

ACTIVE BIOFOIL WITH INCORPORATED ANTIOXIDANT JAPANESE KNOTWEED RHIZOME BARK EXTRACT



The invention is biodegradable chitosan-based foil, which is enriched with a potent antioxidant plant extract, obtained from an invasive plant species, Japanese knotweed (*Polygonum cuspidatum*, *Fallopia japonica* Houtt.), which due to its fast expansion poses global ecological damage, displaces autochthonous plants and leads to a reduction in biodiversity. Moreover, it is causing huge economic harm (e.g. damage to infrastructure). We recently showed that the Japanese knotweed rhizome bark extract has potent antioxidant activity, which is equivalent to that of vitamin C. Moreover, the antioxidant activity of the plant extract was stable for at least 14 days, which was not the case for vitamin C.

Technology

Some physico-chemical properties, biodegradability, total phenolic content, the antioxidant and the antimicrobial activity of the foil were tested. Migration studies of the extract's bioactive compound/s into some food simulants, selected according to EU legislation, were also executed. Moreover, we determined a marker of the antioxidant activity by an *on-line* HPLC-DPPH-UV/Vis method.



Figure: Spectrophotometric DPPH test for testing the antioxidant activity of the plant extract.

TYPE OF COOPERATION

R&D cooperation and technology
licensing opportunity

INTELLECTUAL PROPERTY

Applying for a patent

DEVELOPED BY

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MORE INFORMATION ABOUT THE INVENTION



Main advantages

- The innovation enables production of foils from wastes, thus replacing conventional plastics with marine and plant biowastes.
- The foils will provide active protection of different types of food/cosmetics through direct contact and/or migration of the active ingredients into the food.
- The good mechanical properties and the active protection of the goods will improve the quality and extend the shelf-life of the final products.
- The formulated foils can greatly contribute to zero-waste communities, thus reduce the environmental pollution caused by conventional plastics and further reduce the GHG emissions by using the biowastes and by prolonging the shelf life of the foodstuff.
- The foils are completely biodegradable in compost within 11 days.

Key words

Japanese knotweed rhizome bark, chitosan, foil, antioxidant activity, biodegradable material, active packaging, food/cosmetics packaging