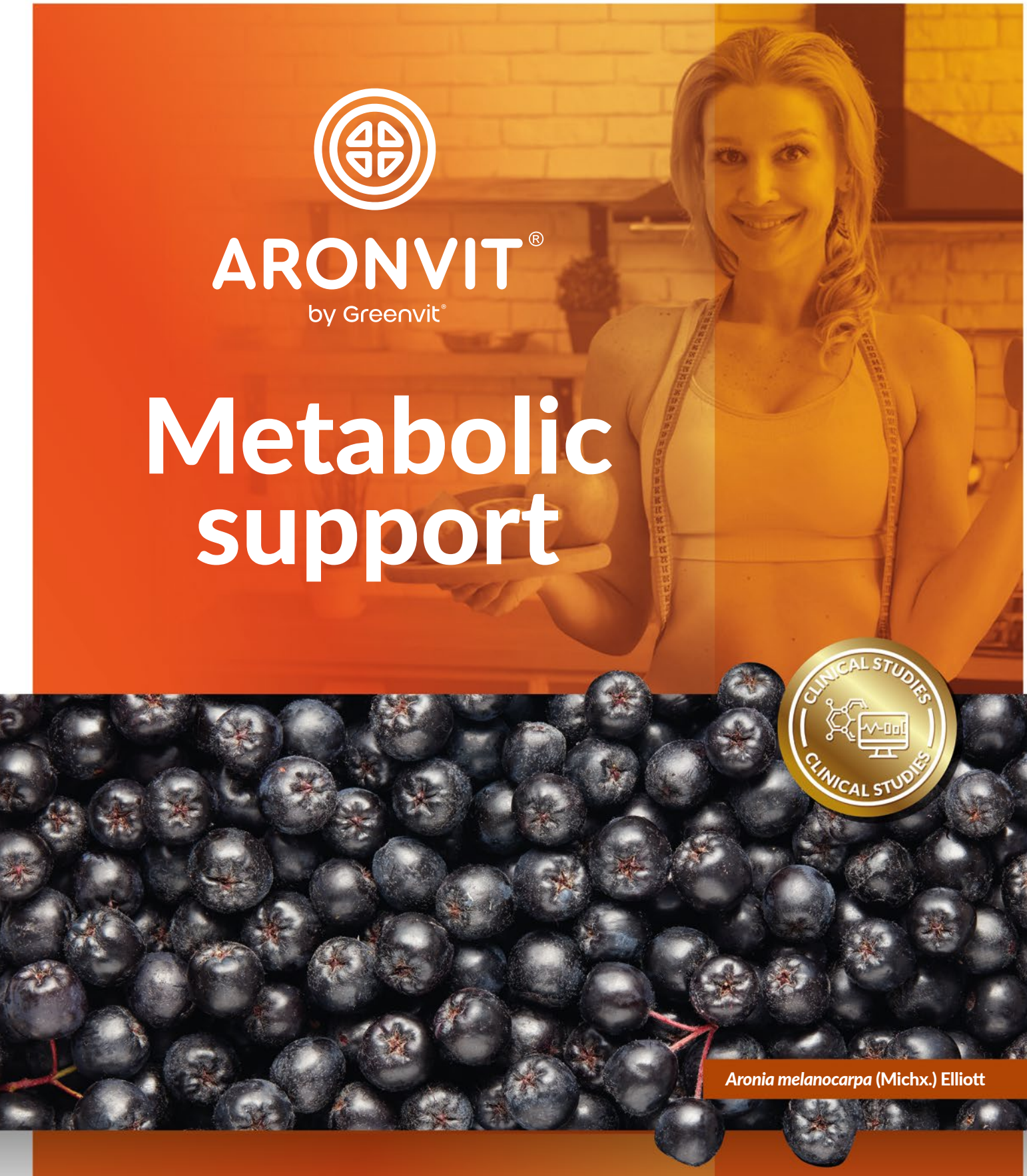
ARONVIT®
by Greenvit®

Metabolic support



Aronia melanocarpa (Michx.) Elliott

METABOLIC HEALTH BOOST
FAVORABLE IMPACT ON LIPID PROFILE
ANTI-INFLAMMATORY ACTIVITY

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What is ARONVIT®

ARONVIT® is a unique, standardized extract from selected aronia berries. As a result of our own technology development efforts we have obtained a pioneering, prime quality extract with a rich anthocyanin content. Thanks to a high content of anthocyanins, **ARONVIT®** extract shows a wide range of beneficial health results, including a number of positive metabolic changes.

