Essiac Effects on Longevity & Mitochondrial Health

The most common use of Essiac is for immune system support in cancer patients and survivors. What else do people use Essiac for, and what unusual benefits are scientists looking into? In this post, we explore experimental research on the potential effects of Essiac on longevity, mitochondrial health, neuroinflammation, cognition, endurance, and more.

Disclaimer: This article is for informational purposes only. Please discuss your health concerns with your doctor. The FDA has not approved Essiac for treating cancer or any other medical condition. Essiac is sold as a herbal dietary supplement.

A Deep Dive into the Effects of Essiac on Cells

The basics

To recap, the original Essiac tea formula likely contains the following herbs and their ratios (Seely et al., 2007):

- Burdock root (*Artium lappa*): ~60%
- Sheep sorrel leaves (*Rumex acetosa L.*): ~30%
- Slippery elm inner bark (*Ulmus rubra*): ~8%
- Indian or Turkey rhubarb root (*Rheum officinale* Baillon/*Rheum palmatum* L.): ~2%

If you haven't already, read our unbiased Essiac review to learn about the main benefits before diving into this post.

Main Essiac active compounds

Few studies have used Essiac to investigate the experimental effects we cover in this article. Therefore, we will analyze the research behind compounds in Essiac that are most likely to have a biological effect (in this order):

1. **Burdock root, including arctigenin and arctiin** (the main active compounds)
2. **Quercetin**, sheep sorrel being one of the best sources of this antioxidant in nature
3. **Emodin**, an active compound from both sheep sorrel and rhubarb root

We'll take on a biohacking approach to see what anti-aging pathways, mitochondria, and neuroinflammation have in common—and whether Essiac can affect them.

Why mitochondrial health matters

Longevity and the prevention of many chronic diseases depend on having healthy and well-functioning mitochondria.

Mitochondria are the powerhouses of cells. They maintain energy balance and provide cells with over 90% of their energy needs. The health of your mitochondria can affect your energy levels, cognition, aging, and susceptibility to diseases such as diabetes, infertility, high blood pressure, traumatic brain injury, and even cancer (Javadov et al., 2020).

Some researchers believe that arctigenin and quercetin from Essiac may support mitochondrial health (Wu et al., 2014; Oliveira et al., 2015).

