COMPARISON OF PHENOL CONTENT OF NATIVE TEXAS WILD INDIGO ROOT AND ASIAN INDIGOWOAD ROOT

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Outline

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  - Indigo plants
- Purpose
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Phenolic acids

- Phenolic acids are secondary metabolites of plants.

(Mattila and Kumpulaninen, 2002)

- Mainly in seeds, leaves, roots and stalk.

(Shahidi and Wanasundara, 1992)

Phenolic acids

- Antibacterial
- Lowering blood pressure
- Increased white blood cells
- Excite the central nervous system
- Eliminate free radicals DPPH
- Prevent cardiovascular disease, diabetes and cancer etc.

(Evans *et al*., 1995; Lodovici *et al*., 2001)

Indigo plants

- Indigo plants refer to the plants that can be indigo dye.
- Traditional Chinese herb (indigowoad root) :
  - *Isatis indigotica* Fort.
  - *Strobilanthes cusia* (Ness) O. ktze
- United States common weeds:
  - *Baptisia tinctoria*.

Indigowoad root

- *Isatis indigotica* Fort.
  - Cruciferae
  - Dry root
- *Strobilanthes cusia* (Ness) O. ktze
  - Acanthaceae
  - Dry stalk

www.fda.gov.tw/upload/133/Content/05-12_北板藍根.pdf

Indigowoad root

- Antibacterial and antiviral
- Detoxification
- Improve immune function
- Antitumor

Baptisia tinctoria.

- Fabaceae
- Dry root

http://www.flickr.com/photos/anitagould/25630246/

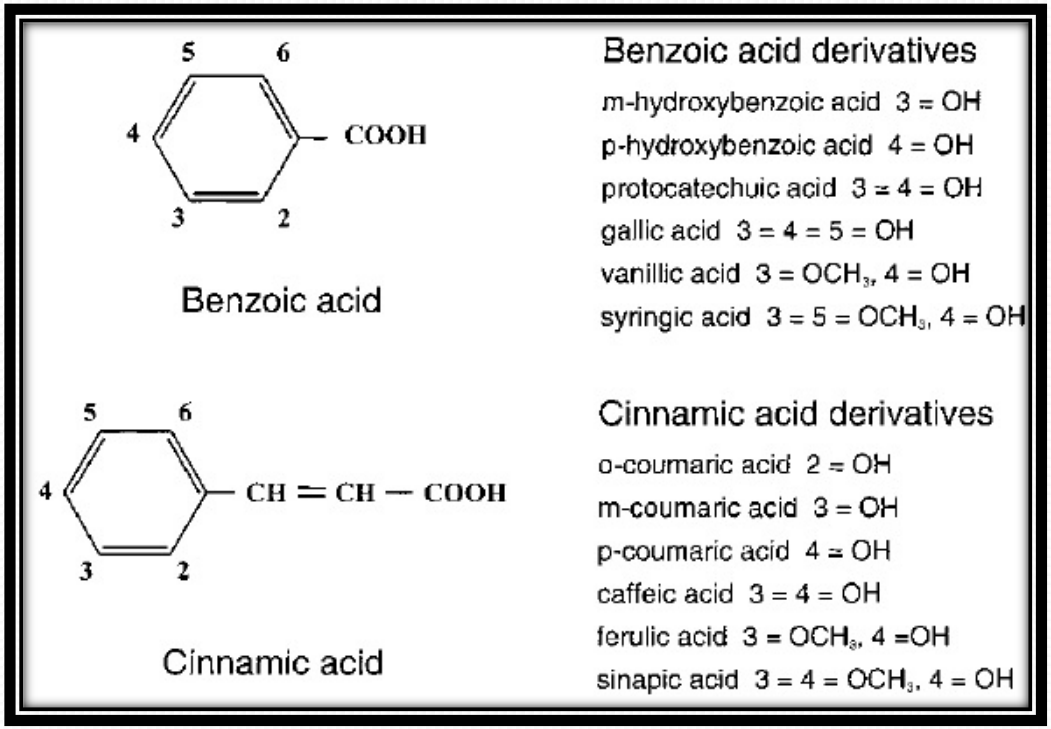
- Anti-inflammation
- Aid digestion
- Treat periodontal disease and sore throat
- Enhance immune activity

Purpose

- Comparison of total phenol and phenolic acids composition of native Texas wild indigo root and Asian indigowoad root.

