The book herbaria of Jacob Breyne (1637–1697) in the collection of Naturalis Biodiversity Center (Leiden, the Netherlands)

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Abstract  Historic herbaria can provide a wealth of information on a diversity of topics, including the past occurrence of plants, their abundance, names and uses. However, 16th and 17th century herbaria are rare and very fragile, and can best be studied after digitization. The collection of Naturalis Biodiversity Center in Leiden, the Netherlands, contains two book herbaria by Jacob Breyne (1637–1697) of Danzig (presently Gdańsk, Poland). These herbaria, dated 1659 and 1673, contain a total of 105 specimens in various states of intactness, and with or without original labels. The identity of the specimens in the Leiden Breyne herbaria was not completely assessed previously. Here we discuss the taxa represented within these two historic herbaria as well as the information contained in the handwritten texts within them. The two Breyne herbaria combined were found to contain 62 species, representing 24 plant families. Both herbaria contain several species now rare around Gdańsk, including two species currently considered regionally extinct (Swertia perennis (Gentianaceae) and Dactylorhiza viridis (Orchidaceae)). Labels with the specimens give a range of information on the collecting locations, ecology, abundance and/or use of the species. The Leiden Breyne herbaria reveal changes in the flora of northern Poland over the course of three centuries, as well as pre-Linnean nomenclature, historic uses of plants and international correspondence between scientists.

INTRODUCTION

Historic herbaria are an important source of knowledge about the history of botany, and science in general. They can provide examples of pre-Linnean nomenclature and systematics (Spalik 2014, Pulvirenti et al. 2015, Costa et al. 2018, 2020), give indications on the uses of plants in the past (Van Andel & Barth 2018) and provide evidence for the historical occurrence of species in a certain area (Santos-Guerra et al. 2011, Pulvirenti et al. 2017, Stefanaki et al. 2018). Furthermore, these collections of dried plants can provide indications about international relations and communication among scientists at the time of their production (Thijssse 2016, Offerhaus et al. 2020). They are a part of the cultural heritage of the places where the plants were collected, and as such should be made accessible to the people of these regions (Van Andel 2017). However, since they are rare and very fragile, they can best be studied using digital images.

The collection of Naturalis Biodiversity Center (NBC, Leiden, The Netherlands) contains two book herbaria made by Jacob Breyne (1637–1697). Breyne was born and raised in Danzig, Prussia (now Gdańsk, Poland), where his father ran a business trading raw materials for paint and medicine production, mainly Polish cochineal: a dye derived from a scale insect feeding on the roots of Scleranthus perennis L. (Caryophyllaceae) (Van Ooststroom 1942, Pękacka-Falkowska 2018, Fleischer 2019, 2020). From an early age he was interested in natural history, received lessons in botany, and took regular trips in the Danzig countryside (Fleischer 2019). Moreover, the Breyne family owned a house and garden along the river Motława, including a collection of exotic plants.

In 1653, Breyne visited the Dutch Republic, to be trained as a merchant by his uncle Pieter Breyne. While there, he visited several gardens, among which were the botanical gardens of Leiden and Amsterdam, and Lockhorst, the house and garden of Hiëronymus van Berverning, a politician and patron of botanists such as Paul Hermann (Van Andel & Barth 2018), and he studied botany at Leiden University (Fleischer 2019). Jacob wanted to continue his studies at the Leiden medical faculty, but was called home to take on the family business after his father’s death. Years later, he was offered the position of professor of Botany at Leiden University, but Breyne declined, and the position was later filled by Paul Hermann (Van Ooststroom 1942, Fleischer 2020).

Back in Danzig, Breyne continued botanizing locally, as well as corresponding with other botanists worldwide. He used his Dutch connections to contact people working for the Dutch East India Company (Vereenigde Oostindische Compagnie, VOC), and thus gain access to plants, seeds, bulbs and dried specimens from Asia and the Cape of Good Hope (Gunn & Codd 1981, Pękacka-Falkowska 2018, Fleischer 2019, 2020).
Breyne published two major works on (mainly exotic) plants: *Exoticarum aliarumque minus cognitarum plantarum centuria prima* (Breyne 1674–1678; known for short as the *Centuria*) and *Prodromus fasciculi rariorum plantarum I & II* (Breyne 1680–1689; *Prodromus*), which he printed himself. He planned on publishing works on local plants, entitled *Phytotutic* and *Viridarius* and *Viridario Borussico* (Pękacka-Falkowska 2018, 2021), but never finished them. His manuscripts on Prussian plants were later used by Gottfried Reyger, who wrote his *Tentamen Florae Gedanensis Methodo Sexuali Accomdatae* (Reyger 1764) on the flora of the area around Danzig (Pękacka-Falkowska 2018).

Jacob Breyne is remembered in botany today for several things: he was one of the first Europeans to describe the tea plant (*Camellia sinensis* (L.) Kuntze, *Theaceae*), based on a description (and possibly dried plant parts) sent to him by Willem ten Rhyne (1649–1700) from Dejima, Japan (Gunn & Codd 1981, Fleisher 2020). He also coined the name *Mesembrianthemum* for a genus of plants in the *Aizoaceae* family, after Breyne by Johann & in the *Phyllanthaceae* (Fleisher 2020). According to Gray (1880), Linnaeus adopted this name in his *Species Plantarum* (Linnaeus 1753), but misspelt it as *Mesembyranthemum*, which has become the official spelling. Finally, the genus *Breynia* J.Forst. & G.Forst. in the *Phyllanthaceae* was named after Breyne by Johann & George Forster (Forster 1776). Linnaeus also named a genus after Breyne (also called *Breyinia* (Linnaeus 1753) ), but this has been synonymized with *Morisonia* Plum. ex L. (*Capparaceae*).

The two Breyne herbaria at NBC contain a source of information which is, as of yet, largely unexploited. It can show developments in plant nomenclature, both on a longer and shorter time span. The labels written by Breyne contain one or several names by pre-Linnaean authors, such as Johann and Caspar Bauhin, Conrad Gesner and Mathias de 'l Obel, as well as some local vernacular names. Then there are the labels added to the 1659 herbarium by De Monchy, of the Rijksherbarium in Leiden (now part of NBC), in the early 20th century, and the article on the 1659 herbarium by Van Ooststroom (1942). These contain binomials in the Linnaean system. Furthermore, from Breyne’s descriptions, we can trace the locations where he collected his specimens, and then see whether these species still occur there. The landscape around Gdańsk is bound to have changed over the three-and-a-half centuries since Breyne collected his plants, due to the expansion of the city and other changes in land use and climate. Hence, plants which may have been common in Breyne’s days may now be very rare, or vice versa.