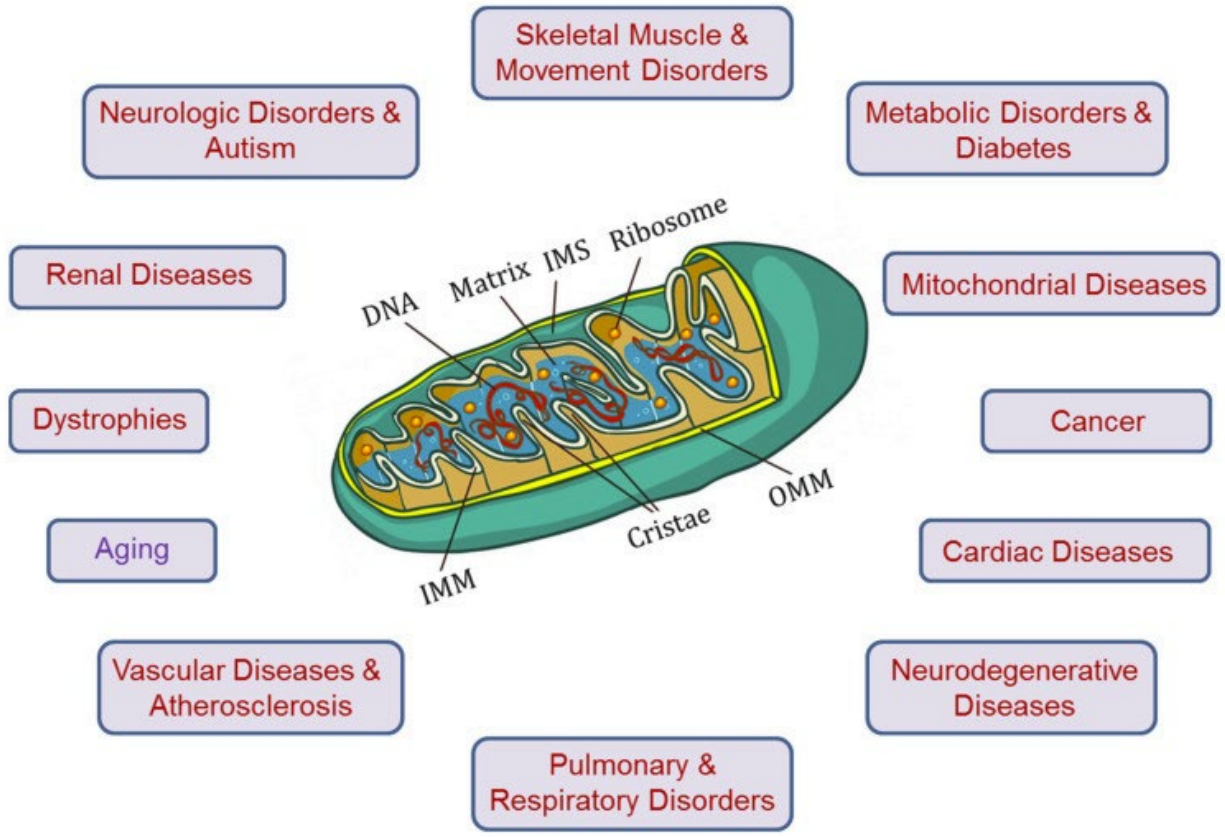

Figure 1: Mitochondria and their involvement in disease and aging (taken from Javadov et al., 2020).

Surprising Potential Benefits of Essiac

All the potential benefits listed below are experimental and based on research on animals and cells. There is not enough evidence to recommend the use of Essiac or its constituent herbs for any of the indications listed here. More clinical studies are needed to determine the efficacy and safety of Essiac in humans.

1) Longevity

Aging and chronic diseases share the same culprits: oxidative stress, low-grade inflammation, DNA damage, sluggish mitochondria, and poor detox (Petersen & Smith, 2016; Zhang et al., 2012; López-Otín et al., 2013).

Several studies researched the antioxidants in Essiac have for combating excessive oxidative stress and inflammation. One group of scientists took the research a step further, proving that **Essiac liquid extract could extend the lifespan of *C. elegans* roundworms from an average of 12-18 days out to 23 days**. This is pretty significant for roundworms (Leonard et al., 2006; Ruiz et al., 2021).

A recent review also mentioned that both quercetin (high in sheep sorrel) and burdock's arctigenin are promising anti-aging compounds (Corrêa et al., 2018).

In another experiment, **arctigenin, arctiin, and other phytochemicals from burdock increased the lifespan of *C. elegans* by up to 25%**. These active compounds turned on longevity and stress-resistance pathways in the cell (such as DAF-16 and JNK-1). (Su & Wink, 2015).

Plus, quercetin seems to increase the number of mitochondria in cells. This phenomenon is called *mitochondrial biogenesis*. Limited data reveal that quercetin may also protect mitochondria from damage due to toxins and oxidative stress. Both mechanisms **help prevent neuromuscular diseases and are vital to healthy aging** (Oliveira et al., 2015).

2) Exercise Endurance

Arctigenin and quercetin hold potential for boosting energy levels and endurance, according to preliminary research.

In one study, arctigenin enhanced the swimming endurance of sedentary rats by boosting the following key antioxidant pathways in the mitochondria (Wu et al., 2014; Burri et al., 2010):

- **AMPK and PGC-1α,** which activate major antioxidant genes (like superoxide dismutase and glutathione peroxidase)
- **PPAR-α,** which burns fat, gets the body into ketosis, and reduces fatigue and inflammation

Arctigenin is an AMPK activator: a compound thought to mimic exercise, even in sedentary animals. By turning on the same pathways in skeletal muscles as exercise, arctigenin might reduce fatigue and increase endurance without training (Wu et al., 2014).

Quercetin is also an exercise mimetic. In mice, quercetin increased exercise tolerance by boosting mitochondrial numbers in the brain and muscles. It acts on pathways like (Davis et al., 2009; Sahagún et al., 2012; Khateeb et al., 2010; Grabowska et al., 2017):

- **PPAR-γ**, which supports detox and reduces blood sugar, blood pressure, cholesterol, and inflammation
- **Sirtuins**, ancient signaling proteins conserved throughout living beings that promote longevity

3) Chronic Fatigue

Based on the research outlined above, scientists think both arctigenin and quercetin have the potential for improving fatigue and related diseases. This theory might, in part, explain why some people with chronic fatigue syndrome (CFS) and fibromyalgia report using Essiac. Clinical data are lacking, though (Wu et al., 2014).

