



Science of Japanese Historical Materials Toward Open Science and Internationalisation

日本史史料の科学研究
オープンサイエンスと国際化の推進に向けて

Ayako Shibutani

渋谷綾子

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中村覚

Takane Mizukami

水上たかね

Kanako Hirasawa

平澤加奈子

Little ad. ちょっと宣伝



渋谷綾子・天野真志編（2023）
『古文書の科学 料紙を複眼的に分析する』
ISBN978-4-86766-004-1 C0021

Full text is open (only in Japanese)
<https://bungaku-report.com/komonjo.html>



About us 東京大学史料編纂所について



The Historiographical Institute (HI) of the University of Tokyo is a research institution for the study of historical documents that span Japan's pre-modern history from ancient times through to the Meiji Restoration



- ✓ Mission: To collect and analyse historical documents from holdings both in Japan and overseas and compile and publish them
- ✓ HI published more than 1,200 volumes since 1901

Today's contents 今日のお話

Science of Japanese
historical materials?

日本史史料の科学研究と
は？

Some analysis
results of Japanese
historical materials

科学分析結果のご紹介

Toward sharing
research data in and
outside Japan

国内外での研究データの
共有にむけて

We show our scientific studies of
Japanese historical materials!



First topic 1つめのお話

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In the beginning



Why science now? 今なぜ科学なのか？

Interview meeting (09/06/2022)



Front row, from left: Ken'ichi Yuyama, Masahiro Tomita,
Akinori Okawa

Back row, from left: Hiroe Nukui, Ayako Shibutani,
Masashi Amano, Akihiko Takashima, Koki Yanbe

Approaches to various scientific information of Japanese historical materials have deepened in recent years

- ✓ Researchers have conducted surveys using microscopes to observe and analyse the structure of papers used as historical materials
- ✓ One of this backgrounds is the update of equipment

For identifying components 構成物の同定用



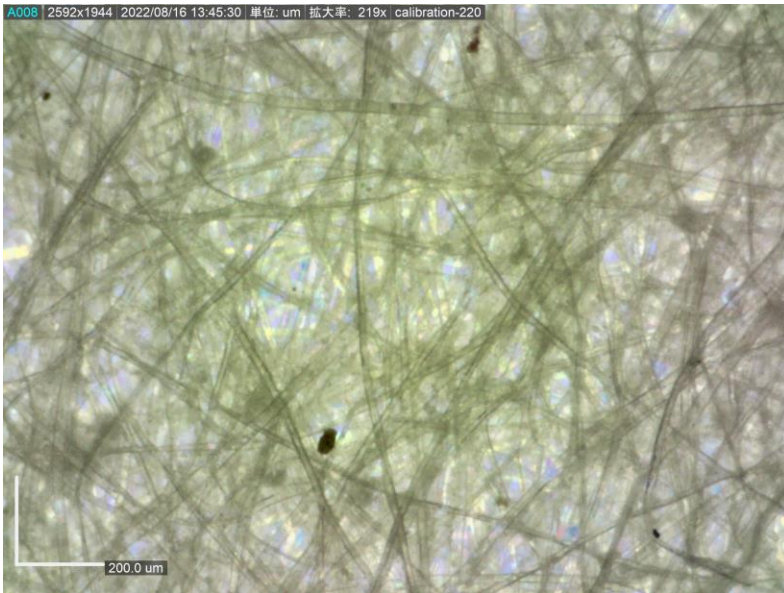
Dino-Lite Edge S
FLC Polarizer



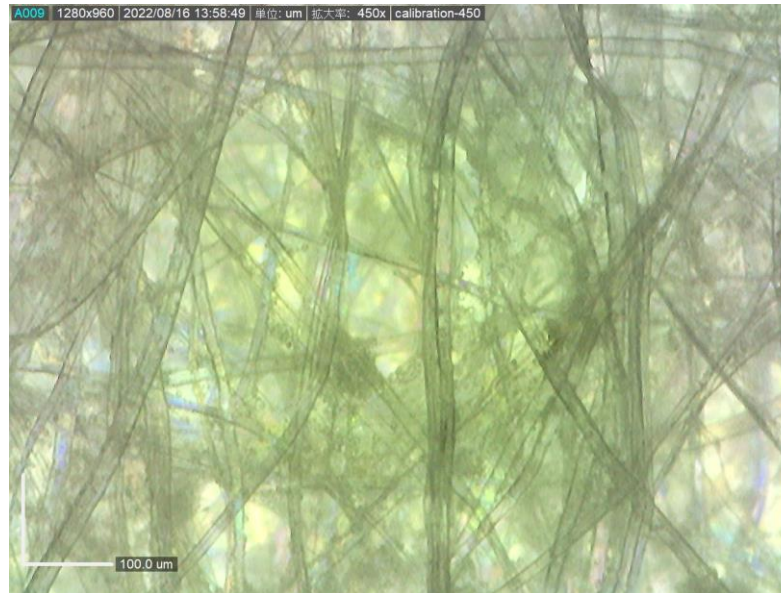
Dino-Lite Premier S
Polarizer 400x



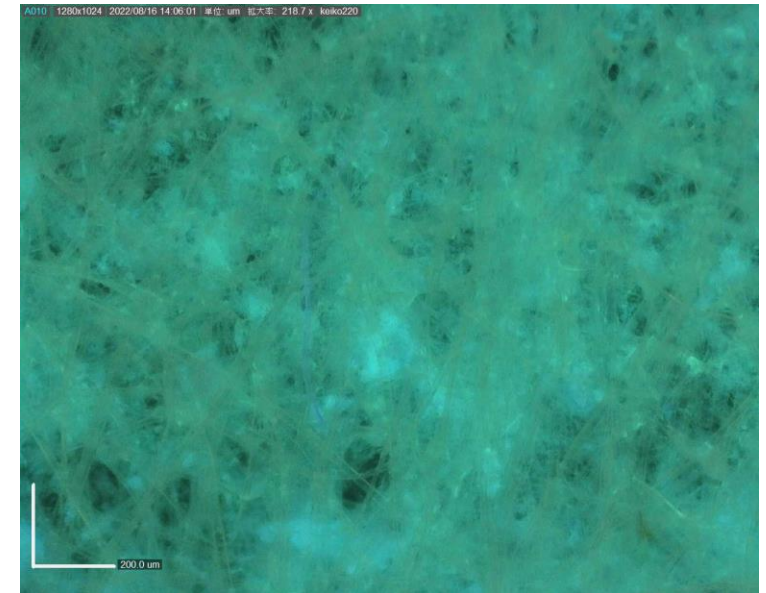
Dino-Lite Premier
M Fluorescence
TCFVW



220x, transmitted & polarised light



450x, transmitted & polarised light



220x, cyan fluorescence

For physical identification 物性の識別用

Fourier Transform Infrared Spectroscopy (FT-IR analysis)



Cooperation with M. Ishida*

3D X-ray microscope (X-ray CT)



Results provided by Y. Niwa*

There are limits to the size of the sample, but both conduct non-destructively

*Inter-University Research Institute Corporation, High Energy Accelerator Research Organization