Phenolic acids

- Hydroxybenzoics
  - Gallic acid
  - Vanillic acid
  - Syringic acid
- Hydroxycinnamics
  - *p*-Coumaric acid
  - Ferulic acid



(Mattila and Kumpulainen, 2002)

Materials and Methods

- Extraction
  - Soluble phenolic acid
    - 80 % Methonal extract
  - Bound phenolic acids - alkaline hydrolysis
    - 10M NaOH in N_2 gas
    - cold mixed solution (diethyl ether and ethyl acetate) extract
  - Bound phenolic acids - acid hydrolysis
    - HCl (37%)
    - cold mixed solution (diethyl ether and ethyl acetate) extract

Materials and Methods

- Analysis of total Phenol
  - Folin & Ciocalteu’s phenol reagent
- Analysis of phenolic acids
  - High-performance liquid chromatography

Results and discussion

Total phenol

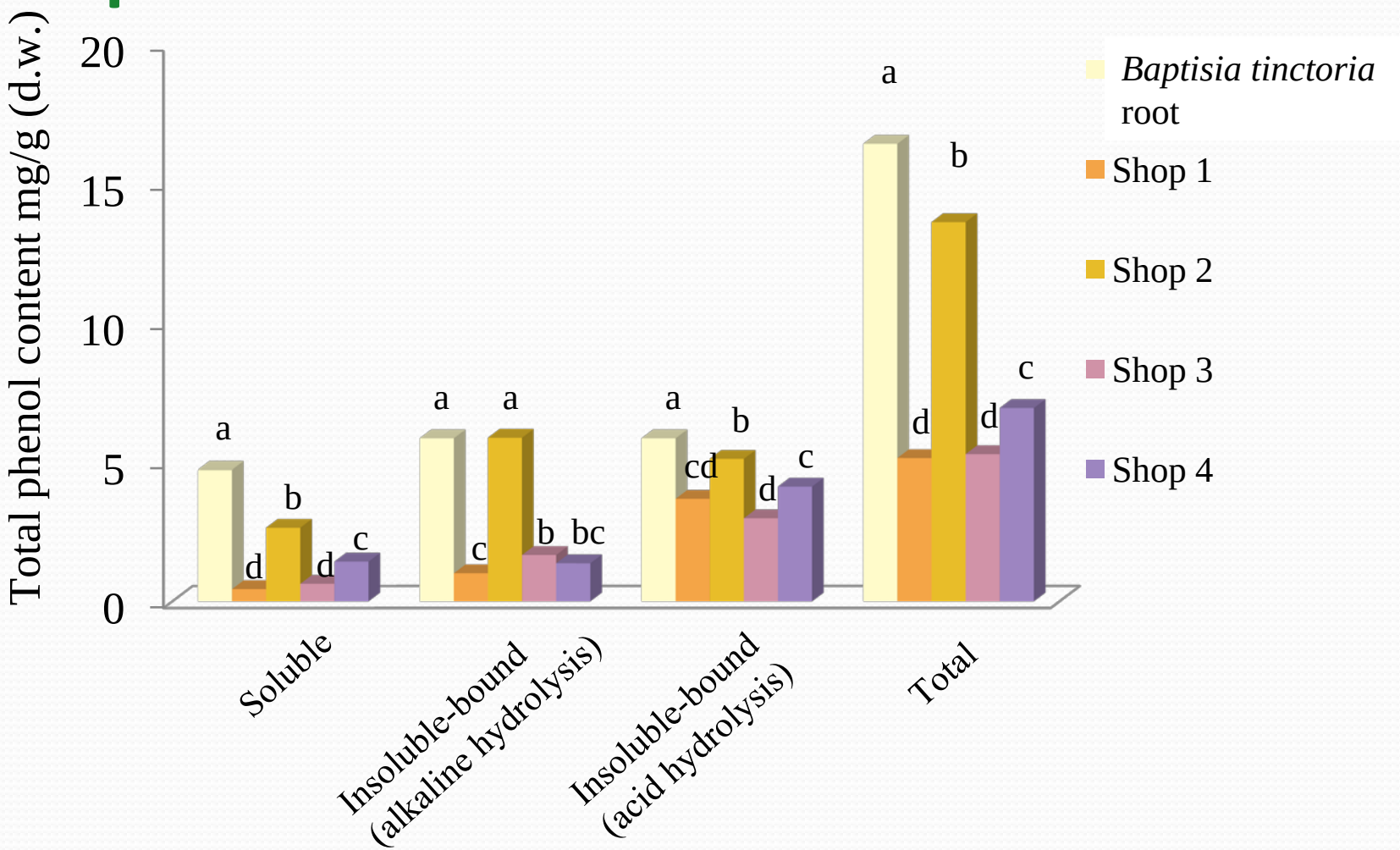


Fig 1. Comparison of total phenolic content in *Baptisia tinctoria* root and indigowoad root from different origin.