4) Metabolic Disorders

By activating AMPK in the mitochondria, arctigenin might also support metabolic health. Some researchers believe arctigenin holds potential for type 2 diabetes, but human studies have yet to be carried out (Huang et al., 2012).

In obese rats with metabolic disorders, arctigenin improved blood sugar levels and fat metabolism. It also increased glucose uptake into muscle cells and decreased the production of both glucose and fat in liver cells. Altogether, this helps clear excess glucose and fat from the bloodstream and liver (Huang et al., 2012).

5) Memory & Cognition

Arctigenin, quercetin, and emodin may have beneficial effects on memory, based on animal experiments.

Arctigenin from burdock seeds prevented and improved memory deficits in mice. It worked by blocking an enzyme called acetylcholinesterase (AChE) that breaks down acetylcholine. **Blocking AChE boosts acetylcholine, the brain's main nootropic**. The effects of arctigenin were comparable to tacrine (Cognex), a drug approved for the treatment of Alzheimer's disease (Lee et al., 2011).

Arctigenin also protected brain cells involved in memory and attention from neurodegeneration in test tubes (Zhang et al., 2013).

In another animal experiment, a quercetin-rich diet improved cognitive dysfunction during the early-middle stage of Alzheimer's disease. Quercetin seems to help clear amyloid plaques and prevent neurofibrillary tangles, abnormal proteins that play a central role in Alzheimer's disease (Lu et al., 2018; Khan et al., 2020).

Similarly, emodin (found in sheep sorrel and rhubarb) improved cognitive deficits in mice with Alzheimer's disease. High doses reduced amyloid deposits in animals' brains by 50%-70% (Wang et al., 2021).

In one placebo-controlled clinical study, eating quercetin-rich onions improved cognitive function in elderly people. The authors argue that quercetin-rich foods may help prevent dementia (Nishimura et al., 2017).

According to the USDA Database for the Flavonoid Content of Selected Foods, **sheep sorrel is even higher in quercetin than onions**. Fresh sheep sorrel packs 86.2 mg of quercetin per 100g, whereas raw onions contain about 21.40mg and red onions 31.77 mg/100g (Bhagwat et al., USDA).

6) Neuroinflammation

Quercetin might also reduce neuroinflammation, inflammation that often sets off a chemical storm in the brain that can lead to degenerative diseases and cognitive dysfunction. Neuroinflammation also contributes to poor appetite and muscle wasting in cancer patients (Costa et al., 2016; Molfino et al., 2014).

Additionally, **quercetin might prevent heavy metals like aluminum from causing brain damage**. In rats, quercetin increases the survival of brain cells exposed to aluminum, a major neurotoxin. Aluminum exposure has been linked to Alzheimer's disease, Parkinson's disease, and Amyotrophic lateral sclerosis (ALS) (Sharma et al., 2016).

7) Brain Fog

Aside from accompanying Alzheimer's, dementia, and even autism, mild cognitive dysfunction can also signal poor brain health or "brain fog." People describe brain fog as a lack of mental focus, clarity, and energy. Brain fog may be due to brain inflammation, which is why natural antioxidants have been proposed as potential therapies (Theoharides et al., 2015).

Some people report using Essiac to combat brain fog. In theory, this might be explained by active compounds in Essiac that boost cognitive health, mitochondrial and metabolic function, and anti-inflammatory pathways. However, research on humans is needed to test this theory out.

8) Cancer Cell Metabolism

Interestingly, some active compounds in Essiac seem to protect only healthy mitochondria while attacking the mitochondria of cancerous cells. This theory hasn't been tested in humans, however (Lee et al., 2020).

For example, in test tubes, arctigenin killed prostate cancer cells by triggering mitochondrial damage. Mitochondria become dysfunctional, which causes deadly levels of inflammation in cancer cells. Arctigenin has this effect only in an environment high in lactic acid, as in tumor tissue (Lee et al., 2020).

Emodin might act in a similar way. It decreases energy levels in cancer cells and suppresses their proliferation by targeting their mitochondria. Emodin seems to block only the overactive mitochondria of cancer cells, without harming healthy cells (Sugiyama et al., 2019).

Read about Essiac and cancer in this article.

In Conclusion

Several active compounds in Essiac may help prevent chronic diseases and promote longevity by supporting mitochondrial and metabolic health.

The main active compounds in Essiac (arctigenin, arctiin, quercetin, and emodin) may support energy levels, endurance, and cognition. Limited research suggests that they might activate anti-aging pathways and reduce inflammation in muscle and brain cells. However, clinical research to support these benefits is mostly lacking.