

IR Spectral Analysis in Traditional Chinese Medicine (TCM) Using Bio-Rad Sadtler Reference Spectra

Michelle D'Souza, Ph. D.
Bio-Rad Laboratories, Inc., Informatics Division, Philadelphia, PA, USA



Spectroscopy

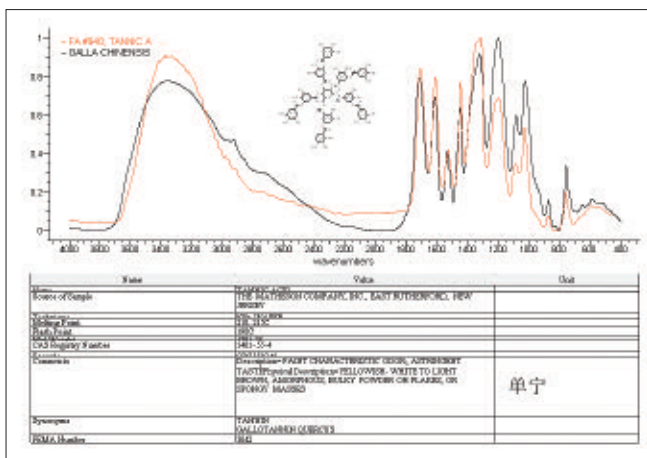
280046

Abstract

Analysis and quality control continues to present challenges to Traditional Chinese Medicine (TCM) researchers. Professor Suqin Sun at TsingHua University is renowned for the application of infrared (IR) spectroscopy in TCM to address these issues. Her research in this area is considered the “gold standard;” recently, she has published a book entitled, *Infrared Spectroscopy for Complex Mixtures: Applications in Food and Traditional Chinese Medicine* [1]. Below are a few examples from Dr. Sun’s research that demonstrate how scientists can successfully use Bio-Rad’s Sadtler IR databases to identify major components of compounds used in TCM. In these examples, the Sadtler reference spectrum is red; the sample TCM spectrum is black.

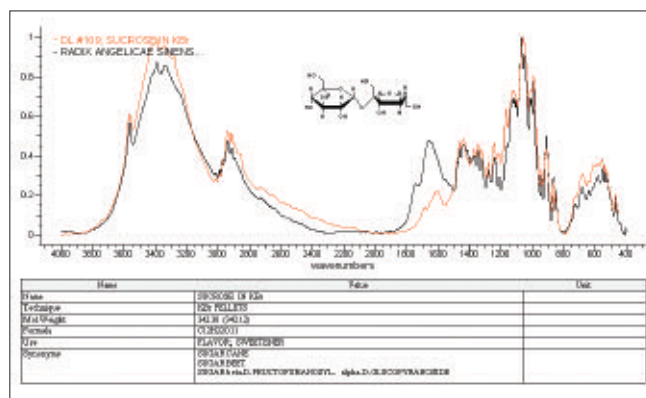
An Analysis of Galla Chinensis

The spectral overlay below shows the results for a search of the Galla Chinensis spectrum against the Sadtler databases. It is clear from this spectral comparison the major component of this TCM is tannin.



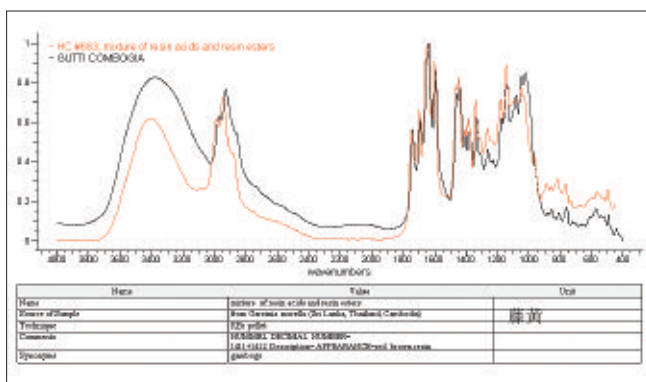
An Analysis of Ophiopogonis Radix

The spectral overlay below shows the results for a search of an Ophiopogonis Radix spectrum. One of the major components identified by the spectral search is inulin.