Second topic 2つめのお話

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Move to next



Contained rice powder 米粉入りの紙でした

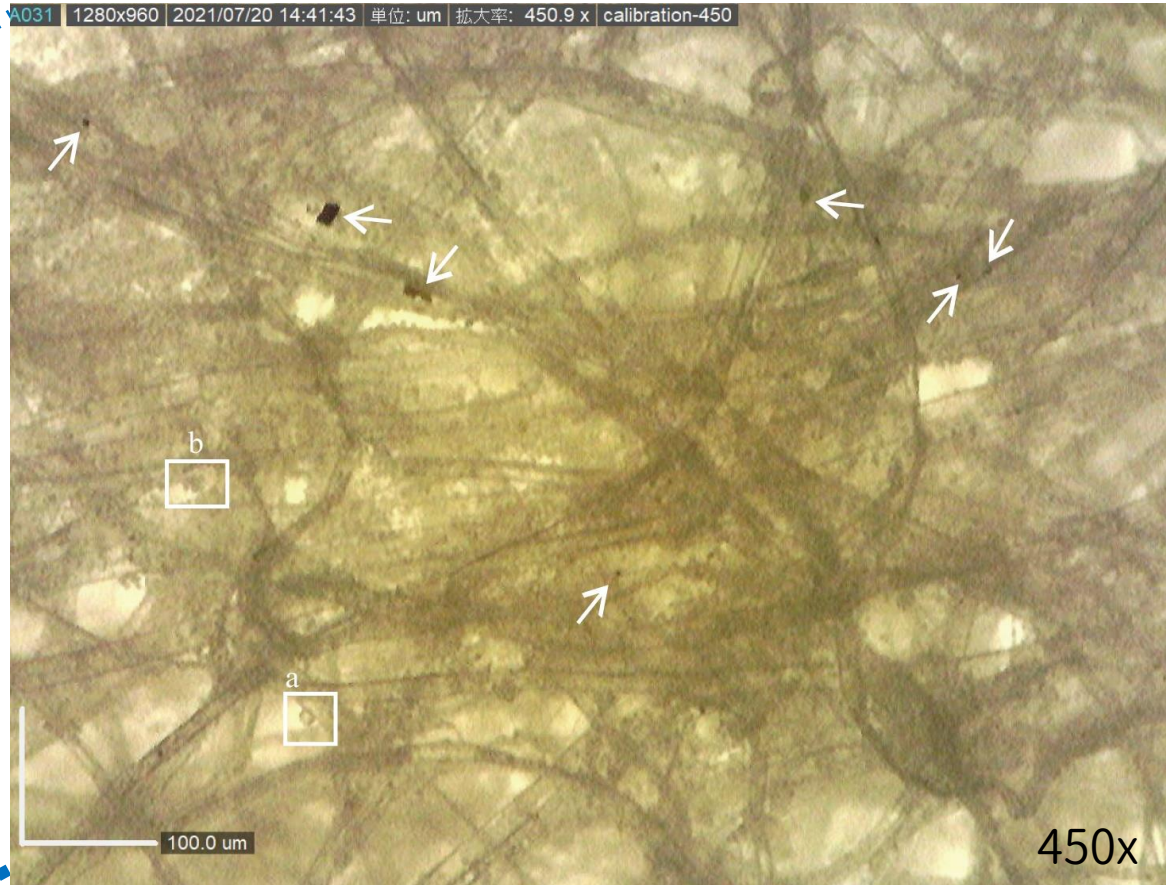
Shibutani is a starch scientist



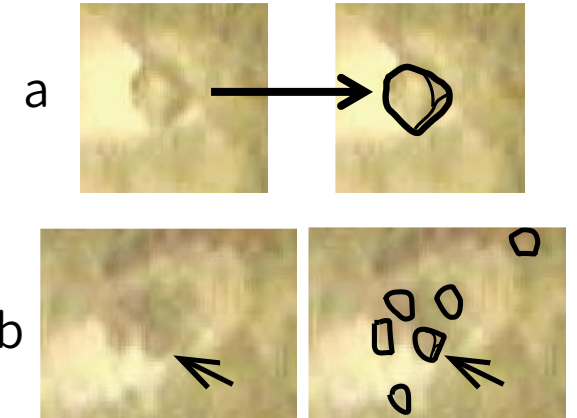
backside



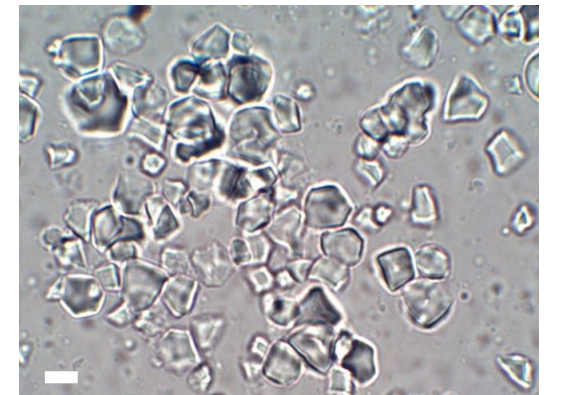
籾杓
Sugeta



Rice starch granules



Modern rice starch

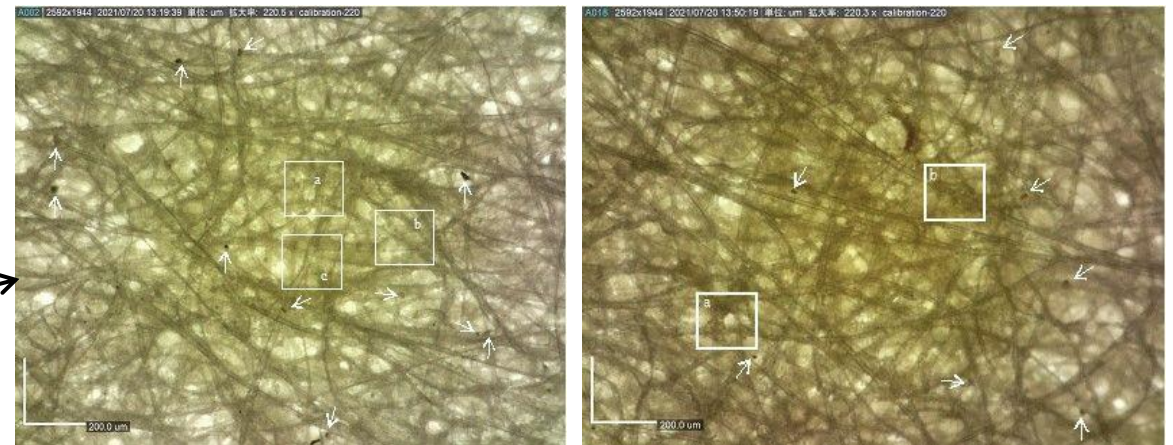
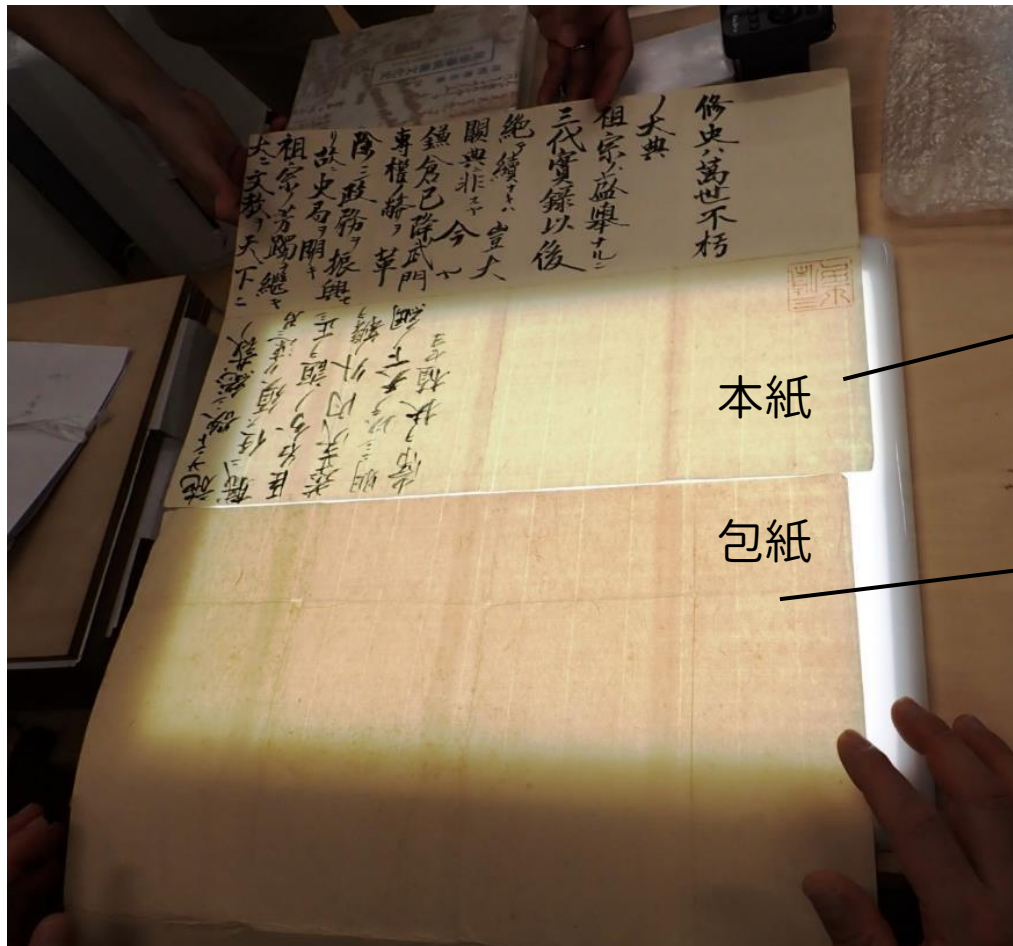


