Abstract

Ethnopharmacological relevance

Three important Anglo-Saxon medical texts from the 10th century contain herbal formulations for over 250 plant species, many of which have yet to be evaluated for their phytochemical and/or pharmacological properties. In this study, three native British plants were selected to determine antimicrobial activity relevant to treating bacterial infections and wounds.
Several preparations of *Agrimonia eupatoria* L., *Arctium minus* (Hill) Bernh. and *Potentilla reptans* L. were screened for antimicrobial activity against selected Gram-positive and Gram-negative bacteria of relevance in wounds using a 96 well plate microdilution method (200, 40 and 8 μg/mL). Minimum inhibitory concentration (MIC) values were determined for the most potent extracts from 2 to 0.004 mg/mL and HPLC chromatograms examined by multivariate analysis. Principle components analysis (PCA) was used to identify chemical differences between antimicrobial activity of the crude extracts.

**Results**

The HPLC–PCA score plots attributed HPLC peaks to the antimicrobial activity with all three plants inhibiting growth of Gram-positive *Staphylococcus aureus* by >50% in four or more extracts. The first two principal components (PC) represented 87% of the dataset variance. The *P. reptans* 75% ethanol root extract exhibited the greatest range of activity with MIC$_{50}$ at 31.25 μg/mL to a total MIC that was also the minimum bactericidal concentration (MBC) at 1 μg/mL. Additionally, the root of *P. reptans*, inhibited growth of Gram-negative bacteria with the 75% ethanol extract having a MIC$_{50}$ at 1 μg/mL against *Pseudomonas aeruginosa* and the decoction a MIC$_{50}$ at 3.9 μg/mL against *Escherichia coli*.

**Conclusions**

The results indicate a moderate antimicrobial activity against common wound pathogens for *P. reptans* suggesting it may well have been effective for treating wound and bacterial infections. Anglo-Saxon literary heritage may provide a credible basis for researching new antimicrobial formulations. Our approach encompassing advanced analytical technologies and chemometric models paves the way for systematic investigation of Anglo-Saxon medical literature for further therapeutic indications to uncover knowledge of native British plants, some of which are currently lost to modern Western herbal medicine.

**Graphical abstract**
Keywords
Anglo-Saxon medicine; European herbals; Antimicrobial; Wound healing; Traditional medicine

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