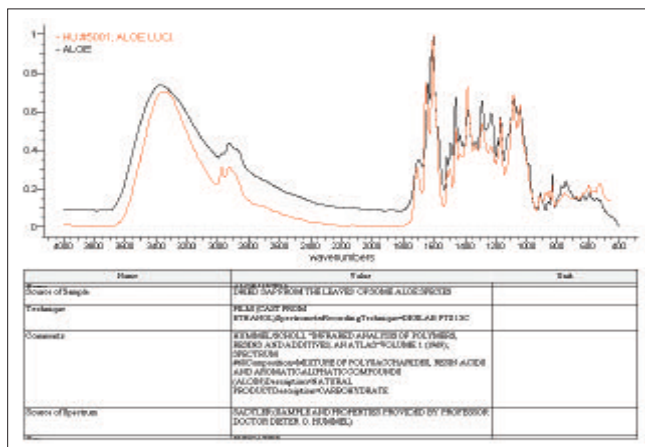
An Analysis of Gamboge

The following example compares a Gamboge spectrum to that of the natural product Garcinia Morella, indigenous to Sri Lanka, Thailand, and Cambodia.

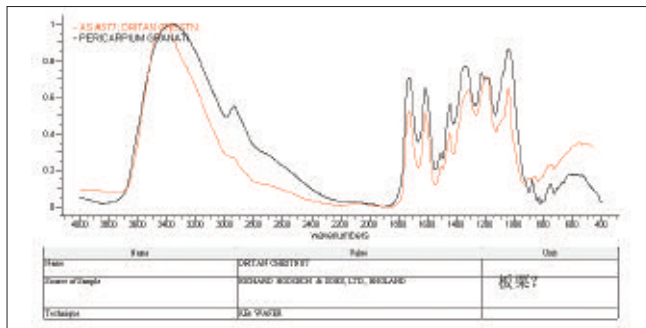


An Analysis of an Aloe Sample

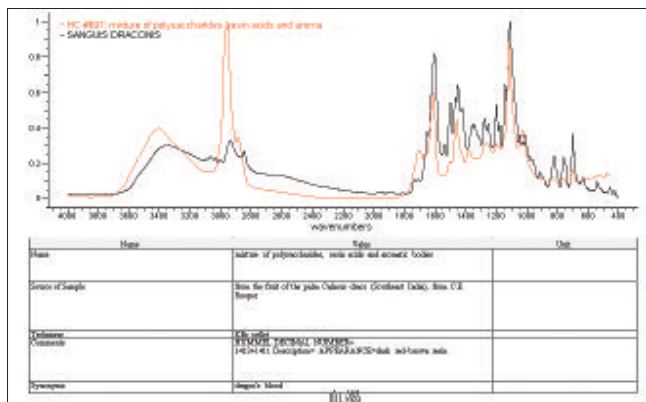
Similarly, the following database search confirms the sample is aloe.