- 129 rice starch granules and 7 plant tissue fragments (white arrow) in this image
- Rice powder accumulated in the centre of the paper

The same single sheet of paper 同じ1枚の紙

Sunome 簀目 was connected the main paper and wrapping paper

Quite similar components



Cut from the same single sheet of paper
✓ The same paper is used for the main paper and the wrapping paper

FT-IR analysis of papers 紙サンプルのFT-IR分析

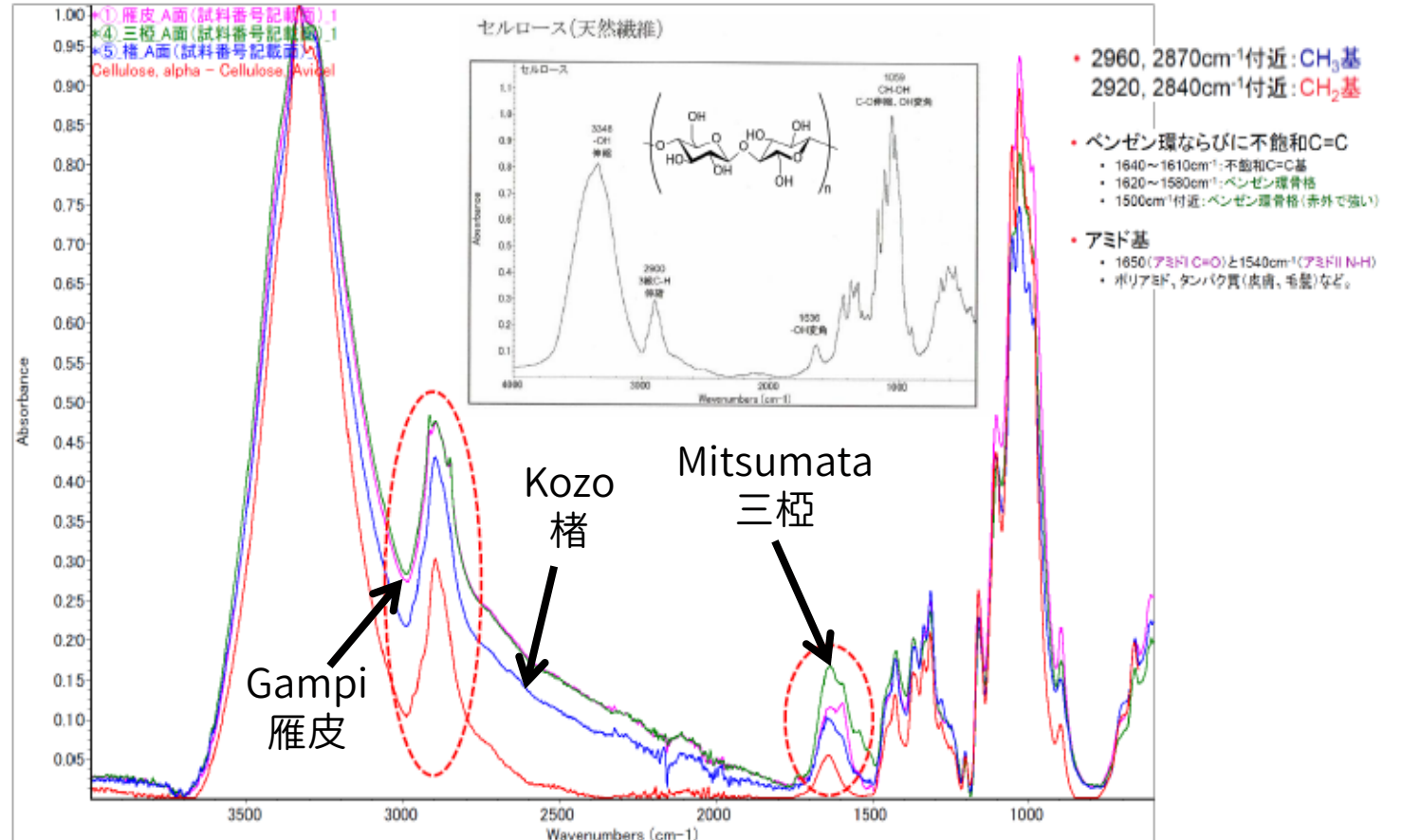
Gampi 雁皮



Kozo 楮



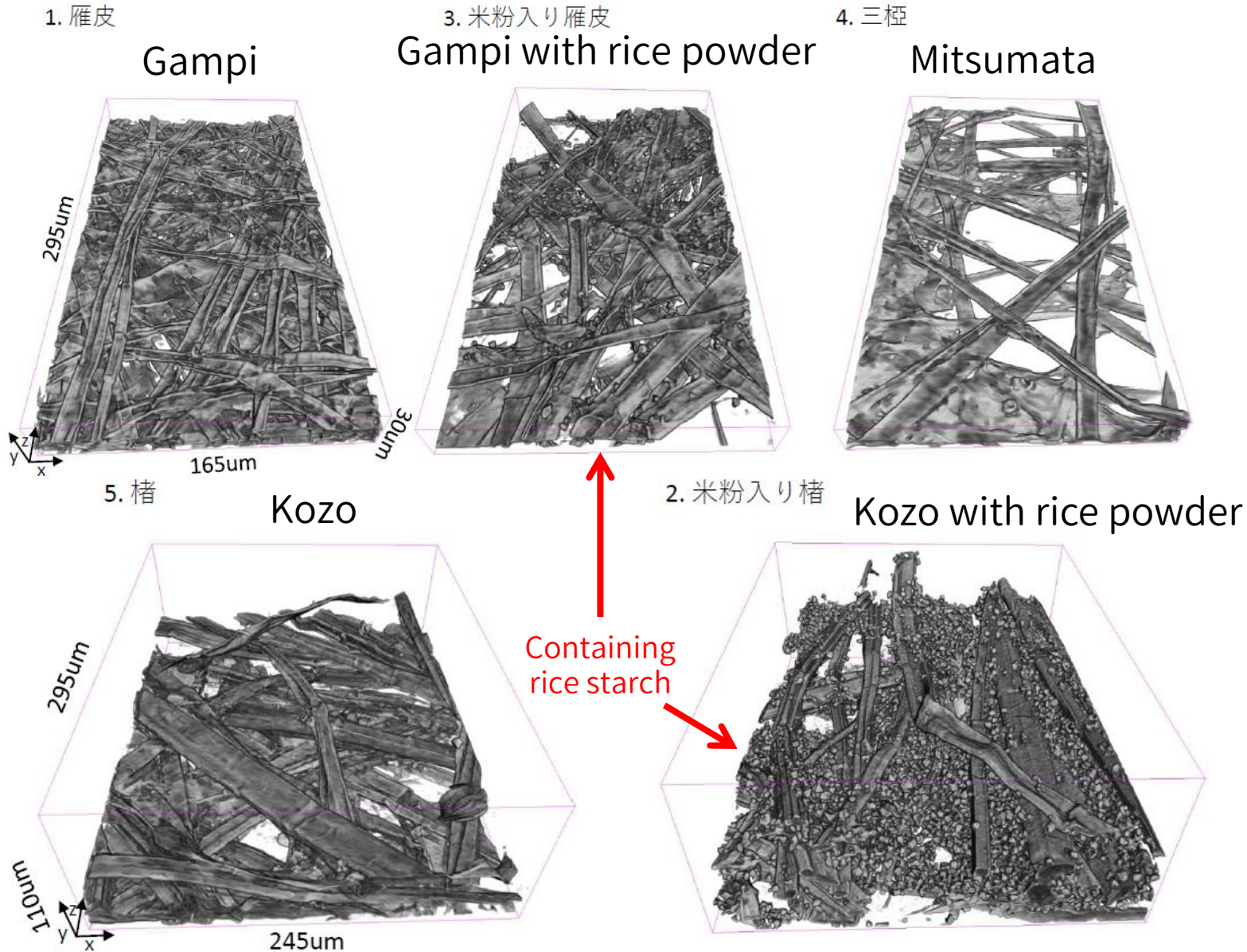
Mitsumata 三桠



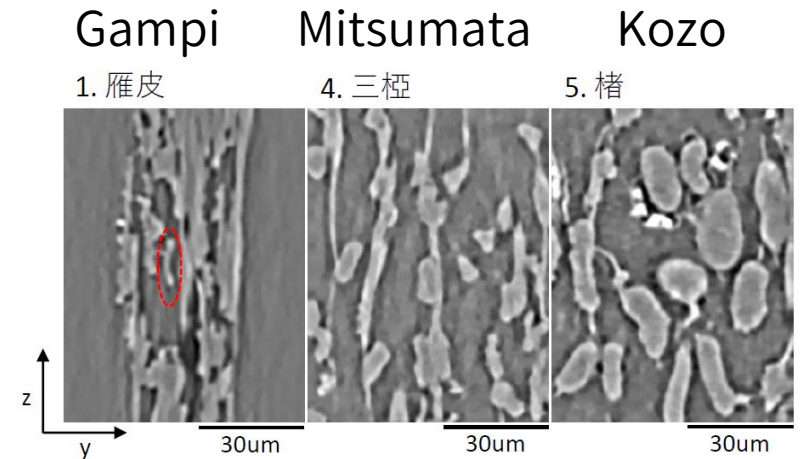