Breyne’s notes in the herbaria could also give some indications of how the plants he collected were used in his day. Living in an era before artificially synthesized medicine, and a trader in the raw materials for dyes and medicines himself, Breyne is likely to have been interested in the practical uses of plants. Finally, these herbaria are part of the cultural heritage of the area in which the plants were mostly collected (Pomerania province, northern Poland), but they have been stored away in the NBC ‘Rare Book Room’, not accessible to the public. This research will open up this piece of Polish heritage, by adding the plants’ details and digital images of the herbarium to the online Naturalis Biportal (biportal.naturalis.nl), where they can be easily and freely accessed.

While exploring the Breyne herbaria and their importance to science today, we wanted to answer the following questions:

- Which species are included in the two Breyne herbaria? To which extent do these represent European / Polish (Prussian) or exotic plants?
- Did Breyne use a particular arrangement in his herbaria (by family/rensemble, by location, alphabetically)?
- Do the accompanying descriptions and labels give indications of the plant uses, collecting locations and abundance, and do these species still occur around the same locations?
- To which extent are the represented species discussed in Breyne’s *Centuria* and Gottfried Reyger’s *Tentamen*?

**METHODS AND MATERIALS**

Both Breyne herbaria in the NBC collection have been digitized, and high-resolution images were used for the identification of plant specimens. These images are freely available through the Naturalis Biportal, and can be found by typing the associated barcode into the search field. When identification depended on details not visible on these images (e.g., hairs, small floral parts), then the herbarium specimens were physically examined under a stereo microscope. To analyse the names, locations and uses stated by Breyne, transcriptions of the labels by Pękacka-Falkowska (2018) and Van Ooststroom (1942) were used.

The identification of plants from the Breyne herbaria was conducted using floras covering eastern Europe (Tutin et al. 1964, Mirek et al. 2002, Jäger 2011, Seybold 2011), as well as the Netherlands (Duijstemaat 2020). The names provided by the identifications of De Monchy and Van Ooststroom were checked against the aforementioned works, and in the International Plant Names Index (IPNI continuously updated) and Plants Of the World Online (POWO continuously updated). These sources were also used to find older synonyms of current names to aid searching for these taxa in other sources.

The current occurrence of taxa was checked using a checklist for the Polish flora (Mirek et al. 2002). The current conservation status was assessed using the red list for Gdańsk and the surrounding area (Markowski & Buliński 2004).

Digital versions of Breyne’s *Centuria* (Breyne 1674–1768) and *Prodromus* (Breyne 1680–1689) and Reyger’s *Tentamen* (Reyger 1764) were used. The presence of plants in these works was checked by searching for the pre-Linnaean names used by Breyne, and comparing descriptions with these names to the specimens in the herbaria.

The paper sheets used to construct the herbaria were checked for watermarks, in order to reconstruct the origins of the paper via the online Memory of Paper database (www.memoryofpaper.eu).

**RESULTS AND DISCUSSION**

**The Leiden Breyne herbaria**

The Breyne herbaria in the Leiden collection are dated 1659 and 1673. They come from the collection of Hieronymus van Beverningk (1614–1690). Breyne is known to have visited Lockhorst, Van Beverningk’s estate near Leiden, and to have seen his collection of tropical plants (Van Ooststroom 1942, Pękacka-Falkowska 2018). Van Beverningk bequeathed his collection of herbaria to his nephew, and through successive inheritors, the herbaria eventually ended up at the Leiden University library. From there, they were transferred to the National Herbarium of the Netherlands, which is now part of NBC (Van Steenis-Kruseman 1979, Pękacka-Falkowska 2018). The 1659 herbarium was restored in 2012, reinforcing several pages.

The two herbaria combined contain a total of 105 plant specimens, although many more were originally present, judging from the remains of plants, labels and pages. The 1659 herbarium consists of two bundles of loose, thick paper sheets, folded over to produce a book-like structure. It lacks a cover of its
Fig. 1 Watermark of an elephant with the letter B, in the second last sheet of the 1659 Breyne herbarium. It is yet unknown which paper producer is associated with this mark.

Fig. 2 A specimen of *Helichrysum arenarium* from the 1673 herbarium. This species is represented by six specimens in this herbarium.
own, but has been wrapped in an early 20th century cover with the Dutch title *Herbarium door JACOB BREYNE verzameld in de omgeving van Danzig. Anno 1659* (Herbarium by Jacob Breyne, collected in the surroundings of Danzig. Anno 1659). It contains 48 specimens, one or several per page, although a large number of empty sheets with remains and imprints of plants suggests there were once more. The second last sheet of the herbarium contains a watermark in the shape of an elephant with a ‘B’ on its body (Fig. 1). This watermark is not represented in the ‘Memory of Paper’ database. Hence, the origin of the paper is yet unknown.

The 1673 herbarium is bound into a book with the title *Planta Rariores Borussiacae et Cassubicae anno 1673* (Rare Plants of Prussia and Kashubia anno 1673). It contains 57 specimens, generally one per page, and seems to be missing fewer plants than the 1659 herbarium: at least ten plants seem to be missing, and twelve pages have been cut out. Breyne is known to have made a ‘duplicate’ of the 1673 Leiden herbarium, which he sent to James Petiver in England and which is now in the collection of the Natural History Museum in London (as part of the Sloane Herbarium, HS 231, ff. 88-113), but not yet digitally available (Britten et al. 1958, Fleisher 2020). Future research into this herbarium could possibly give more insights into the specimens lost from the Leiden herbaria, but is beyond the scope of the current paper. A recent paper by Pękacka-Falkowska (2021) sheds more light on the correspondence between Breyne and Petiver.

**Specimen composition**

Both herbaria contain a large diversity of plants. A complete list of taxa present can be found in Appendix 1 for the 1659 herbarium and in Appendix 2 for the 1673 herbarium. The combined total of 105 specimens in both herbaria consists of 62 species from 24 families, including two Lycopodiaceae species and one fungus. Well-represented families are Asteraceae (29 specimens, 13 spp.) and Apiaceae (9 specimens, 5 spp.); 11 species were found in both herbaria. The same number of species were represented more than once within one of the herbaria (6 spp. in the 1659 herbarium, 5 spp. in the 1673), with six specimens of *Helichrysum arenarium* (L.) Moench (Asteraceae) (Fig. 2) and four of *Antennaria dioica* (L.) Gaertn. (Asteraceae). Breyne may have strived to document the diversity within these species, as his descriptions point at differences in, e.g., flower colour and leaf shape. Of *A. dioica* both staminate and pistillate plants are represented. It is not clear if this was by intention or coincidental, as Breyne did not add a remark on this difference. Sexual differentiation in plants only became apparent in the late 17th century, with the work of Camerarius (1694).

