Opuntia ficus indica and *Opuntia macrorhiza*: Promising Sources of Flavonols – Comparison between varieties from different origins

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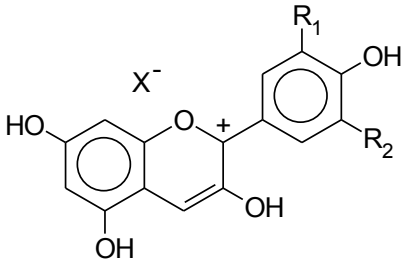
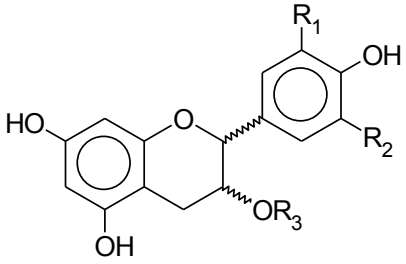
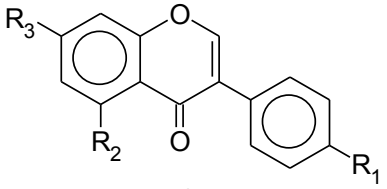
Flavonoids



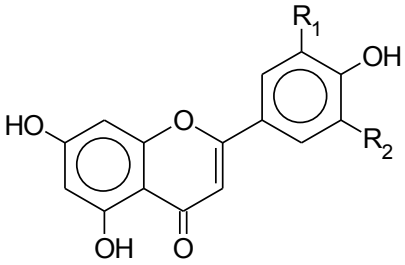
Anthocyanidine



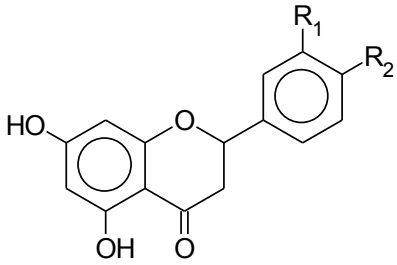
Flavan-3-ole (Catechine)



