At home photography workstation for labels

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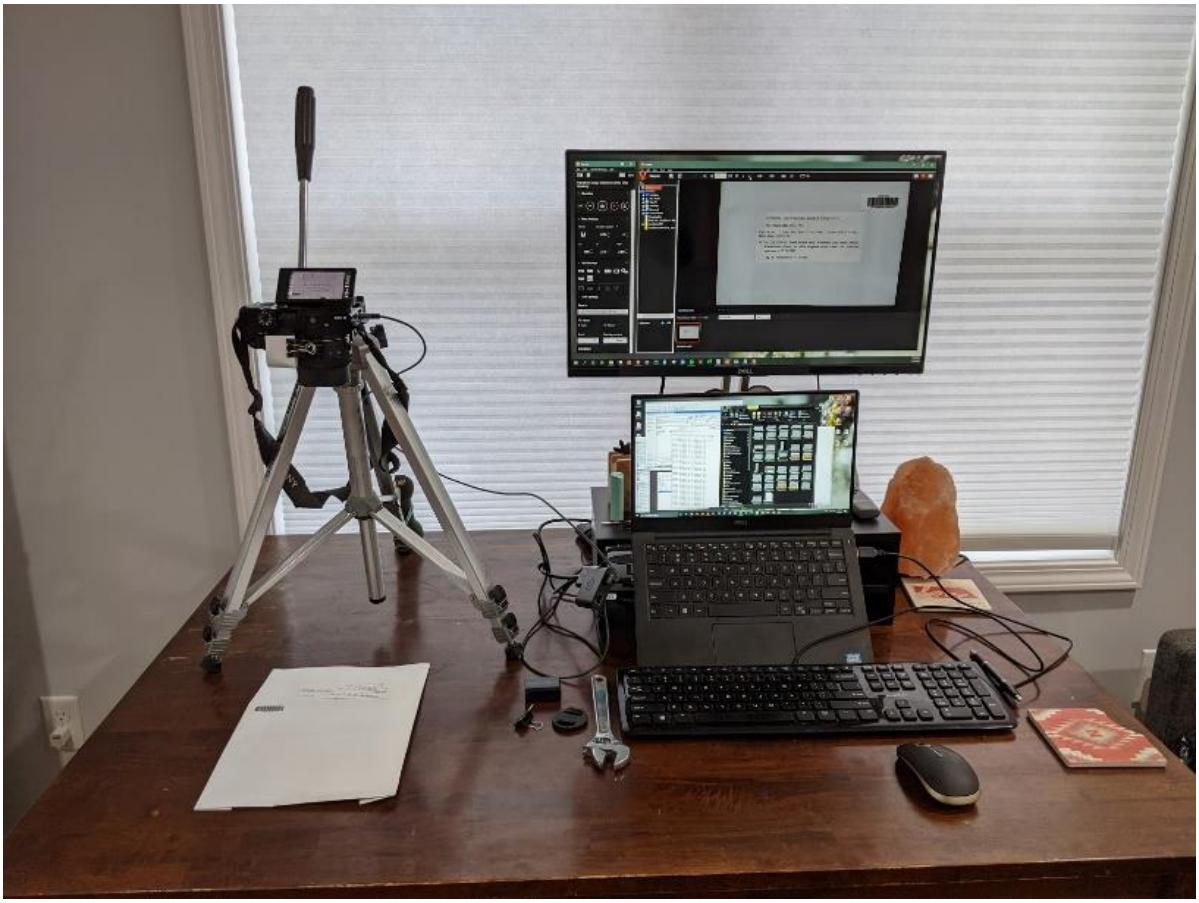
2 February 2021

The motivation behind this system was to develop a home imaging setup that is simple, has a small footprint, and is relatively inexpensive. I happen to own a mirrorless Sony digital camera and a tripod, so I didn't have to purchase any of the equipment. If you have access to a table, computer, camera, and tripod at home or work, you should be able to setup a similar home imaging station. Expect to do some research and testing. It took me a day to get the system up and running for testing. Of course, this also depends on if you can remove specimens from your collection.