**Removal of specimens**

From the 1659 herbarium at least 60 specimens have been completely removed, as indicated by the remains of plants, labels and glue (Fig. 3). At least ten plants were removed from the 1673 herbarium. The removal seems to have taken place before the 20th century: Van Ooststroom (1942) mentioned only the
plants currently present, and also, evidence is lacking that De Monchy has identified plants that are no longer present. This means that any of the owners between Breyne himself and, eventually, the Rijksherbarium, could have removed (part of) the missing specimens.

Some plants have left impressions in the paper, giving indications of their shape and size. Determining species just from this imprint was, however, impossible. Where a plant had been removed, but labels and/or written text on the sheet remained, a tentative identification was attempted, such as in a case where Breyne mentioned ‘nidus avis’, and described a plant with stem, flowers, leaves and roots in a single, pale colour. The name, together with the mentioned colour pattern indicate that a specimen of the Bird’s-Nest Orchid (*Neottia nidus-avis* (L.) Rich., *Orchidaceae*) was once present here. The same has been done for other pages with missing plants. Names deriving from these tentative identifications have been put between brackets in Appendices 1 and 2.

In a few instances, only the label was removed, often very roughly, while the corresponding specimen is still in place. This indicates a certain specific interest in the labels, as well as the specimens. It is unclear why someone removed these labels from the herbarium rather than simply copying the information.

On several pages, plant names have been written, but there is no indication that plants and/or labels were once present on these same pages. Fifteen such situations are found in the 1659 herbarium. Although plants may have been removed from these pages, leaving no traces, it is more likely that these pages never contained any plants, and that these names were just notes by Breyne, indicating species he was planning to include in the herbaria. From the 1673 herbarium, twelve pages have been cut out. These may or may not have contained plants. Again, it is not known who cut out these pages and why.

Both herbaria seem to have had their pages ordered differently in the past, as indicated by the page numbers written in the top right corner. The original numbers in the 1673 herbarium have been crossed out, and new numbers were written underneath. Why the order of the pages was changed, and who changed the page numbers in the 1673 herbarium, is as yet unknown.

**Order of specimens**

The plants within the 1659 herbarium do not seem to follow any particular order with regards to family, habitat, alphabetic or otherwise. Within the four sections of the 1673 herbarium, however, plants are arranged according to family, although Breyne most likely did not use the system of plant families as we know it today, but arranged his plants according to their resemblance, either observed by himself or by previous authors (Table 1).

An exception is a mixing-up of *Cyperaceae* and *Juncaceae* in section 2. Breyne used the name ‘Gramen’ (grass) for most of these species (2 *Cyperaceae*, 2 *Juncaceae* and 2 *Poaceae*; for one *Cyperaceae* species, Breyne uses ‘Juncus’ (rush)), indicating that he considered them to be of the same group. Comparing with Caspar Bauhin’s *Pinax* (1623), it seems differences between *Cyperaceae*, *Juncaceae* and *Poaceae* were not yet (completely) known in Breyne’s time.

**Plantae rariores**

The 1673 herbarium bears the title *Plantae Rariores Borussiae et Cassubiae*, indicating it would mainly contain rare plants from this region (modern Pomerania and Kashubia). In spite of the title, Breyne did not mention the abundance of taxa in this herbarium, something he regularly did in the 1659 herbarium. Some of the indications of abundance associated with Breyne’s collected taxa have changed over time. While *Daucus carota* L. (Apiaceae), which Breyne mentioned as being found ‘everywhere’, is still considered Least Concern, *Dactylorhiza viridis* (L.) R.M.Bateman, Pridgeon & M.W.Chase (*Orchidaceae*), which flowered ‘in great abundance’ in Breyne’s days, is now considered Regionally Extinct on the Red List for Gdańsk and surroundings (Markowski & Buliński 2004).

The Red List for the surroundings of Gdańsk (Markowski & Buliński 2004) mentions 26 taxa also present in Breyne’s collections, with two taxa considered Regionally Extinct (*Swertia perennis* L. (Gentianaceae) and *Dactylorhiza viridis*; Fig. 4). One species is Critically Endangered (*Pulicaria dysenterica* (L.) Bernh, *Asteraceae*), while five are Endangered (*Anthoxanthum nitens* (Weber) Y.Schouten & Veldkamp (Poaceae), *Bupleurum longifolium* L. (Apiaceae), *Gentiana cruciata* L. (Gentianaceae), *Swertia perennis* L. (Gentianaceae), *Gentianella campylacea* (L.) Bernh. *Asteraceae*). *Dactylorhiza viridis* was observed as Critically Endangered in Breyne’s herbarium (Fig. 4).

**Table 1**

| Section | Family name | # specimens |
|---------|-------------|-------------|
| 1       | Santalaceae | 1           |
|         | Cornaceae  | 1           |
|         | Ericaceae  | 2           |
|         | Rosaceae   | 1           |
| 2       | Fabaceae   | 3           |
|         | Cyperaceae | 1           |
|         | Juncaceae  | 2           |
|         | Cyperaceae | 2           |
|         | Poaceae    | 2           |
|         | Apiaceae   | 4           |
|         | Ranunculaceae | 1    |
Table 2  Threatened and regionally extinct species from the Breyne herbaria, as mentioned on the Red List for Gdańsk and surrounding area (Markowski & Buliński 2004).

| Herbarium | Conservation status* | Species name** | Family |
|-----------|-----------------------|----------------|--------|
| 1659      | VU                    | Helianthemum nummularium (L.) Mill. | Cistaceae |
|           |                       | Hypochaeris maculata L. | Asteraceae |
|           |                       | (Pulsatilla pratensis (L.) Mill.) | Ranunculaceae |
|           |                       | Pyrola rotundifolia L. | Ericaceae |
|           | EN                    | Anthoxanthum nitens (Weber) Y.Schouten & Veldkamp | Poaceae |
|           |                       | (Gentiana cruciata L.) | Gentianaceae |
|           |                       | Silphiodaucus prutenicus (L.) Spalik, Wojew., Banasiak, Piwczynski & Reduron | Apiaceae |
|           |                       | Thesium ebracteatum Hayne | Santalaceae |
|           | CR                    | Pulicaria dysenterica (L.) Bernh. | Asteraceae |
|           | RE                    | Dactylorhiza viridis (L.) R.M.Bateman, Pridgeon & M.W.Chase | Orchidaceae |
|           |                       | Swertia perennis L. | Gentianaceae |
| 1673      | VU                    | Alyssum alyssoides (L.) L. | Brassicaceae |
|           |                       | Antennaria dioica (L.) Gaertn. | Asteraceae |
|           |                       | Viscum album L. | Santalaceae |
|           | EN                    | Anthoxanthum nitens (Weber) Y.Schouten & Veldkamp | Poaceae |
|           |                       | Bupleurum longifolium L. | Apiaceae |

* Conservation status as used by IUCN (2012): VU = Vulnerable, EN = Endangered, CR = Critically Endangered, RE = Regionally Extinct.

