

Cytotoxic prenylated phenols of false indigo-bush (*Amorpha fruticosa* L.)

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Introduction

False indigo-bush (*Amorpha fruticosa* L., Fabaceae) is an invasive shrub native to central and eastern North America that exhibits various biological activities (e.g. antioxidant, antidiabetic, insecticidal). This study aimed to examine the *in vitro* cytotoxic activity of prenylated phenolic constituents of *A. fruticosa*.

Methods

The phenolic constituents were isolated from the *A. fruticosa* fruit (Figure 1) using open column chromatography and thin layer chromatography (Figure 2). The structures of the isolated compounds were determined by comparing their UV, MS and NMR spectra with literature data. Cytotoxicity was examined in the MTT assay.



Figure 1. Fruits of *Amorpha fruticosa*.
(source: <http://www.plantsoftheworldonline.org>)

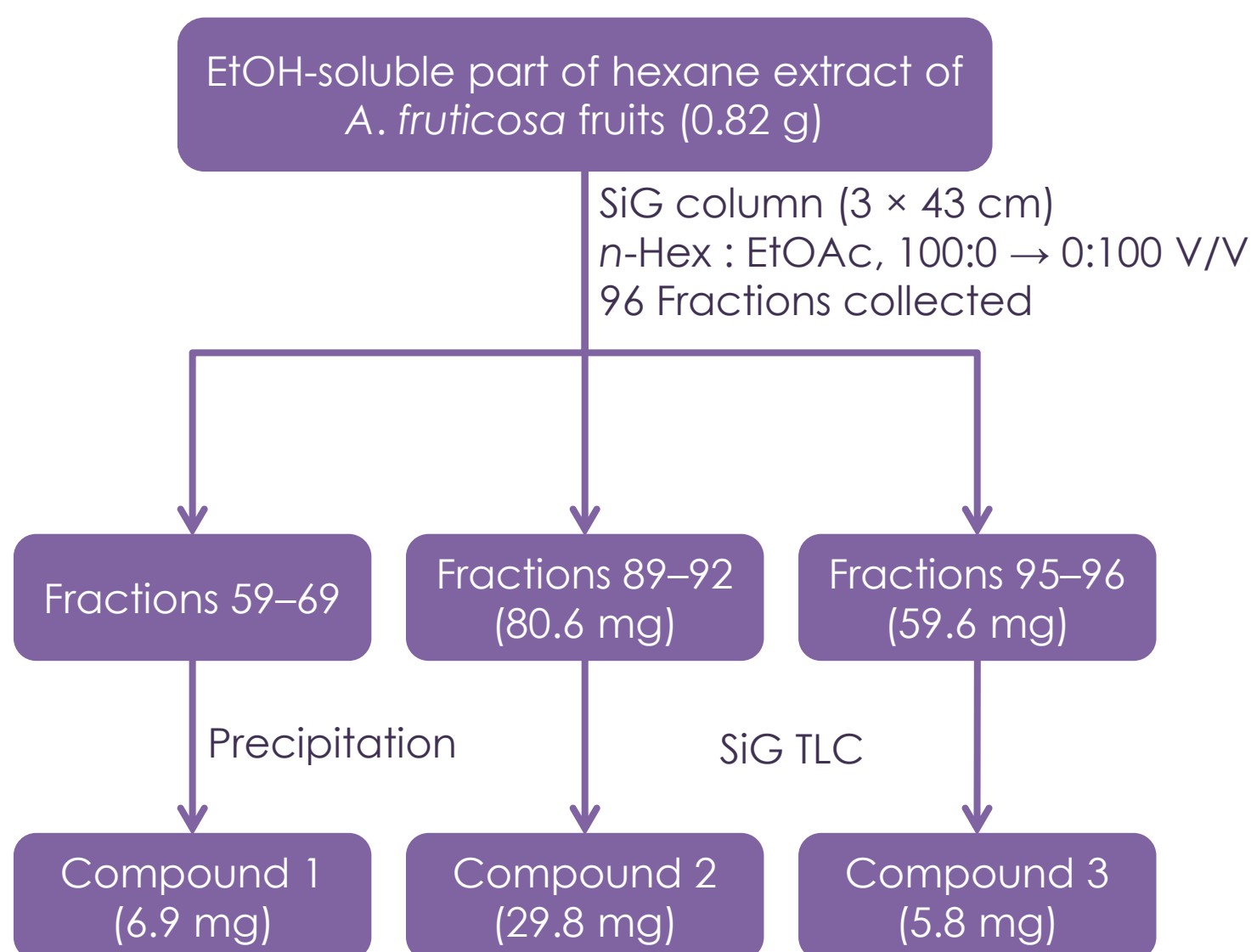


Figure 2. Isolation procedure.