All software is in this workflow is free. Sony Imaging Edge can be downloaded and used to capture, rotate, and crop images and then save them directly to your computer. There are probably similar programs for your specific camera and if not, you can save the images to an SD card, transfer them to your computer and then use GIMP. Immediately after getting the first raw image, I use the Barcode Renamer program to change the file name to the barcode. The BIMP plugin for GIMP is used to batch the color adjustment and compression of the images. BIMP can also batch rotate and crop. I tested optical character recognition (OCR) with the tesseract package in RStudio.



Camera

- Sony α6000 (ILCE-6000)
- Lens: Optical Steady Shot, E-mount (SELP1650)
    - Ø40.5
    - E 3.5-5.6/PZ 16-50 OSS
    - 0.25m/.92ft-0.30m/0.98ft

Software

- Sony Imaging Edge: Remote, Viewer, & Edit
- Barcode Renamer
- BIMP plugin for GIMP
- RStudio

Sony camera settings (Sony Remote software)

- Mode: M
- Shutter speed: 1/50
- F: 9
- ISO: 400
- Aspect ratio: 16:9
- Zoom: 38 (This depends on what you are trying to fit in the viewer)
- Flash on
- Save image as a jpeg
- Paper clipped over the flash to soften flash

Barcode Renamer

- https://help.lichenportal.org/index.php/en/resources-2/renaming-image-files-automatically/
- Used to rename all images by the barcode in the image
- Specimens that need two or more images (when an annotation label is in a different location on the packet) are renamed manually with "_a" at the end.

Photo editing (Sony Edit software)

- Crop: 5:4 aspect ratio for normal-sized loose packets
- Crop: 16:9 for oversized packets
- Custom crop if all the information cannot fit in 5:4 or 16:9 (annotation labels and specimens that have too much information to fit)

BIMP in GIMP batch photo processing

- Sharpen
    - -70 (sharper)
- Batch color adjustment
    - Brightness: 0.22 (This depends on the brightness of the photo shoot batch)
    - Contrast: 0.44
    - Compression: 75% (reduces file size to

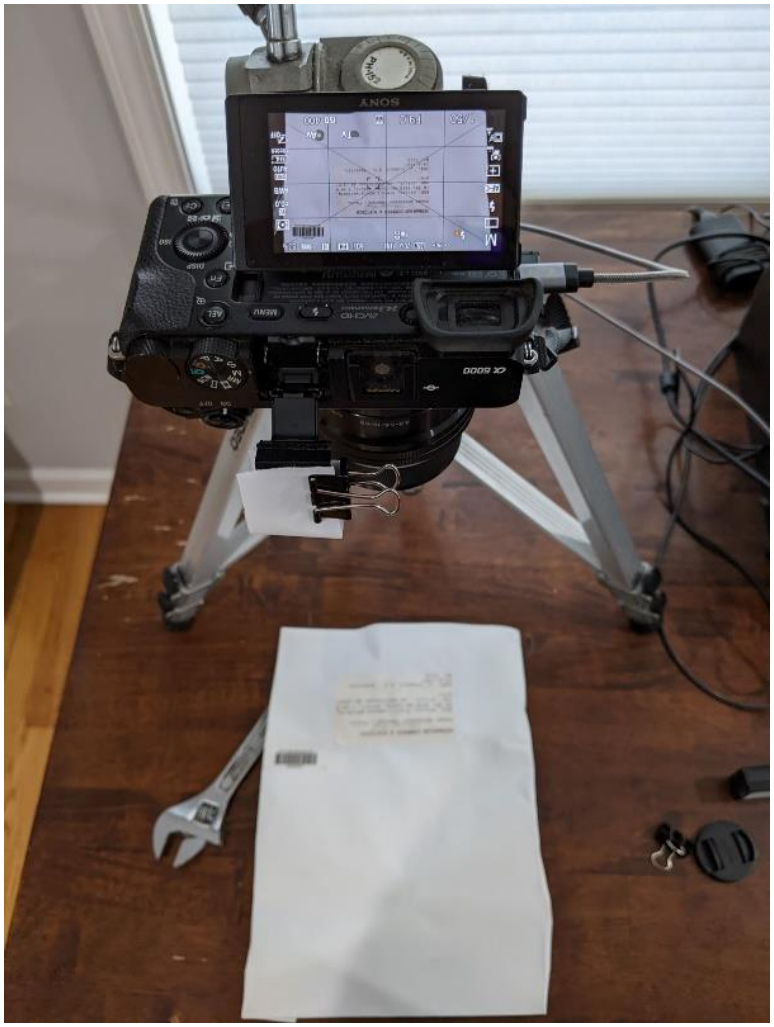
OCR (testing stage)