** Names in brackets indicate a tentative identification.

Fig. 5  Two leaves and an inflorescence of Laportea canadensis (above) and a specimen of Lycopodium sp. (below). Laportea canadensis is not known to occur in Europe, and so may have been sent to Breyne from its natural range in North America, or from a plant in cultivation.
Silphiodaucus prutenicus (L.) Spalik, Wojew., Banasiak, Piwczyński & Reduron (Apiaceae) and Thesium ebracteatum Hayne (Santalaceae). Two of these species are currently threatened also at a national scale, namely Swertia perennis (L.) Wedd. (Urticaceae) and Thesium ebracteatum (Kaźmierczakowa et al. 2014). The 1673 herbarium contains fewer (currently) rare plants than the 1659 herbarium (Table 2).

Exotics

Breyne’s herbaria contain 34 species not known to (currently) occur in the region around Gdańsk (see Appendix 3). These may have been collected on trips further afield, or sent to Breyne by one of his many correspondents. One such exotic is a specimen of Laportea canadensis (L.) Wedd. (Urticaceae) in the 1659 herbarium (Fig. 5). This plant is native to the eastern parts of North America, and not known to have been introduced or escaped into the wild in Europe (Chew 1969). Judging from the small size of the specimen (two single leaves and a small inflorescence), rather than an entire plant, it may have been sent to Breyne in a letter, either from North America, or from a plant in cultivation. Sadly, Breyne did not label this specimen, leaving us to guess at its origins.

Other plants not currently known from the Gdańsk region include several species more commonly associated with higher elevations, such as Buphthalmum salicifolium L. (Asteraceae). Although the Gdańsk region is at a comparatively low elevation, Breyne mentions many of his collecting sites as being located between heather on hilly grounds, where some of these high-elevation species may have found a home too.

Ecological notes

On the labels of many specimens in the 1659 herbarium, Breyne provides notes on the collecting location. These notes often include the name of a town, but also some ecological remarks, the detail of which is remarkable for an early herbarium such as this. Many plants have been collected ‘inter ericas’, i.e., between heather. Some plants were collected in woodlands or meadows, many in hilly or mountainous surroundings. One specimen was collected ‘in a lush forest’, a second ‘in a dark forest’, while another was collected ‘in a valley, at the side of running fountains’. According to his labels, Breyne collected multiple specimens in the grasslands around the Danzig gallowies. The ecological notes in Breyne’s herbaria can give us clues on the historical occurrence of ecosystems at the associated collecting locations. They show the occurrence of (possibly quite extensive) heather-covered hills in the Gdańsk area, as well as peatland ecosystems at ‘Insula Neringa’ (Mierzeja Wiślana), judging from specimens of Eriophorum vaginatum L. (Cyperaceae) and Vaccinium uliginosum L. (Ericaceae) collected there.

In one particular case, Breyne mentions on his label the co-occurrence of another species. For a specimen of Pyrola chlorantha Sw. (Ericaceae), Breyne mentions it growing where “Calceolus Mar.” also grows. This name could refer to Calceolus marianus Mill., now a synonym of Cypripedium calceolus L., the Lady’s Slipper Orchid (Orchidaceae).

On the labels of many specimens, Breyne mentions the flowering time. The months May, June, July and August are mentioned, suggesting Breyne collected mainly in these months. Other remarks found on the labels of both herbaria can be found in Appendix 4.

Collecting locations

On many labels in the 1659 herbarium, the location of collecting is mentioned (no place names are mentioned in the 1673 herbarium, except for Kashubia and Austria). Breyne used the German names of Prussian towns, and often with a deviating spelling. Many places are in the direct surroundings of Danzig, such as Bahrenwinkel (now Niedźwiednik), Jasken / Jaskendahle (Jaśkową Dolinką), Brętowo and Miggaw (Piecki-Migowo) (Fig. 6). Another popular collecting location was near the monastery at Oliwe (Oliwa). Two locations are further from Danzig: Beren / Beeren (Kościierzyna) and Neerinck / Insula Neringa (Mierzeja Wiślana). One town in central Poland is mentioned (Torunia; now known as Toruń), from which Breyne was sent a specimen of Pulsatilla Mill. (Ranunculaceae).

Uses

With four specimens in the 1659 herbarium, Breyne mentioned that the plants were used by people. For two specimens of Rhododendron tomentosum Harmaja (Ericaceae) (pages 6 and 27), the use of this plant in brewing beer was mentioned. Breyne notes that the Swedes had imported 20 ‘voeder’ (cartloads)
of this plant from the ‘Neering’ (Friscie Nehrung, Mierzeja Wiślana) to add to their soldiers’ beer, ‘because it makes for furiousness’. Leaves of *R. tomentosum* (known as Labrador Tea) are still used in the production of alcoholic beverages today, although its use has been banned in the past for causing aggressive behaviour (Dampc & Luczkiewicz 2015).

Next to a specimen of *Huperzia selago* (L.) Bernh. ex Schrank & Mart. (*Lycopodiaceae*) on page 5, Breyne writes “deese Muscus drijeft soo sterck as Sabina” (“this Muscus expulses as strongly as Sabina”). *Muscus* was a name used for *Lycopodiaceae* (and other spore-bearing plants) by apothecaries (IPNI continuously updated); Sabina probably refers to *Juniperus sabina* L. (*Cupressaceae*), a plant known to have been used as an abortifacient (Riddle 1997). This indicates the application of *H. selago* as an abortifacient drug; a use indeed known from other parts of Europe (Hatfield 2004, Kenicer 2018).