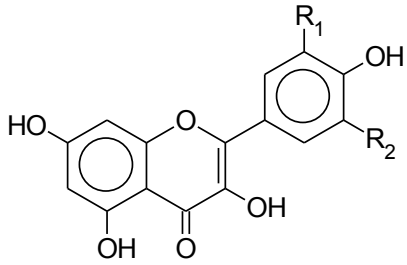
Isoflavone



Flavone



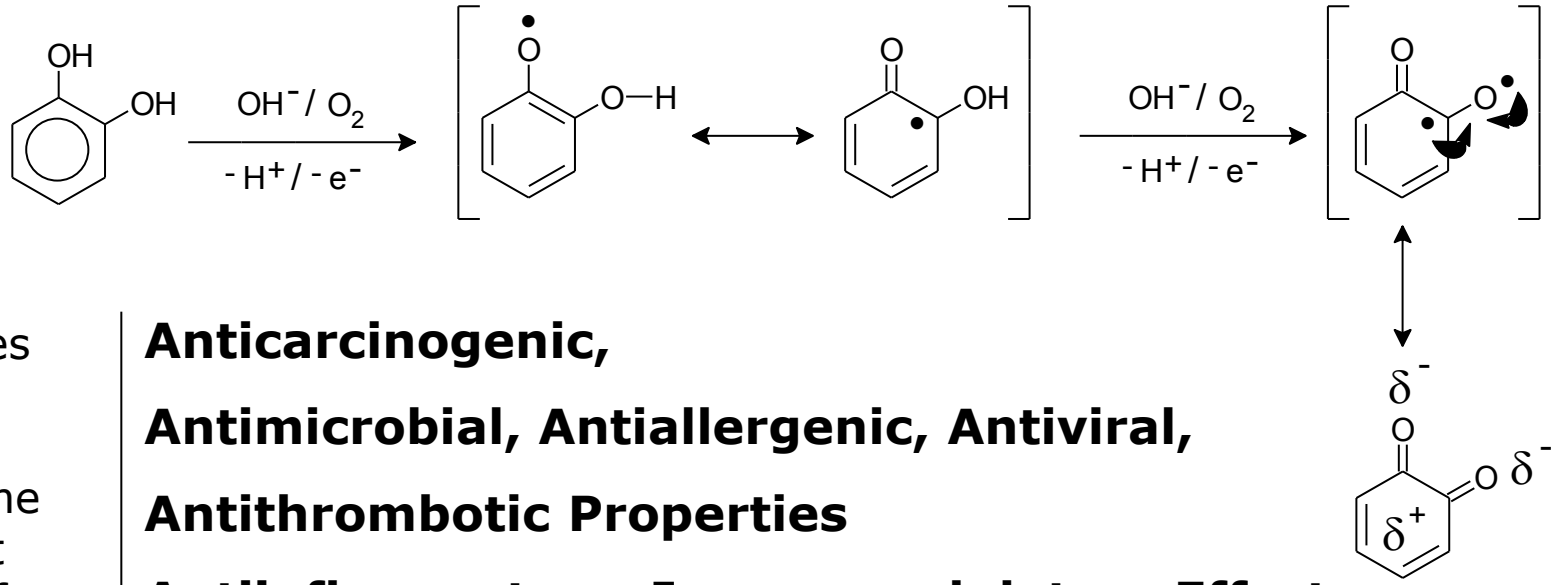
Flavanone



Flavonole

Physiological Properties

Far most important: **Antioxidant Activity**



Besides

or

to some extent basis for

Anticarcinogenic,

Antimicrobial, Antiallergenic, Antiviral,

Antithrombotic Properties

Antiinflammatory, Immunmodulatory Effects

Estrogenic activity

Enzyme-inhibition

Cactus pear plant

Cactus Pear plant → ***Opuntia* spp.** → **Cactaceae**

manifold species and varieties

Opuntia ficus indica
(Indian fig)

- **Cladode**
- **Fruit**

Problems

Many investigations interested only in analyzing pigments (betacyanins and betxanthins)

Only a few investigations in the literature deal with **flavonoids of cactus pear species and varieties**

- most of them used acidic hydrolysis for the determination of aglycons

- controversial results: Some say „quercetin", some say „kaempferol" and some say „ isorhamnetin"

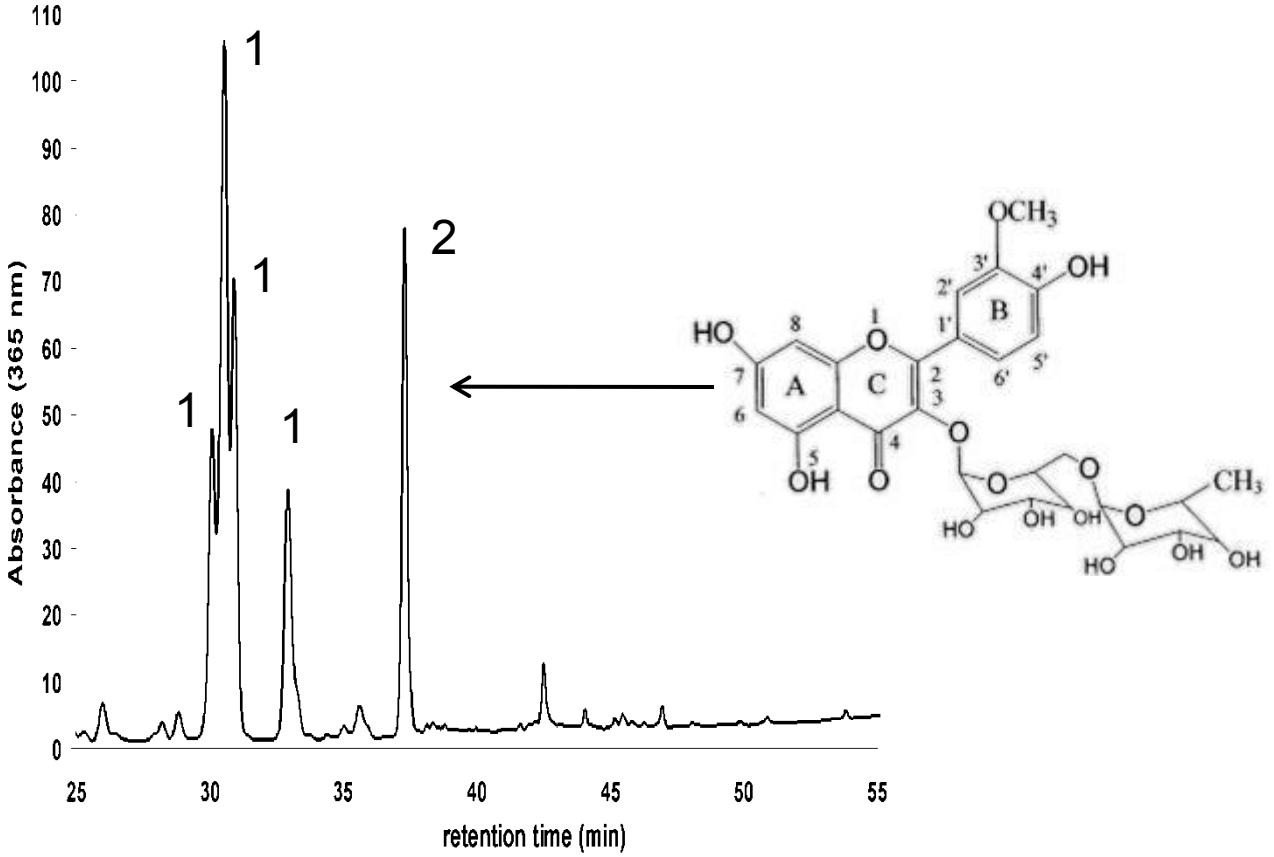
- few investigations on physiological properties (e.g. antioxidant activity)