- Easy, but time-consuming way: Import to google drive. right-click jpeg in the Drive folder and open it with Google Docs. Must do this manually for each image.
- More technical, but faster: R tesseract script generates text files for each image automatically.

```
#  library(tesseract)
#
#  images <- list.files(path = "./", pattern = "*.JPG", full.names = TRUE, recursive = FALSE)
#  for (i in images){
#  textfile <- paste(i, ".txt", sep = "")
#  text <- ocr(i)
#  writeLines(text = text, con = textfile)
#  }
```

Field Museum Image Upload

Upload to: alliance.fm.pri\Imaging_Scratch\Botany

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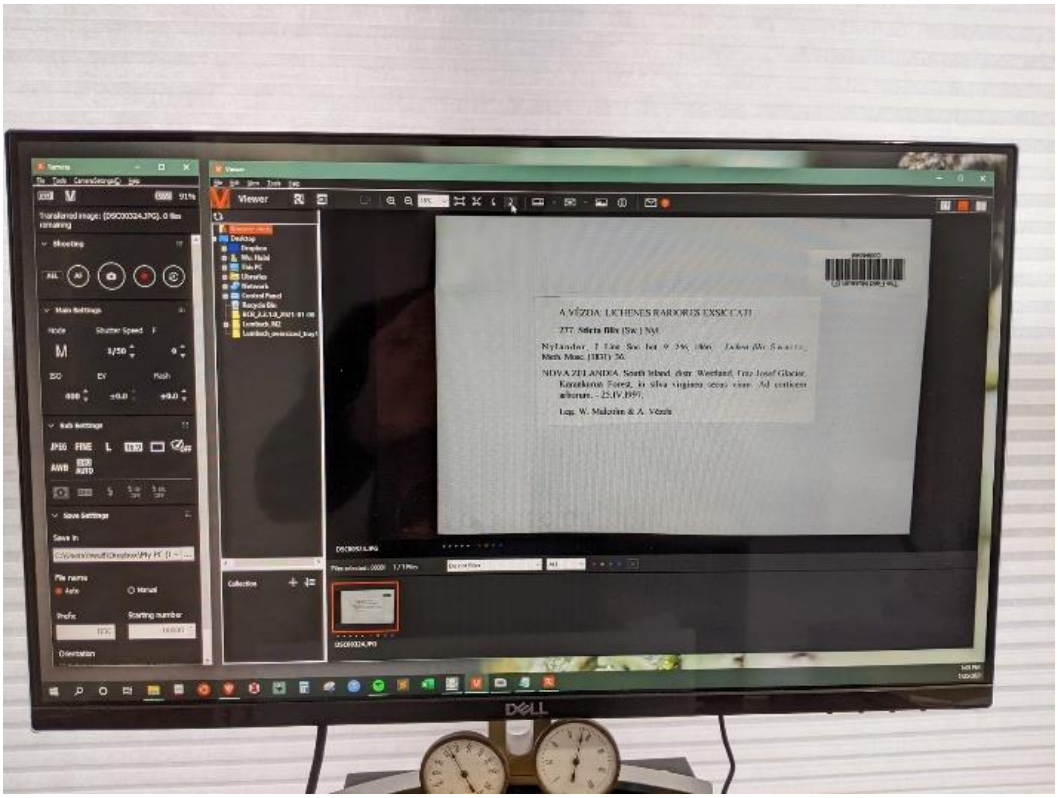
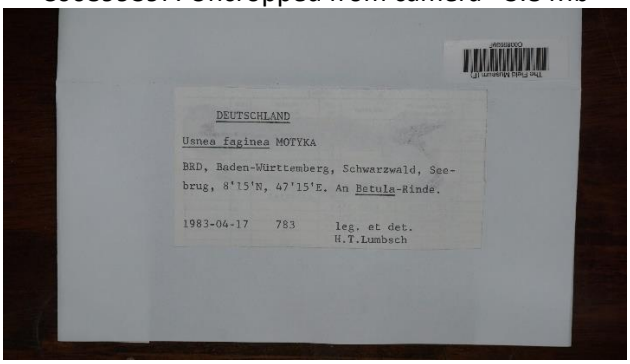
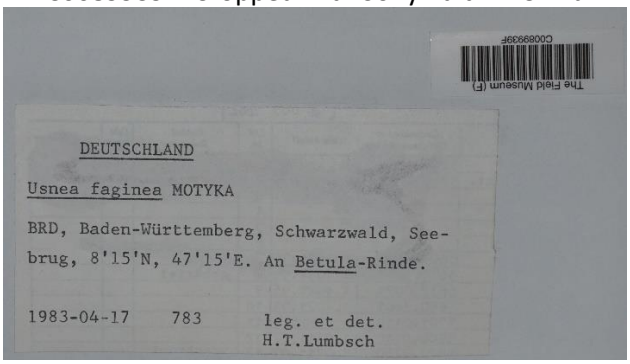