Specification

Thanks to procurement sources of raw materials from local contractors **GREENVIT®** is able to fully manage product identity and quality. **ARONVIT®** has been standardized for the content of anthocyanins (HPLC) and polyphenols (UV) as well.

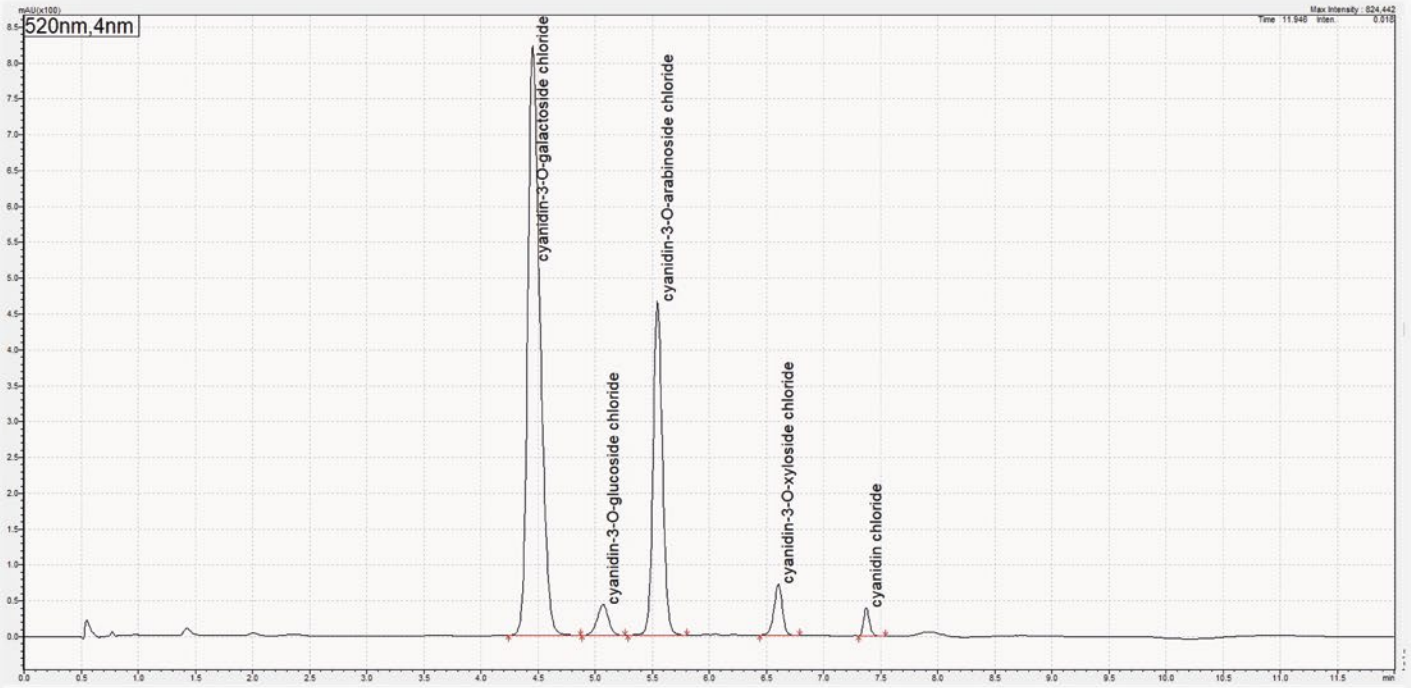


Figure 1. Anthocyanin fractions: Cy-3-gal Cy-3-ara Cy-3-xyl Cy-3-glu

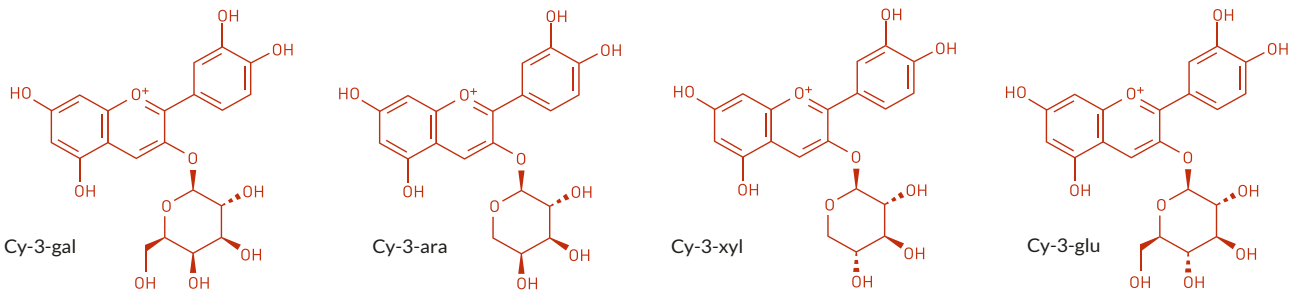


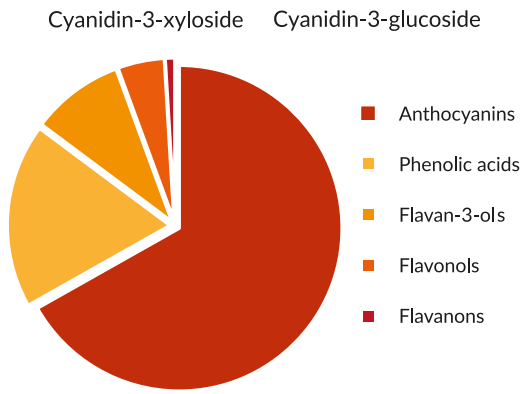
Figure 2.

Metabolic support

Table 1.

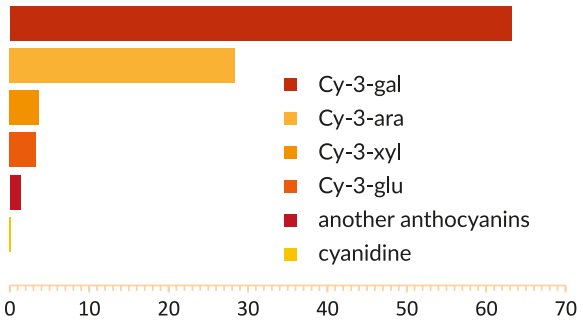
Product ARONVIT® 15% - Aronia berry dry extract Physico-chemical parameters	Method	Specification
Anthocyanins calculated as Cyanidin 3- glucoside chloride	SOP: L/I-54 (HPLC, USP)	min. 15%
Polyphenols calculated as catechin	SOP: L/I-02/01 (UV-VIS)	min. 25%
Total proanthocyanidins (PAC) %	DMAC (eq B2)	min. 10%

Figure 3.



The proportion of particular groups of active compounds in ARONVIT®, expressed as % of polyphenols determined by HPLC. The averaged results of analysis of three separate batches of the extract are presented.

Figure 4.



The percentage contribution of individual anthocyanins relative to the total amount of these compounds.

Structure of anthocyanins in ARONVIT®
Based on determinations carried out by HPLC. The averaged results of analysis of three separate batches of the extract are presented (Kucharska 2022)

Qualitative (LC-MS) and quantitative (HPLC) analysis of six batches of ARONVIT® extract[1] showed that the polyphenols in it include compounds belonging to anthocyanins, flavonols, flavanols, flavan-3-ols and phenolic acids. The result of qualitative and quantitative identification of anthocyanins in ARONVIT®is shown in Figure 3. and Figure 4.

ARONVIT® antioxidant activity - spectrophotometric analysis

The total content of phenolic compounds in 3 batches of ARONVIT® extract, determined by the method with Folin--Ciocalteu reagent in terms of gallic acid, was 63.46 g GAE/100 g extract[2]. This naturally translated into an above--average high antioxidant activity of our extract (Table 2).

Antioxidant activity - spectrophotometric analysis ARONVIT® (mMol Trolox /100 g)

Method used	DPPH	ABTS	FRAP
	336.05	394.88	352.56

Table 2.

Antioxidant activity of ARONVIT® determined by spectrophotometric methods.

Recommended use and dose

ARONVIT® is a dark purple to black fine powder. It can be suitably used in the form of syrup, capsule and tablets. The suggested daily dose is 50-150 mg.

