Tetsuya Inagaki

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Education:

Ph.D., Agricultural Sciences, Nagoya University, 2011
Concentrations: Wood Sciences, Vibrational Spectroscopy
Dissertation: Establishment of NIR archaeometry for wooden materials

Master degree, Agricultural Sciences, Nagoya University, 2008
Concentrations: Wood Sciences, Vibrational Spectroscopy
Dissertation: Near-Infrared Spectroscopic Investigation of the Hydrothermal
Degradation Mechanism of Wood

Bachelor degree, Agricultural Sciences, Nagoya University, 2006
Concentrations: Wood Sciences, Vibrational Spectroscopy
Dissertation: Near-Infrared Spectroscopic Monitoring of the Water Adsorption/Desorption Process
in Modern and Archaeological Wood

Experience:

Associate professor, April 2021
Graduate School of Bioagricultural Sciences, Nagoya University, Japan
Lecturer, September 2016- March 2021
Graduate School of Bioagricultural Sciences, Nagoya University, Japan
Assistant Professor, April 2011-
Graduate School of Bioagricultural Sciences, Nagoya University, Japan

Research skill:

Wood Sciences, NIR spectroscopy, Chemometorics, THz time domain spectroscopy, Machine learning

Award:

2013: NIR advanced award (Japan Council for Near Infrared Spectroscopy)

2019: The Japan wood research society award

Paper achievement:

1	K. Mitsui, T. Inagaki, S. Tsuchikawa, "Monitoring of Hydroxyl Groups in Wood during Heat Treatment Using NIR Spectroscopy", *Biomacromolecules*, 9, 286-288 (2008)
2	T. Inagaki, H. Yonenobu, S. Tsuchikawa, "Near-Infrared Spectroscopic Monitoring of the Water Adsorption/Desorption Process in Modern and Archaeological Wood", *Applied spectroscopy*, 62, 860-865 (2008)
3	T. Inagaki, K. Mitsui, S. Tsuchikawa, "Near-Infrared Spectroscopic Investigation of the Hydrothermal Degradation Mechanism of Wood as an Analogue of Archaeological Objects. Part I: Softwood", *Applied spectroscopy*, 62, 1209-1215 (2008)
4	T. Inagaki, K. Mitsui, S. Tsuchikawa, "Near-Infrared Spectroscopic Investigation of the Hydrothermal Degradation Mechanism of Wood as an Analogue of Archaeological Objects. Part II: Hardwood", *Applied spectroscopy*, 63, 753-758 (2009)
5	T. Inagaki, Y. Shinoda, M. Miyazawa, H. Takamura, S. Tsuchikawa, "Near Infrared Spectroscopic Assessment of Contamination Level of Sewage", *Water science and technology*, 61, 1957-1963 (2010).
6	T. Inagaki, H. W. Siesler, K. Mitsui, S. Tsuchikawa, "Difference of the Crystal Structure of Cellulose in Wood after Hydrothermal and Aging Degradation: A NIR Spectroscopy and XRD Study", *Biomacromolecule*, 11, 2300-2305 (2010)
7	T. Inagaki, M. Schwanninger, R. Kato, Y. Kurata, W. Thanapase, P. Puthson, S. Tsuchikawa, "Eucalyptus Camaldulensis Density and Fiber Length Estimated by Near Infrared Spectroscopy", *Wood Science and Technology*, 46, 143-155 (2012).
8	T. Inagaki, Y. Shinozuka, K. Yamada, H. Yonenobu, A. Hayashida, S. Tsuchikawa, A. Yoshida, Y. Hoshino, K. Gotanda, Y. Yasuda, "Rapid Prediction of Past Climate Condition from Lake Sediments by Near-Infrared (NIR) Spectroscopy", *Applied Spectroscopy*, 66, 673-679 (2012)
9	T. Inagaki, P. Sirisomboon, C. Liu, W. Thanapase, S. Tsuchikawa, "High Accuracy Rapid Prediction and Feasibility of On-site Nondestructive Estimation of Para Rubber Quality by Spectroscopic Methods", *Journal of Wood Science*, 59, 119-126 (2013)
10	T. Inagaki, I. D. Hartley, S. Tsuchikawa, M. Reid, "Prediction of Oven-dry Density of Wood by Time-