Viewer
A VÉZDA: LICHENES RARIORES EXSICCATI
DELL

Following a label image from raw to fully processed

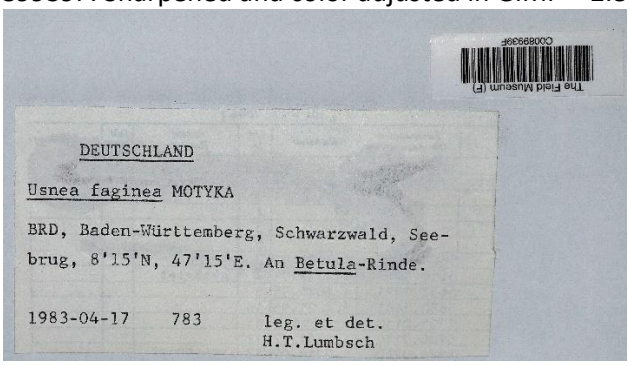
C0089939F: Uncropped from camera - 3.8 Mb



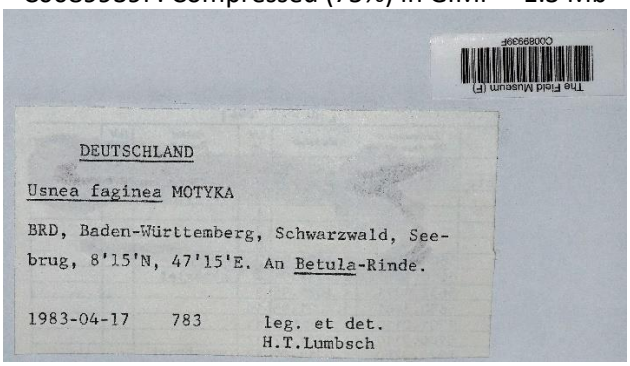
C0089939F: Cropped with Sony Edit – 4.3 Mb



