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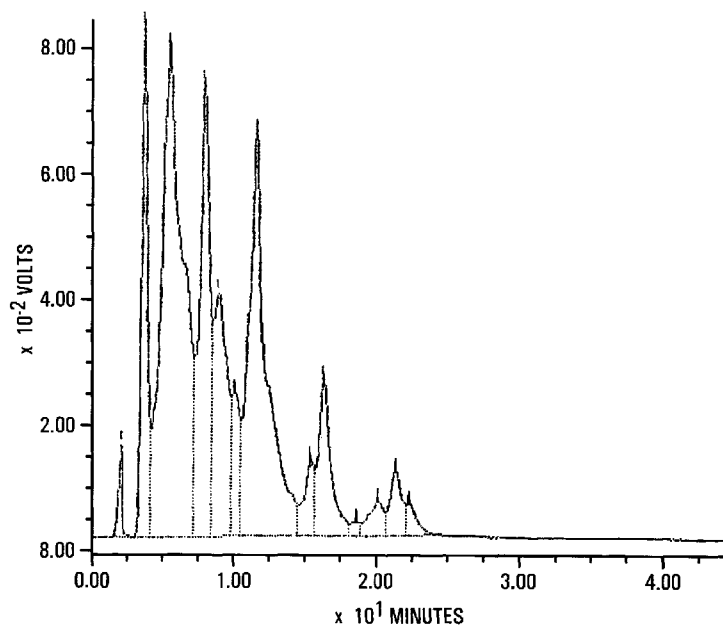
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(54) Title: NATURAL MARINE SOURCE PHOSPHOLIPIDS COMPRISING FLAVONOIDS, POLYUNSATURATED FATTY ACIDS AND THEIR APPLICATIONS



(57) Abstract: A phospholipid extract from a marine or aquatic biomass possesses therapeutic properties. The phospholipid extract comprises a variety of phospholipids, fatty acid, metals and a novel flavonoid.



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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

NATURAL MARINE SOURCE PHOSPHOLIPIDS COMPRISING FLAVONOIDS,  
POLYUNSATURATED FATTY ACIDS AND THEIR APPLICATIONS

Cross-Reference to Related Application

This application claims the benefit of United States  
5 Provisional Patent Application Serial No. 60/307,842, filed  
July 27, 2001, which is incorporated herein by reference in its  
entirety.

Field of the Invention

The present invention is directed to nutraceutical,  
10 pharmaceutical or cosmetic compositions, particularly to  
phospholipid compositions derived from natural marine or  
aquatic sources.

Background of the Invention

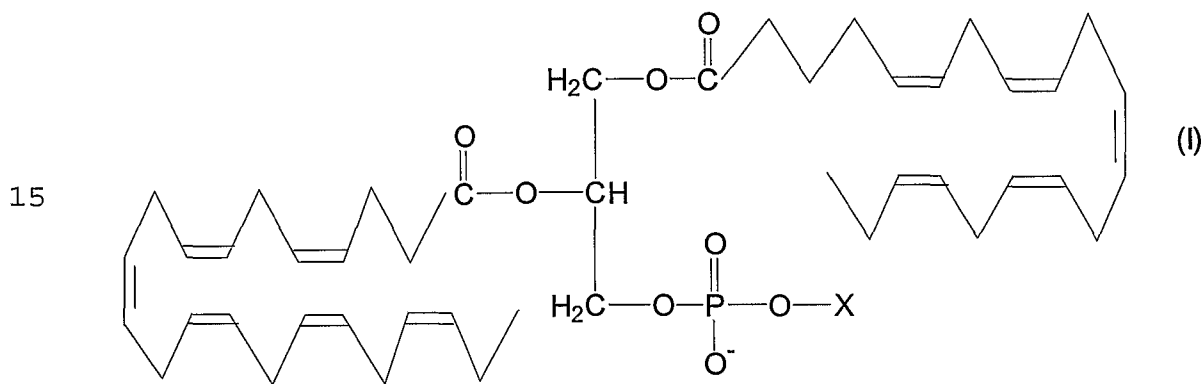
United States Patent No. 5,434,183 issued on July 18,  
15 1995 describes a phospholipid emulsion derived from marine  
and/or synthetic origin comprising polyunsaturated fatty acids  
and having anti-inflammatory and immunosuppressive effects and  
which promotes normal brain or retinal development and  
function. U.S. 5,434,183 does not disclose the presence of  
20 flavonoids or nervonic acid (a mono-unsaturated fatty acid) in  
the composition.

