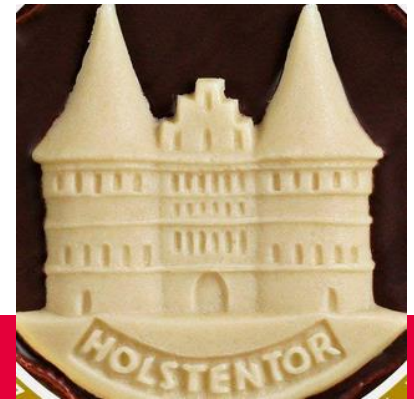


From marzipan in Lübeck to olive oil in Jordan



veronika.hellwig@th-luebeck.de
GJU Network Meeting SAMS 2021

Waste in marzipan industry



up to 10 t almonds/day

German Federal Ministry of Education and Research BMBF 13FH018IX5 (VEREMA; 2015-2020)

Antioxidative und antibiotische Substanzen aus der stofflichen VERwertung von RESTstoffen der MARzipan-Industrie

Antioxidant and antibiotic substances from material use of waste of the marzipan industry

blanching
4 min; 96 °C

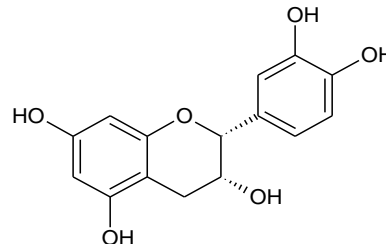
7200 l blanch
water/day

almond skin

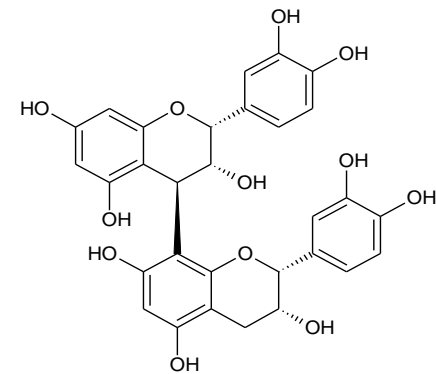
transportable
and storable
material

new product
for end user

up to 30 t marzipan/day

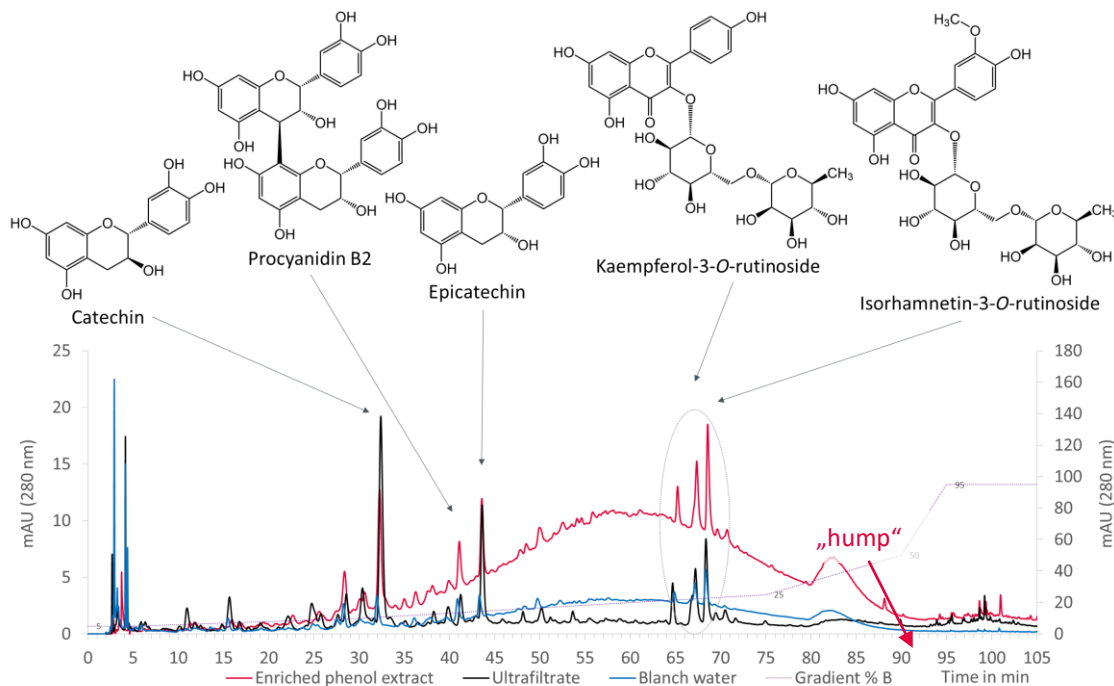


Catechin / Epicatechin



Procyanidin B2

Mandalari G et al. Antioxidant and Photoprotective Effects of Blanch Water, a Byproduct of the Almond Processing Industry. *Molecules* 2013; 18(10):12426-12440



