

Chemometric Multivariate Analysis for Species Classification in the Genus *Baccharis* (Asteraceae)

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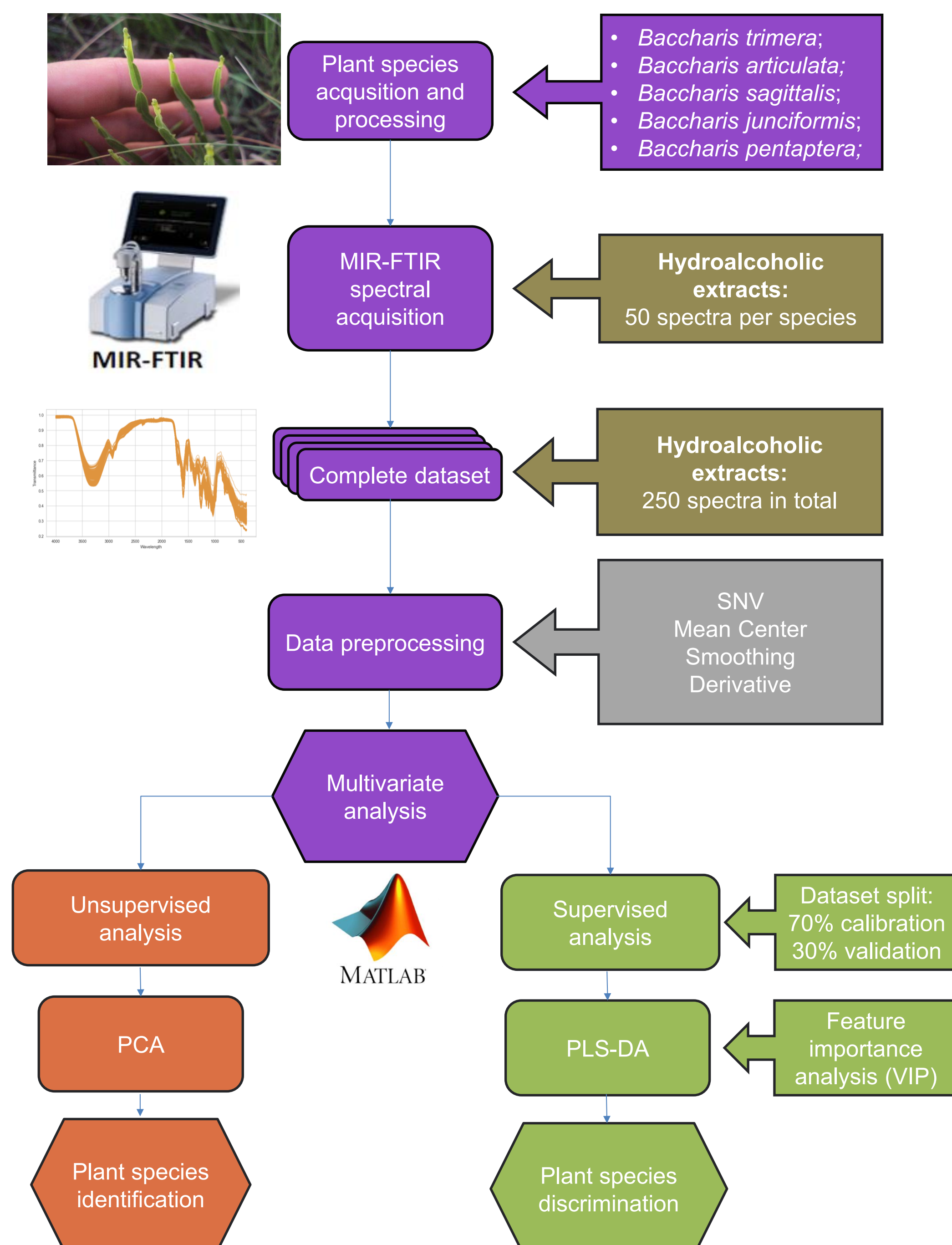
INTRODUCTION & AIM

Carquejas (*Baccharis* spp.) are among the ten most traded medicinal plants in Brazil. Despite their popularity, only *Baccharis trimera* has an official quality control protocol, which is restricted to morphological characteristics.