	domain Terahertz Spectroscopy", *Holzforschung*, 68, 61-68 (2014)
11	T. Inagaki, B. Ahmed, I. D. Hartley, S. Tsuchikawa, M. Reid, "Simultaneous Prediction of Density and Moisture Content of Wood by Terahertz Time Domain Spectroscopy", *Journal of Infrared Millimeter and Terahertz Wave*, 35, 949-961 (2014)
12	G. Hans, R. Kitamura, T. Inagaki, B. Leblon, S. Tsuchikawa, "Assessment of Variations in Air-dry Wood Density using Time-of-flight Near-infrared Spectroscopy", *Wood Material Science & Engineering*, 10, 57-68 (2015)
13	H. Kobori, T. Inagaki, T. Fujimoto, T. Okura, S. Tsuchikawa, "Fast Online NIR Technique to Predict MOE and Moisture Content of Sawn Lumber", *Holzforschung*, 69, 329-335 (2015)
14	L. Tolvaj, S. Tsuchikawa, T. Inagaki, D. Varga, "Combined Effects of UV Light and Elevated Temperatures on Wood Discolouration", *Wood Science and Technology*, 49, 1225-1237 (2015)
15	T. Inagaki, K. Mitsui, S. Tsuchikawa "Visualisation of Degree of Acetylation in Beech wood by Near Infrared Hyperspectral Imaging", *Journal of Near Infrared Spectroscopy,* 23, 353–360 (2015)
16	R. Kitamura, T. Inagaki, S. Tsuchikawa, "Determination of True Optical Absorption and Scattering Coefficient of Wooden Cell Wall Substance by Time-of-flight Near Infrared Spectroscopy", *Optic Express,* 24, 3999-4009 (2016)
17	T. Inagaki, M. Miyuki, S. Tsuchikawa, "NIR Spectral-kinetic analysis for thermally degraded Sugi (Cryptomeria japonica) wood", *Applied Physics A*, 122, 208 (2016)
18	K. Konagaya, T. Inagaki, R. Kitamura, S. Tsuchikawa, "Optical Properties of Drying Wood Studied by Time-Resolved Near-Infrared Spectroscopy", *Optic Express*, 24, 9561-9573(2016)
19	T. Inagaki, D. Nozawa, Y. Shimomura, S. Tsuchikawa, "Three-fibre-based diffuse reflectance spectroscopy for estimation of total solid content in natural rubber latex", *Journal of Near infrared spectroscopy*, 24, 327–335 (2016)
20	E. A. Salca, H. Kobori, T. Inagaki, Y. Kojima, S. Suzuki, "Effect of heat treatment on colour changes of black alder and beech veneers", *Journal of Wood Science*, 62,297-304 (2016)
21	T. Ma, T. Inagaki, S. Tsuchikawa, "Calibration of SilviScan data of Cryptomeria japonica wood concerning density and microfibril angles with NIR hyperspectral imaging with high spatial resolution", *Holzforschung,* 71, 341-347 (2017)
22	T. Inagaki, T. Watanabe, S. Tsuchikawa "The effect of path length, light intensity and co-added time on the detection limit associated with NIR spectroscopy of potassium hydrogen phthalate in aqueous Solution", PLoS ONE 12(5): e0176920 (2017)
23	K. Phuangsombut, A. Terdwongworakul, N. Suttiwijitpukdee, A. Phuangsombut, S. Tsuchikawa, T. Inagaki, T. Ma, "Classification of mung bean seeds for sprout production using near-infrared spectroscopy and hyperspectral imaging", *Thai Society of Agricultural Engineering Journal*, 23, 23-29 (2017)
24	S. Sugimoto, T. Fujimoto, H. Tsutsumi, T. Inagaki, S. Tsuchikawa, "Dynamic behavior of wood