HPLC chromatogram of blanch water, phenolic extract and ultrafiltrate (LiChrosorb C18 H₂O/Acetonitrile/HOAc), Assignment via MSⁿ and comparison with analytical standards



Open Access | Published: 22 February 2020

Polyphenols from waste streams of food industry: valorisation of blanch water from marzipan production

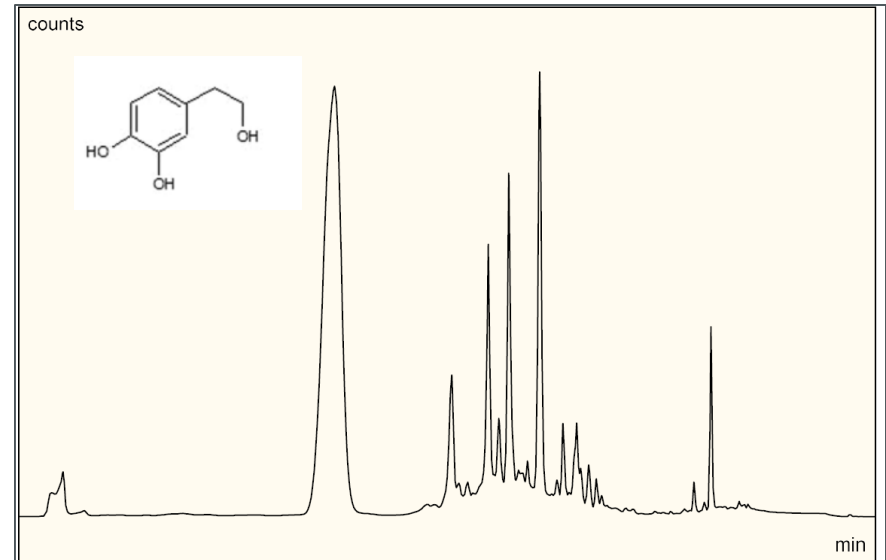
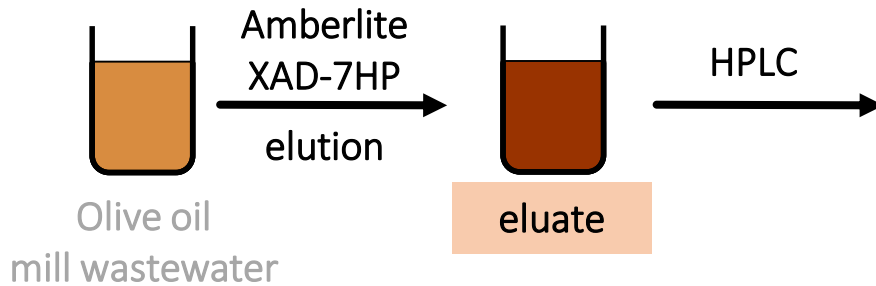
Veronika Hellwig & Johanna Gasser

Phytochemistry Reviews **19**, 1539–1546 (2020) | [Cite this article](#)

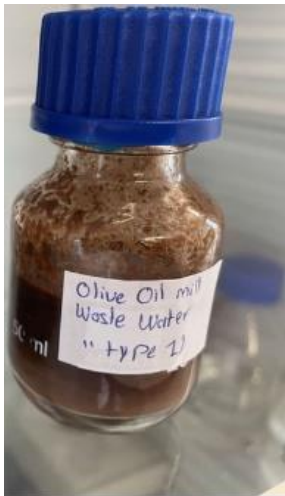
2484 Accesses | 6 Citations | [Metrics](#)