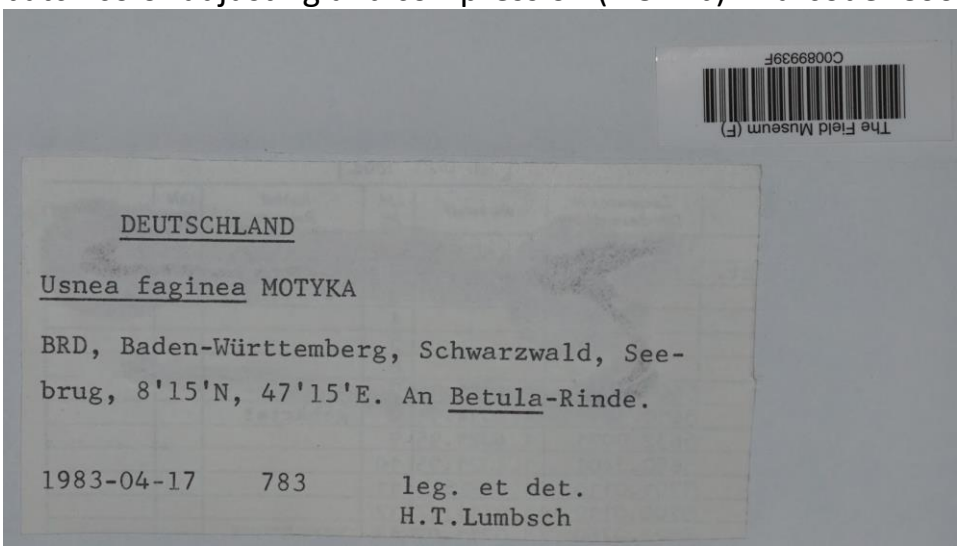
C0089939F: Sharpened and color adjusted in GIMP – 2.8 Mb



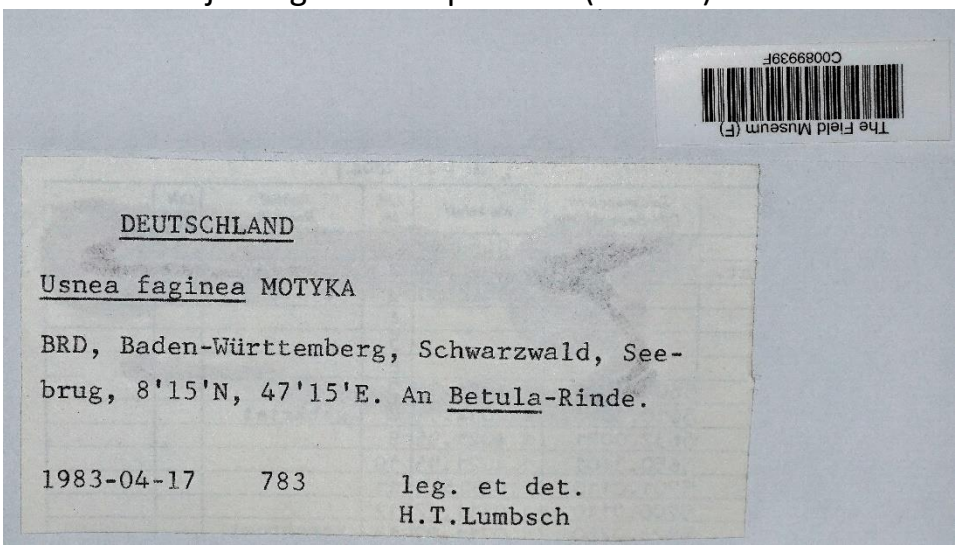
C0089939F: Compressed (75%) in GIMP – 1.3 Mb



Before batch color adjusting and compression (4.3 Mb) - Barcode: C0089939F



After batch color adjusting and compression (1.3 Mb) - Barcode: C0089939F

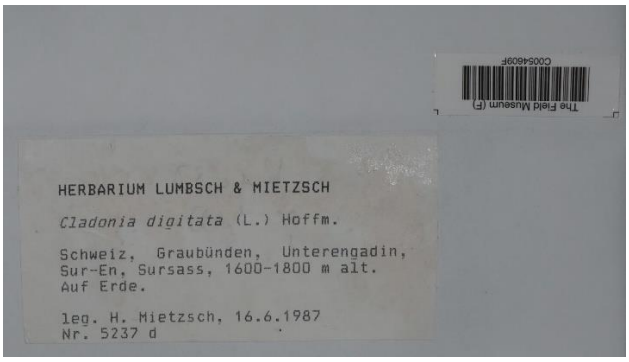


Tesseract OCR result generated from final processed image copied and pasted from text file

