

## Accepted Manuscript

Botanical origin characterisation of tannins using infrared spectroscopy

Mario Malacarne, Giampaolo Antonioli, Daniela Bertoldi, Tiziana Nardin,  
Roberto Larcher

PII: S0308-8146(17)31113-5  
DOI: <http://dx.doi.org/10.1016/j.foodchem.2017.06.131>  
Reference: FOCH 21353

To appear in: *Food Chemistry*

Received Date: 22 February 2017  
Revised Date: 16 June 2017  
Accepted Date: 22 June 2017

Please cite this article as: Malacarne, M., Antonioli, G., Bertoldi, D., Nardin, T., Larcher, R., Botanical origin characterisation of tannins using infrared spectroscopy, *Food Chemistry* (2017), doi: <http://dx.doi.org/10.1016/j.foodchem.2017.06.131>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



## 1 **Botanical origin characterisation of tannins using infrared spectroscopy**

2 Mario Malacarne<sup>a</sup>, Giampaolo Antonioli<sup>a</sup>, Daniela Bertoldi<sup>a</sup>, Tiziana Nardin<sup>a</sup>, Roberto  
3 Larcher<sup>a\*</sup>

4 <sup>a</sup> Centro Trasferimento Tecnologico, Fondazione E. Mach, via E. Mach 1, 38010 San Michele  
5 all'Adige (TN), Italia.

6 \* Author to whom correspondence should be addressed: e-mail [roberto.larcher@fmach.it](mailto:roberto.larcher@fmach.it), tel.  
7 num. 0461-615361, fax num. 0461-615288.

8

### 9 **ABSTRACT**

10 Different approaches to analysing the botanical origin of tannins have been proposed in the  
11 last fifteen years, but are generally time consuming and require the use of advanced  
12 instrumentation. This study aims to suggest an effective, easy, rapid and cheap method based  
13 on the acquisition of FT-IR spectra of 3 g/L hydroalcoholic tannin solutions, overcoming  
14 possible disadvantages due to sample or particle size inhomogeneity. 114 commercial powder  
15 tannins from 7 different botanical sources (oak, chestnut, gall, quebracho, tea, grape skin and  
16 grape seed) were collected and the FT-IR spectra were acquired in the region 926-5011 cm<sup>-1</sup>.  
17 Partial Least Squares regression, Discriminant Analysis and Artificial Neural Networks were  
18 applied to FT-IR spectra to investigate the possibility of differentiating the 7 botanical  
19 origins. The best results were obtained using Discriminant Analysis, with 95% correct re-  
20 classification, and 97% grouping of grape skin and seed in a single source.

21

### 22 **1. INTRODUCTION**

23 The term tannin is believed to derive from tan, whose original sense was to convert skins into  
24 leather, and probably goes back to a Celtic word indicating an oak tree  
25 ([http://www.etymonline.com/index.php?l=t&p=4&allowed\\_in\\_frame=0](http://www.etymonline.com/index.php?l=t&p=4&allowed_in_frame=0). Accessed 08.06.17).

26 Tannin compounds are widely distributed in many species of plants, where they play a role in  
27 protecting against predation and perhaps also as pesticides, as well as in plant growth  
28 regulation.

Download English Version:

<https://daneshyari.com/en/article/7584435>

Download Persian Version:

<https://daneshyari.com/article/7584435>

[Daneshyari.com](https://daneshyari.com)