<https://link.springer.com/article/10.1007/s11101-020-09663-y>

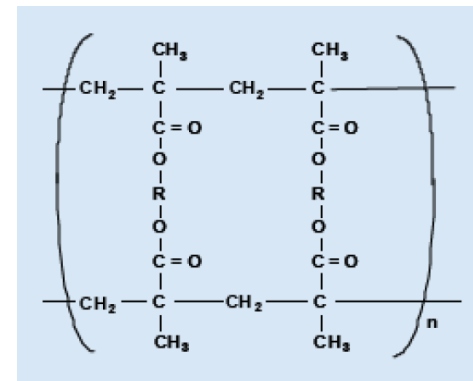
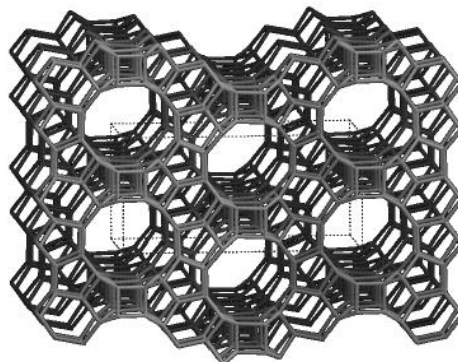
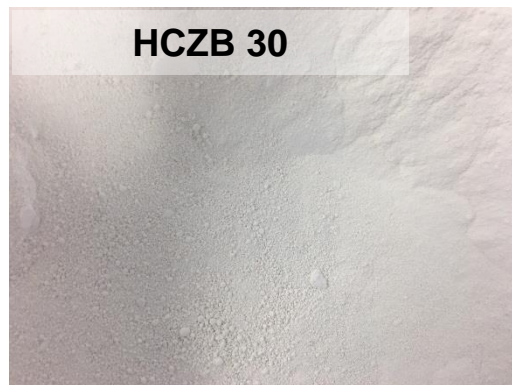
Olive oil mill wastewater (OMW) in cooperation with Prof. Khanfar, GJU



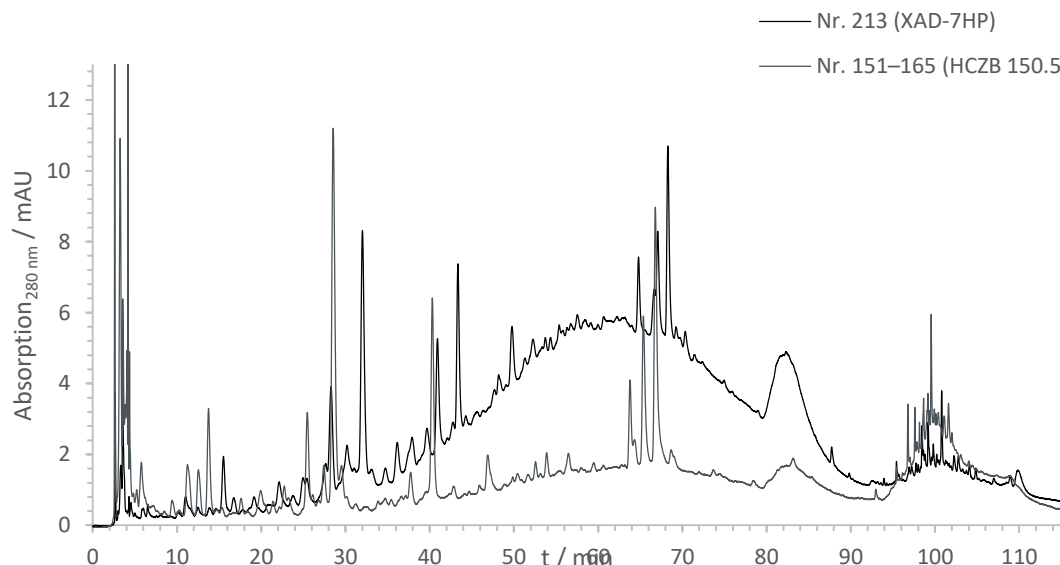
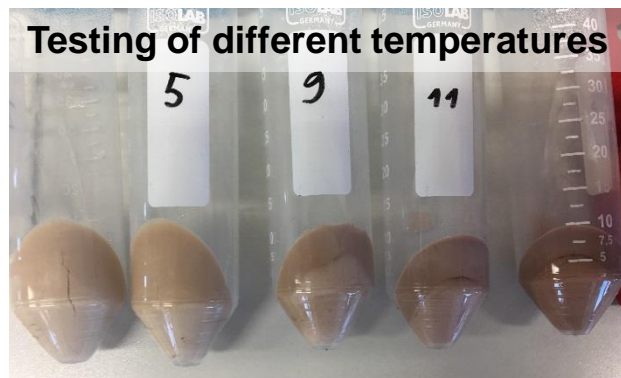
HPLC (LiChrosorb C18 H₂O/ACN/HOAc;
fluorescence excitation/emission nm)



Beta zeolites vs. XAD resins



Chemical structure of Amberlite XAD7HP Adsorbers
Technical Data Sheet, Rohm and Haas, 2006



Thiel A et al. New zeolite adsorbents for downstream processing of polyphenols from renewable resources. *Engineering in Life Sciences* 2013; 13(3):239-246.

- Established methodology for adsorption of polyphenols is working.

Next steps:

- Identification of compounds via LC-MS/MS
- Adaption of adsorption using local materials (zeolites)
- Scale-up

Polyphenols are a recyclable resource from waste in food industry.