

Does the traditional medicinal use of *Leonurus cardiaca* L. as specified by the European Medicines Agency (EMA) monographs reflect documented historical use and current research? A content analysis.

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Introduction & Aim

- *Leonurus cardiaca* L., also known as motherwort, is a herb currently used by Western herbal practitioners in cardiovascular disorders, nervous tension and gynaecological complaints¹.
- The whole herb is used medicinally and is stated to have a "pungent odour and a very bitter taste"².
- It was traditionally used for its antispasmodic, diaphoretic, nervine, emmenagogue and tonic properties².
- The EMA herbal monographs were created for the purpose of providing clear information to healthcare professionals, providing a basis in marketing authorisation and supervision of medicine safety³.
- According to the EMA⁴, *L. cardiaca* has traditional use in nervous disorders and cardiac complaints; however gynaecological use isn't mentioned.
- Historical texts allow for past uses to be preserved and revisited, in case once popular uses are slowly forgotten.

Aim: To investigate the documented historical uses of *Leonurus cardiaca* in order to assess the traditional uses as outlined in the EMA monograph.



Figure 1. Illustrations and woodcut prints of *L. cardiaca*.^{6,7,8}

Methodology

- Content analysis was used for coding and analysing data; this allows for conclusions to be drawn from texts with regard to the contexts of their use⁵.
- Raw data was extracted from source texts into a framework.
- Data was then translated and coded for comparison and discussion.
- Data was extracted from:
 - The EMA monograph on *Leonurus cardiaca* L.
 - 30 source texts ranging from 50^{CE} to 1915^{CE}.