	chemical components under drying process measured by near-infrared spectroscopy", *Journal of Near infrared spectroscopy*, 25, 400-406 (2017)
25	I. A. Sofianto, <u>T. Inagaki</u>, M. Itoh, S. Tsuchikawa, "Stiffness and moisture content prediction model of wooden veneer using fast online near-infrared (NIR) spectroscopic system", *Forestry Research and Engineering: International Journal*, 1**,** 40-43, (2017)
26	I. A. Sofianto, <u>T. Inagaki,</u> K. Kato, M. Itoh, S. Tsuchikawa, "Modulus of elasticity prediction model on sugi (Cryptomeria japonica) lumber using online near-infrared (NIR) spectroscopic system", *International Wood Products Journal,* 8, 193-200 (2017)
27	H. Yang, <u>T. Inagaki</u>, T. Ma, S. Tsuchikawa, "High-Resolution and Non-destructive Evaluation of the Spatial Distribution of Nitrate and Its Dynamics in Spinach (Spinacia oleracea L.) Leaves by Near-Infrared Hyperspectral Imaging", *Frontiers in Plant Science,* 8, 1937 (2017)
28	<u>T. Inagaki</u>, Y. Asanuma, S. Tsuchikawa, "Selective assessment of duplex heat-treated wood by near-infrared spectroscopy with principal component and kinetic analyses", *Journal of Wood Science*, 64, 6-15 (2018)
29	V. T. H. Tham, <u>T. Inagaki</u>, S. Tsuchikawa, "A novel combined application of capacitive method and near-infrared spectroscopy for predicting the density and moisture content of solid wood", *Wood Science and Technology*, 52, 115-129 (2018)
30	T. Ma, X. Li, <u>T. Inagaki</u>, H. Yang, S. Tsuchikawa, "Noncontact evaluation of soluble solids content in apples by near-infrared hyperspectral imaging", *Journal of Food Engineering,* 224, 53-61 (2018)
31	M. Ban, <u>T. Inagaki</u>, T. Ma, S. Tsuchikawa, "Effect of cellular structure on the optical properties of wood", *Journal of Near Infrared Spectroscopy,* 26, 53-60 (2018)
32	<u>T. Inagaki</u>, H. Yonenobu, Y. Asanuma, S. Tsuchikawa, "Determination of physical and chemical properties and degradation of archeological Japanese cypress wood from the Tohyamago area using near-infrared spectroscopy", *Journal of Wood Science*, 64, 347-355 (2018)
33	T. Ma, G. Schajer, <u>T. Inagaki</u>, Z. Pirouz, S. Tsuchikawa, "Optical characteristics of Douglas fir at various densities, grain directions and thicknesses investigated by near-infrared spatially resolved spectroscopy (NIR-SRS)", *Holzforschung*, 72, 789-796 (2018)
34	K. Phuangsombut, T. Ma, <u>T. Inagaki,</u> S. Tsuchikawa, A. Terdwongworakul, "Near-infrared hyperspectral imaging for classification of mung bean seeds", *Iinternational Jjournal of Food Properties*, 21, 799-807 (2018)
35	T. Ma, <u>T. Inagaki</u>, S. Tsuchikawa, "Non-destructive evaluation of wood stiffness and fiber coarseness, derived from SilviScan data, via near infrared hyperspectral imaging", *Journal of Near Infrared Spectroscopy,* 26*,* 398–405 (2018)
36	<u>T. Inagaki,</u> N. Katayama, R. Cho, X. Chen, S. Tsuchikawa, "Near infrared estimation of concentration of ginsenosides in Asian ginseng", *Journal of Near Infrared Spectroscopy*, 27, 115-122 (2019).
37	R. Nokkaew, V. Punsuvon, <u>T. Inagaki</u>, S. Tsuchikawa, "Determination of Carotenoids and DOBI

