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Volume 47, Issue 12, August 2014, Pages 2061-2071Orthogonal Partial Least Squares Model for Rapid Prediction of Antioxidant Activity of *Pereskia bleo* by Fourier Transform Infrared Spectroscopy (Article)Sharif, K.M.^a, Rahman, M.M.^a ✉, Azmir, J.^a, Khatib, A.^a, Hadijah, S.^a, Mohamed, A.^b, Sahena, F.^c, Zaidul, I.S.M.^a ^aKulliyah of Pharmacy, International Islamic University Malaysia, Jalan Sultan Ahmed Shah, Kuantan, Pahang, Malaysia^bCyberjaya University College of Medical Sciences, Cyberjaya, Selangor, Malaysia^cSchool of Industrial Technology, Universiti Sains Malaysia, Pulau Pinang, Malaysia

Abstract

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Pereskia bleo is a species of primitive cactus. In the present study, infrared spectroscopy was used to characterize the antioxidant activity of *P. bleo* leaves by multivariate analysis. A total of twenty-four extracts were prepared in different solvents. Antioxidant activities were measured by 1,1-diphenyl-2-picrylhydrazyl assay and fingerprinted by infrared spectroscopy between 4000 and 400 cm^{-1} at a resolution of 2 cm^{-1} . A three component multivariate orthogonal partial least squares model with R^2Y of 0.88 and Q^2 of 0.86 was developed to correlate infrared spectra with antioxidant activity and evaluated by internal cross-validation and a true external test. For external validation, bioactivity of new extracts of *P. bleo* was predicted using the model, and -OH, -NH, and -CH were identified as functional groups responsible for the activity. In summary, a successful orthogonal partial least squares model was developed using infrared spectroscopy as a rapid method to predict antioxidant activity. © 2014 Copyright Taylor & Francis Group, LLC.

Author keywords

Antioxidant activity Fourier transform infrared spectroscopy Orthogonal partial least squares *Pereskia bleo*

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References (27)

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Chemical diversity of propolis and the problem of standardization(2005) *Journal of Ethnopharmacology*, 100 (1-2), pp. 114-117. Cited 262 times.
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(2017) *Journal of Food and Drug Analysis*

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- 2 Bárcenas, R.T., Yesson, C., Hawkins, J.A.
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 (2011) *Cladistics*, 27 (5), pp. 470-489. Cited 45 times.
 doi: 10.1111/j.1096-0031.2011.00350.x
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-
- 3 Van Beek, T.A., Tetala, K.K.R., Koleva, I.I., Dapkevicius, A., Exarchou, V., Jeurissen, S.M.F., Claassen, F.W., (...), Van Der Klift, E.J.C.
Recent developments in the rapid analysis of plants and tracking their bioactive constituents
 (2009) *Phytochemistry Reviews*, 8 (2), pp. 387-399. Cited 36 times.
 doi: 10.1007/s11101-009-9125-9
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-
- 4 Bhullar, K.S., Jha, A., Youssef, D., Rupasinghe, H.P.V.
Curcumin and its carbocyclic analogs: Structure-activity in relation to antioxidant and selected biological properties
 (2013) *Molecules*, 18 (5), pp. 5389-5404. Cited 37 times.
<http://www.mdpi.com/1420-3049/18/5/5389/pdf>
 doi: 10.3390/molecules18055389
[View at Publisher](#)
-
- 5 Bylesjö, M., Eriksson, D., Kusano, M., Moritz, T., Trygg, J.
Data integration in plant biology: The O2PLS method for combined modeling of transcript and metabolite data
 (2007) *Plant Journal*, 52 (6), pp. 1181-1191. Cited 107 times.
 doi: 10.1111/j.1365-313X.2007.03293.x
[View at Publisher](#)
-
- 6 Cozzolino, D.
Near infrared spectroscopy in natural products analysis
 (2009) *Planta Medica*, 75 (7), pp. 746-756. Cited 74 times.
<http://www.thieme-connect.com/ejournals/pdf/plantamedica/doi/10.1055/s-0028-1112220.pdf>
 doi: 10.1055/s-0028-1112220
[View at Publisher](#)
-
- 7 Ebada, S.S., Edrada, R.A., Lin, W., Proksch, P.
Methods for isolation, purification and structural elucidation of bioactive secondary metabolites from marine invertebrates
 (2008) *Nature Protocols*, 3 (12), pp. 1820-1831. Cited 59 times.
 doi: 10.1038/nprot.2008.182
[View at Publisher](#)
-
- 8 Eriksson, L.
 (2006) *Multi- and Megavariate Data Analysis*. Cited 993 times.
 Umeå, Sweden,: Umetrics AB
-
- 9 Goh, K.L.
 (2000) *Malaysian Herbaceous Plants*. Cited 12 times.
 Kuala Lumpur, Malaysia, Advanco Press

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Easmin, S. , Zaidul, I.S.M. , Ghafoor, K.
 (2017) *Journal of Food and Drug Analysis*

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 Sharif, K.M. , Rahman, M.M. , Azmir, J.
 (2015) *Biomedical Chromatography*

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 (2005) *Pulp and Paper Canada*

