

# EXTRACTABILITY OF POLYPHENOLS FROM LOCAL HERBS USING TRADITIONAL EXTEMPORANEOUS PREPARATIONS

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## INTRODUCTION

With the increasing consumption of herbal teas, a number of public health issues e.g. efficacy, safety and quality assurance have attracted concern.<sup>1</sup> Comprehensive phytochemical and pharmacological analysis is very crucial as a key step in determining the toxic effects of plant constituents in herbal infusions.<sup>2</sup> By studying the influence of various factors, such as time and temperature of extraction, on antioxidant activity and solid to liquid polyphenolic extraction can lead to more information on the efficient preparation of herbal teas.

## AIMS

- To investigate the physicochemical properties of eight different locally available herbal tea infusions.
- To determine the polyphenolic content and antioxidant activity in relation to steep time and temperature.
- To investigate the heavy metal content in the herb material and herbal infusion using Microwave Plasma-Atomic Emission Spectrometry (MP-AES).

## METHOD

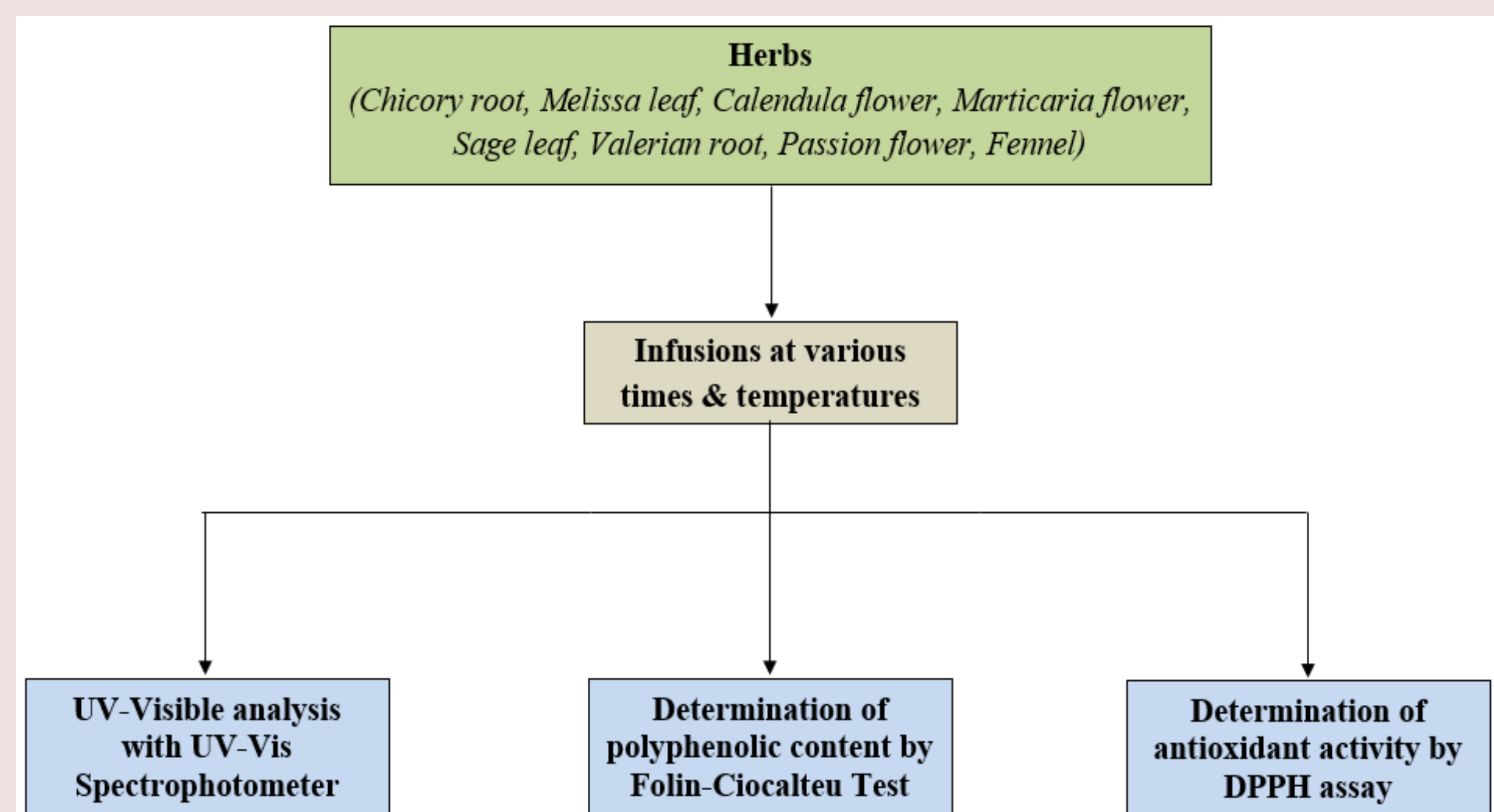


Figure 1: Flow diagram illustrating the preparation of the samples and spectrophotometric analysis.