Results

Compound 1 was identified as 5,7-dihydroxy-8-geranylflavanone, compound 2 as 2-carboxy-3,5-dihydroxy-4-geranylbenzyl, and compound 3 as 2-carboxy-3-hydroxy-4-prenyl-5-methoxybenzyl (Figure 3). All tested prenylated phenols showed cytotoxicity (IC₅₀ range 10.55–166.11 µg/mL), with the exception of compound 1 which did not reduce the LS174 cells survival (Figure 4). Compound 1 was selective and exhibited pronounced activity against the HeLa cell line (IC₅₀ = 10.55 µg/mL).

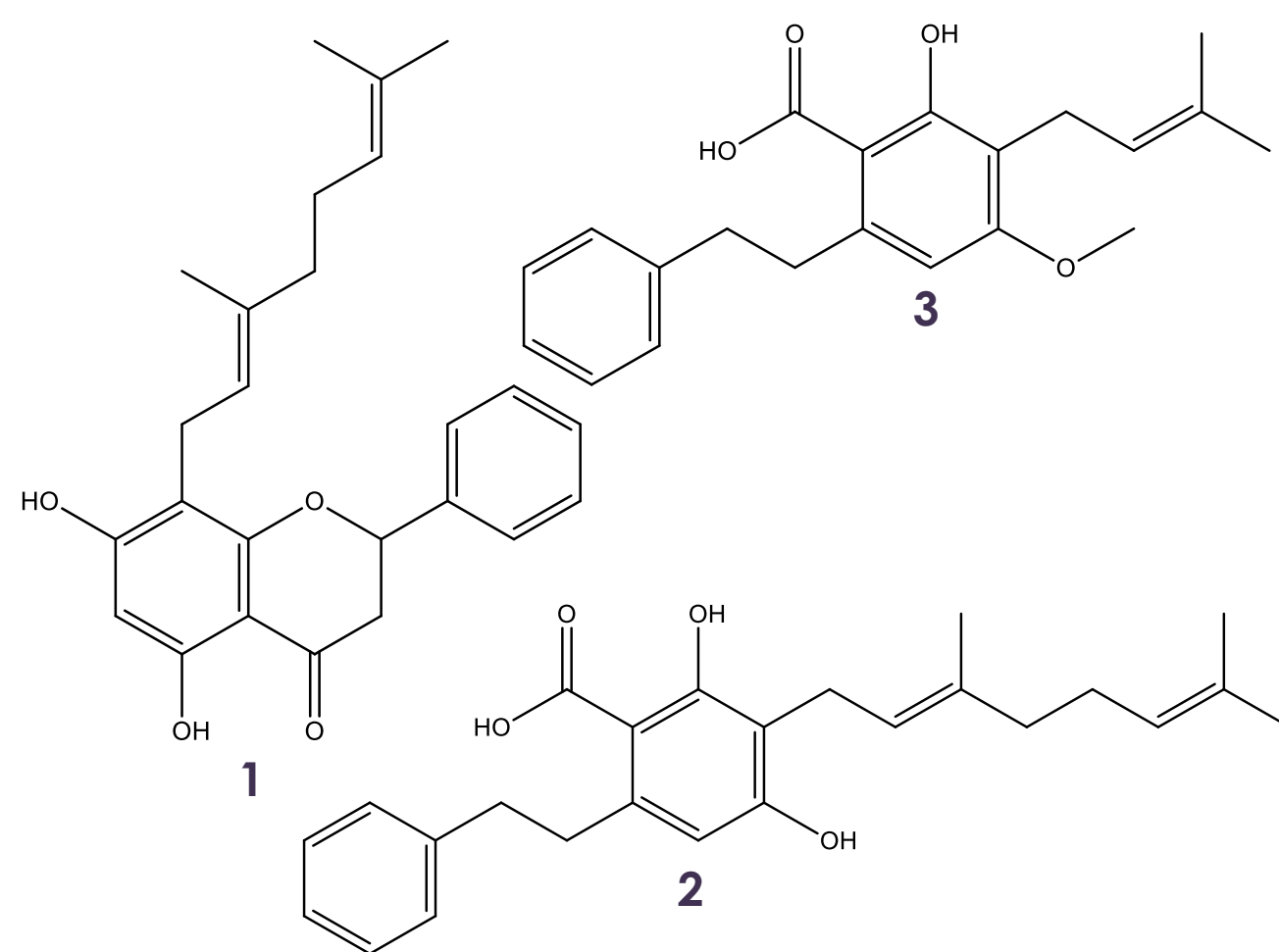


Figure 3. Structures of isolated compounds.

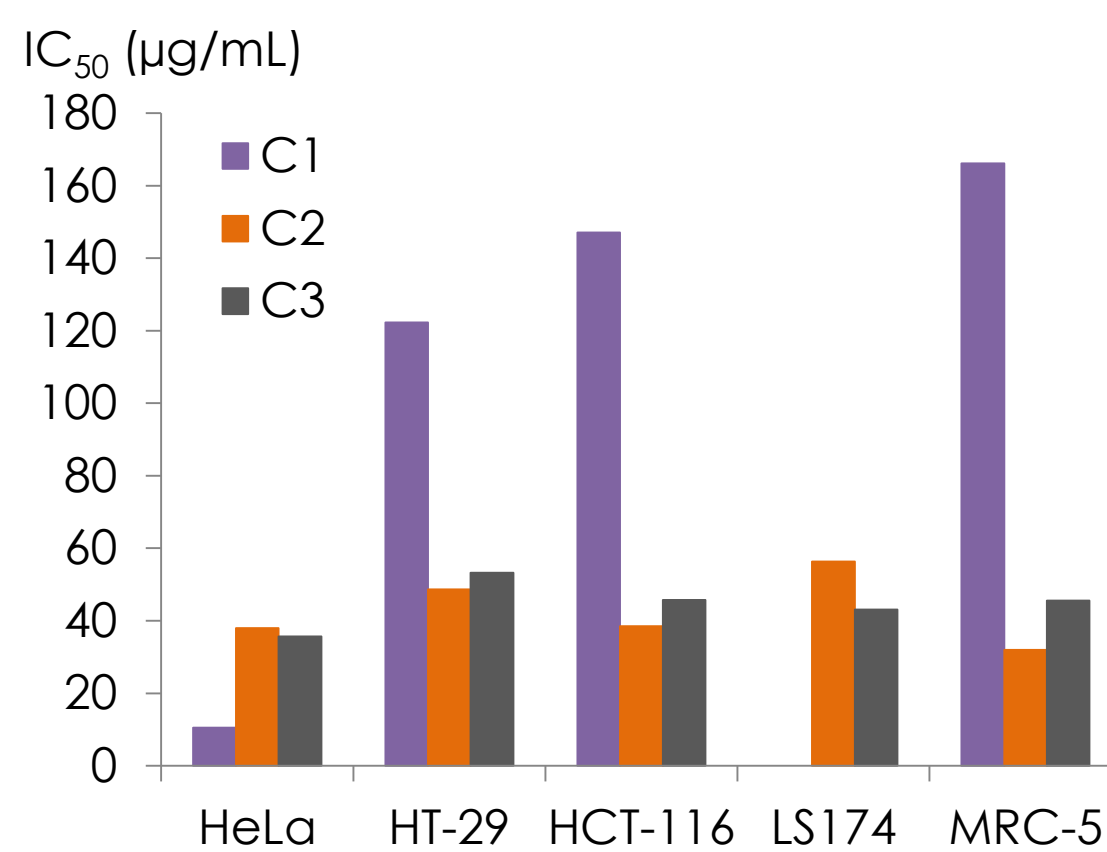


Figure 4. Cytotoxic activity of compounds isolated from *A. fruticosa* fruits.

Conclusion

5,7-Dihydroxy-8-geranylflavanone exhibited strong and selective activity against the HeLa cells in the MTT assay, therefore, its cytotoxic potential can be considered significant. Further studies are needed to fully assess the demonstrated effect.

Acknowledgement