Courtesy by M. Ishida

Non-destructive examination

Paper fibres by X-ray CT X線CTで紙の繊維を見る



Non-destructive examination



Courtesy by Y. Niwa & T. Ishii

FT-IR result of paper piece 修理紙片のFT-IR分析

Nakanoin Ipponki 中院一品記

Kozo paper

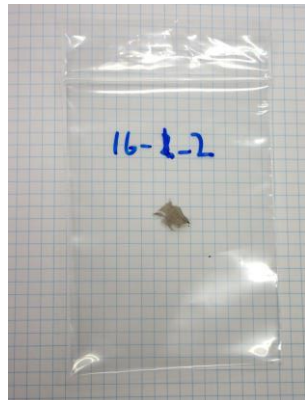


中院家史料 (S0073-14-2)

Permalink <https://cliomg.hi.u-tokyo.ac.jp/viewer/image/ldata/000/0073/14/2/00000002.jpg>

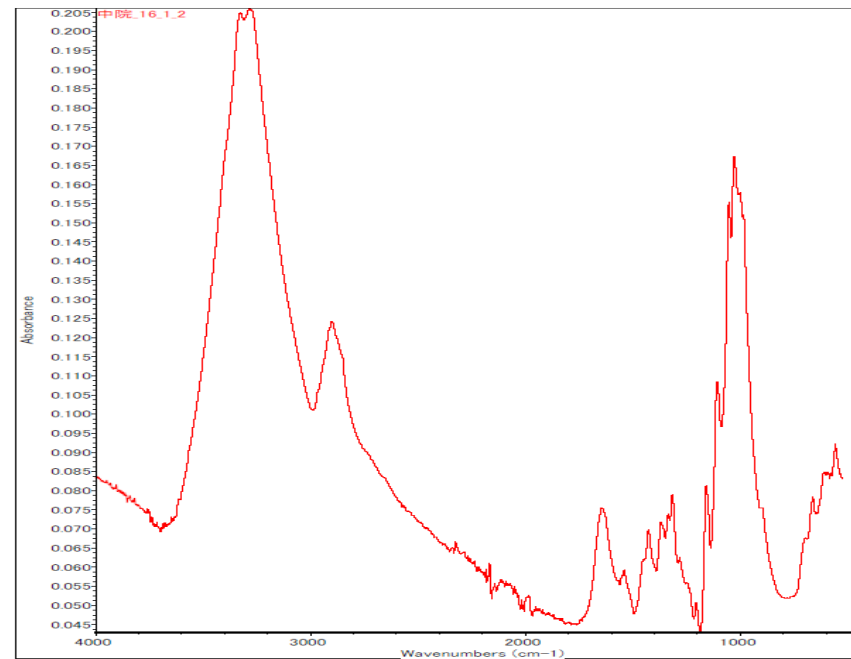
タグ BD2016-012801-00000002.jpg

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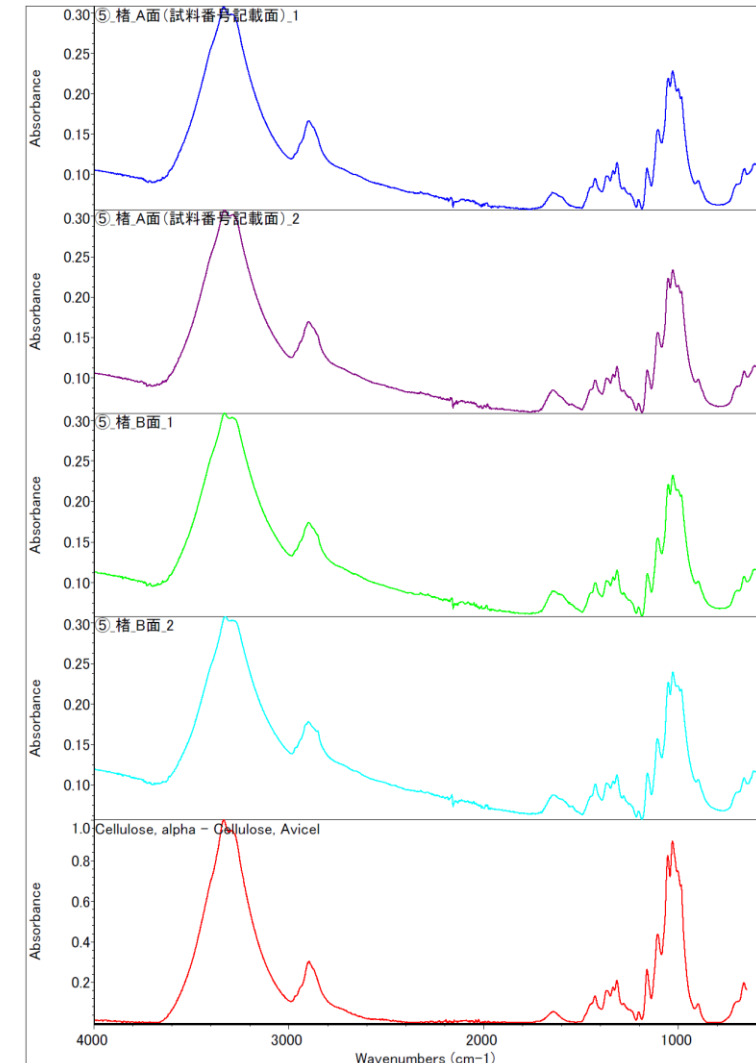