Breyne also mentioned the consumption of the berries of *Vaccinium uliginosum* L. (*Ericaceae*) (a specimen on page 5), and how eating a large amount can cause drunkenness, “as if one had drunk much wine”. The berries of this species are still eaten, and are known in German as Trunkelbeere (‘drunk-berries’) (Jäger 2011). Page 5 of the 1659 herbarium also contains a specimen of *Scleranthus perennis* L. (*Caryophyllaceae*). This is the host plant of *Porphyrophora polonica* (Linnaeus, 1758), the scale insect used to produce the dye known as Polish cochineal. Breyne and his family traded in Polish cochineal, so Breyne most likely knew the use of this plant in his trade. Nevertheless, he did not mention it on the label attached to the specimen.

The only reported use in the 1673 herbarium is that of *Anthoxanthum nitens* (Webber) Y. Schouten & Veldkamp (*Poaceae*). Breyne mentioned that the plants were harvested in the mountains, and that they were given in bundles to young ladies in the spring, because of their scent. *Anthoxanthum nitens* is known for its scent, and was used as a stewing herb. As such, it was commonly used in churches, and even used as an alternative to incense (POWO continuously updated). In this context, it was dedicated to Mary in the Christian religion, which explains Breyne’s use of the name Gramen Mariae.

**Previous owners of the herbaria**

Both herbaria seem to have been sent to correspondents of Breyne. It is known that both herbaria were in the possession of Hiéronymus van Beveringk (Pejkać-Falkowska 2018), but it is unknown whether he was the original receiver, or that he acquired them later. Within the handwritten texts of the 1659 herbarium, the abbreviation UE (‘U Edele = Your Honour) is found on three sheets (p. 2, 11, 12), along with indications that certain plants could be seen in other people’s gardens (p. 11, 12; ‘...kunt UE sijn bij...’ [‘...Your Honour can see at...’]), or that the specimen was sent to Breyne by this unknown ‘Your Honour’ (p. 2; ‘...die UE sende...’ [‘...that Your Honour sent me...’]).

On the frontispiece of the 1673 herbarium, three handwritten lines indicate that it was once part of a *Bibliothecae Latinae Publicae*. The handwriting is the same as that used in the *Codex Vossianus*, which includes several 16th-century book herbaria held in the library of Leiden University (Stefanaki et al. 2019). This makes it likely that the handwriting was added when this herbarium became part of the university library collection.

**Other people mentioned**

Next to authors of scientific works, several other names are mentioned in the 1659 herbarium. On page 11, Breyne writes that ‘this species with broader leaves Your Honour can see with Sr. Hermanus van den Burch’. It is currently unknown who Hermanus van den Burch was, but he may have owned a garden in the Dutch Republic. The plant that went with the text is no longer present.

On the next page (p. 12), the name of ‘my cos. [cousin] Johan Breyne’ is mentioned, stating he had a form of the plant with narrow leaves, which is no longer present in the herbarium. Jacob Breyne had been called Johannes Breyne, who lived in Amsterdam. Johannes traded in drugstore supplies, and may have had a garden of his own.

On the label of a specimen of *Pilosella lactucaella* (Wallr.) P.D.Sell & C.West (*Asteraceae*) on page 20, the collecting location mentioned is ‘in a meadow behind the Oliwe not far from Ambrosie’s court, where the various Satyria stand’. Ambrosie could refer to the Dutch Menononite distiller Ambrosius Vermöllen (also written as Vermeulen or Vermoeilen), who had a distillery in Danzig in the early 17th century (Niemantsverdriet 1996), and may have had a garden outside the city near Oliwa, perhaps for growing the herbs used to make his Danziger Goldwasser. Satyria may refer to orchids in general, or to what is now known as *Dactylorhiza viridis*, previously known as *Satyrium viride* L. (cf. herbarium specimen L.0076018 in the general NBC herbarium).

In a piece of text written on an unnumbered sheet, Breyne states he has received ‘Pulsatilla caerulea odoratissima’ from Jacobus Hase, from Thorunia (Torún). It is unknown who Jacobus Hase was, and how he related to Breyne.

**Centuria, Promordum and Tentamen**

Out of all species represented by specimens in both herbaria, only one is mentioned in Breyne’s *Centuria* (1674: 130). This concerns what is probably a double-flowered form of water avens (*Geum rivale* L., *Rosaceae*). The *Centuria* contains an image of this plant, showing its multi-petalled flowers. None of the plant specimens present in the herbaria were mentioned in the *Promordus*. Of the species in the 1659 herbarium, 12 are mentioned with a matching name and description in Gottfried Reyger’s *Tentamen* (1764), while three species match partially (i.e., a very similar name with a matching description). For the 1673 herbarium, nine species match in name and description, while seven do so partially (Appendix 5). With seven specimens, Breyne mentioned his planned works *Pomerellia Viridario* and *Viridario Borussiaco*, which he never finished. Possibly, Breyne had already decided to include these species in his manuscripts, and used these specimens as a basis for his illustrations and/or descriptions.

**Origin of specimens and function of the 1659 herbarium**

Although most specimens in the 1659 herbarium have indications of their collecting location, and were thus most likely collected by Breyne himself, there are indications that some plants were sent to Breyne by others. In Breyne’s days, a network of scholars exchanged knowledge (and for botanists: plant specimens) through letters. This network was known as the Republic of Letters, and included intellectuals from all over the world (Daston 1991). Breyne corresponded with many fellow botanists in Europe and elsewhere, such as Willem ten Rhynie (a doctor in service of the Dutch East India Company (VOC), visiting Japan and South Africa) and Hiéronymus van Beveringk in Leiden. Moreover, Breyne may have corresponded with garden owners and nurserymen, exchanging knowledge as well as specimens.

For some of the specimens in the 1659 herbarium we may expect that they came to Breyne through letters. Firstly, with two specimens Breyne actually mentioned the plants being sent to him. The specimen of *Swertia perennis* L. (*Gentianaceae*) on page 2 was sent by ‘UE’ (‘Your Honour’, see above). In a piece of text without a plant on an unnumbered sheet, it is mentioned that a specimen under the name ‘Pulsatilla caerulea odoratissima’ was sent from Thorunia (Torún) by Jacobus Hase.
Furthermore, the specimens of Laportea canadensis (L.) Wedd. (Urticaceae) on page 13 may have been sent to Breyne as well, from North America or from a plant in cultivation. This species is not known to occur naturally in Europe, so it is unlikely that Breyne would have encountered it on his countryside trips. Secondly, the small size of the specimens would have allowed them to be included with a letter. Sadly, the Laportea specimens were not labelled by Breyne, leaving us without further clues as to their origin.