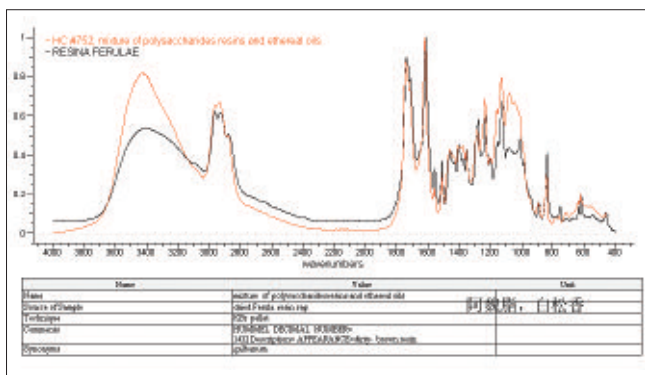
An Analysis of Pericarpium Granat



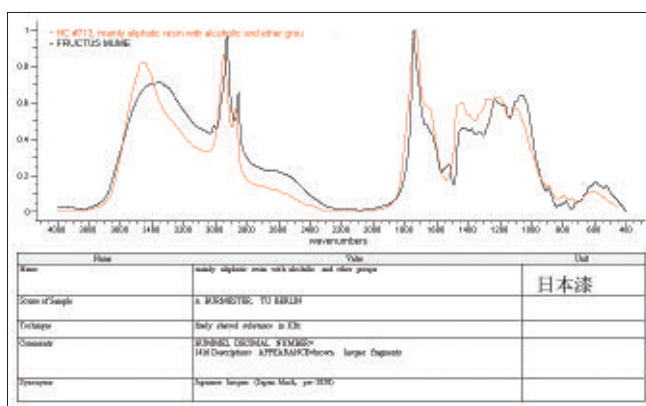
An Analysis of Daemonorops Draco Bl



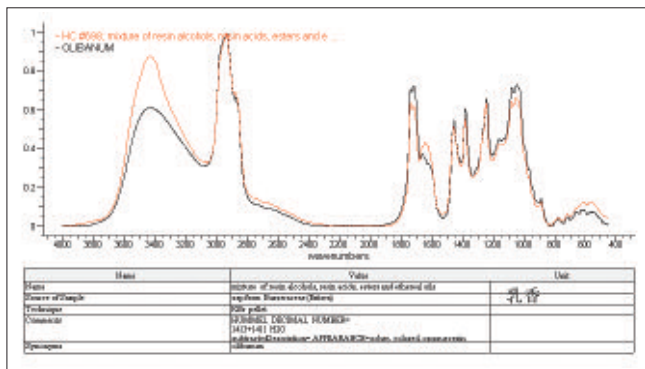
An Analysis of Chinese Asafoetida



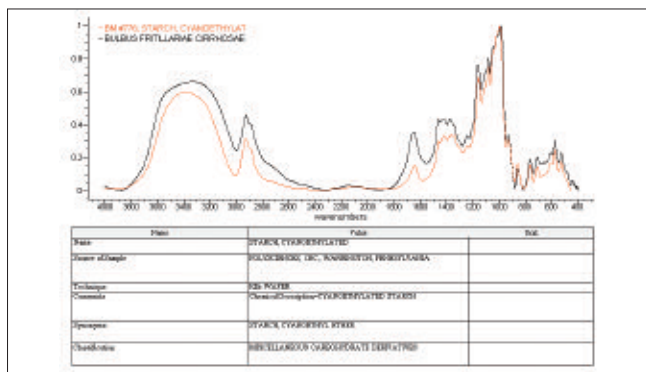
An Analysis of Armeniaca Mume Sieb



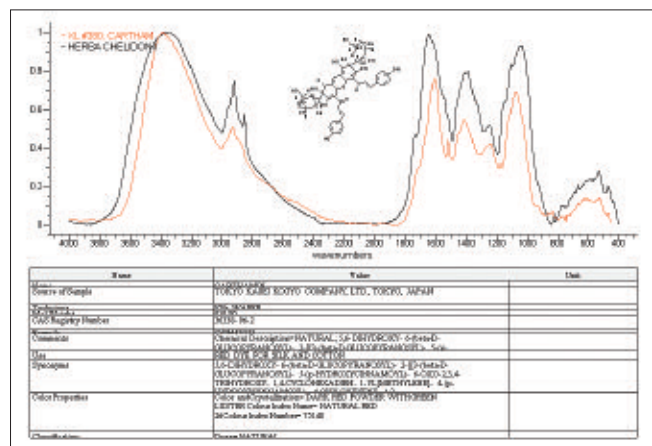
An Analysis of Frankincense



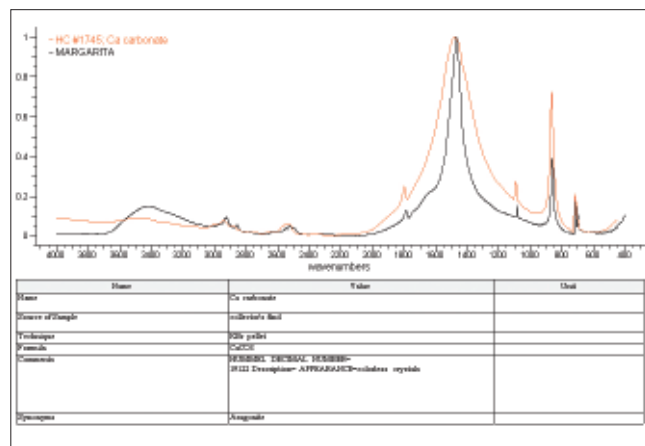
An Analysis of Bulbus Fritillariae Cirrhosae