	Content in Crude Palm Oil by Spectroscopy Techniques: Comparison of Raman and FT-NIR Spectroscopy", *International journal of geomate*, 16, 92-98(2019)
38	I. A. Sofianto, T. Inagaki, T. Ma, S. Tsuchikawa, "Effect of knots and holes on the modulus of elasticity prediction and mapping of sugi (Cryptomeria japonica) veneer using near-infrared hyperspectral imaging (NIR-HSI)", *Holzforshung*, 73, 259-268 (2019)
39	V. T. H. Tham, T. Inagaki, S. Tsuchikawa, "A new approach based on a combination of capacitance and near infrared spectroscopy for estimating the moisture content of timber", *Wood Science and Technology*, 53, 579-599 (2019)
40	T. Ma, T. Inagaki, S.Tsuchikawa, "Three-dimensional grain angle measurement of softwood (Hinoki cypress) using near infrared spatially and spectrally resolved imaging (NIR-SSRI)", *Holzforschung,* 73, 817-826 (2019)
41	H. Wang, T. Inagaki, I. D. Hartley, S. Tsuchikawa, M. Reid, "Determination of dielectric function of water in THz region in wood cell wall result in an accurate prediction of moisture content", *International Journal of Infrared and Millimeter Waves*, 40,673-687 (2019)
42	S. H. Mahdiyanti, T. Inagaki, S. Tsuchikawa "Analysis of wood thermal degradation using 2D correlation of near infrared and visible-light spectroscopy", *Journal of Near Infrared Spectroscopy*, 27, 354-369 (2019)
43	H. Kanayama, T. Ma, S. Tsuchikawa, T. Inagaki, "Cognitive spectroscopy for wood species identification: Near infrared hyperspectral imaging combined with convolutional neural network", *Analyst*, 144,6438-6446 (2019)
44	T. Ma, T. Inagaki, M. Ban, S. Tsuchikawa, "Rapid identification of wood species by near-infrared spatially resolved spectroscopy (NIR-SRS) based on hyperspectral imaging (HSI)", *Holzforschung,* 73, 323-330 (2019)
45	T. Ma, T. Inagaki, S. Tsuchikawa, "Rapidly visualizing the dynamics state of free, weakly, and strongly hydrogen-bonded water with lignocellulosic material during drying by near-infrared hyperspectral imaging", *Cellulose*, 27, 4857-4869 (2020)
46	M. Kashima, S. Tsuchikawa, T. Inagaki, "Simultaneous detection of density, moisture content and fiber direction of wood by THz-time domain spectroscopy", *Journal of Wood Science*, 66, 27 (2020)
47	D. D. Viet, T. Ma, T. Inagaki, N. T. Kim, N. Q. Chi, S. Tsuchikawa, "Physical and Mechanical Properties of Fast Growing Polyploid Acacia Hybrids (A. auriculiformis × A. mangium) from Vietnam", *Forests,* 11, 717 (2020)
48	T. Ma, S. Tsuchikawa, T. Inagaki, "Rapid and nondestructive seed viability prediction using near-infrared hyperspectral imaging coupled with a deep learning approach", *Computers and Electronics in Agriculture,* 177, 105683 (2020)
49	T. Ma, L. Schmileck, T. Inagaki, S. Tsuchikawa, "Rapid and nondestructive evaluation of hygroscopic behavior changes of thermally modified softwood and hardwood samples using near-infrared

