

Research on the Efficacy of Neuronic Acid-Rich Vegetable Oils and its Product Development

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Abstract: Neuronic acid, a 24-carbon monounsaturated fatty acid, was named for its initial discovery in animal brains. It is particularly abundant in the brain, especially in white matter, primarily residing in nerve fiber myelin sheaths and playing a crucial role in brain development and function. Deficiency of neuronic acid can lead to a series of neurological disorders. Recent research has found that certain plant fruits in China are rich in neuronic acid, such as *Acer truncatum*, *Xanthoceras sorbifolia*, and *Malaria oleifera*. However, the specific roles and mechanisms of neuronic acid in the brain remain unclear. Our laboratory has conducted in-depth and meticulous research on the effects of *Acer truncatum* seed oil and *Xanthoceras sorbifolia* seed oil on brain development and prevention of neurological diseases using mice and *Drosophila melanogaster* as animal models, employing advanced technologies in behavioral science, molecular biology, cell biology, gut microbiomics, and metabolomics. The results revealed that *Acer truncatum* seed oil significantly promotes brain development, improves clinical symptoms in autistic mice, and demonstrates remarkable therapeutic effects on multiple sclerosis. Both *Acer truncatum* seed oil and *Xanthoceras sorbifolia* seed oil significantly extend the lifespan of *Drosophila melanogaster*. Based on these findings, our laboratory has developed a series of functional foods utilizing neuronic acid-rich *Acer truncatum* seed oil and *Xanthoceras sorbifolia* seed oil. Among them, the neuronic acid-fortified fermented goat milk powder has been launched on the market and has received widespread acclaim from consumers. Our research achievements have laid a solid foundation for the healthy and sustainable development of the *Acer truncatum* and *Xanthoceras sorbifolia* industries.

Keywords: Neuronic acid; Vegetable oil; Brain; Functional food