Aims

Only a few investigations in the literature deal with flavonoids of cactus pear varieties and species

- Identification of flavonol compounds
- Comparison of varieties of different origin
- Developing a comparitive and soft hydrolysis method
- Comparison with *O. macrorhiza*
- Determination of the antioxidant activity

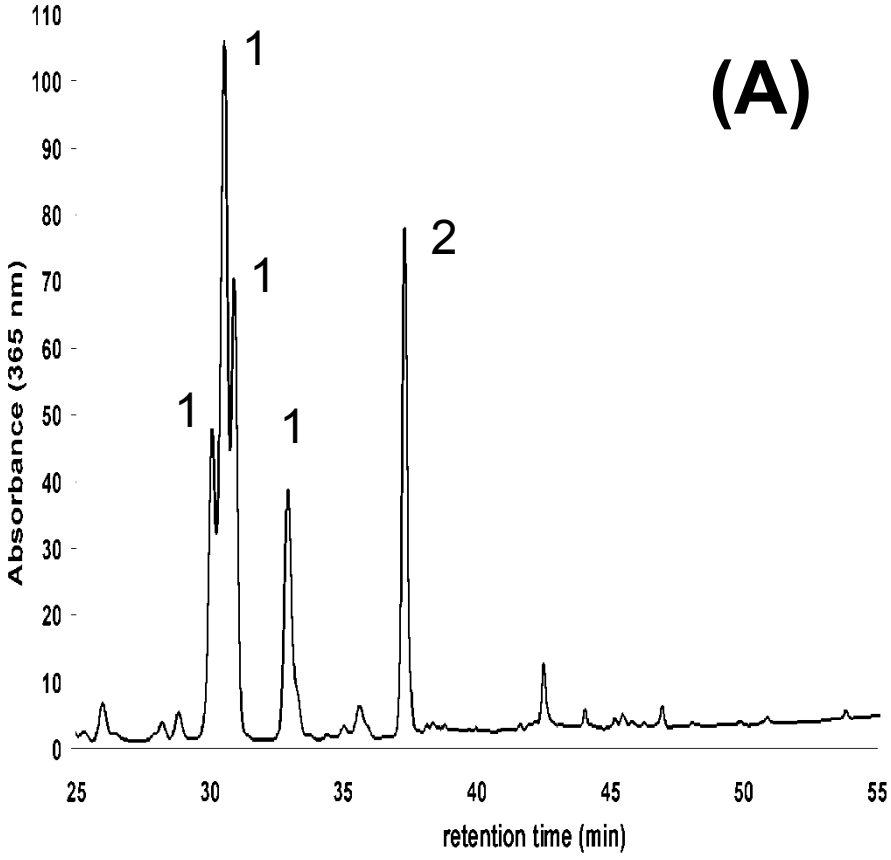
Flavonols in *O. ficus indica* peel

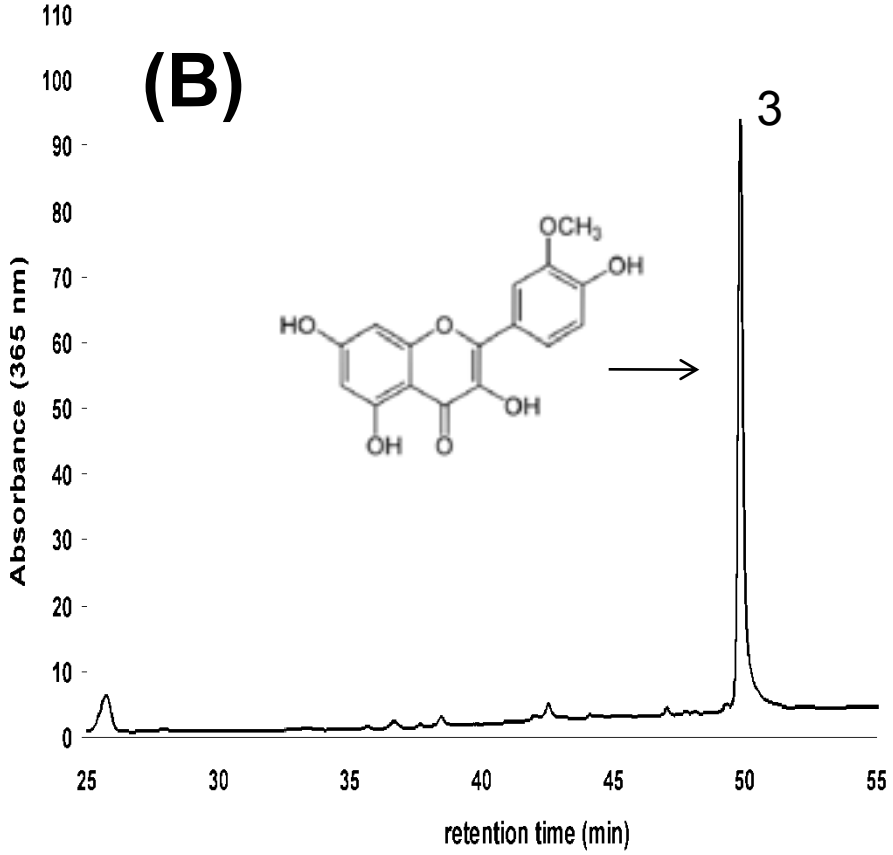


(1) isorhamnetin glycosides, (2) isorhamnetin-3-*O*-rutinoside

Flavonols in *O. ficus indica* peel

Before (A) and after (B) enzymatic hydrolysis





(1) isorhamnetin glycosides, (2) isorhamnetin-3-*O*-rutinoside, (3) isorhamnetin.

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Analytical Methods

Identification and quantification of flavonol aglycons in cactus pear (*Opuntia ficus indica*) fruit using a commercial pectinase and cellulase preparation