Although some references to a receiver (‘UE’, see above) would indicate that the 1659 herbarium was meant as a gift, the large number of pages without indications of plants being present would suggest a different use of (part of) this herbarium. Perhaps, Breyne used these sheets to (temporarily) store plants he received from, or was going to send to, others, or that he was planning to discuss with fellow botanists. The 1673 herbarium was most likely made as a gift, judging from the large and elaborately arranged specimens, the amounts of text on each label and the fact this herbarium has been bound into a hardcover, as opposed to the loose sheets of the 1659 herbarium.

CONCLUSIONS

The two Breyne herbaria in the Leiden collection contain 62 species from 24 families, represented by a total of 105 specimens. While the specimens do not seem to have been placed in any particular order in the 1659 herbarium, a family-like arrangement is found in the 1673 herbarium. Many taxa are native to eastern Europe; the 34 represented taxa not locally native may have been sent to Breyne through his contacts in the Republic of Letters or collected on trips further afield. All of Breyne’s collecting locations were reconstructed using his writing on the labels, yielding locations mostly near Gdańsk.

Many taxa are rarer today than they were in Breyne’s day, as indicated in his handwritten texts on the labels. Out of all taxa in both herbaria, 24 are represented on a Red List for Gdańsk and surroundings and two in the Polish Red List. The species Swertia perennis and Dactylorhiza viridis are now considered regionally extinct, even though D. viridis was mentioned by Breyne as ‘flowering in great abundance’. This shows the importance of historical herbaria in the reconstruction of the past distribution of plants, and the changes in the landscape around Gdańsk over the past three centuries.

Breyne mentioned uses of four taxa, as a strewing herb, for interest of historical herbaria in the reconstruction of the past distribution of plants, and the changes in the landscape around Gdańsk over the past three centuries.

As biodiversity worldwide faces large threats, it is important to know what species were once there, and their former abundance. This can help us understand what is already lost, and what we need to protect, or possibly restore. Herbaria in general have an important role to play in this process, but historical herbaria even more so. They can provide evidence of the occurrence of plants in pre-industrial times, showing parts of the vegetation of the area in which they were collected, before modern human interference. In addition, historical herbaria can provide information on the connections between plants and humans, in times when this was much more important in everyday life, than it is (or, rather, seems to be) today. Further research into the contents and producers of historical herbaria may help us in our aims to preserve biodiversity, as well as provide insights into the history of science and society in general.

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REFERENCES

Bauhin C. 1623. Pinax theatri botanici. Liber primus: 1–14. Ludovicus Regius, Basel. https://bidigral.rjb.cscie.es/viewer/10754?offset=.

Breyne J. 1674–1678. Exoticum italicum minus cognitum plantarum centuria prima. David-Fridericus Rhetius, Danzig. https://bidigral.rjb.cscie.es/viewer/10814?offset=#page=1&viewer=picture&n=0&öq=.

Breyne J. 1680–1689. Prodromus fasciculi rariorum plantarum. David-Fridericus Rhetius, Danzig. https://bidigral.rjb.cscie.es/viewer/10795?of fset=page=1&viewer=picture&n=0&öq=.

Britten J, Dandy JE, Savage S 1958. The Sloane herbarium: an annotated list of the Horti sicii composing it; with biographical details of the principal contributors. British Museum, London. https://www.biodiversitylibrary.org/ item/233790.

Camerarius RJ. 1694. De Sexu Plantarum epistola. Romney, Tübingen. Chew WL. 1969. A monograph of Laportea (Urticaceae). The Garden’s Bulletin, Singapore 25: 111–178. https://www.biodiversitylibrary.org/item/148433.

Costa RMS, Pavone P, Carbonaro RA, et al. 2020. An anonymous pre-Linnaean herbarium among the ‘treasures’ of the ‘Civita and A. Urino Re- cupero’ joint library of Catania (Italy). Plant Biosystematics 154: 910–923. https://doi.org/10.1080/11263504.2020.1722273.

Costa RMS, Van Andel TR, Pavone P, et al. 2018. The pre-Linnaean herbarium of Paolo Boccone (1633–1704) kept in Leiden (the Netherlands) and its connections with the imprinted one in Paris. Plant Biosystematics 152: 489–500. https://doi.org/10.1007/s1223504.2018.1445132.

Dandée A, Luczkiewicz M. 2015. Labrador tea – the aromatic beverage and spice: a review of origin, processing and safety. Journal of the Science of Food and Agriculture 95: 1577–1583. https://doi.org/10.1002/jsfa.6889.

Daston L. 1991. The ideal and reality of the Republic of Letters in the Enlightenment. Scientific Context 4: 367–386.

Duistermaat H. 2020. Heuvels’ Flora van Nederland, 24th ed. Noordhoff, Groningen, Utrecht / Naturalis Biodiversity Center, Leiden.

Fleischer A. 2019. Breyne’s botany: (Re-)locating nature and knowledge in Danzig (circa 1660–1720). Locations of Knowledge in Dutch Contexts. Brill, Leiden, Boston.

Fleischer A. 2019. ‘Traveling salesmen or scholarly travelers? Early modern botanists on the move marketing their knowledge of nature.’ In: Goeing A-S, Parry G, Feingold M (eds), Early modern universities: Networks of higher learning: 371–381. Brill, Leiden, Boston.

Foster, IR. 1776. Characteres generum plantarum, qua in titinis ad insulas maris Australis, colleguerunt, descripserunt, delinearunt,annis 1772–1775. Prostant apud B. White, T. Cadell, & P. Elmsly, London. https://www.biodiversitylibrary.org/item/23365.

Gray A. 1880. Mesembrianthemum – not Mesembryanthemum. Botanical Gazette 5: 86–89

Gunn M, Codd LE. 1981. Botanical exploration of Southern Africa. Balkema, Cape Town.

Hatfield G. 2004. Encyclopedia of folk medicine: Old World and New World traditions. ABC-CLIO, Santa Barbara, Denver, Oxford.

IPNI (International Plant Names Index). Continuously updated. https://www.ipni.org/ [accessed 8 Mar. 2021].

IUCN (International Union for the Conservation of Nature). 2012. IUCN Red List categories and criteria, version 3.1, second edition. IUCN, Gland. https://www.iucn.org/content/iucn-red-list-categories-and-criteria-versio n-31.

Jäger EJ (ed). 2011. Rothmaler Exkursionsflora von Deutschland. Gefäßpflanzen: Grundband, 20th ed. Spektrum Akademischer Verlag, Heidelberg.
Kaźmierczakowa R, Zarzycki K, Mirek Z (eds). 2014. Polish Red Data book of plants. Polish Academy of Sciences, Cracow.

