Agro2Circular

Territorial Circular Systemic Solution for the Upcycling of Residues from the Agrifood Sector

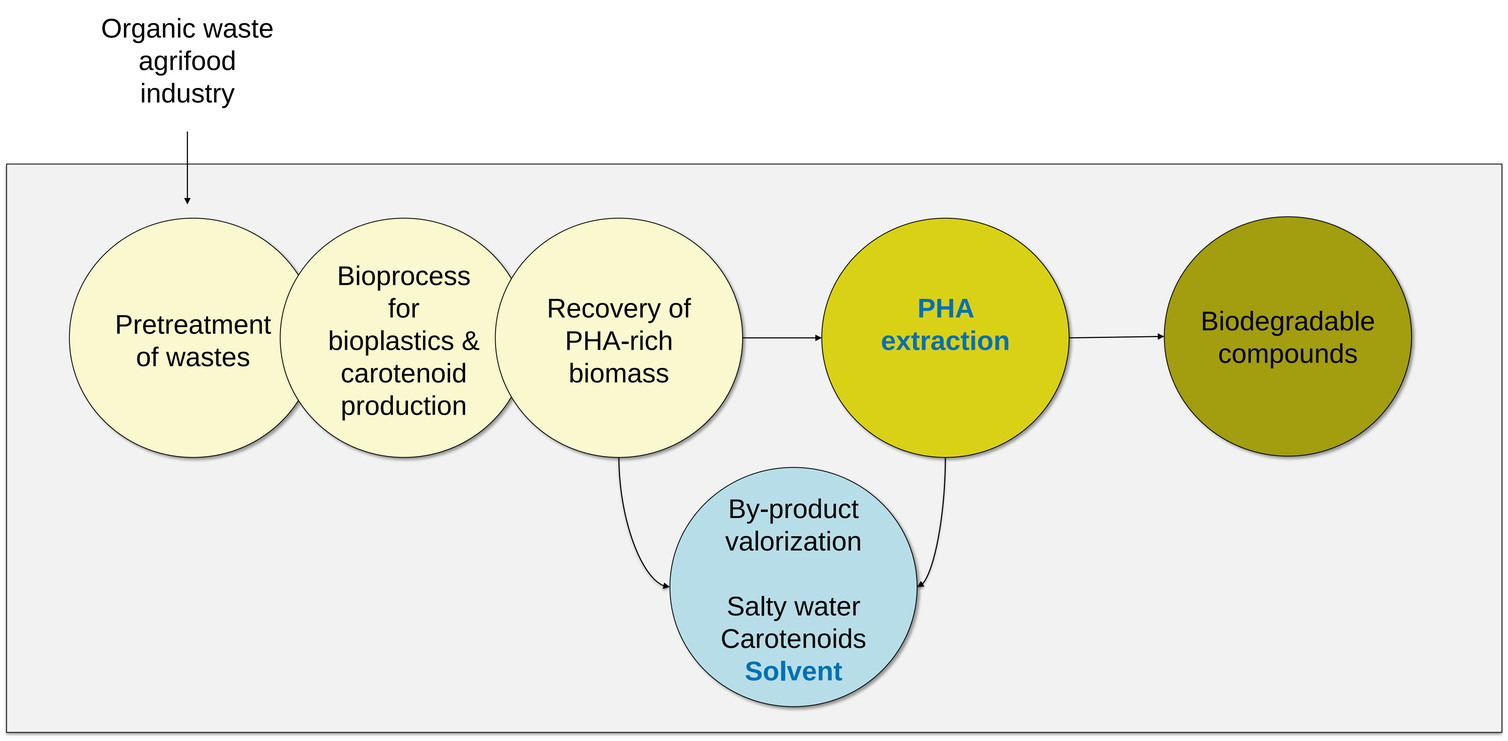
Raquel Barbosa, Sanjay Pal, Alan Werker
Raquel.Barbosa@wetsus.nl

The hidden value of agrifood sector residues

Agro2Circular aims to convert principal residues in the agrifood sector (fruits & vegetables and plastic multilayers) into valued renewable products and services. In close collaboration with an extensive network of European partners, the goal is to generate opportunities for agricultural circularity.

Organic waste will be upcycled via extraction, fermentation, and purification into new food formulations, nutraceuticals, and cosmetics. Residual organic waste is used as a feed source for biotechnological routes that generate biodegradable biopolymers (PHA) for cosmetics and biodegradable plastics. Furthermore, the project will showcase the first recycling value chain for multilayered films.

Multilayers will be washed, delaminated, and recycled via an innovative enzymatic recycling process, producing recycled plastics for food packaging and agricultural films. The innovative recycling solutions will be demonstrated in the region of Murcia (Spain). This benchmark will serve to motivate and nurture Murcia regional circular economies. The project furthermore casts a template that can teach and enable other areas to engage public, and industrial stakeholders, to do so too.



Upcycling of agro-industry organic waste into biodegradable compounds

Towards circularity

PHA is a biobased and biodegradable polymer with thermoplastic properties like polypropylene and polyethylene. Agricultural residues are excellent feedstocks for PHA production. Bacteria convert the fermented organic residuals into PHA.

PHA in bacteria acts as a ‘food and energy survival reservoir’, in a similar sense of purpose that accumulated fat can serve in mammals. PHA can be subsequently purified from the biomass with environmentally friendly solvents to obtain a natural biopolyester in powder or granule form.

As project partner, Wetsus focuses on green solvent extraction of PHA from the PHA-rich-biomass. The recovered PHA biopolymers are pure (>98%) and of high-quality, with a favorable sustainability profile. Project partners will subsequently compound the PHA into food packaging and agricultural films that will be evaluated for mechanical properties, food grade application, recycling, and biodegradability.

(1) PHA and (2) pot prototype made of PHA produced as part of the Scalibur project (https://scalibur.eu)

Project partners

The Agro2Circular consortium consists of 41 partners from 9 EU countries, including companies, research institutes and decision makers (public, policy, financing and standardization). The focus of the project is on the Murcia region (Southeast of Spain).

Contacts
Project coordinator, CETEC (Spain) | fuensanta.monzo@agro2circular.org
Communication, ICONS (Italy) | info@agro2circular.eu

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