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-
- 10 Günzler, H., Gremlich, H.U.
(2002) *IR Spectroscopy: An Introduction*. Cited 322 times.
Weinheim, Germany,: Wiley-vcn Verlag GmbH
-
- 11 Lu, X., Rasco, B.A.
Determination of Antioxidant Content and Antioxidant Activity in Foods using Infrared Spectroscopy and Chemometrics: A Review
(2012) *Critical Reviews in Food Science and Nutrition*, 52 (10), pp. 853-875. Cited 35 times.
doi: 10.1080/10408398.2010.511322

View at Publisher
-
- 12 Lu, X., Webb, M., Talbott, M., Van Eenennaam, J., Palumbo, A., Linares-Casenave, J., Doroshov, S., (...), Rasco, B.
Distinguishing ovarian maturity of farmed white sturgeon (*Acipenser transmontanus*) by fourier transform infrared spectroscopy: A potential tool for caviar production management
(2010) *Journal of Agricultural and Food Chemistry*, 58 (7), pp. 4056-4064. Cited 27 times.
doi: 10.1021/jf9038502

View at Publisher
-
- 13 Menges, F.
(2013) *Spekwin32 - optical spectroscopy software*. Cited 2 times.
Version 1.71.6.1, accessed January 6, 2014
<http://www.webcitation.org/6MQAe1ki6>
-
- 14 Metzging, D., Kiesling, R.
The study of cactus evolution: The pre-DNA era
(2008) *Haseltonia*, (14), pp. 6-25. Cited 11 times.

View at Publisher
-
- 15 Roggo, Y., Chalus, P., Maurer, L., Lema-Martinez, C., Edmond, A., Jent, N.
A review of near infrared spectroscopy and chemometrics in pharmaceutical technologies
(2007) *Journal of Pharmaceutical and Biomedical Analysis*, 44 (3 SPEC. ISS.), pp. 683-700. Cited 529 times.
doi: 10.1016/j.jpba.2007.03.023

View at Publisher
-
- 16 Roy, P.P., Roy, K.
On some aspects of variable selection for partial least squares regression models
(2008) *QSAR and Combinatorial Science*, 27 (3), pp. 302-313. Cited 442 times.
<http://www3.interscience.wiley.com/cgi-bin/fulltext/114292100/PDFSTART>
doi: 10.1002/qsar.200710043

View at Publisher
-
- 17 Sharif, K.M., Rahman, M.M., Zaidul, I.S.M., Jannatul, A., Akanda, M.J.H., Mohamed, A., Shamsudin, S.H.
Pharmacological relevance of primitive leafy cactuses pereskia
(2013) *Research Journal of Biotechnology*, 8 (12), pp. 134-142. Cited 7 times.
-


-
- 18 Socrates, G.
(2004) *Infrared and Raman Characteristic Group Frequencies: Tables and Charts*. Cited 6210 times.
Chichester, England;: J. Wiley and Sons
-
- 19 Tistaert, C., Dejaegher, B., Chataigné, G., Rivière, C., Nguyen Hoai, N., Van, M.C., Quetin-Leclercq, J., (...), Vander Heyden, Y.
Potential antioxidant compounds in *Mallotus* species fingerprints. Part II: Fingerprint alignment, data analysis and peak identification
(2012) *Analytica Chimica Acta*, 721, pp. 35-43. Cited 25 times.
doi: 10.1016/j.aca.2012.01.058
View at Publisher
-
- 20 Trygg, J., Holmes, E., Lundstedt, T.
Chemometrics in metabonomics
(2007) *Journal of Proteome Research*, 6 (2), pp. 469-479. Cited 725 times.
doi: 10.1021/pr060594q
View at Publisher
-
- 21 Trygg, J., Wold, S.
Orthogonal projections to latent structures (O-PLS)
(2002) *Journal of Chemometrics*, 16 (3), pp. 119-128. Cited 1142 times.
doi: 10.1002/cem.695
View at Publisher
-
- 22 Guidelines for the Assessment of Herbal Medicine
(1991) *Guidelines for the assessment of herbal medicine*
WHO, accessed January 6, 2014
<http://www.webcitation.org/6MQ72n6eF>
-
- 23 Quality control methods for medicinal plant materials
(1998) *Quality control methods for medicinal plant materials*. Cited 848 times.
WHO, accessed January 6, 2014
<http://www.webcitation.org/6MQ7Dt9qG>
-
- 24 Wohlfarth, C.H., Wohlfahrt, B.
3 mixtures of water and organic compounds
(2001) *Pure Organometallic and Organononmetallic Liquids, Binary Liquid Mixtures, Landolt-Börnstein - Group IV Physical Chemistry*, 18 A. Cited 2 times.
In: Lechner M. D., editors Heidelberg, Germany;: Springer
-
- 25 Yeniay, O., Göktas, A.
A comparison of partial least squares regression with other prediction methods
(2002) *Hacet. J. Math. Stat.*, 31, p. 13. Cited 59 times.
-

- 26 Yuliana, N.D., Khatib, A., Verpoorte, R., Choi, Y.H.
Comprehensive extraction method integrated with NMR metabolomics: A new bioactivity screening method for plants, adenosine a1 receptor binding compounds in orthosiphon stamineus benth

(2011) *Analytical Chemistry*, 83 (17), pp. 6902-6906. Cited 43 times.
doi: 10.1021/ac201458n

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