Shukushi 宿紙
(recycled paper)

FT-IR of the piece



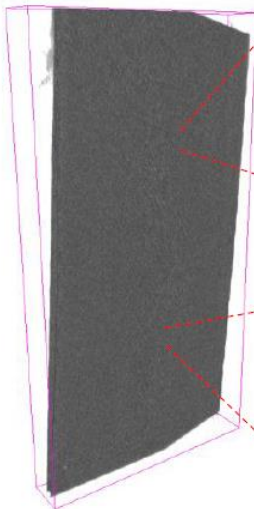
Not any damage



X-ray CT analysis of paper piece 修理紙片のX線CT

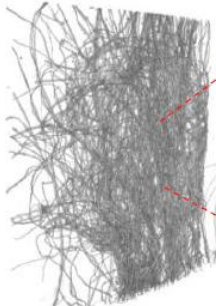
Whole Image
(vision 16000 μ m)

aA.



Wide-field
(vision 2800 μ m)

bB.



cC.



High magnification
(vision 500 μ m)

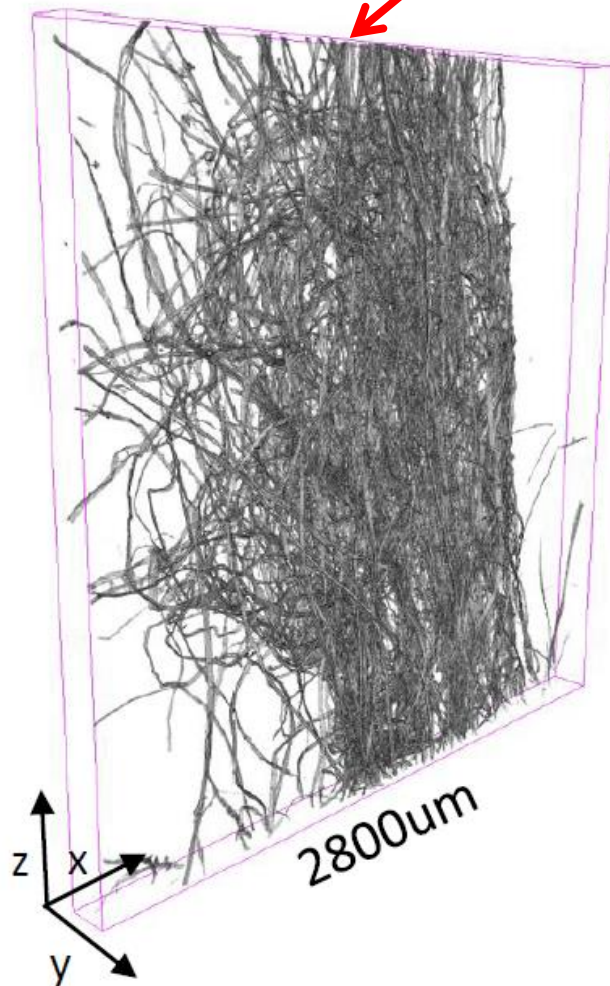
dD.



eE.

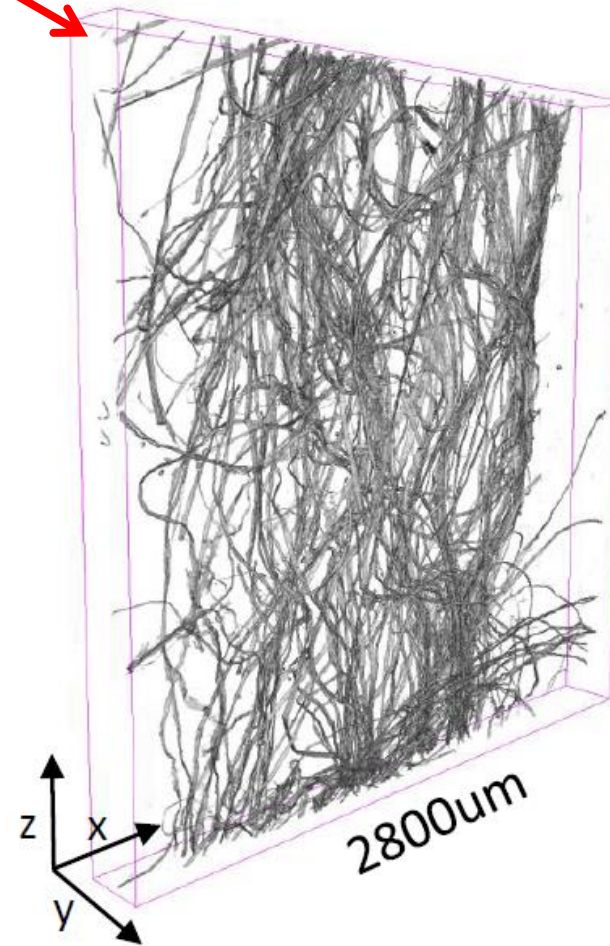


bB



Containing
rice starch

cC



Not any damage

Courtesy by Y. Niwa & T. Ishii

The last topic 最後のお話

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Move to next



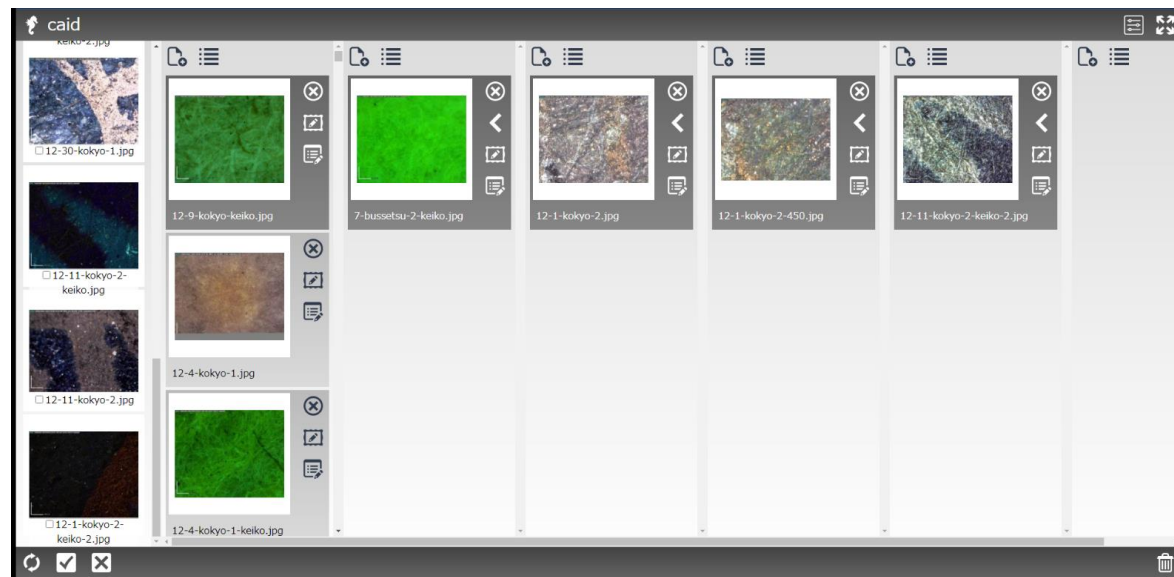
Developed a management tool ツール作りしました

Recording Images

Analysing Images



Survey



Sharing Image Data

Connecting to Info.
Infrastructure

(Shibutani, et al. 2022;
Nakamura 2023)

