Traditional Knowledge for Green Innovation with Japanese Persimmon Tannin, Kakishibu

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Editors

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Springer

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ISBN 978-981-95-7804-7 ISBN 978-981-95-7805-4 (eBook)
https://doi.org/10.1007/978-981-95-7805-4

The original submitted chapters 2, 3, 4, 5, 6, and 7 have been translated into English. The translation was done using artificial intelligence. A subsequent revision was performed by the author(s) and editors to further refine the work and to ensure that the translation is appropriate concerning content and scientific correctness. It may, however, read stylistically different from a conventional translation.

This Springer imprint is published by the registered company Springer Nature Singapore Pte Ltd.
The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

Preface

Even I, a Japanese, have not been aware of Kakishibu for a long time. I was struck by its water-repellent capabilities and minimal environmental impact. Furthermore, I was impressed to learn that it is produced from the fermented juice of astringent persimmons. This was my genuine reaction upon initially encountering Kakishibu, a traditional Japanese product with a history spanning more than a millennium.

My encounter with Kakishibu dates back to 2019. Until then, I had been collaborating with a high school teacher, Toshihiko Matsuda, the author of Chap. 6, for many years in the development of STEM education programmes that focus on traditional Japanese technologies such as Kyoto vegetables and Japanese tea. When he was transferred to Kizu High School in Kizugawa City, Kyoto Prefecture, one of the three major Kakishibu production regions (Kyoto, Hiroshima, and Gifu) in 2018, he initiated business applications of Kakishibu with his high school students. I first encountered Kakishibu when high school students introduced their business plans and demonstrated a water-repellent experiment using a newspaper coated with Kakishibu.

He and his high school students requested that I develop a STEM education programme for children and guardians concerning Kakishibu. I promptly commenced the development of this programme with my undergraduate students, and the first workshop was conducted in January 2020. At that time, in contrast to the STEM education programme presented in Chap. 8, the focus of the programme was minimal regarding environmental issues and was primarily centred on water repellence.

Then, the COVID-19 pandemic struck, and we had no choice but to give up implementing the STEM education programme. As described in Chap. 6, the pandemic also became a major obstacle to the realisation of students' business plans to solve environmental problems and contribute to the UN's Sustainable Development Goals (SDGs) using Kakishibu. Nevertheless, we decided to do what we could even during the pandemic, and, as explained in Chap. 8, we developed and implemented a STEM education programme in which participants could participate online after receiving experimental equipment by mail. We also reorganised the content of the STEM education programme to include environmental issues and contributions to the SDGs.

One of the major turning points after that was my visit to the Australian National Centre for the Public Awareness of Science (CPAS) at the Australian National University (ANU) in August 2022, where we began collaborative research with Dr Graham Walker, co-author of Chap. 8, to add elements of Culturally Relevant Pedagogy and Utility Value Intervention to the STEM education programme. This led to a greater focus on the cultural and historical aspects of Kakishibu and traditional knowledge.

Another significant milestone was the seminar I delivered at CPAS, ANU, in March 2023, during which attendees had the opportunity to engage with a STEM education programme centred on Kakishibu. Professor Sujatha Raman, who is the co-editor of this publication and the author of Chaps. 1 and 9, along with her doctoral student Bangle Wu, co-author of Chap. 9, both of whom were present in the audience, facilitated a deeper discussion contrasting Kakishibu with plastics and Per- and Polyfluoroalkyl Substances (PFAS). They have been leading the UNESCO Chair in Science Communication for the Public Good since 2022. The UNESCO Chair covered the topic of green innovation and the plastic society, as described in Chap. 1.

This discourse led to subsequent interviews with stakeholders involved in Kakishibu and contributed to the creation of a novel green innovation framework based on these interviews. Moreover, this discussion heightened my awareness of the importance of integrating the Japanese views of nature with Western scientific approaches, which underpin both Kakishibu and plastics. This conceptual discussion is elaborated in Chap. 2.

Viewing it from this perspective, it becomes evident once again that the primary entities within the narrative of Kakishibu are the *shibuya*, traditional small-scale Kakishibu manufacturing and sales companies. Chapter 3 documents the history and development of Kakishibu authored by a shibuya, Mimasu Kashichi Shouten Co., Ltd., which was founded in 1872. Readers will observe how the company has continually embraced new challenges while honouring its traditions. There is no doubt that *shibuya* remains at the core of Kakishibu; however, this publication also explores the pathways undertaken by scientists and engineers in promoting the integration of Western scientific principles with traditional practices, thereby contributing to green innovation (Chaps. 4, 5, and 7). These discussions extend beyond mere proposals for enhancing Kakishibu through scientific and technological means to encompass considerations on the responsible utilisation of such technologies and the necessary modifications in our actions and lifestyles.

As previously outlined, this publication employs Kakishibu as a case study to examine the philosophy, science, technology, and responsibilities inherent in traditional Japanese knowledge. It also delineates a pathway towards sustainable innovation by integrating it with Western scientific principles. While the book is organised to be read sequentially from Chap. 1, readers may opt to commence with the chapters that most engage their interest.

Finally, I would like to make a request to readers who are interested in Kakishibu and the green innovation that utilises it. That is to emphasise the utmost respect for traditional knowledge. As stated in Chap. 9, rapid and large-scale development is

not advisable, and an appropriate use, design and solutions must be maintained. Specifically, one potential mechanism is the fair trade of Kakishibu, including the protection of traditional production techniques. It would be beneficial to keep Joseph Needham's words, inspired by Taoism, ‘while it is impossible to avoid acquiring knowledge, we must endeavour not to employ knowledge that poses a threat to humanity’ (Nakayama et al., 1988), firmly in mind, and to ensure that Kakishibu is not exploited and modified too much.

Reference

Nakayama, S., Matsumoto, S., & Ushiyama, K. (1988). *Josefu Nidamu no sekai (The world of Joseph Needham)*. Nihon Chiiki Shakai Kenkyujo.

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Acknowledgements

This book would not have been possible without the support of the lab members (Kaneshiro, R., Nakashima, W., Takatsuka, M., Morisaki, R., Arima D., Hagihara, K., Tsushi, Y., Sano R., and Azai, H.) at Shiga University and the Australian National Centre for the Public Awareness of Science (CPAS), Australian National University (ANU) support for the UNESCO Chair in Science Communication for the Public Good. We also thank Yasunori Yamashita and Yuki Satsuma for participating in the interviews, Questacon members for their advice on the STEM workshop about Kakishibu, and Mei Han Lee and Momoko Asawa for their valuable editorial assistance. This work was partly supported by JSPS KAKENHI Grant Number 21KK0230, and this book was published with the support of the Shiga University Press Grant Programme.

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