Benefits of using ARONVIT® and target group

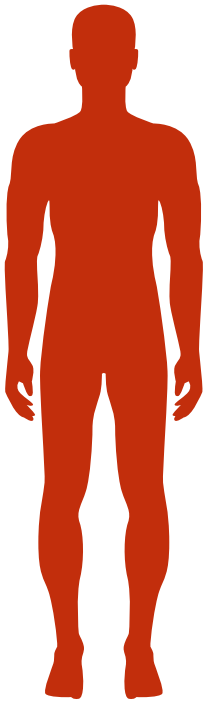
Aronia is the healthiest berry in the world, with one of the highest scores on the ORAC[3] scale. In other words, as an antioxidant, it has the highest capacity of absorbing reactive oxygen species (ROS). The bioavailability of polyphenols and anthocyanins in food depends mostly on food storage conditions and techniques of meals preparation. Processing and purification of vegetal food affect adversely on the level of antioxidant substances. That's why ARONVIT® standardized extract with the high content of anthocyanins and polyphenols is a perfect choice to ensure proven, versatile health benefits[4].

ARONVIT® is recommended for individuals exposed to adverse environmental factors. It provides natural support in:

- healthy metabolic function
- managing blood sugar levels in diabetes
- reducing triglyceride levels
- lowering cholesterol levels
- supporting anti-inflammatory activity[5]

Figure 5.

Anthocyanins influence on human health parameters



↑ antioxidant activity

↑ metabolic health

↓ triglycerides

↓ LDL

↓ oxLDL

↓ inflammatory process

ARONVIT® trademark

ARONVIT® registered trademark is the property of **GREENVIT®** company. The trademark may be used solely together with the purchased extract complex.

Impact of anthocyanins on diabetes

Anthocyanins are good for the improvement of lipid parameter, glucose levels, endothelial function and redox status in the body weight loss. In particular, anthocyanins show protection properties for the metabolic system[6]. Moreover, a diet rich in anthocyanins improves the plasma lipid profile by reducing the total cholesterol concentration, LDL fraction and triglycerides[7]. Additionally, by reducing the action of enzymes active in lipid metabolism, anthocyanins inhibit their oxidation and immunological response to LDLox and their capture by macrophages[8]. The findings from studies conducted on animal models to analyze the protective effect of anthocyanins in insulin resistance and obesity showed that anthocyanins are effective in increasing tissue responsiveness to insulin, reducing weight gain and lipid accumulation. For instance, in study (Yamane et all., 2017) demonstrated the suppression of elevation of postprandial blood glucose levels. Finally, anthocyanins help prevent the damage to blood vessels, typical in the course of diabetes, and the positive effect of anthocyanins on microcirculation translates into their positive impact on diabetic retinopathy.

Influence of anthocyanins on anti-inflammatory activity

The anti-inflammatory action of anthocyanins is manifested in the regulation of tension in capillary walls, which in turn reduces the cell inflammatory response. Anthocyanins inhibit, among all, NF-κB and the synthesis of inflammatory mediators (PGE2), and reduce the activity of COX-2. They regulate PLA2, COX-2, LOX enzymes and have the ability to regulate iNOS activity. As a part of their protective function in inflammatory processes, anthocyanins trigger the synthesis of prostacyclin (PGI2) produced in endothelial cells and foster their anti-aggregation action (like acetylsalicylic acid).

Impact of aronia on GLP-1 and metabolism

Aronia due to its content of bioactive compounds such as cyanidin-3,5-diglucoside, may positively influence GLP-1 levels by inhibiting the DPP IV enzyme. This action, along with other beneficial metabolic effects, suggests the potential use of aronia as a natural support in the treatment of type 2 diabetes and other metabolic disorders[7].

Conclusion

The positive effects of anthocyanin intake, as described above, occur as a result of a combined action of several mechanisms. While only some of them are directly connected with the antioxidative effect, and the majority is triggered by anthocyanin indirect action.

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Case Studies

Comparison of the Effects of Standardized Aronia Extract on Selected Markers Related to Metabolic Disorders

Randomized, Parallel, Placebo-Controlled Trial

The aim of the study was to compare the effects of aronia berry extract (ARONVIT®) on selected biomarkers associated with the risk of developing various diseases.

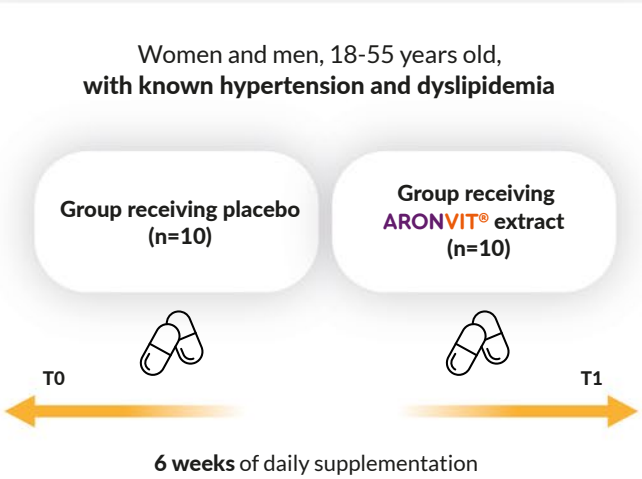

Figure 6.