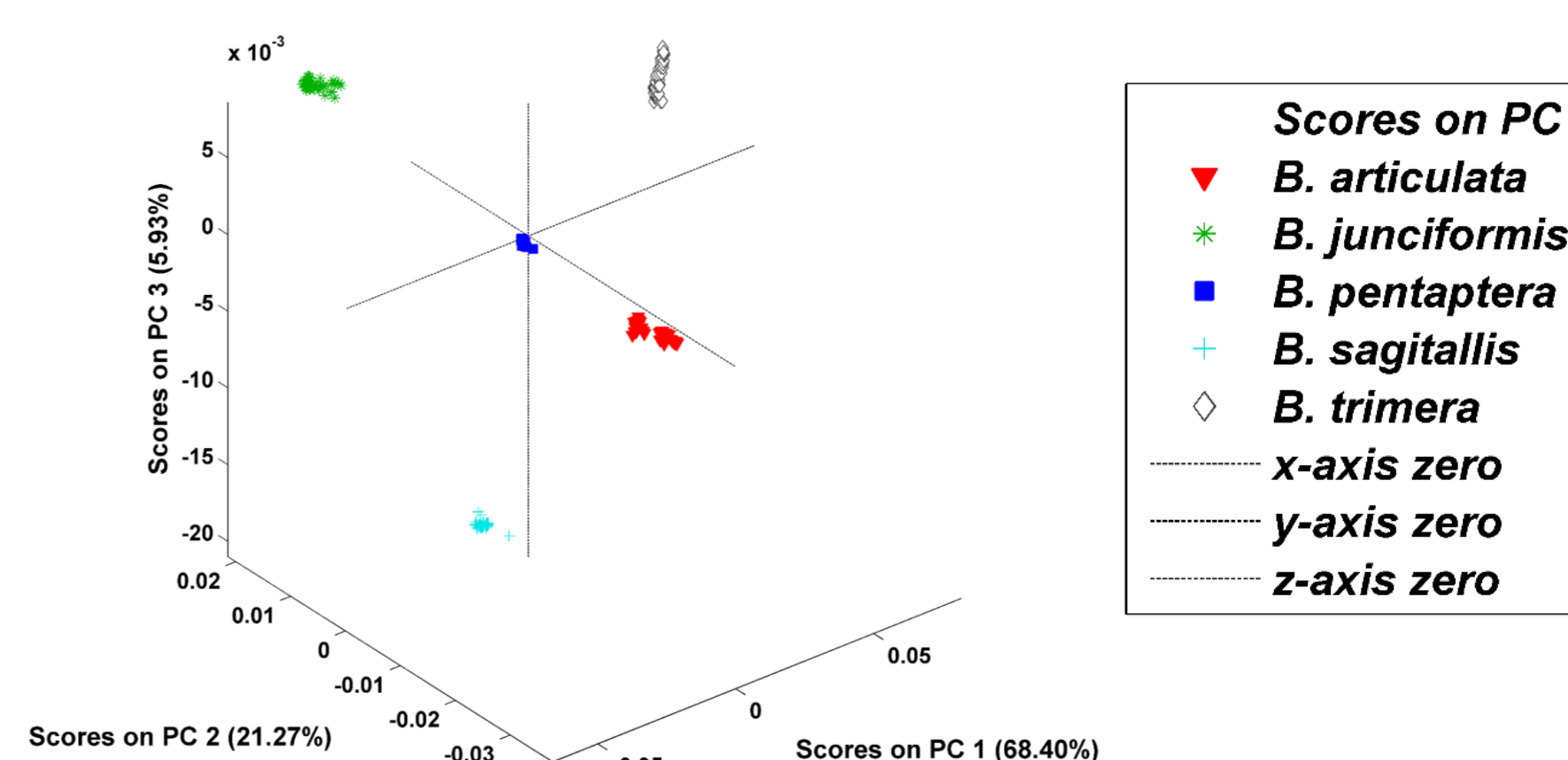
This study developed a machine learning-based chemometric model using mid-infrared Fourier Transform Infrared Spectroscopy (FTIR) and multivariate analysis to improve species authentication and strengthen quality control of commercial *carqueja* products.