‘classification and annotation
for image data (caid)’

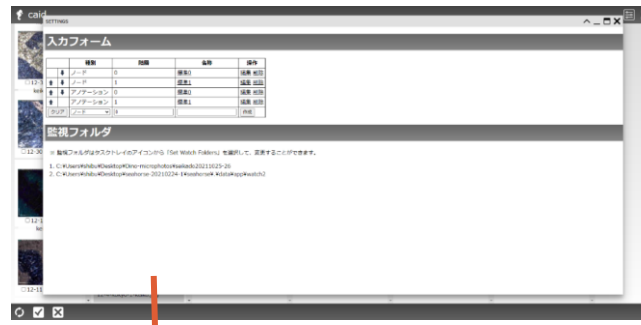


Data management by caid caidによるデータ管理

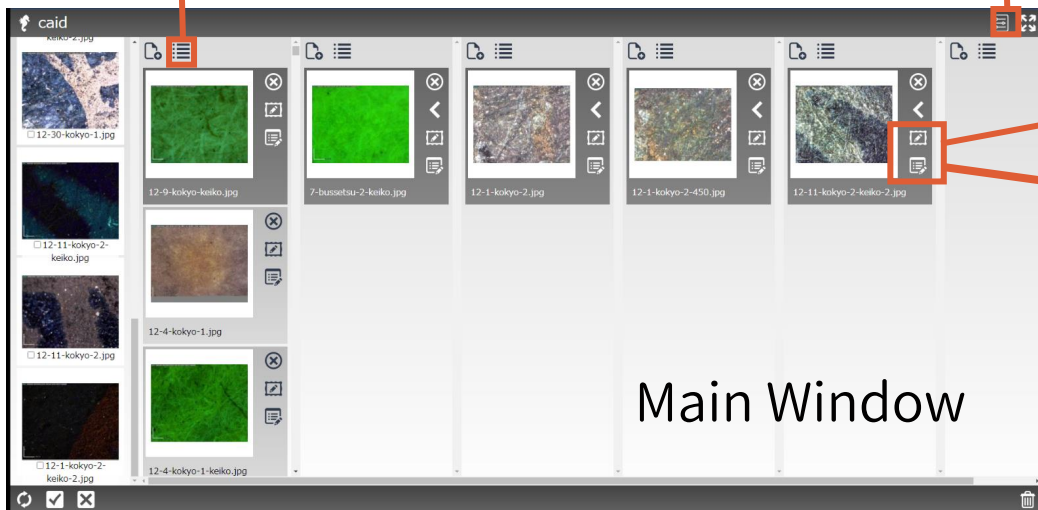
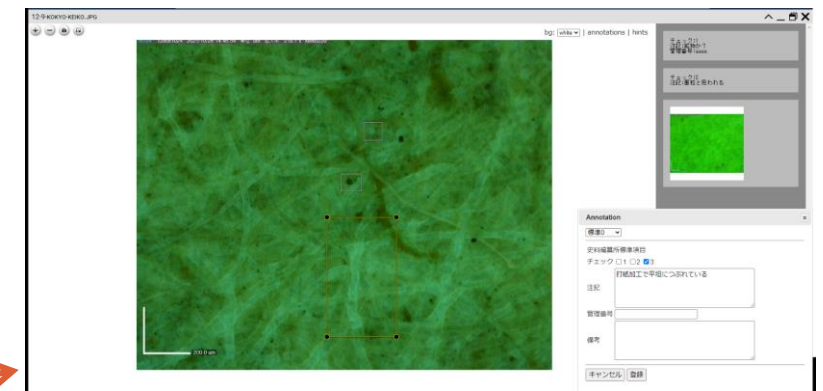
Image Data List

Image	Title	史料名	管理番号	注記	点数	所属者	撮影撮影年月日	撮影装置・セット	撮影場所	備考
	yonata_1.jpg									
	matsunoo-94takaiji-6-keiko.jpg	足利義氏書状	目録番号94	220巻・筆光	1	松尾大社	20211020	Dino-Life Premier M Fluorescence (紫外) TCFVW 顕微鏡用紫外光透視度セット	一紙左から7cm, 下から11.7cm	
	matsunoo-94takaiji-6.jpg	足利義氏書状	目録番号94	220巻・透透光	1	松尾大社	20211020	Dino-lifeR&D (研究開発) セット 顕微鏡用紫外光透視度セット	一紙左から7cm, 下から11.7cm	
	matsunoo-94takaiji-5-keiko.jpg	足利義氏書状	目録番号94	220巻・筆光	1	松尾大社	20211020	Dino-Life Premier M Fluorescence (紫外) TCFVW 顕微鏡用紫外光透視度セット	一紙左から7cm, 上から11cm	
	matsunoo-94takaiji-5.jpg	足利義氏書状	目録番号94	220巻・透透光	1	松尾大社	20211020	Dino-lifeR&D (研究開発) セット 顕微鏡用紫外光透視度セット	一紙左から7cm, 上から11cm	