ARONVIT® extract demonstrated a remarkable ability to stabilize homocysteine level

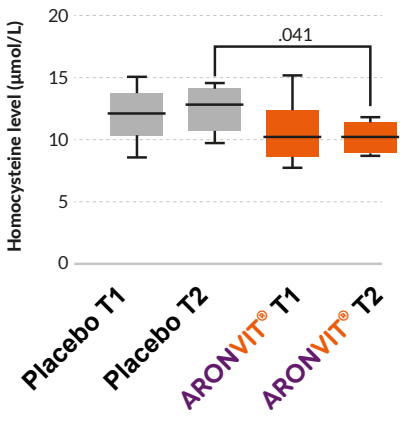

Figure 7. *Changes in homocysteine levels in serum of patients using placebo and ARONVIT®. Results are presented as a level of homocysteine at T1 (before supplementation) and T2 (at the end of supplementation). P values were calculated with Dunn's multiple comparisons test.*

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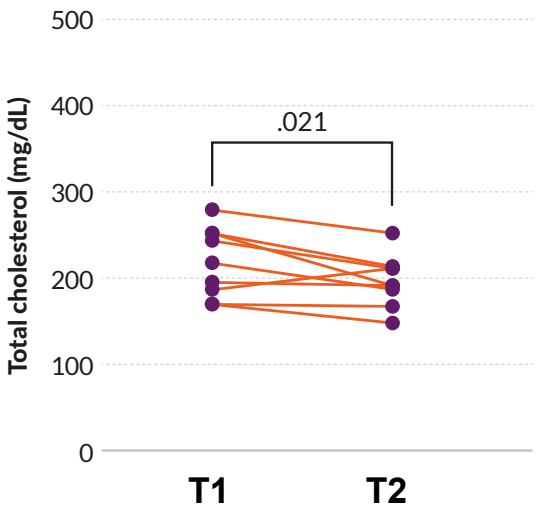

Figure 8. *Changes in total cholesterol level in serum of patients using placebo and* ARONVIT®. *Results are presented as a total cholesterol level at T1 (before supplementation) and T2 (at the end of supplementation). P value was calculated with a paired t-test.*

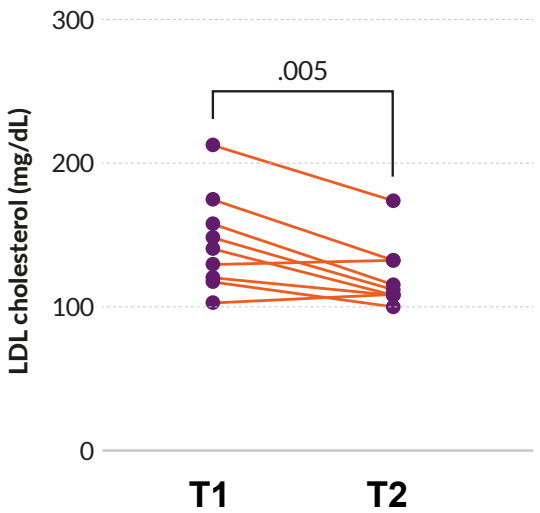

Figure 9. *Changes in LDL cholesterol level in serum of patients using placebo and* ARONVIT®. *Results are presented as a LDL cholesterol level at T1 (before supplementation) and T2 (at the end of supplementation). P value was calculated with a paired t-test.*

Following 6 weeks of ARONVIT® supplementation, patients exhibited a noteworthy reduction in **total cholesterol** levels (p = 0.021), but no statistically significant alterations were seen in the placebo group. In the ARONVIT® group, the mean decrease in total cholesterol was 21.8 mg/dL.

Patients who received ARONVIT® experienced a notable decrease in **LDL cholesterol** levels after 6 weeks (p = 0.005), but the placebo group did not show any statistically significant changes. In the ARONVIT® group, the mean reduction in LDL cholesterol was 22.3 mg/dL

Changes in the lipid profile were also evident in the reduction of the **LDL/HDL** ratio in patients taking ARONVIT® (p=0.013).