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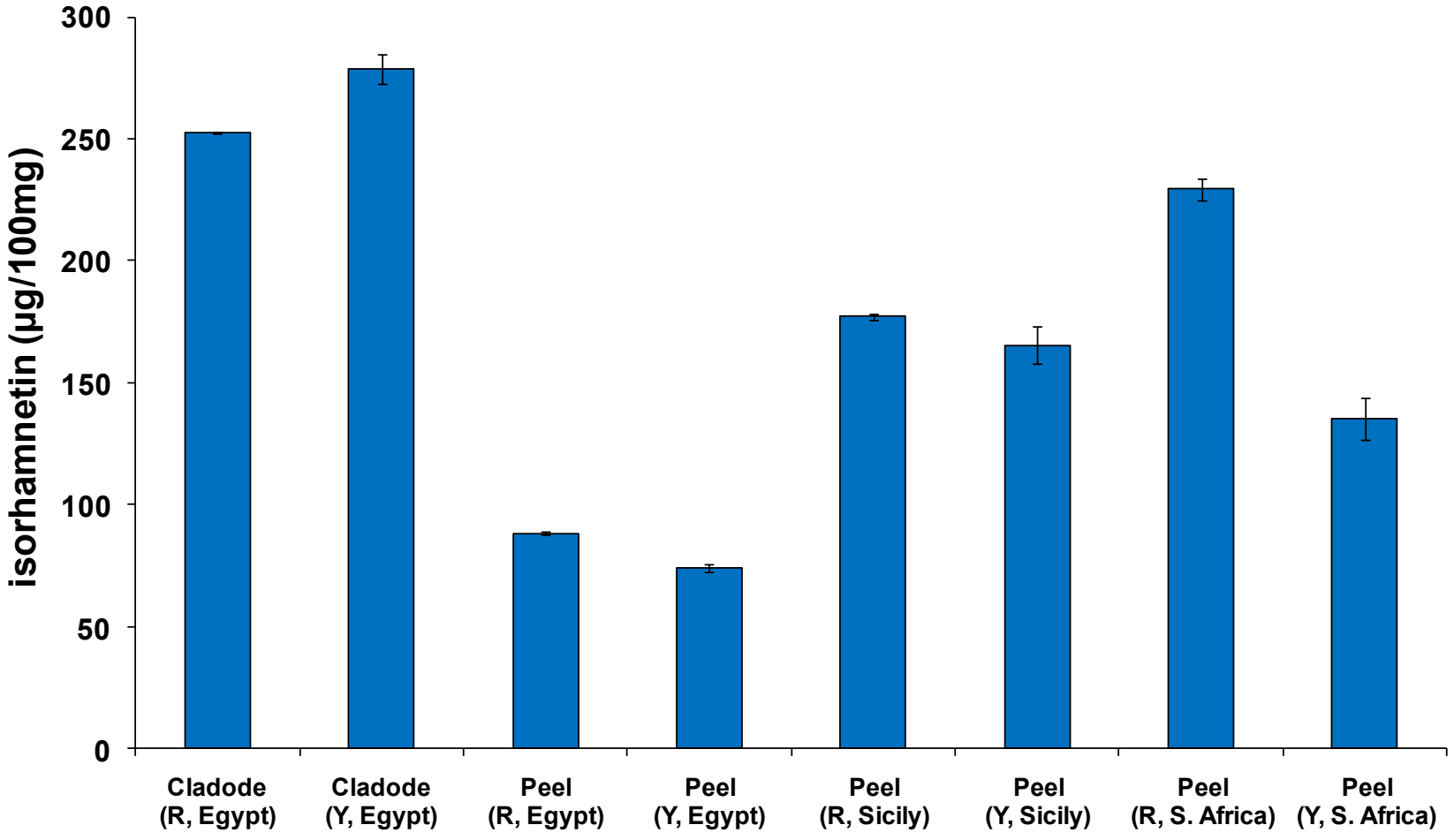