Phenolic acids - Methanol extract

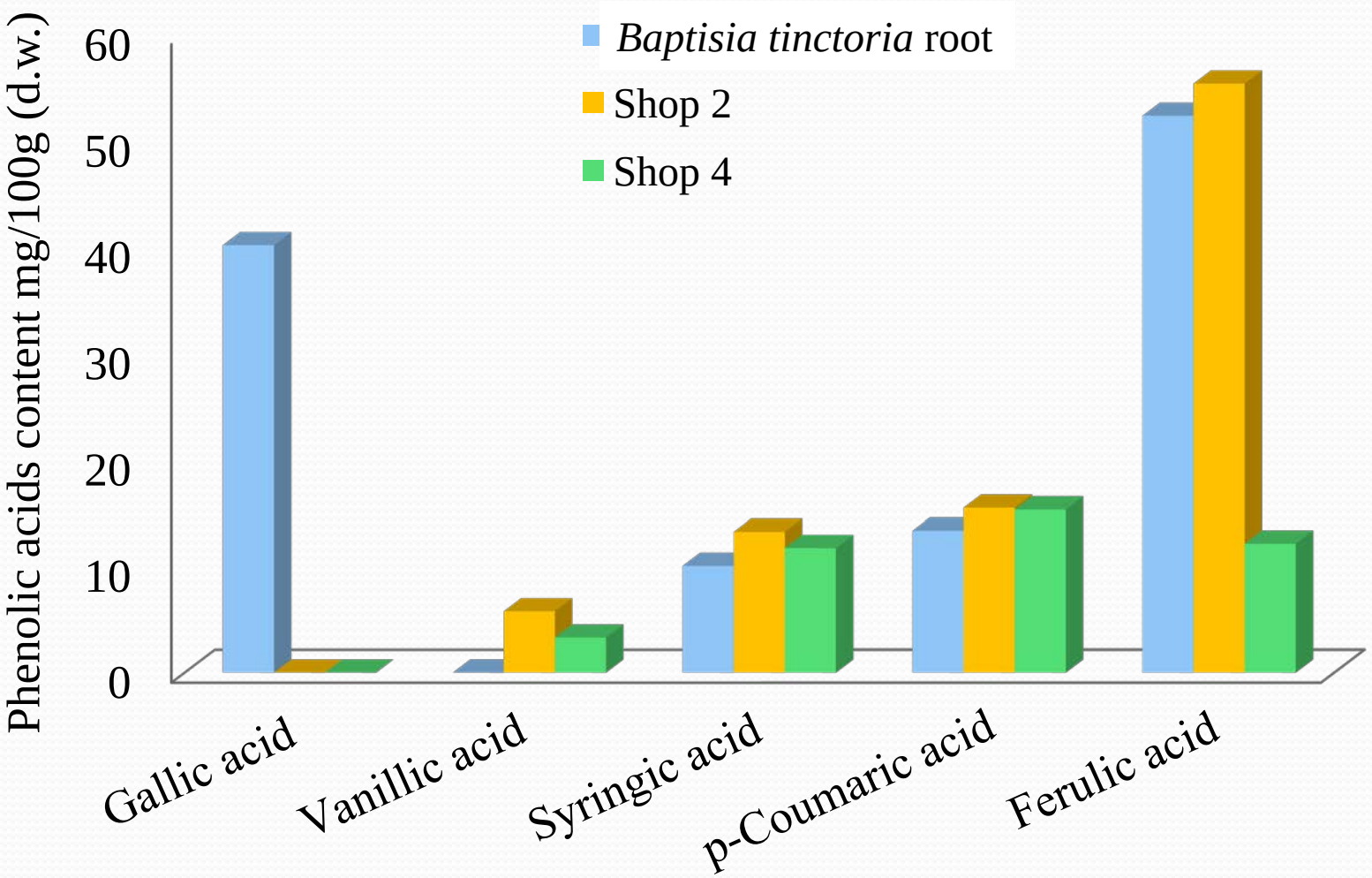


Fig 2. Comparison of phenolic acids content in *Baptisia tinctoria* root and indigowoad root methanol extract.