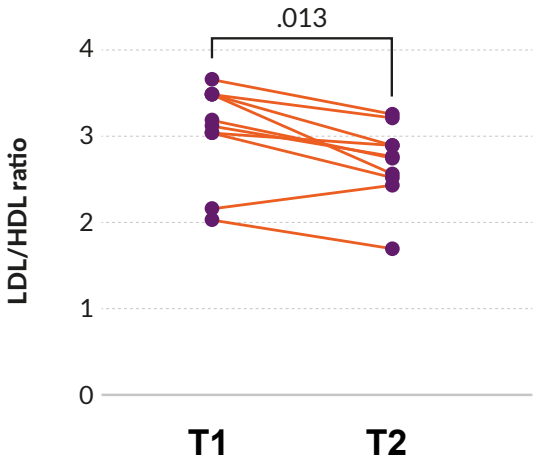

Figure 10. *Changes in LDL/HDL ratio in serum of patients using placebo and* **ARONVIT®**. *Results are presented as a LDL/HDL ratio at T1 (before supplementation) and T2 (at the end of supplementation). P value was calculated with a paired t-test.*

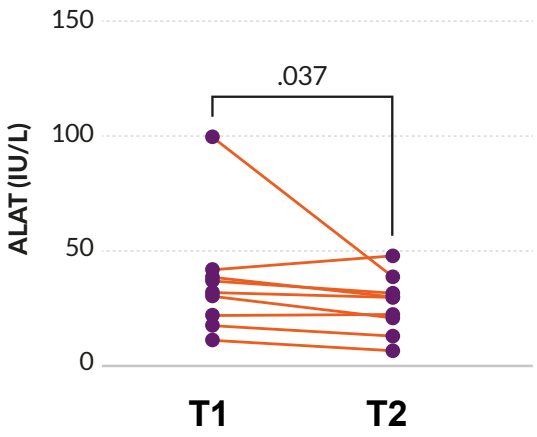

Figure 11. *Changes in ALAT activity in the serum of patients using placebo and* **ARONVIT®**. *Results are presented as the activity of ALAT at T1 (before supplementation) and T2 (at the end of supplementation). P value was calculated with a paired t-test.*

ARONVIT® has shown efficacy in enhancing lipid markers, providing a viable strategy for maintaining cardiovascular well-being. These findings underscore the potential of **ARONVIT®** as a beneficial adjunct in promoting overall cardiovascular health.

After 6 weeks of **ARONVIT®** supplementation, clinical assessment revealed a noticeable effect on the serum activity of **alanine aminotransferase (ALAT)**. The patients experienced a mean reduction of 9.7 IU/L in **ALAT** activity (P=0.037).

Atherosclerosis is closely linked to metabolic syndrome. Liver dysfunction, indicated by elevated ALAT activity, is often seen in individuals with metabolic syndrome. These individuals are at higher risk of developing atherosclerosis due to the interconnected pathways involving inflammation, lipid metabolism, and endothelial dysfunction. **ARONVIT®** supplementation may contribute to the management of atherosclerosis-related conditions.

References:

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2. (A. Kucharska, Wroclaw University of Life Sciences; 2022).

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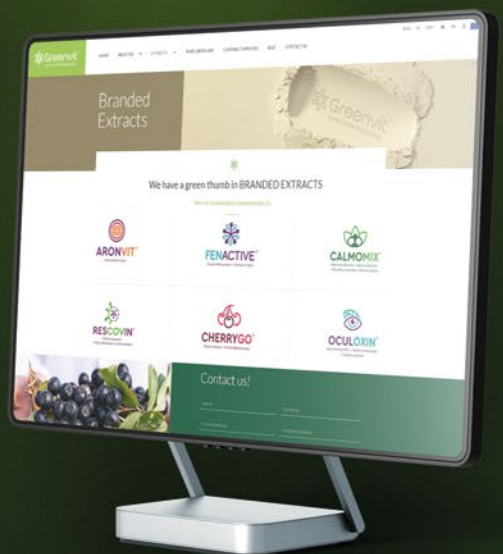
Curious about what else nature has to offer? Explore our full range of high-quality, standardized extracts — carefully developed to support modern health needs. From metabolic balance and immune support to cognitive focus and eye health — each of our ingredients blends tradition with science, delivering effective clean-label solutions.



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