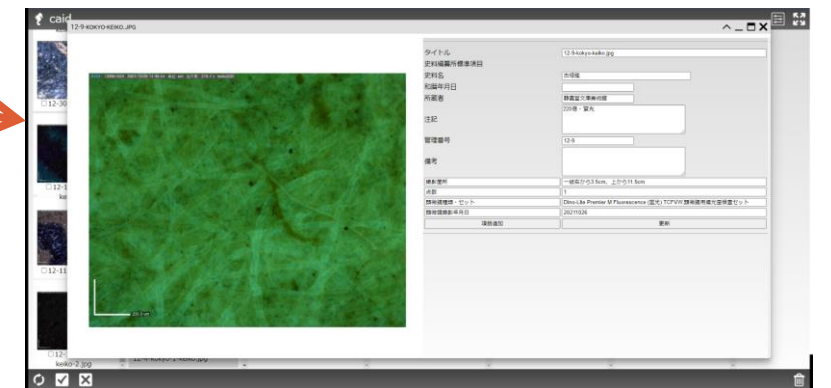
Setting Form



Annotation Window

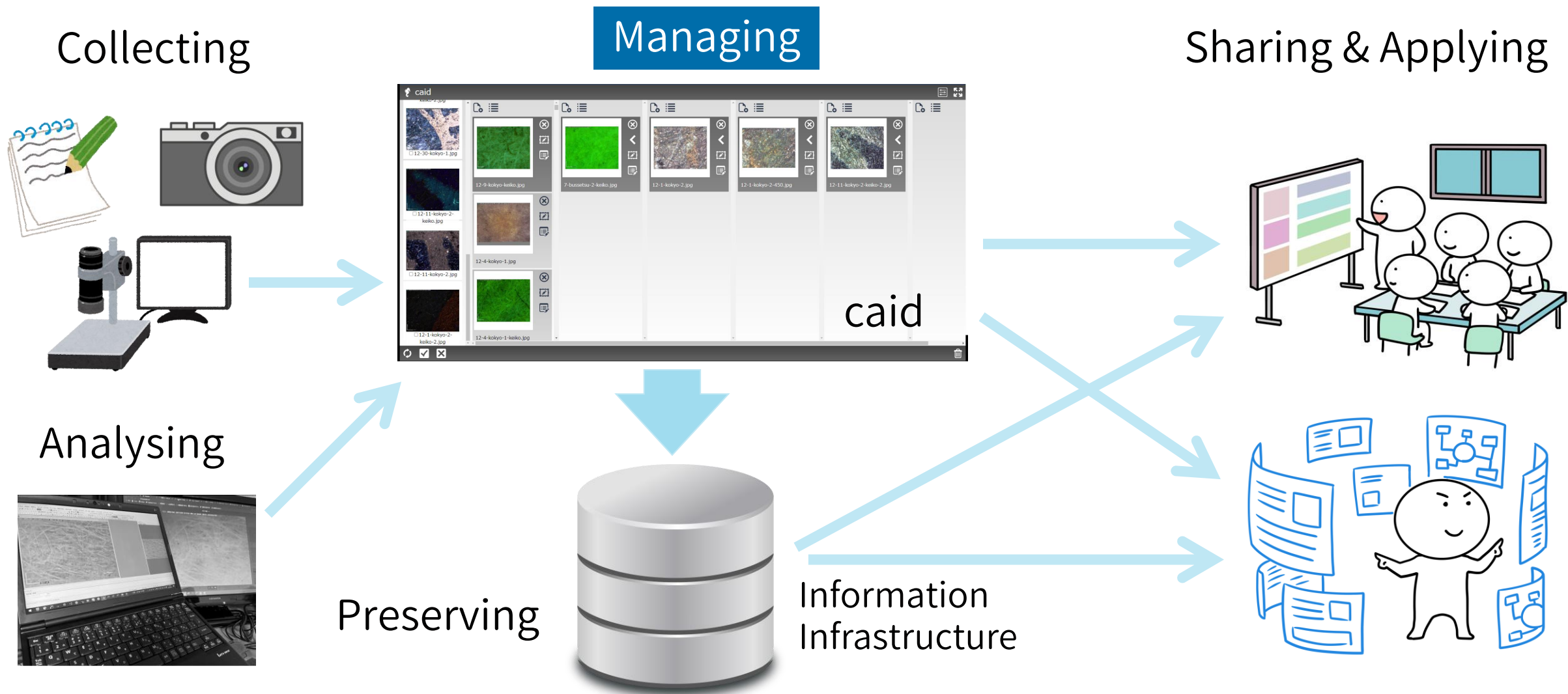


Main Window



Node Window

Share & apply data データの共有・活用できます

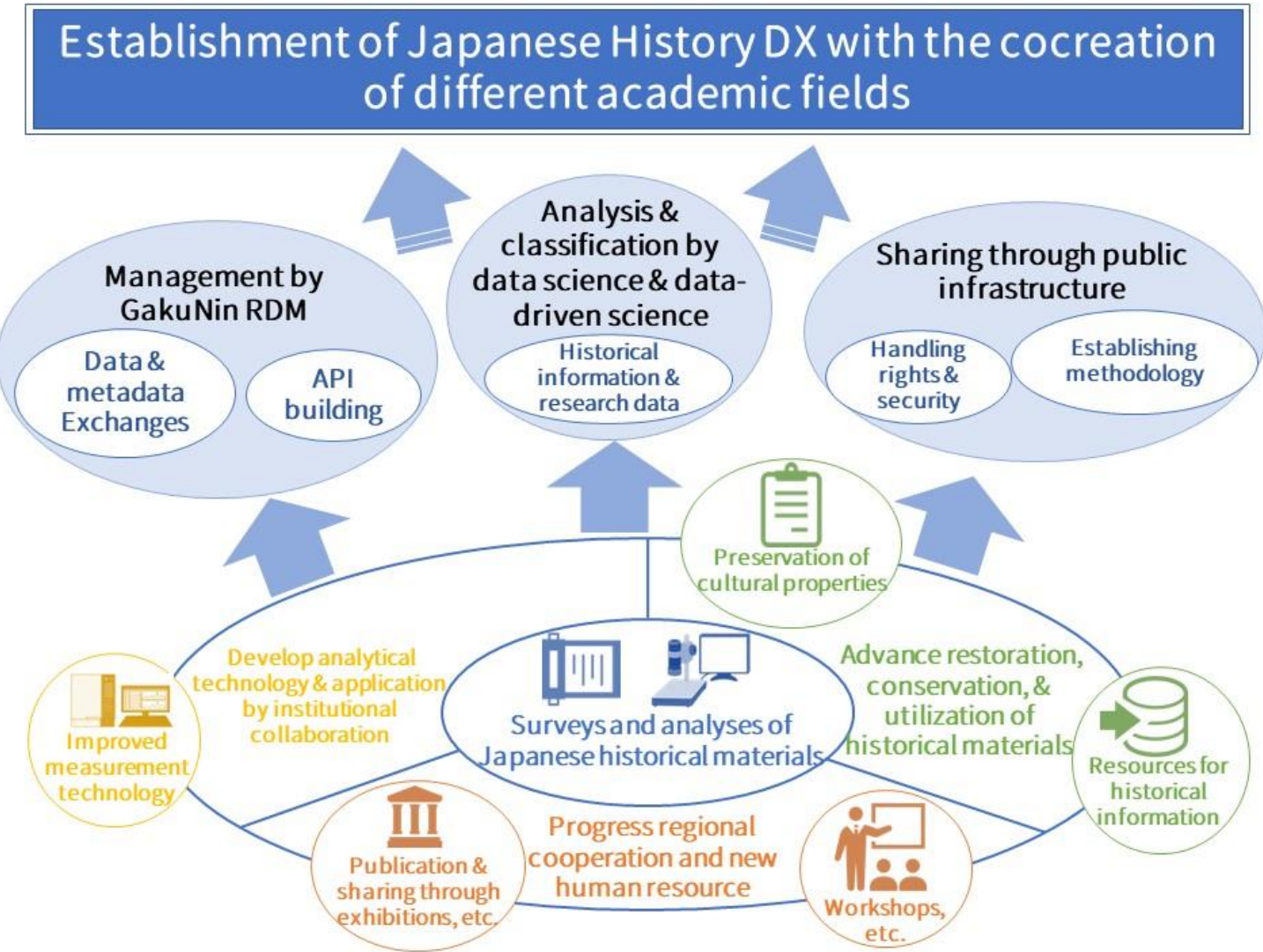


(Shibutani, et al. 2022; Nakamura 2023)