METHOD

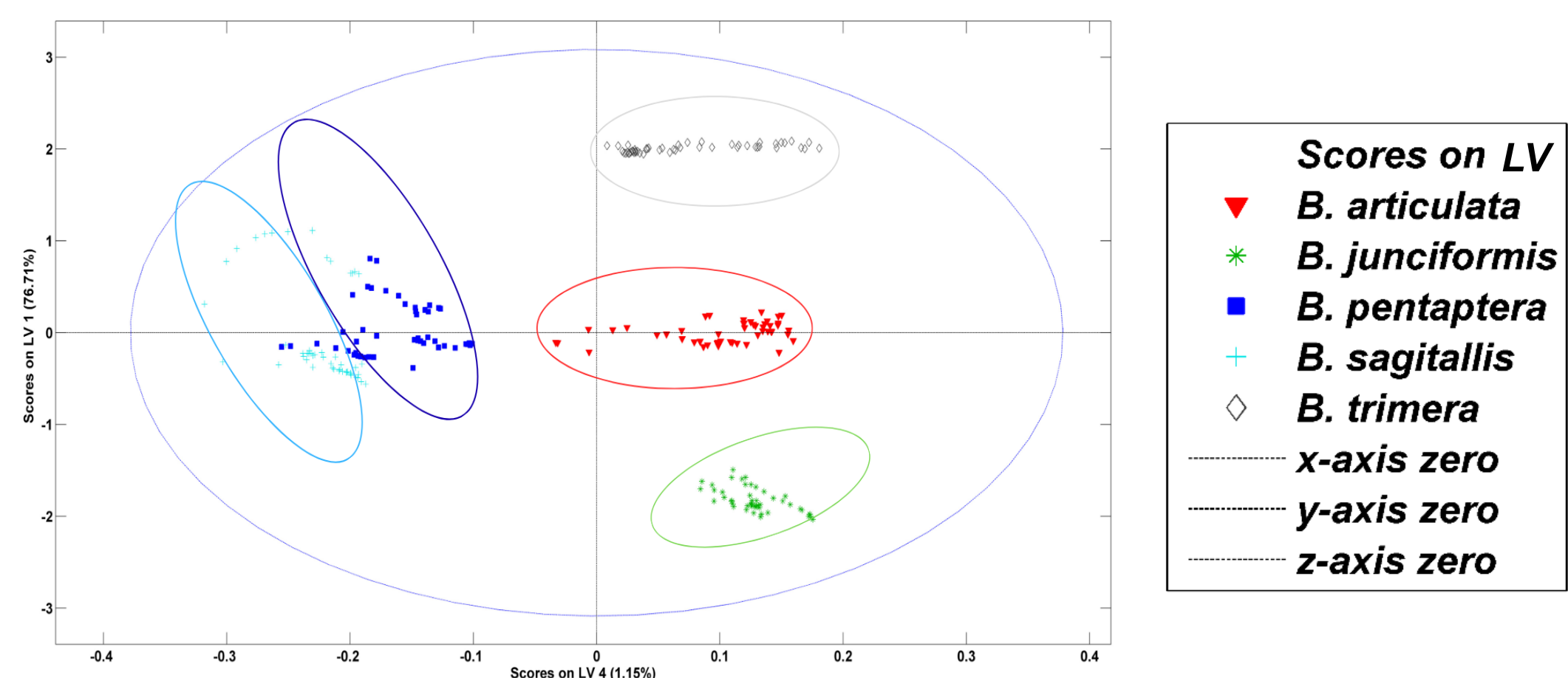


RESULTS & DISCUSSION

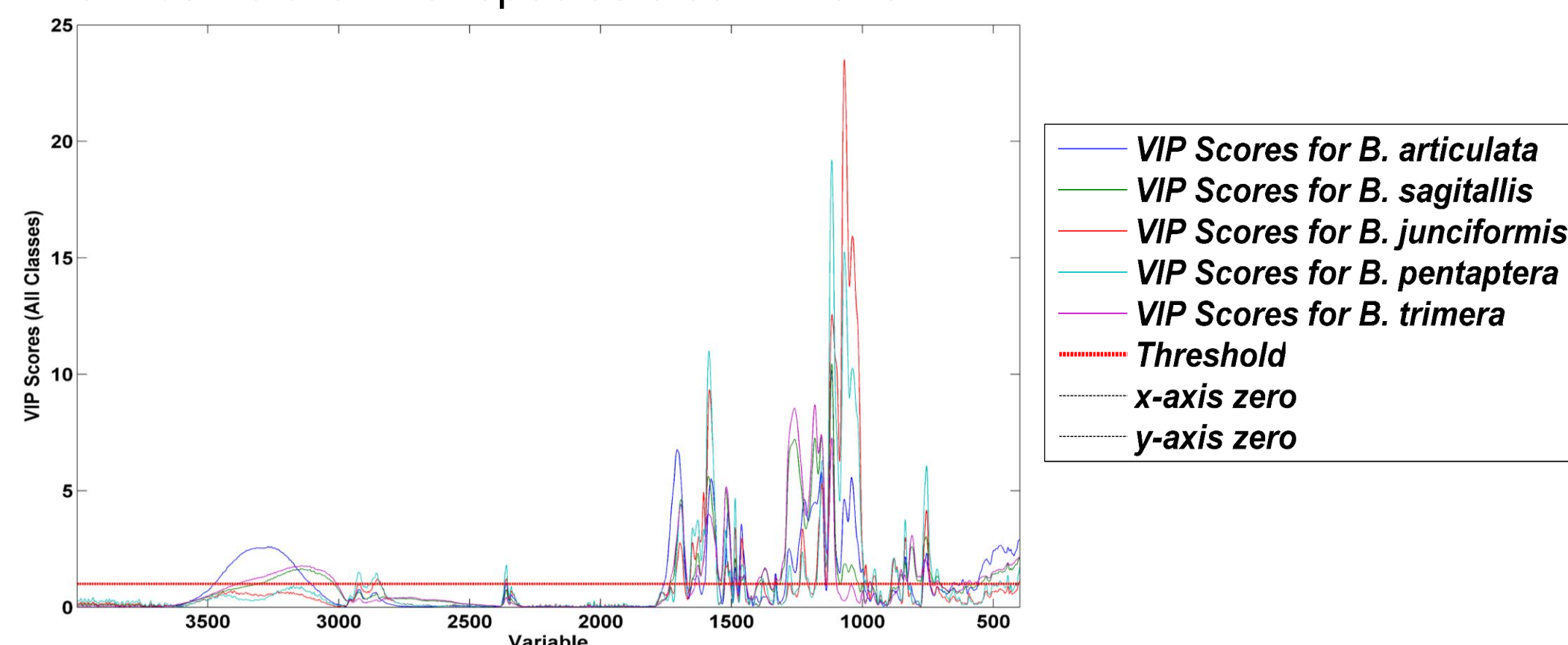
PCA captured 98% of total variance, clearly discriminating all five *Baccharis* species with six principal components.



The PLS-DA model explained 88.9% of the total variance. Using four latent variables, the model achieved 90% overall classification accuracy, with specificity and sensitivity of 90% and 71%, respectively.



The spectral regions between 1750 and 750 cm^{-1} were identified as the most relevant for species discrimination.



CONCLUSION

Machine learning-based chemometric models successfully distinguished the *Baccharis* species, reinforcing their value as innovative tools for quality control and standardization of carqueja products.

FUTURE WORK / REFERENCES