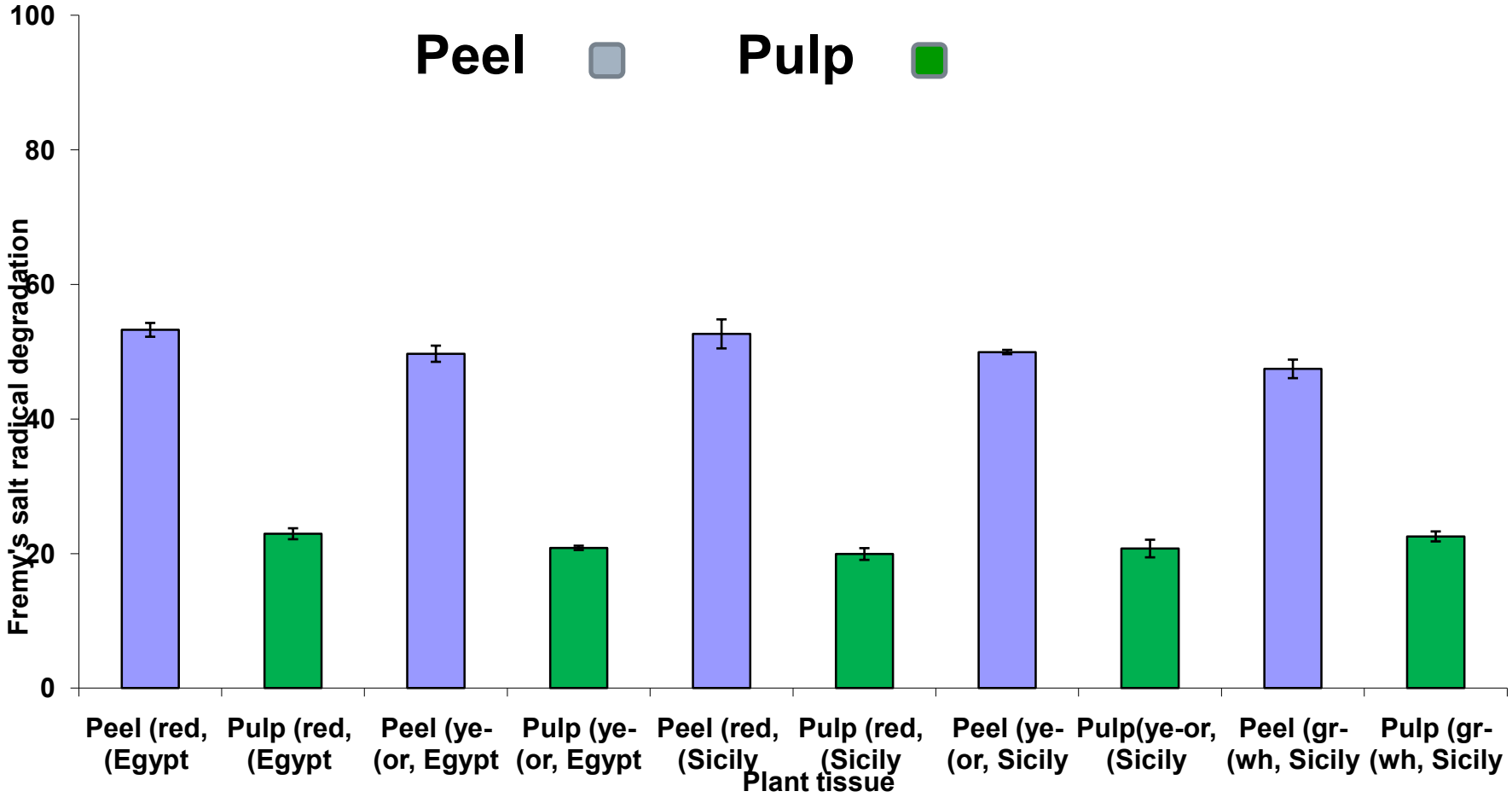
Flavonols in *O. ficus indica* from different origins