Phenolic acids - Alkaline hydrolysis

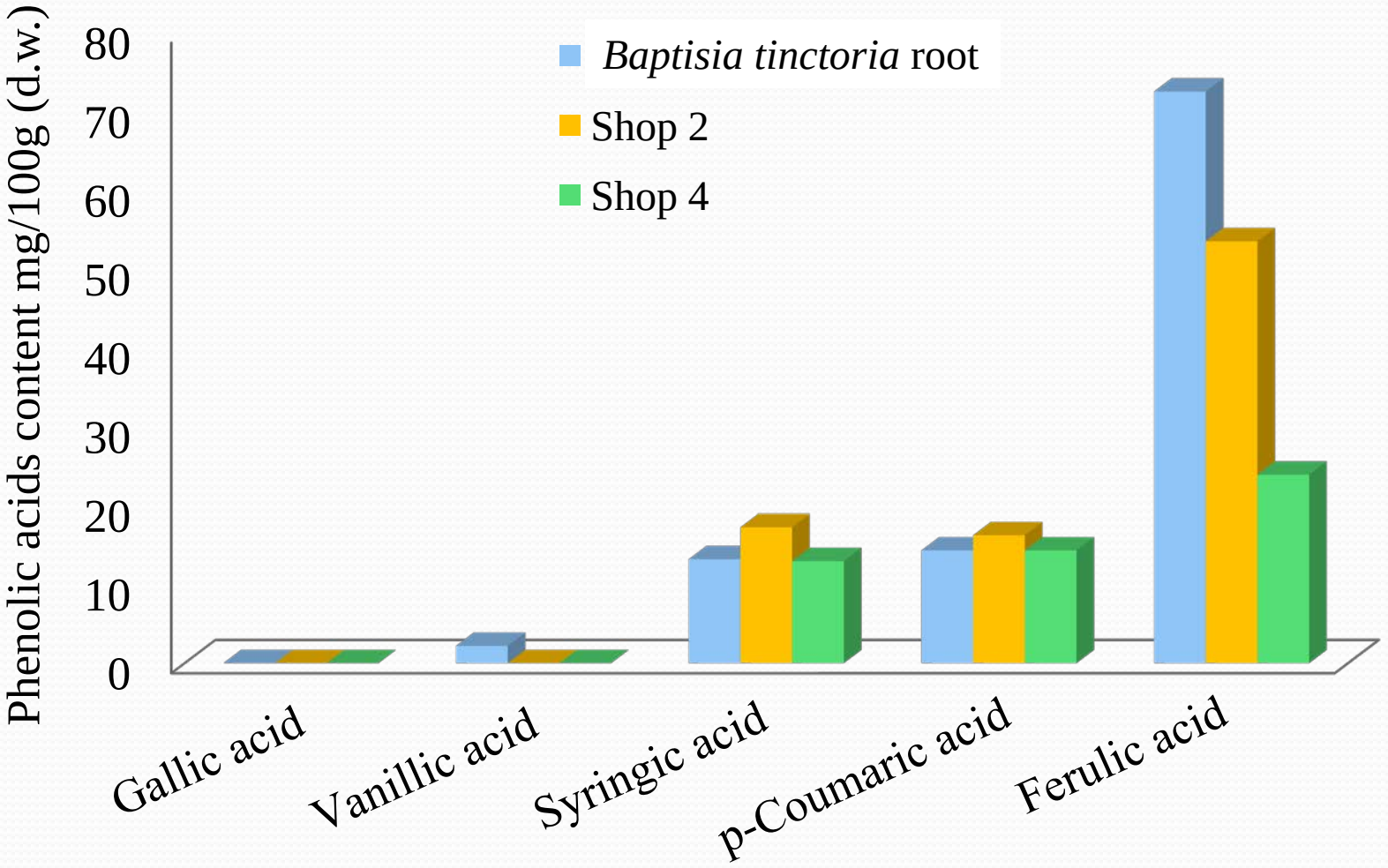


Fig 3. Comparison of phenolic acids content in *Baptisia tinctoria* root and indigowoad root after alkaline hydrolysis.