JP 2215351, published on August 28, 1990, discloses a  
method for extracting and purifying phospholipids from fresh  
krill. Krill is lyophilized and then extracted with ethanol to  
25 produce an extract which is fractionated by absorption column  
chromatography to produce high purity phosphatidyl choline and  
phosphatidyl ethanolamine. There is no disclosure of a  
phospholipid extract comprising a flavonoid or nervonic acid.

WO 00/23546, published on April 27, 2000, discloses methods for extracting lipid fractions from marine and aquatic animal material by acetone extractions. The resulting non-soluble and particulate fraction is further solvent extracted with ethanol or ethylacetate to achieve further lipid extractions.

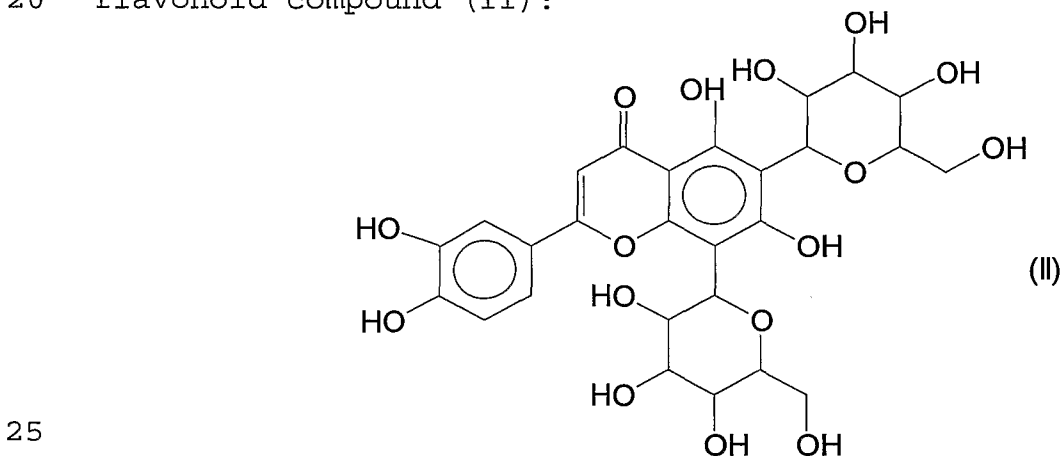
Summary of the Invention

In one aspect, the invention provides novel phospholipids, wherein the two fatty acids chains of the phospholipid are occupied by eicosapentanoic acid (EPA) and docosahexanoic acid (DHA) simultaneously, within the same molecule, i.e.: a phospholipid of the general formula (I):



wherein X represents a moiety normally found in a phospholipid.

In a further aspect, the invention provides a novel flavonoid compound (II):



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The novel phospholipids and the novel flavonoid compound are derived from an extract from a marine or aquatic biomass.

There is also provided a phospholipid extract comprising the above noted phospholipids and flavonoid compound derived from a marine or aquatic biomass. The extract and the components are useful in the prevention or treatment of a variety of disease states and for the aesthetic enhancement of an animal, including human, body. Pharmaceutical, nutraceutical and cosmetic compositions containing the extract and uses thereof are also within the invention, as are commercial packages contain the compositions of the invention.

#### Detailed Description of the Invention

##### 1. Phospholipids

Phospholipids are complex lipids containing phosphorus. The phosphatides, known as phospholipids, are usually divided into groups on the basis of compounds from which they are derived. In addition to two chains of fatty acids they contain phosphoric acid, glycerol and nitrogenous bases such as choline. Important phospholipids are phosphatidylcholine (PC), phosphatidylethanolamine (PE) and phosphatidylinositol (PI). Their nature as amphophilic molecules provides them with unique physicochemical properties. Their function as the principle components of cell membranes makes phospholipids essential for all vital cell processes. They are widespread as secretory and structural components of the body and can mimic or enhance natural physiological processes.

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