Kenicer GJ. 2018. Scottish Plant Lore. Royal Botanic Gardens, Edinburgh.

Linnaeus C. 1753. Species plantarum. Laurentius Salvius, Stockholm.

Markowski R, Bińński M. 2004. Endangered and threatened vascular plants of Gdańskie Pomerania. Acta Botanica Cassubica Monographiae 1: 5–56.

Mirek Z, Piękoś-Mirkova H, Zajac A, et al. 2002. Flowering plants and pteridophytes of Poland: a checklist. W. Szafer Institute of Botany, Kraków.

Niemsantsvetriet H. 1996. Menno’s sporen nog te vinden in Gdańsk en Siberië. Trouw Newspaper, 26-01-1996. https://www.trouw.nl/gs-b2abcfaf.

Offerhaus A, De Haas E, Porck H, et al. 2020. The Zierikzee Herbarium: An analysis of the contents and origins of an enigmatic herbarium. Blumea 66: 1–52. https://doi.org/10.3767/blumea.2021.66.01.01.

Pękacka-Falkowska K. 2018. Jacob Breyne’s Horti sicci from 1659 and 1673 (English). Zapiski Historyczne 83: 47–83. https://doi.org/10.15762/ZH.2018.61.

Pękacka-Falkowska K. 2021. The English connection: Jacob and Johann Philipp Breyne, James Petiver and plants: the correspondence between the Breynes and Petiver from the 1690s. Kwartalnik Historyczny 5: 167–198.

POWO (Plants Of the World Online). Continuously updated. https://powo.science.kew.org/results.

Pulvirenti S, Indriolo MM, Pavone P, et al. 2015. Study of a pre-Linnaean Herbarium attributed to Francesco Cupani (1657–1710). Candollea 70: 67–99. https://doi.org/10.15553/c2015v701a8.

Pulvirenti S, Pavone P, Carbonaro RA, et al. 2017. Taxonomic study of the plants to be found in the only herbarium of Paolo Boccone (1633–1704) at present existing in Italy. Plant Biosystematics 151: 745–759. https://doi.org/10.1080/11263504.2017.1320317.

Reyger G. 1764. Tentamen florae Gedanensis methodo sexuali accommodatae. D.L. Wedel, Gdańsk. https://www.biodiversitylibrary.org/item/98179.

Riddle JM. 1997. Eve’s herbs: A history of contraception and abortion in the West. Harvard University Press, Cambridge, London.

Santos-Guerra A, Jarvis CE, Carine MA, et al. 2011. Late 17th century herbarium collections from the Canary Islands: The plants collected by James Cuninghame in La Palma. Taxon 60: 1734–1753. https://doi.org/10.1002/tax.606017.

Seybold S. 2011. Die Flora Deutschlands und der angrenzenden Länder, 95th ed. Quelle & Meyer Verlag, Wiebelshiem.

Spalik K. 2014. Pre-Linnaean herbaria viva of Helwing in the collections of the National Library of Poland and the University of Warsaw. Acta Societatis Botanicorum Poloniae 83. https://doi.org/10.5586/asbp.2014.008.

Stefanaki A, Porck H, Grimaldi IM, et al. 2019. Breaking the silence of the 500-year-old smiling garden of everlasting flowers: The En Tibi book herbarium. PLOS One 14: e0217779. https://doi.org/10.1371/journal.pone.0217779.

Stefanaki A, Thijsse G, Van Uffelen GA, et al. 2018. The En Tibi herbarium, a 16th century Italian treasure. Botanical Journal of the Linnean Society 187: 397–427. https://doi.org/10.1093/botlinnean/boy024.

Stefanaki A, Thijsse G. 2016. Tusschen pampier geleyt, ontstaan, verspreiding en gebruik van de vroegste herbaria. In: Upelhaar L, Chavannes-Mazel CA (eds), De Groene Middeleeuwen: 64–93. Lecturis, Eindhoven.

Van Andel TR. 2017. Open the treasure room and decolonize the museum. University of Leiden, Leiden. http://www.clusiusstichting.nl/wp-content/uploads/2014/09/Tekst-boekje-oratie-van-Andel-Engels.pdf.

Van Andel TR, Barth N. 2018. Paul Hermann’s Ceylon Herbarium (1672–1679) at Leiden, the Netherlands. Taxon 67: 977–988. https://doi.org/10.12705/675.8.

Van Ooststroom SJ. 1942. Een 17de eeuwsch herbarium uit de omgeving van Danzig. In: Jeswiet J (ed), Gedenkboek J. Valckenier Suringar. Veenman & Zonen, Wageningen.

Van Steenis-Kruseman MJ. 1979. The collections of the Rijksherbarium. Blumea 25: 29–55.
## Appendix 1

Plants included in the 1659 herbarium.