Antioxidant activity (ESR Spectroscopy) of both peels and pulps of *O. ficus indica* from different origins

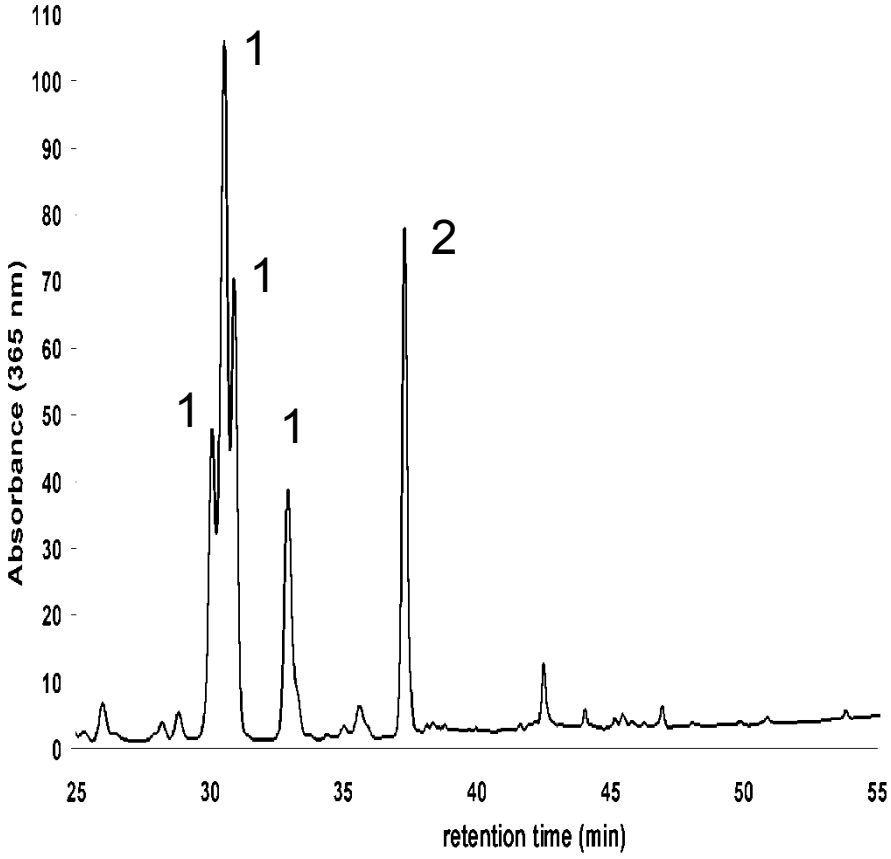


Degradation (%) of fremy's salt radical (1mM) after 15 min by diluted extracts (1:15)