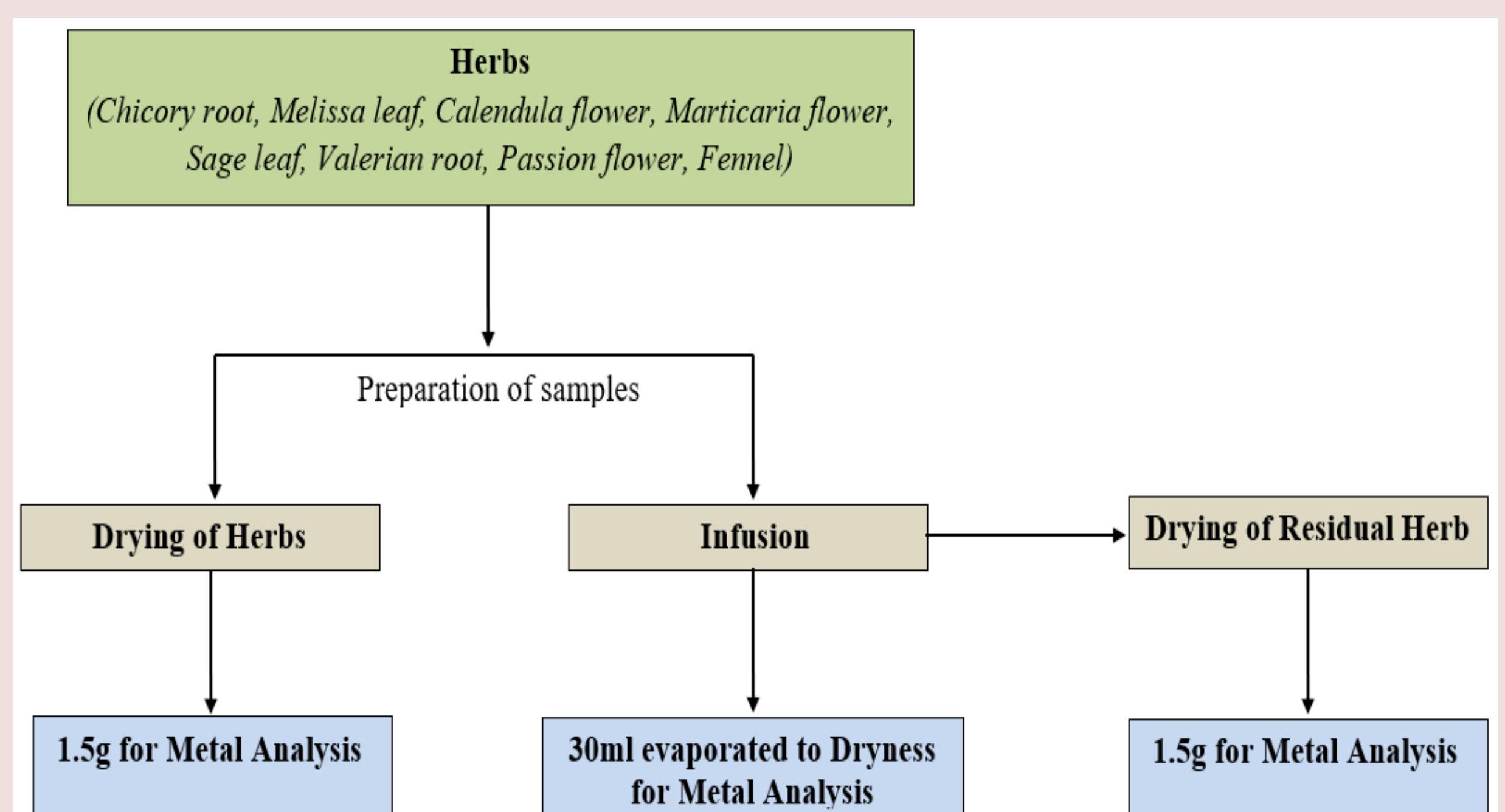


Figure 2: Flow diagram illustrating the preparation of the samples prior to heavy metal analysis.

## RESULTS

A highly significant correlation was observed between colour intensity and anthocyanin content ( $r=0.958$ ) and between anthocyanin content and flavonoid ratio ( $r=0.951$ ).

An inverse correlation was observed between the content of polyphenols (with time & temperature) and LC50 in Melissa leaf tea ( $r=-0.964$ ), Marticaria flower ( $r=-0.856$ ) and Valerian root ( $r=-0.891$ ). A greater antioxidant activity was present with a higher polyphenolic content in these herbal infusions.

As, Cu and Pb were the most abundant metals in both the herb material and infusion. Ag, Cd, Cr and Hg were present at lower quantities. Sn showed the highest extractability whilst the lowest extractability was exhibited by Ag, Cd and Hg.

