

## **Waste recovery and circular economy: a resource from orange peels deriving from production of orange juice**

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### **Abstract.**

In the perspective of bio-sustainable development and renewable resource technologies, by-products and waste from agro-industrial sector represent a relatively cheap source of material suitable for several aims, which would reduce both the amount of waste and the related costs of disposal, while producing added-value nutritional products.

The processing waste of oranges find various fields of application, in fact in addition to their use in agriculture as a fertilizer, orange peels can be used to produce candied fruit. Moreover, in a very recent application with the aim to recover these industrial residues, a chemical process that allows the processing of orange peel waste has been developed. This process is useful for obtaining a purified cellulose suitable for spinning, thus creating a truly innovative and sustainable fabric (Orange Fiber). In this work, the orange peels obtained from industrial processing waste were subjected to a first hydroalcoholic extraction which allowed to obtain an extract rich in essential oils that could be used in the food sector to produce liqueurs and/or aromas, but also in the cosmetic or pharmacological sectors.

Subsequently, the peels after hydroalcoholic extraction were dried and this residue represents a valuable product rich in dietetic fiber useful in nutraceutical and pharmaceutical fields. Moreover, the same product could be used as fertilizer in agriculture. In lights of this, citrus fruit processing waste can be considerate as a sustainable and renewable energy source.