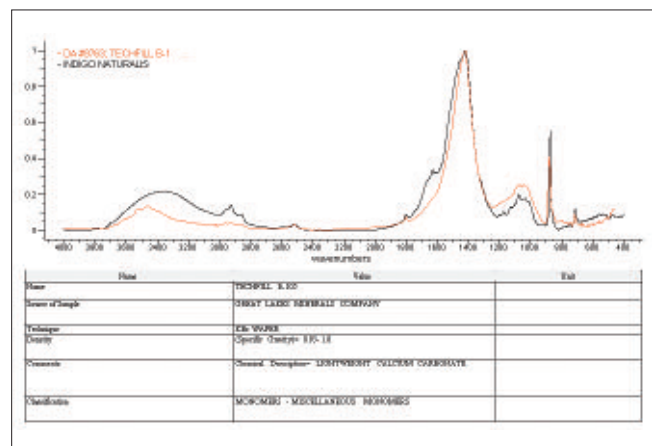
An Analysis of Greater Calandine Herb



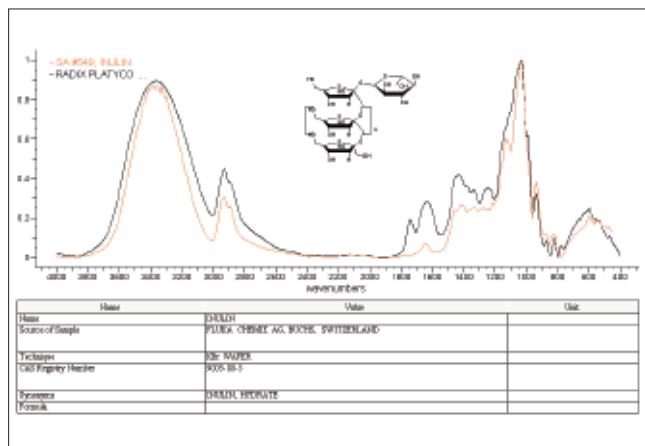
An Analysis of Pearl



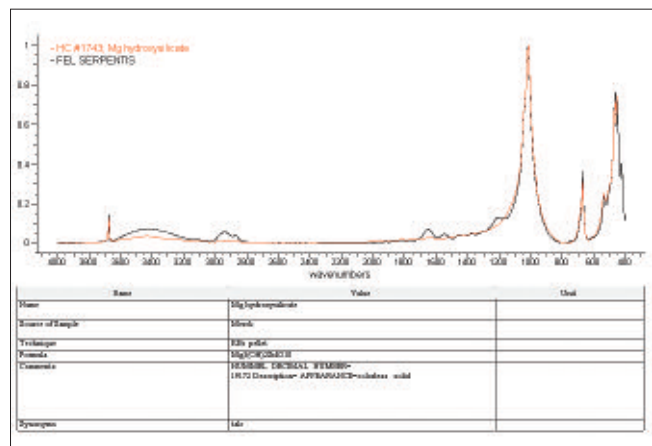
An Analysis of Natural Indigo



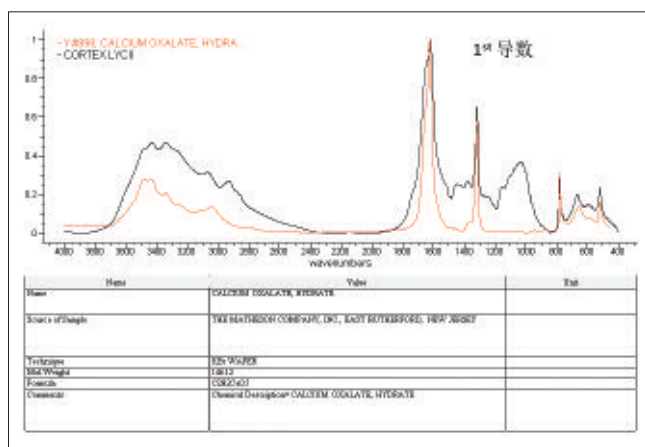
An Analysis of Platycodon Grandiflorus



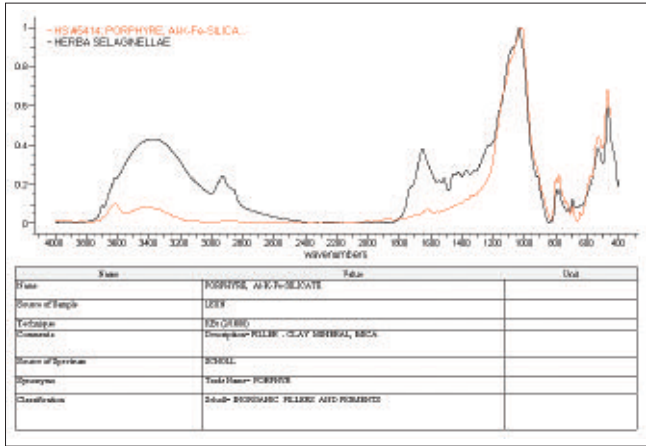
An Analysis of Snake Bite



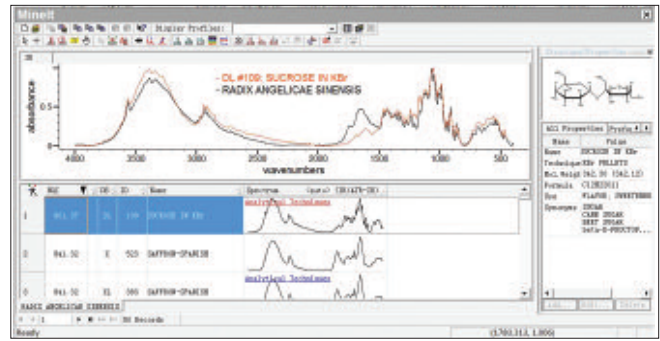
An Analysis of Peels from Lycium Chinense Mill (1st Derivative)



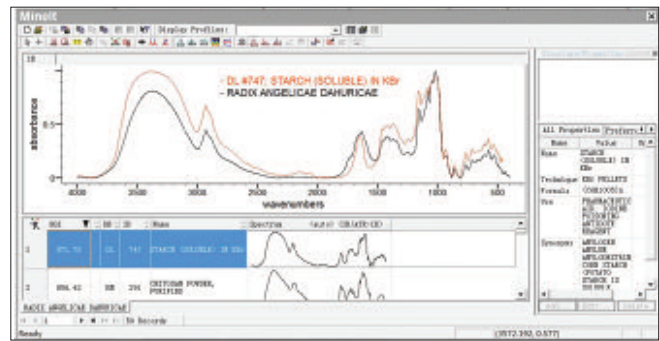
An Analysis of Herba Selaginellae



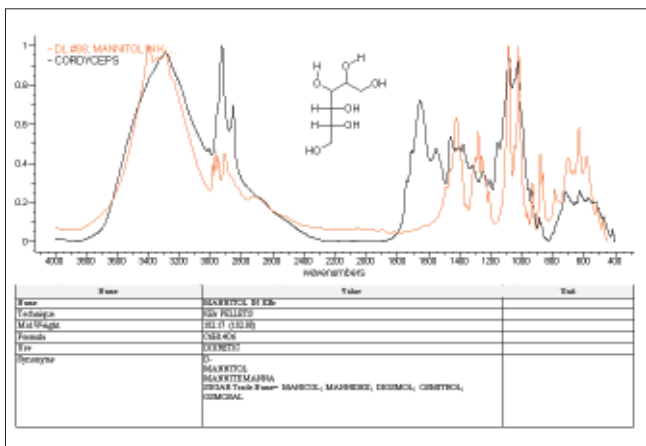
An Analysis of Angelica Sinensis