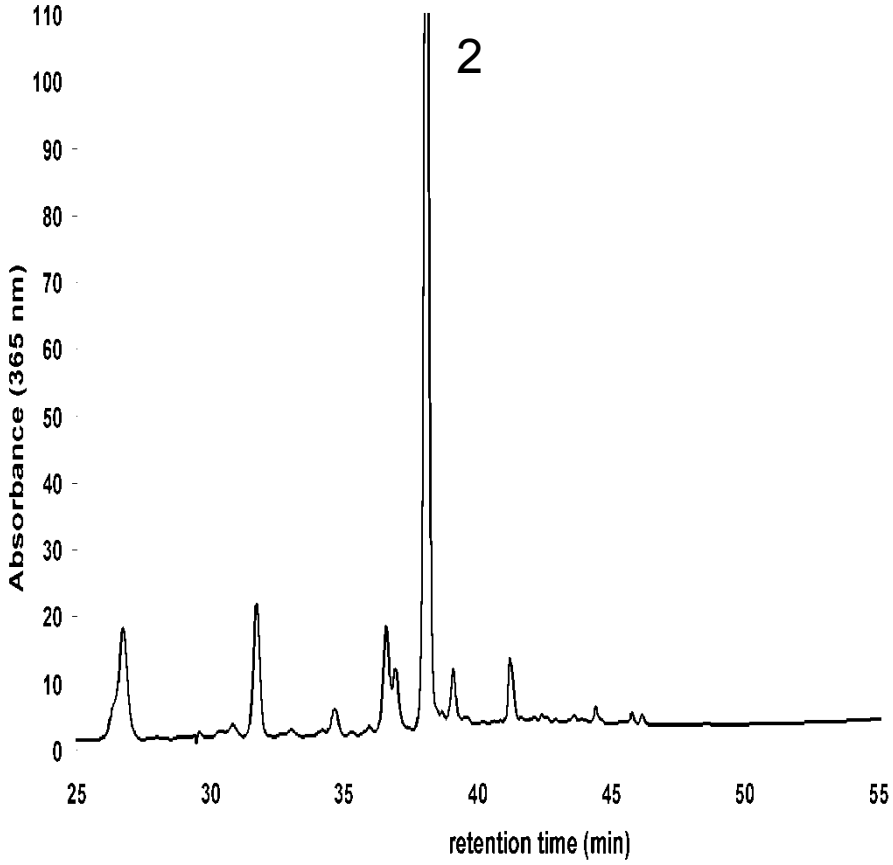
O. ficus indica vs. *O. macrorhiza*

Flavonols in *O. ficus indica* and *O. macrorhiza*

O. ficus indica

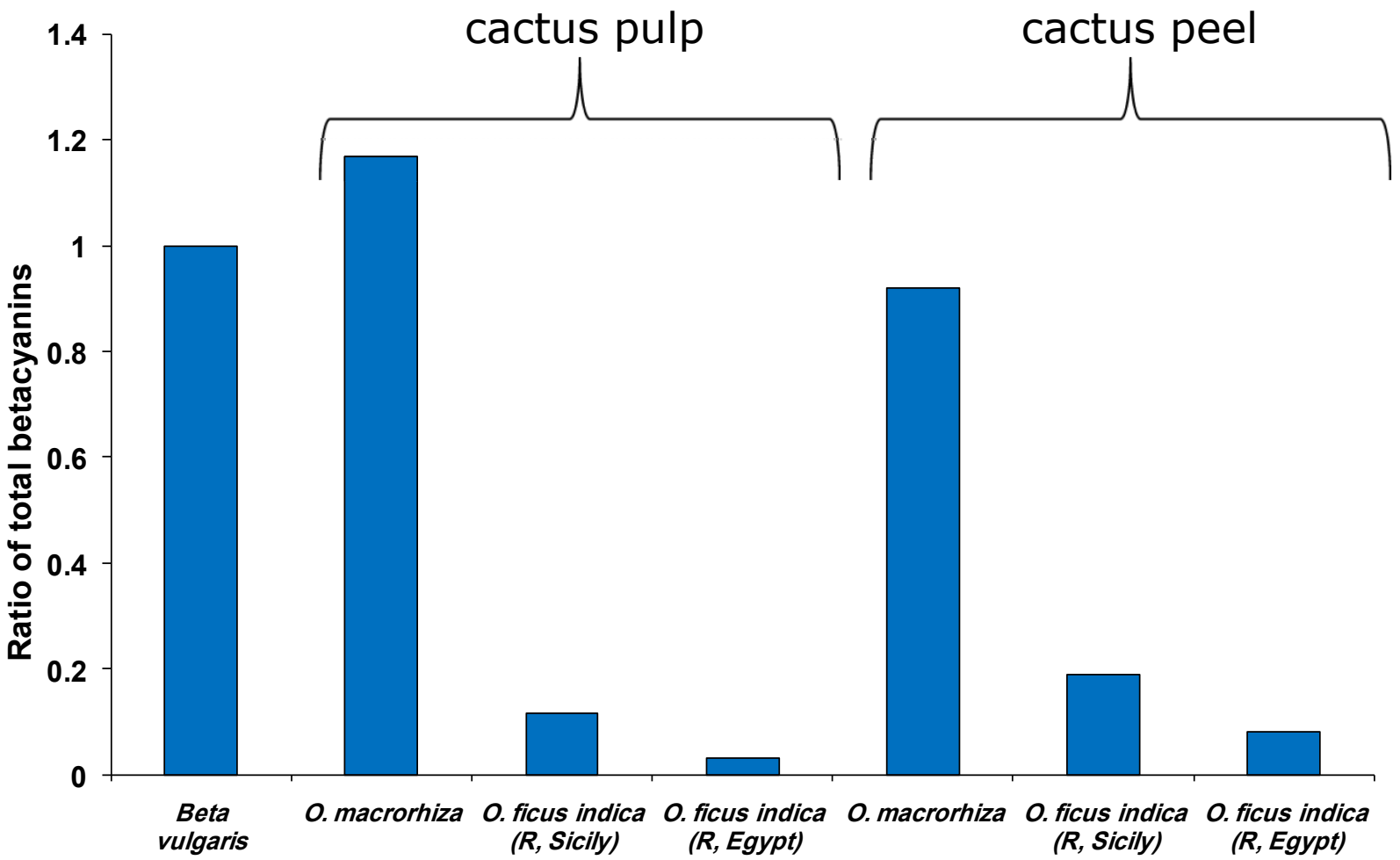


O. macrorhiza

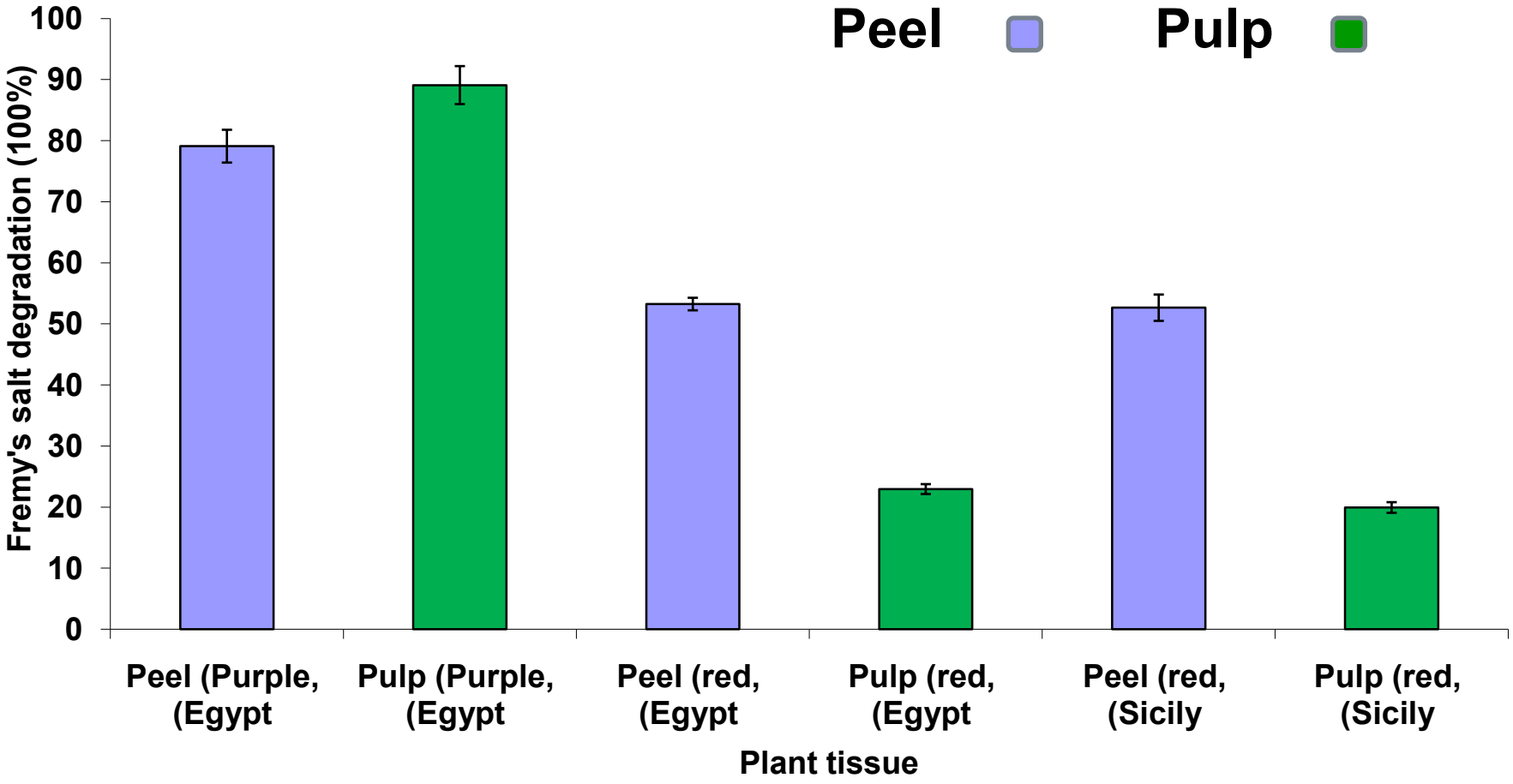


(1) isorhamnetin glycosides, (2) isorhamnetin-3-*O*-rutinoside

Betacyanins in *O. ficus indica* and *O. macrorhiza*



Antioxidant activity (ESR Spectroscopy) of *O. ficus indica* and *O. macrorhiza*



Degradation (%) of fremy's salt radical (1mM) after 15 min by diluted extracts (1:15)

Summary

- *Opuntia ssp.*: Promising sources of bioactive flavonols

- Enzymatic hydrolysis more soft than acidic hydrolysis for the determination of flavonol aglycons (no formation of degradation products)

- Dominant flavonol: Isorhamnetin

- *O. macrorhiza* comparatively highest in betcyanins and antioxidant activity

Thank you for your attention !!!