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Published study shows Kemin spearmint and rosemary extracts improve learning and memory in SAMP8 mice

Builds support for antioxidant mechanism of action for Neumentix™ Phenolic Complex K110-42

Des Moines, Iowa – September 29, 2016 – A recently published medical school study shows Kemin's proprietary antioxidant-based ingredients, spearmint extract and rosemary extract, improve learning and memory in SAMP8 mice. The study also revealed reduced brain tissue markers of oxidative stress providing the first indications of how these potent extracts may act in the brain to improve cognitive performance.

The study, "Effect of botanical extracts containing carnosic acid or rosmarinic acid on learning and memory in SAMP8 mice," conducted at St. Louis University School of Medicine Division of Geriatrics, was published in *Physiology and Behavior* in August 2016.

In this study, researchers evaluated the effects of a spearmint extract (5% rosmarinic acid) and two rosemary extracts (60% and 10% carnosic acid) on learning and memory in the SAMP8 model of accelerated aging. Three doses of actives for each extract were tested along with a placebo condition.

"The SAMP8 mouse model is an established animal model for studying age-related cognitive decline and oxidative damage to brain tissue," said Dr. Susan Farr, Professor at St. Louis University School of Medicine, Division of Geriatrics and Research Scientist at the VA Medical Center, St. Louis. "Previous research has shown the SAMP8 mice to be an excellent model for testing ingredients that could provide potential cognitive health solutions that translate to humans."

After 90 days of treatment, SAMP8 mice were tested in T-maze foot shock avoidance, object recognition and lever press paradigms. These tests assess both hippocampal-dependent and procedural learning and have been shown to translate to human learning and memory capabilities. The study showed spearmint extract with 5% rosmarinic acid improved acquisition and retention in T-maze foot shock avoidance and object recognition. In addition, rosemary extract containing 60% carnosic acid improved acquisition and retention in T-maze foot shock, object recognition and lever press; and rosemary extract with 10% carnosic acid improved retention in T-maze foot shock avoidance and lever press.

"The results suggest that these extracts have exciting possibilities for cognitive benefits in humans. In addition, the reduction in oxidative stress markers in specific areas of the mouse brain indicates that these extracts are having effects at the cellular level in the brain, which could be a mechanism for the observed learning and memory improvements," said Dr. Farr.

Mice treated with all three extracts showed reduced brain tissue markers of oxidative stress. In the brain cortex, 4-hydroxynonenal was reduced after treatment with all three extracts compared to the vehicle treated SAMP8. Protein carbonyls were reduced in the hippocampus after administration of spearmint containing 5% rosmarinic acid and rosemary with 10% carnosic acid.

The spearmint extract used in the SAMP8 study was derived fromNeumentix™ Phenolic Complex K110-42. Neumentix is Kemin's spearmint-based cognitive performance ingredient. Beyond rosmarinic acid, the Phenolic Complex contains more than 50 polyphenolic compounds, including salvianolic acid A and B, lithospermic acid and caftaric acid, which research suggests may act in the brain to reduce oxidative stress, protect neurons in the brain, increase neurotransmitter levels and promote new neural growth.

For additional information on this study and additional research around Neumentix, visit Kemin Booth II159 duringSupplySide West, Oct. 4-8 in Las Vegas.

For more information on Neumentix, visit https://www.kemin.com/en/north-america/products/neumentix.

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