Conduct Japanese History DX 史料学DXやっています

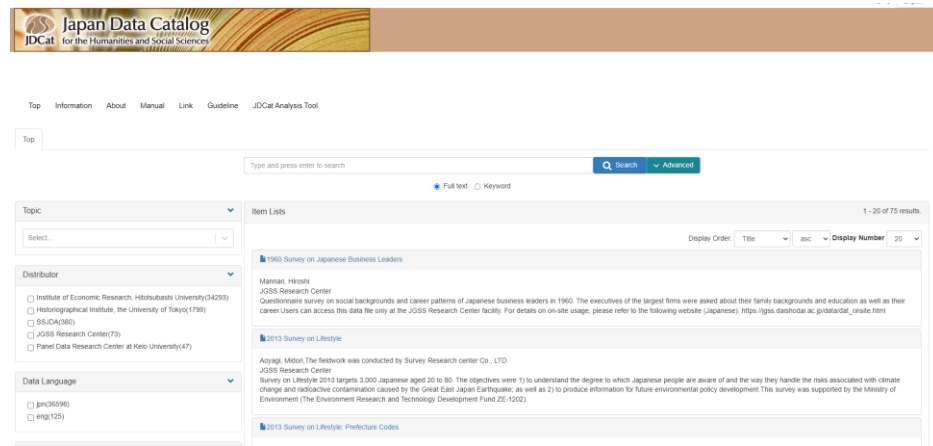
Offering a model of Japanese history DX through data-driven science to analyse morphological data from papers of historical materials

More info. (in Japanese)
https://www.nii.ac.jp/creded/nii_ac_jp_creded.html



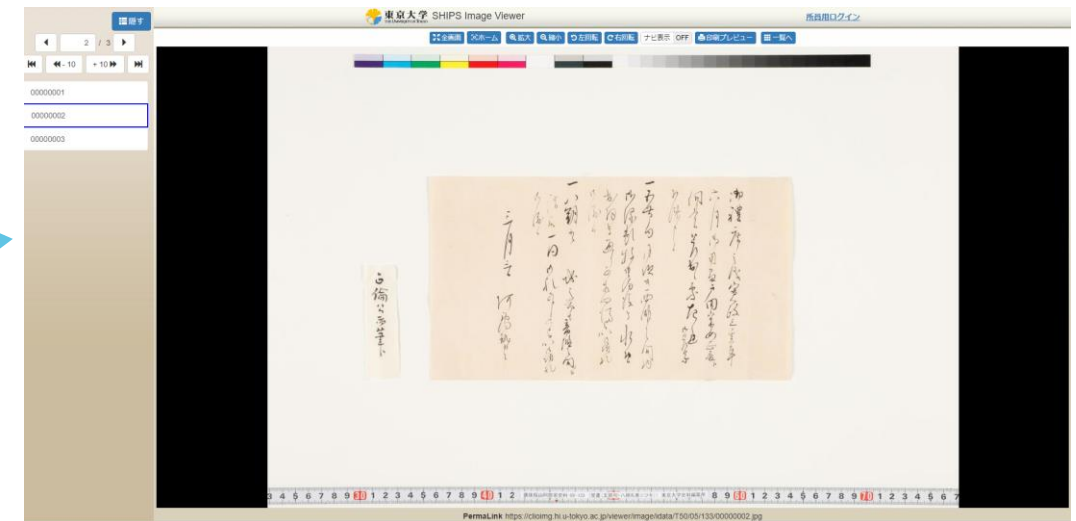
Updated our data to JDCat JDCatへ搭載が進みました

JDCat (<https://jdcatalog.jp/>)



HI did

- ✓ The interpretation of each item in the JDCat metadata schema
- ✓ Information on text specific to humanities data
- ✓ Methods for describing geographic and temporal ranges



Materials of the Bingo-Fukuyama Han Abe-ke

SHIPS Image Viewer

Promoting DB English translation 英訳進んでます

Summary database of the *Ishin Shiryo*

DB screen

Summary database of the Ishin Shiryo

Database > Summary database of the Ishin Shiryo

Keyword(s)

Advanced Search

Name Official Position Place Name

Subject

Date (Japanese Calendar)

Please enter a Japanese calendar date. (E.g. 文久2)

Year Leap Month Day

or ~

Year Leap Month Day

Source

Search Clear Search History

About This Database

Summary database of the Ishin Shiryo

The book data of the book "Dai Nippon Restoration Historical Materials" (Reconstruction Historical Materials Secretariat, approx. 4200 volumes) is registered. Although it was completed in 1994, we will continue to add data related to the study of political history during the end of the Edo period. Already, the data of "Fukkoki" (already published, 15 volumes in total) is available (select "01" in the [Source] menu of the search screen). In addition, each outline data of the "Recovery History Document Summary" is linked to the digital image data of the "Dai Nippon Restoration History Manuscript".

About Database User Policy Database Update Schedule FAQ

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Keyword "perry" → Select No. 10

Summary database of the Ishin Shiryo

Database > Summary database of the Ishin Shiryo > Search List > Search Detail

Previous Next List

Records 10 of 63

[Source] 維新史料綱要

[Hen / Volume / Page] 1巻 417頁

[Date (Japanese Calendar)] 嘉永6年6月3日(18530060030)

[Kōyō Entry] Matthew Calbraith Perry, commander of the US East India Squadron, comes to Uruga with the flagship USS Susquehanna, as well as the USS Mississippi, USS Plymouth, and USS Saratoga. Uruga bugyō kumiyoriki Nakajima Saburōsuke (Nagatane) and others inquire as to the Americans' intentions, inform them of the national law, and try to send them to Nagasaki, but Perry does not oblige.

[Kōyō Entry (Japanese)] 米國使節東印度艦隊司令長官海軍代将ペリー、旗艦サスクエハナに乗り、ミシシッピ・プリマス・サラトガを率い、浦賀に来る。奉行組与力中島三郎助「永瀬」等、米艦に就き来意を問ひ、且國法を諭し、長崎に到らしめんとす。ペリー、肯ぜず。

[Name] ペリー,中島三郎助,中島永瀬

[Official Position] 米國東印度艦隊司令長官,米國海軍代将,浦賀奉行組与力

[Place Name] 浦賀,長崎

[Subject] 米國使節,米國軍艦,サスクエハナ,ミシシッピ,プリマス,サラトガ,米国外交

[Note 1] 277/052

[Note 2] KA039-0637

Image Image

<https://wwwap.hi.u-tokyo.ac.jp/ships/w03-en/search>

Launched HI Lab HI Labはじめました

This may be fed back to archival data as research resources, thus achieving a distribution in which the archival data circulate that can advance the digital transformation of Japanese historical research



データセット

正保琉球国絵図データセット
正保琉球国絵図デジタルアーカイブの地名をまとめて利用するためのデータセットを公開しています。

くずし字データセット
東京大学史料編纂所が公開する史料画像データの中から、くずし字画像を切り出したデータセットを公開します。

『日本中世気象災害史年表稿』データセット
藤木久志 編『日本中世気象災害史年表稿』（高志書院、ISBN978-4-86215-031-8）に関するデータセットを公開しています。

For more info, visit our booth!



<https://lab.hi.u-tokyo.ac.jp/>

For happiness to all みんなの幸せのために



Science of Japanese historical materials

- ✓ Even non-destructive analyses can obtain information



Simple and inexpensive equipment to get information

- ✓ Anyone can investigate the materials
- ✓ Institution cooperation is also important



Apply quantitative analysis & international standard

- ✓ See my edited book and visit our booth!



Acknowledgements

- JSPS Grant-in-Aid for Scientific Research (A) (No. 19H00549, 20H00010, 20H00023, 23H00011)
- Program for Constructing Data Infrastructure for the Humanities and Social Sciences
- KEK International and Inter-institution Network for Accelerator Science to Next Generation (IINAS-NX)
- FY2023 Collaborative Research, Historiographical Institute, the University of Tokyo
- ‘Establishment of Japanese History DX with the cocreation of different academic fields’ by “Developing a Research Data Ecosystem for the Promotion of Data-Driven Science”
- The project of “The University of Tokyo Excellent Young Researcher”
- Project for the Creation of an International Hub for Ishin Shiryō Research
- Program for Constructing Data Infrastructure for the Humanities and Social Sciences