	hyperspectral imaging (NIR-HSI)", *Holzforschung*, 75, 345-357 (2021)
50	T. Ma, <u>T. Inagaki</u>, S. Tsuchikawa, "Demonstration of the applicability of visible and near-infrared spatially resolved spectroscopy for rapid and nondestructive wood classification", *Holzforschung*, 75, 419-427 (2021)
51	H. Wang, Y. Horikawa, S. Tsuchikawa, <u>T. Inagaki</u>, "Terahertz time-domain spectroscopy as a novel tool for crystallographic analysis in cellulose", *Cellulose*, 27, 9767-9777 (2020)
52	T. Ma, Y. Xia, <u>T. Inagaki</u>, S. Tsuchikawa, "Rapid and nondestructive evaluation of soluble solids content (SSC) and firmness in apple using Vis–NIR spatially resolved spectroscopy", 2.59+, 173, 111417 (2021)
53	T. Ma, Y. Xia, <u>T. Inagaki</u>, S. Tsuchikawa, "Non-destructive and fast method of mapping the distribution of the soluble solids content and pH in kiwifruit using object rotation near-infrared hyperspectral imaging approach", *Post harvest biology and technology*, 174, 111440 (2021)
54	H. Wang, S. Tsuchikawa, T. Inagaki, " Terahertz time-domain spectroscopy as a novel tool for crystallographic analysis in cellulose: the potentiality of being a new standard for evaluating crystallinity", *Cellulose*, 28, 5293-5304 (2021)
55	J. Zhao, T. Ma, T. Inagaki, Q. Chen, Z. Gao, L. Sun, H. Cai, C. Chen, C. Li, S. Zhang, S. Tsuchikawa, "Finite Element Method Simulations and Experiments of De-tachments of Lycium barbarum L.", Forests, 12, 699 (2021)
56	Jian Zhao, Te Ma, Tetsuya Inagaki, Yun Chen, Guangrui Hu, Zhiwei Wang, Qingyu Chen, Zening Gao, Jianguo Zhou, Miaohai Wang, Satoru Tsuchikawa *, Jun Chen *, "Parameter Optimization of Vibrating and Comb Brushing Harvesting of Lycium barbarum L. based on FEM and RSM", Horticuluture, 7・186・2021
58	Te Ma, Genki Morita, Tetsuya Inagaki, Satoru Tsuchikawa* , "Moisture transport dynamics in wood during drying studied by long-wave near-infrared hyperspectral imaging" Cellulose, 29, 133-145 (2022)
59	Dang Duc Viet, Te Ma, Tetsuya Inagaki, Nguyen Tu Kim, Satoru Tsuchikawa*, "Near-infrared spectroscopy and hyperspectral imaging can aid in the prediction and mapping of polyploid acacia hybrid wood properties in tree improvement programs", Holzforschung, 75, 1067-1080 (2021)
60	Te Ma, Tetsuya Inagaki, Masato Yoshida, Mayumi Ichino, Satoru Tsuchikawa*, "Measuring the tensile strain of wood by visible and near-infrared spatially resolved spectroscopy", cellulose, 28, 10787-10801 (2022)
61	Han Wang, Hiroki Kataoka, Satoru Tsuchikawa, Tetsuya Inagaki*, "Terahertz time-domain spectroscopy as a novel tool for crystallographic analysis in cellulose: cellulose I to cellulose II, tracing the structural changes under chemical treatment", cellulose, https://doi.org/10.1007/s10570-022-04493-x、Cellulose volume 29, pages3143–3151 (2022)
62	Jiraporn Onmankhong, Te Ma, Tetsuya Inagaki*, Panmanas Sirisomboon, Satoru Tsuchikawa

	Cognitive spectroscopy for the classification of rice varieties: A comparison of machine learning and deep learning approaches in analysing long-wave near-infrared hyperspectral images of brown and milled samples, Infrared Physics and Technology, 123, 104100 (2022)
63	Te Ma, Genki Morita, Tetsuya Inagaki*, Satoru Tsuchikawa, "Experimental study and three-dimensional modeling of moisture transport in wood by means of near-infrared hyperspectral imaging coupled with a heat and mass transfer simulation method", Holzforschung, 76, 699-710, https://doi.org/10.1515/hf-2021-0203
64	Anniver Ryan Lapuz, Satoru Tsuchikawa , Tetsuya Inagaki, Te Ma, Veronica Migo, ""Production of Nanocellulose Film from Abaca Fibers", Crystals, https://doi.org/10.3390/cryst12050601,