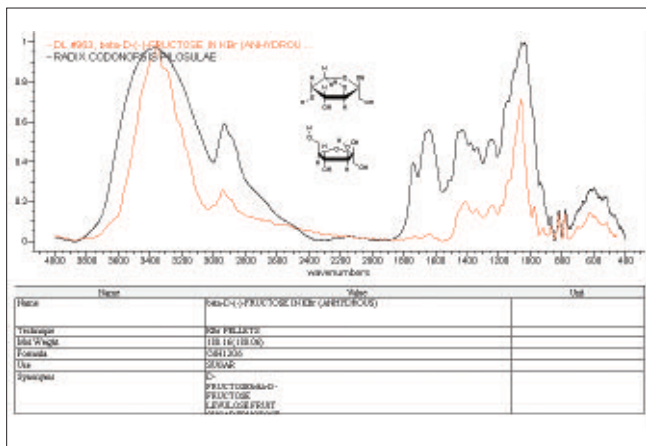
An Analysis of A. dahurica (Fisch.) Benth. et Hook



An Analysis of Cordyceps Sinensis (Berk.) Sacc



An Analysis of Codonopsis Pilosula



These examples demonstrate how Sadtler spectral databases can be used within Traditional Chinese Medicine for the identification, verification, or classification of compounds.

References

- Sun, Su-Qin ; Zhou, Qun ; Chen, Jian-Bo. *Infrared Spectroscopy for Complex Mixtures: Applications in Food and Traditional Chinese Medicine*; Li, XiaoHong; Ren, HuiMing; Ed; Chemical Industry Press: Beijing, P. R. China, 2011.



Bio-Rad
Laboratories, Inc.