Phenolic acids - Acid hydrolysis

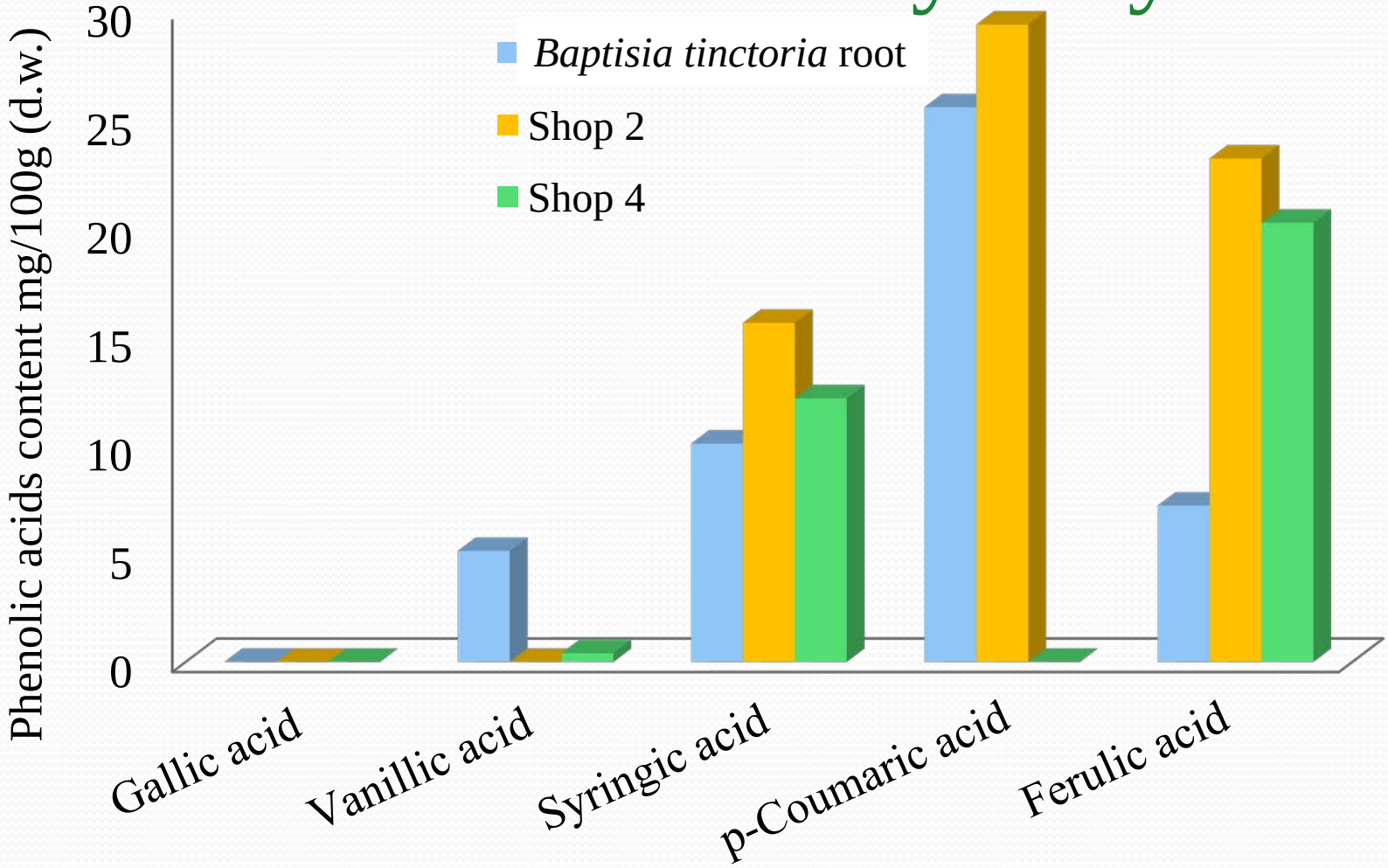


Fig 4. Comparison of phenolic acids content in *Baptisia tinctoria* root and indigowoad root after acid hydrolysis.

Conclusions

- Total phenol content of *baptisia tinctoria* root was significantly higher than commercial indigowoad root (Total 16.43 ± 0.51 mg GAE / g d.w.).

- Composition of phenolic acids in *baptisia tinctoria* root and commercial indigowoad root, whether the constituents or the level of each constituent were different.

Conclusions

- *Baptisia tinctoria* root extract contains gallic acid (40.19 ± 14.42 mg / 100 g d.w.) and commercial indigowoad root doesn’t contains gallic acid.

- Phenolic compounds analysis of indigowoad root samples bought from different stores, their phenolic compounds constituents were all the same, but the levels of each constituent were significantly different.

Thank you for your attention