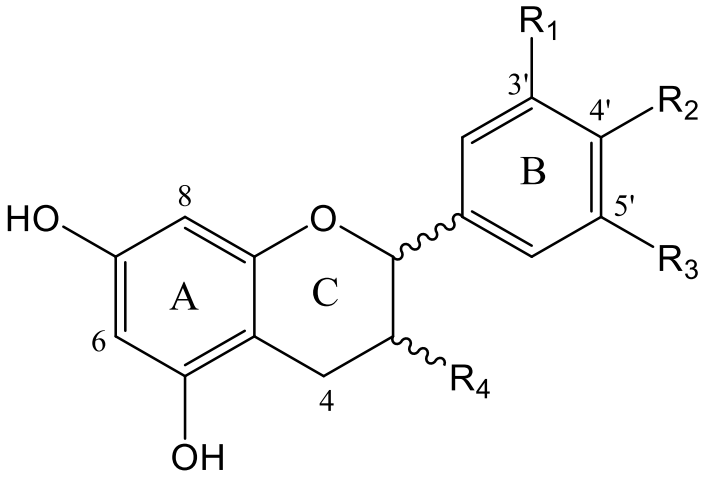


(I);

[010] wherein, when R_1 is OCH3, R_2 is OH and R_3 is H, when R_1 is OH, R_2 is H and R_3 is H, when R_1 is OH, R_2 is OH and R_3 is H, or when R_1 is OH, R_2 is OH and R_3 is OH; and R_4 is 3-(α)-OH, 3-(β)-OH, 3-(α)-O-sugar or 3-(β)-O-sugar; wherein the proanthocyanidin has a degree of polymerization ranging from 50 to 65; and a pharmaceutically acceptable carrier or salt.

[011] The monomer units of the proanthocyanidin are bonded to each other via C4-C8 bonding, C4-C6 bonding, or C2-O7 bonding. The monomer units of the proanthocyanidin further comprise R or S optical isomers at C2, C3 or C4.

[012] The monomer units of the proanthocyanidin comprise flavonoid compounds such as gallocatechin, galloepicatechin or epigallocatechin.

[013] The pharmaceutical composition disclosed in the present invention comprises catechin, epicatechin, ~~epiafzetechin~~ epiafzelechin, gallates, flavonols, flavandiols, leucocyanidins or procynidins and flavan-3-ol.

[014] The pharmaceutical composition disclosed in the present invention is extracted from the plants of *Ericaceae*, *Rosaceae*, *Pinaceae*, *Vitaceae* or *Urticaceae*, the plants of *Urticaceae* including *Boehmeria nivea L. Gaud*.

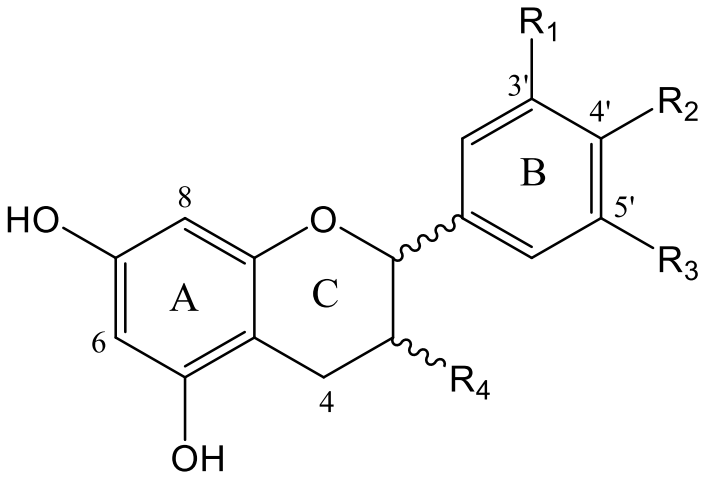
[015] The proanthocyanidin of the pharmaceutical composition disclosed in the present invention has a degree of polymerization ranging from 50 to 65, preferably ranging from 55-65, more preferably 55-60.

[016] The pharmaceutically acceptable salt of the pharmaceutical composition disclosed in the present invention includes sodium salt, potassium salt, amine salt, magnesium salt, calcium salt, zinc salt, aluminum salt, zirconium salt, dicyclohexylamine salt, methyl-D-glucosamine salt, arginine salt, lysine salt, histidine salt or glutamine salt.

[017] The pharmaceutical composition disclosed in the present invention can be used to treat or prevent brain diseases, aging related diseases caused by the generation of active oxides, or to prevent and treat aging.

[039] The complete purification method may comprise the following steps. The partially purified extract is dissolved in ethanol or methanol aqueous solution and placed into a molecular sieve column. Next, an elution is performed using different solutions and/or mixing solutions to purify and separate the proanthocyanidin. In one embodiment, the elution sequence of different solutions is 95% ethanol, 95% ethanol/methanol (1:1, v/v), 50% methanol and 50% acetone aqueous solution. The solutions which are eluted out through each eluent are collected in batches. Next, the purified proanthocyanidin in the eluted-out solution is detected using liquid chromatography (254 nm). The proanthocyanidin polymer solutions with various molecular weight distributions may be obtained by collecting the solutions which are eluted out through different eluents. Next, each of the eluted-out solution is concentrated below 40°C and freeze-dried to obtain the purified proanthocyanidin polymer. In one embodiment, the molecular sieve column used in the elution is Sephadex LH-20 column (purchased from German Amersham Corporation).

[040] In the disclosure, the monomer units of the purified proanthocyanidin have the following formula:



(I).

[041] In one embodiment, when R_1 is OCH_3, R_2 is OH and R_3 is H. In another embodiment, when R_1 is OH, R_2 is H and R_3 is H. In another embodiment, when R_1 is OH, R_2 is OH and R_3 is OH. In the formula, R_4 may be 3-(α)-OH, 3-(β)-OH, 3-(α)-O-sugar or 3-(β)-O-sugar, wherein the monomer units of the proanthocyanidin are bonded to each other via C4-C8 bonding, C4-C6 bonding, or C2-C7 bonding.

[042] The monomer units of the proanthocyanidin comprise R or S optical isomers at C2, C3 or C4.

[043] The monomer units of proanthocyanidins can also include flavonoids such as catechin, epicatechin, ~~epiafzetechin~~ epiafzelechin, gallocatechin, galloepicatechin, epigallocatechin, gallates, flavonols, flavandiols, leucocyanidins or procynidins. In one embodiment, the monomer units of proanthocyanidins comprise flavan-3-ol or flavane derivative.