Timeline of Historical Sources

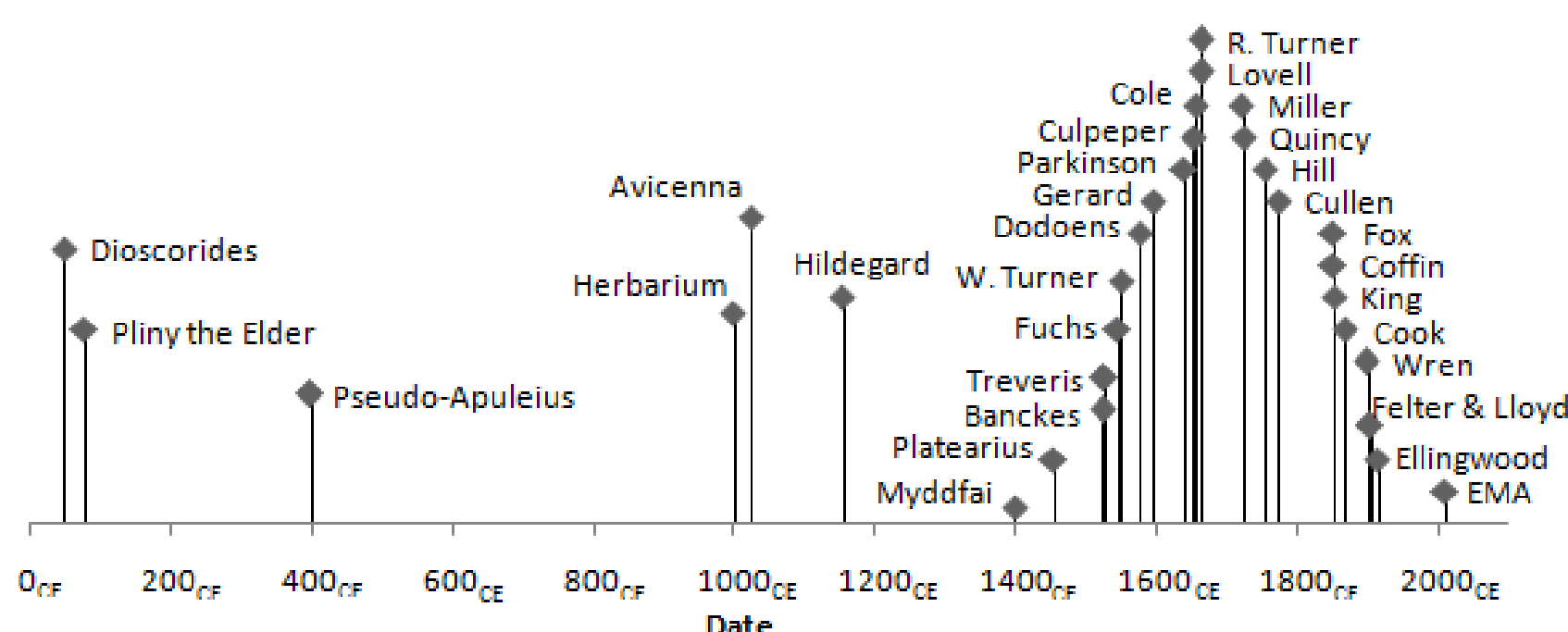


Figure 2. Timeline of historical sources.

Results & Discussion

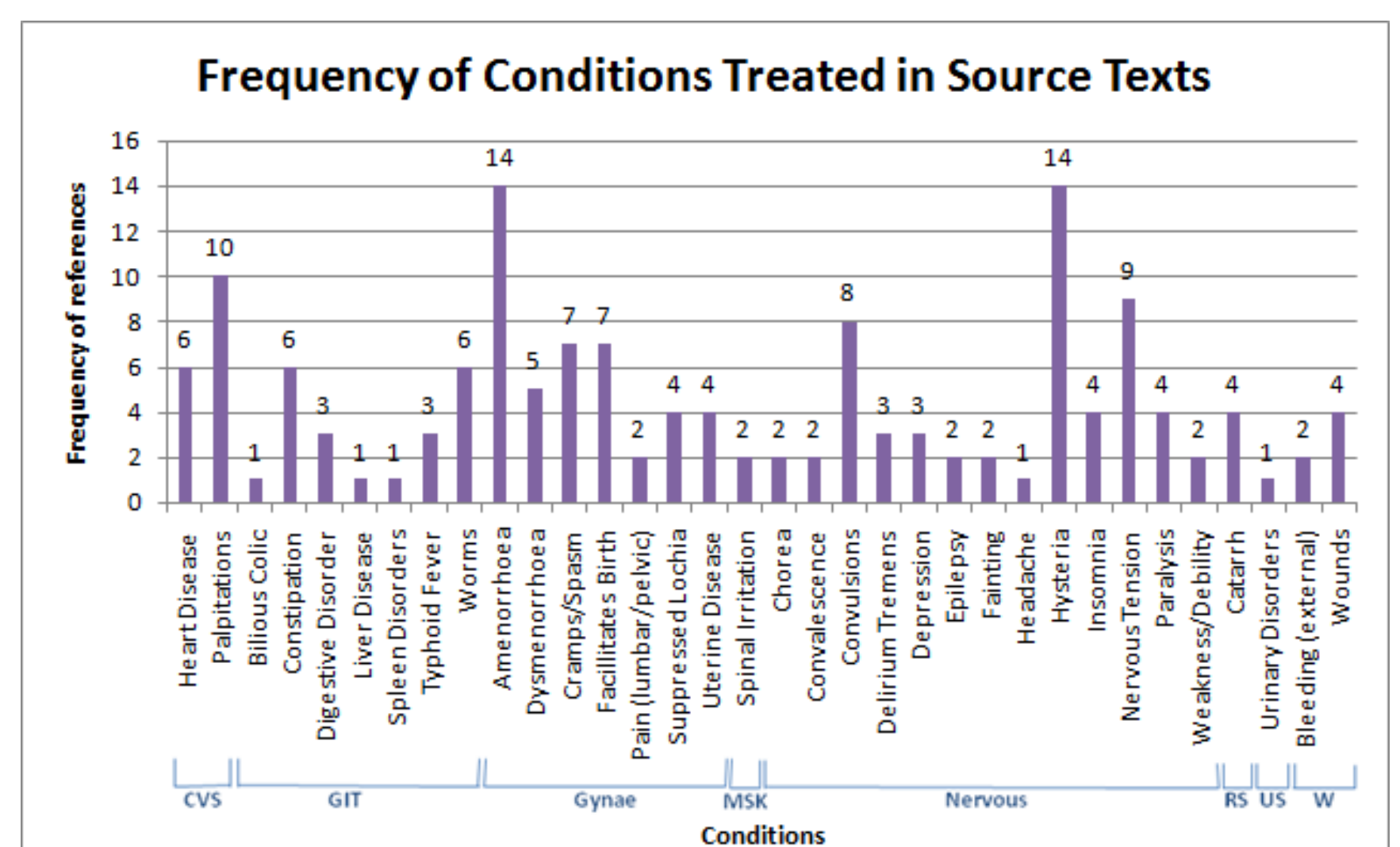
- The majority of texts were published during the early modern period (1500^{CE} - 1800^{CE}).
- 11 texts had no discernible entry for *L. cardiaca*.
- Several authors referenced previous herbals and authors.
- Two entries were near identical to previous herbals suggesting plagiarism.
- The EMA referenced very few historical sources (just 4 from before 1918).