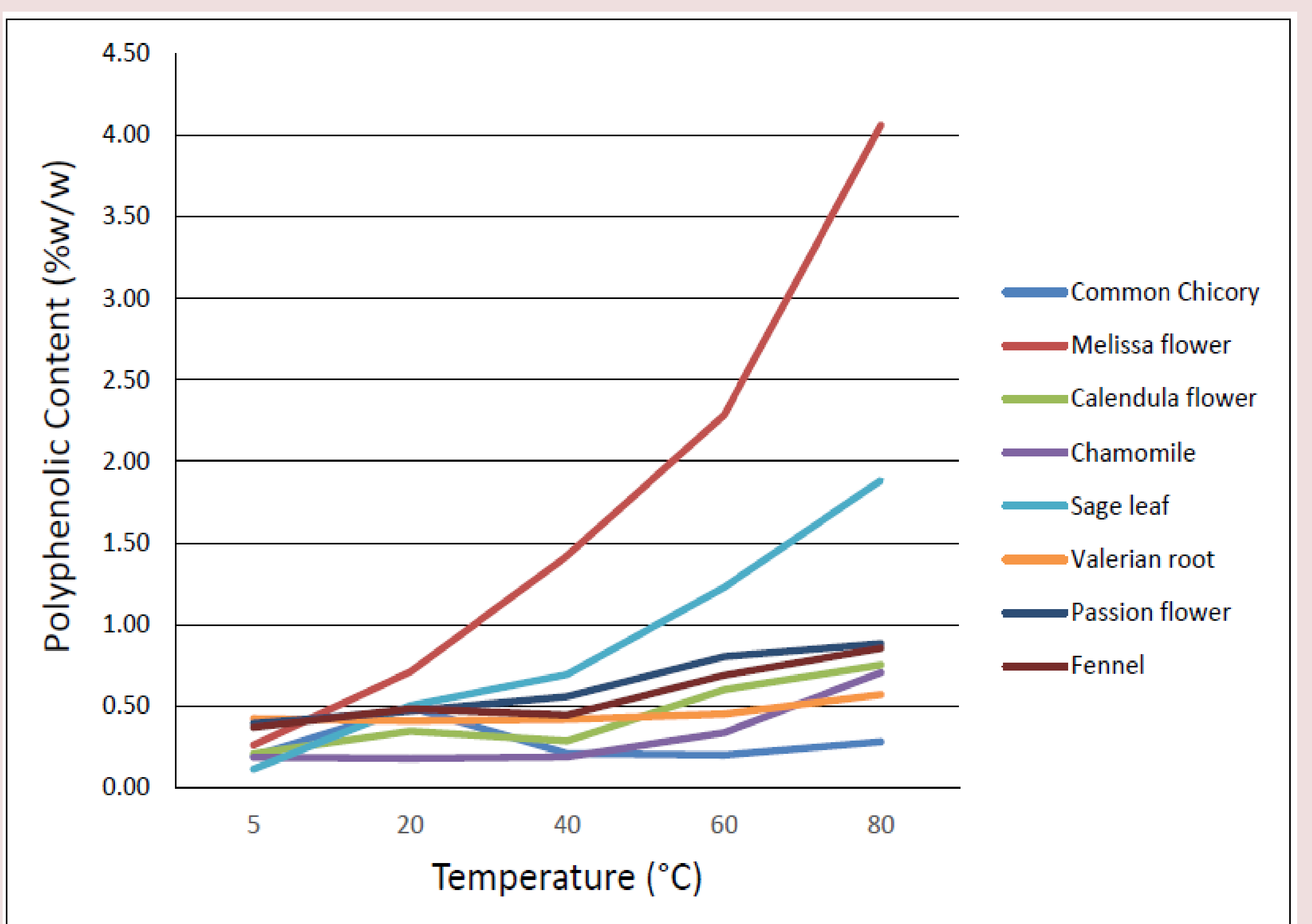


Figure 3: Cumulative polyphenolic content with increasing temperature in all herbal tea infusions.

## CONCLUSION

The presence of toxic metals, minerals and other constituents in herbal substances does not always imply that these will be present in the final infusion to the consumer. There is no common infusion formula or instruction for the time and temperature for the different herbal substances. Each herbal substance should be studied and evaluated individually.

Obtained results may contribute to investigate new ways of understanding the connection between natural products and disease prevention. Until more specific, clinically supported data is generated, herbal tea consumers will still be influenced by empirical evidence, traditional medicine practices and prior experiences when making their choices.

## REFERENCES

1. Zhao J., Deng J.W., Chen Y.W. & Li S.P. Advanced phytochemical analysis of herbal tea in China. *Journal of Chromatography A*. 2013; 1313:2–23.
2. Noller B.N., Kumar V., Lajis H. & Ali L. Protocols on safety, efficacy, standardization, and documentation of herbal medicine. *Pure Appl.Chem*. 2008; 80(10):2195–2230.