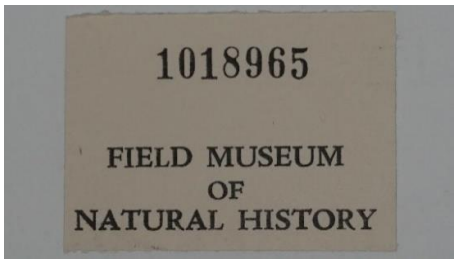
1. C0089939F main label

i iN
wun
DEUTSCHLAND | | “ |
| Usnea faginea MOTYKA — ss |
BRD, Baden-Wiirttemberg, Schwarzwald, See-)
| brug, 8'15'N, 47'15'E, An Betula-Rind&
1983-04-17 783 leg. et det.
| | | H.T.Lumbsch

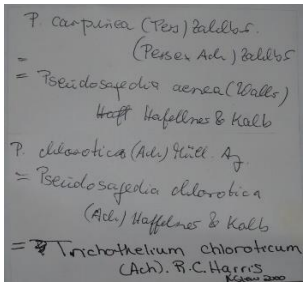
Before - Barcode: C0054609F with _a and _b accompanying photos



3.1 Mb

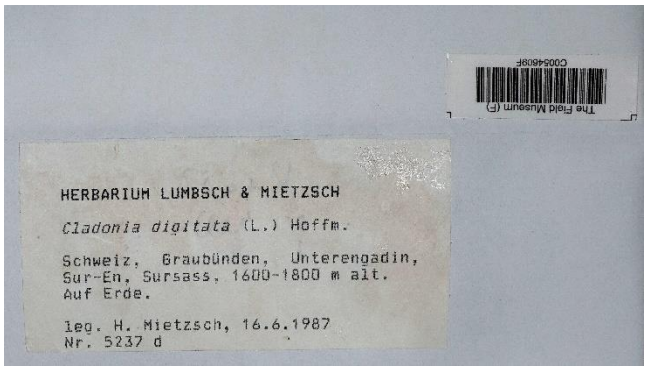


1.3 Mb



3.4 Mb

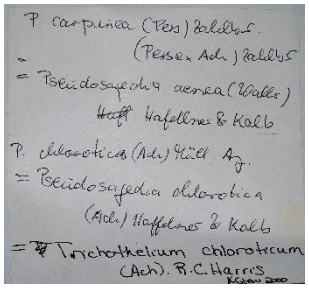
After - Barcode: C0054609F with _a and _b accompanying photos



1.4 Mb



0.6 Mb



1.6 Mb

Tesseract OCR result generated from final processed image copied and pasted from text file

1. C0054609F main label

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«HERBARIUM LUMBSCH & MIETZSCH ™ a
 €ladania digitata (L.) Hotfm. | |
| Schweiz, Graublinden, Unterengadin, ©
Sur-En, Sursass, 1600-1800 m alt. |
| Auf Erde. | | |
«leg. H. Mietzsch, 16.6.1987
. Net, 2oee GS. : |
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2. C0054609F_a

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1018965
\ FIELD MUSEUM
oe
NATURAL HISTORY _
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3. C0054609F_b

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T Campincr (eg) MelDlol
ae (Poser. Actes ) BbLboe
ae Teidlesaye oles veree( Walt )
& Kalb
?. hbssolica (Ate) Ue 4
Beccole SCO vo ah Ion ee
ie Ack.) Wollelews & Koll
= 3 \nchoMelrum Chiorolrcum
CAdn). 8 -C. Wares
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