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Results & Discussion (Cont'd)

- The EMA monograph was justified in its recommendation for the indications of nervous tension and cardiac complaints.
- However, as shown in Fig. 3 below, there were further uses for *Leonurus cardiaca* which were not included in the EMA assessment.
- The highest frequency of uses were for the nervous, gynaecological and gastrointestinal systems of the body. The most frequently appearing conditions were amenorrhoea, hysteria, palpitations and nervous tension.
- Gynaecological uses, along with a number of other uses, frequently featured in historical texts but were not present in the EMA monograph.
- Posology was difficult to ascertain as ranges varied widely. The EMA recommended a higher dose of liquid extract than historical texts suggested; however, historical sources recommended far higher doses of powder than the EMA monograph suggests.



CVS - cardiovascular, GIT - gastrointestinal, Gynae - gynaecological, MSK - musculoskeletal, RS - respiratory, US - urinary, W - wounds

Figure 3. Frequency of conditions treated in source texts with use of *L. cardiaca*.

- Historical sources did not contain contraindications or safety information; therefore safety of the herb was difficult to establish. However, its emmenagogue properties may explain the EMA's contraindication for use in pregnancy.
- Several factors had an impact on the results including translation and coding challenges, scarcity and plagiarism of texts, authentication of motherwort and difficulties associated with data mining.
- Much herbal knowledge may have been lost over time due to an inability or unwillingness to record it.
- Limited current research to back-up gynaecological use.

Conclusion & Recommendations

- The EMA indications appeared frequently throughout source texts; however motherwort appeared to have more uses than the EMA monograph suggests.
- Lack of recent research into motherwort's gynaecological uses may have contributed to the omission of these uses on the EMA monograph.
- Gynaecological use shows promise and may warrant further investigation with additional gynaecological studies recommended.
- Additional research required in order to decipher texts using a different system of medical belief.
- A greater number of sources and further analysis of posology advised.

References

- 1 Bone, K. (2007) *The Ultimate Herbal Compendium*. Queensland: Phytotherapy Press.
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- 3 EMA (2018) *European Union monographs and list entries*. www.ema.europa.eu
- 4 EMA (2010) *European Union herbal monograph on Leonurus cardiaca L., herba*. www.ema.europa.eu
- 5 Krippendorf, K. (2004) *Content Analysis: An Introduction to its Methodology*. London: Sage.
- 6 Thomé, O.W. (1885) *Flora von Deutschland Österreich und der Schweiz, Tafeln, vol. 4: t. 524*.
- 7 Parkinson, J. (1640) *Theatrum Botanicum: The Theatre of Plants*. London: Tho. Cotes.
- 8 Gerard, J. (1597) *The Herbal or Generall Historie of Plantes*. London: John Norton.