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New Study Identifies 7-Hydroxymatairesinol as Key Lignan in Food Sources

Norway spruce remains most potent and economical source of direct enterolactone precursor

LOCARNO, SWITZERLAND & EASTON, PA – October 19, 2006 – Linnea, the exclusive supplier of HMRLignan™, announced today that new Finnish research has uncovered the naturally occurring existence of 7-hydroxymatairesinol as the dominant lignan in wheat, triticale, barley, corn, amaranth, millet and oat bran.

The study entitled, “Identification of 7-hydroxymatairesinol and several other previously unidentified lignans in cereals, oilseeds and nuts--the role of extraction method,” by Smeds, AI, et al. Department of Biochemistry and Pharmacy, Abo Akademi University, details how a new analytical technique was able to reveal, for the first time, the presence of the compound 7-hydroxymatairesinol in a variety of food sources. Prior to the results of this research, the lignan was known to be found in Norway spruce (*Picea abies*), which still remains the most potent, and hence, economically viable source for manufacture into dietary supplements and functional foods.

“The results of this study demonstrate that 7-hydroxymatairesinol is a common lignan in foods, and an important micronutrient in the human diet,” says Robin Ward, Vice President of Marketing, Linnea Inc.

The researchers analyzed 24 plant lignans through HPLC-MS/MS in bran extracts of 16 cereal species, four nut species and oilseeds (sesame and linseeds). Of these 24 lignans,

18 were previously unidentified in these sources; 16 of the lignans were identified in analyzed samples. Specifically, points out Ward, “7-hydroxymatairesinol, which has not been detected in cereals previously because of destructive extraction methods, was the dominating lignan in wheat, triticale, barley, corn, amaranth, millet and oat bran.”

According to study authors, the proportion of “new” lignans of the total lignan content exceeds 50%; *i.e.*, the new lignans are dominant in wheat, barley, corn, and quinoa bran and in amaranth. Further, in triticale bran, the proportion is nearly 50%, and in rye, oats, buckwheat, millet, and dhurra bran, the proportion is between 26 and 44%. In spelt wheat and all rice species, the proportion is between 3 and 16%.

In earlier studies, such as Pietinen, et al¹, researchers noted that the primary phytoestrogens in the Scandinavian diet are lignans, and enterolactone is the most important circulating lignan. The researchers found that high enterolactone levels were associated with increased consumption of rye products and other whole foods compared to those with low serum enterolactone. They also stated that serum enterolactone level was significantly inversely associated with risk of breast cancer. In addition, the 2002 Framingham Offspring Study in the USA concluded that high intake of lignans in postmenopausal women was associated with a favorable metabolic cardiovascular risk profile².

Says Ward, “Although flax is often considered to be one of the richest sources of dietary lignans, it is unlikely in these studies that flax was a key source of lignans. However, with its abundance in grains and other foods, it is clear that 7-hydroxymatairesinol is a significant source of dietary lignans as part of a healthy diet regimen. The new research validates HMRlignan™ as an exceptional choice for inclusion in dietary supplements and functional foods.”

As a unique source of lignans, HMRlignan™ (7-hydroxymatairesinol) is a highly bioavailable and efficient precursor of enterolactone. HMRlignan™ is standardized to contain 80,000 mg/100 g of lignans and the daily dosage to raise enterolactone levels is 10 - 30 mg. “For manufacturers, HMRlignan™ is the most cost-effective and highest

quality source of lignans,” Ward asserts. “HMRLignan™ is ideally suited for supplements geared towards women’s health as well as for cardiovascular support.”

Derived from Norway spruce (*Picea abies*), HMRLignan™ is a direct enterolactone precursor dietary supplement. It is a proprietary and patent-protected product manufactured and marketed worldwide by Linnea, Switzerland.

About Linnea

From its headquarters and manufacturing facility in Locarno, Switzerland, Linnea specializes in the manufacture of botanical extracts and phytochemicals, and is a leading supplier to the pharmaceutical, dietary supplement and cosmetic industries. HMRLignan™ is a proprietary, patent protected, product manufactured by Linnea SA. The company’s U.S. office, Linnea Inc., is located in Easton, Pennsylvania. For more information about HMRLignan™, visit our Web site at www.hmrlignan.com or call 1-888-253-0044.

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1. Cancer Epidemiol Biomarkers Prev. 2001 Apr;10(4):339-44.
2. J Nutr. 2002 Feb;132(2):276-82.