| Page nr. | Barcode | Specimen state | Location on sheet | Name(s) given by Breyne | Author(s) cited by Breyne | Family | Current identification | Species according to Van Ooststroom | Species according to De Monchy |
|----------|---------|----------------|-------------------|--------------------------|---------------------------|--------|-----------------------|----------------------------------|-------------------------------|
| unnumbered sheet | L2112068 | Specimen much damaged | Central | Hediasarum peregrinum | Carolus Clusius | Lamiaceae | Lycopus europaeus | Lycopus europaeus |
| 2 | L2112069 | Specimen present | Central | Gentiana palustris latifolia flore punctato | Caspar Bauhin | Gentianaceae | Swertia perennis | Swertia perennis |
| 3 | L2112070 | Specimen removed | Left | | | | | |
| | L2112071 | Specimen removed | Top Centre | | | | | |
| | L2112072 | Specimen removed | Bottom Centre | | | | | |
| | L2112073 | Specimen removed | Right | | | | | |
| unnumbered sheet | L2112074 | No Specimen | Central | Gentiana cruciata major | (Gentianaceae) | Poaceae | (Gentiana cruciata L.) | Anthoxanthum montanum (Weber) Y.Schouten & Veldkamp |
| | L2112075 | Specimen present | Central | Poaceae | Anthoxanthum nitens | | Hierochloë australis |
| 4 | L2112076 | Specimen present | Central | Teucrium | \(\text{Onagraceae}\) | Epilobium sp. | Epilobium angustifolium | Epilobium palustre |
| | L2112077 | Specimen present | Top Left | Chamaecistus flore luteo | Caspar Bauhin | Cistaceae | Helianthemum nummularium | Helianthemum nummularium |
| | L2112078 | Specimen present | Top Right | Panax Chimonicum Polyg. | Pietro Mattioli | Lycopodiaceae | Schoranthus perennis | Schoranthus perennis |
| | L2112079 | Specimen present | Bottom Left | Muscos erytus rosamor sus saturate virida | Ioanne Thalio | Lycopodiaceae | Schoranthus perennis | Schoranthus perennis |
| | L2112080 | Specimen present | Bottom Right | Vaccinium Patromica | Conrad Gesner | Ericaceae | Vaccinium uliginosum | Vaccinium uliginosum |
| | L2112081 | Specimen present | Top Left | Cistus Ledon folia | Caspar Bauhin | Ericaceae | Rhododendron tormentosum Hampe | Ledum palustre |
| | L2112082 | Specimen present | Top Centre | Fentum quinque siliquae singulati | Caspar Bauhin | Fabaceae | Hippocrepis unisiliquosa | Hippocrepis unisiliquosa |
| | L2112083 | Specimen present | Top Right | Anonynus tenufolia | Carusd Clusius | Santalaceae | Thesium ebracteatum | Thesium ebracteatum |
| | L2112084 | Specimen present, label removed | Bottom Left | | | | | |
| | L2112085 | Specimen & label removed | Bottom Centre | Viola barbata angustifolia | Jacques Dalechamps | Caryophylica | Dianthus carthusianorum | Dianthus carthusianorum |
| | L2112086 | Specimen present | Bottom Right | | | | | |
| 6 | L2112087 | Specimen present | Left | Origanum speciosum | | Lamiaceae | Oreganum vulgare | Oreganum vulgare |
| | L2112088 | Specimen present | Centre | Origanum speciosum | | Lamiaceae | Epilobium sp. | Epilobium angustifolium |
| | L2112089 | Specimen present, label removed | Right | | | | | |
| | L2112090 | Specimen & label removed | Bottom Right | | | | | |
| | L2112091 | Specimen & label removed | Left | | | | | |
| | L2112092 | Specimen & label removed | Centre | | | | | |
| | L2112093 | Specimen much damaged | Right | | | | | |
| 8 | L2112094 | Specimen & label removed | Left | | | | | |
| | L2112095 | Specimen & label removed | Right | | | | | |
| | L2112096 | Specimen & label removed | Left | | | | | |
| | L2112097 | Specimen & label removed | Centre | | | | | |
| | L2112098 | Specimen removed, specimen mostly removed | Right | | | | | |
| 9 | L2112099 | Specimen & label removed | Left | | | | | |
| | L2112100 | Specimen present | Centre | Pyrola rotundifolia major fol. amplexifolium mollique | Caspar Bauhin | Ericaceae | Pyrola rotundifolia | Pyrola rotundifolia |
| | | | | | | | | |
| Barcode   | Specimen state | Location on sheet | Family           | Name(s) given by Breyne | Author(s) cited | Species according to Van Ooststroom | Species according to De Monchy | Appendix 1 (cont.) |
|-----------|----------------|-------------------|-------------------|------------------------|----------------|-------------------------------------|--------------------------------|-------------------|
| L.2112101 | Specimen present | Right              | Asteraceae        | Centaurea stoebe L.   | Carolus Clusius | Pyrula rotundifl. L.          | Pyrula rotundifl. L.      |                          |
| L.2112102 | No label         | Top                | Urticaceae        | Laportea canadensis   | (L.) Wedd.      | Pyroloium montanum             | Pyroloium montanum         |                          |
| L.2112104 | Specimen present & label removed | Left               | Fabaceae          | Vicia sylvatica       | L.           | Pyrula rotundifl. L.          | Pyrula rotundifl. L.      |                          |
| L.2112106 | Specimen present | Right              | Ericaceae         | Pyrola rotundifl. L.  | Mistelkraut      | Pyrula rotundifl. L.          | Pyrula rotundifl. L.      |                          |
| L.2112108 | Specimen present | Right              | Fabaceae          | Vicia cracca          | L.           | Pyrula rotundifl. L.          | Pyrula rotundifl. L.      |                          |
| L.2112110 | Specimen present & label removed | Centre            | Asteraceae        | Scorzonera fallax L.  | Johann Bauhin   | Crepis paludosus               | Crepis paludosus          |                          |
| L.2112111 | Specimen present & label removed | Right              | Apiaceae          | Daucus carota L.      |                         | Daucus carota L.              | Daucus carota L.          |                          |
| L.2112112 | Specimen present | Left               | Orchidaceae       | Orchis maculata       |                         | Orchis maculata               | Orchis maculata            |                          |
| L.2112113 | No Specimen      | Top                | Orobanchaceae     | Orobanche quibusadum  | (Orobanchaceae) | Orobanche sp.                  | Orobanche quibusadum      |                          |
| L.2112115 | Specimen present & label removed | Right              | Orchidaceae       | Orchis maculata       |                         | Orchis maculata               | Orchis maculata            |                          |
| L.2112117 | Specimen present | Left               | Apocynaceae       | Apocynum montanum     |                         | Apocynum montanum             | Apocynum montanum          |                          |
| L.2112119 | Specimen present | Right              | Apiaceae          | Daucus montanus        |                         | Daucus montanus               | Daucus montanus            |                          |
| L.2112202 | No Specimen      | Top                | Apocynaceae       | Apocynum fallax L.    |                         | Apocynum fallax L.            | Apocynum fallax L.         |                          |
| L.2112203 | No Specimen      | Right              | Apiaceae          | Daucus carota L.      |                         | Daucus carota L.              | Daucus carota L.           |                          |
| L.211224   | Specimen present | Right              | Orchidaceae       | Orchis maculata       |                         | Orchis maculata               | Orchis maculata            |                          |
| Page nr. | Barcode        | Specimen state        | Location on sheet | Name(s) given by Breyne | Author(s) cited by Breyne | Family         | Current identification | Species according to Van Ooststroom | Species according to De Monchy |
|---------|----------------|-----------------------|-------------------|--------------------------|---------------------------|----------------|--------------------------|-----------------------------------|------------------------------|
| 25      | L.2112129      | Specimen present      | Right             | Testiculus vulpinus      |                           | Orchidaceae   | (Dactylorhiza viridis)   | Orchidaceae sp.                   |                              |
|         | L.2112130      | Specimen present      | Right             | Phalanrium ramosum       | Mathias de l'Ozel         | Asparagaceae  | Anthericum ramosum L.   | Anthericum ramosum                |                              |
|         | L.2112132      | Specimen present      | Bottom Right      | Juncus alpinus capitulo languinosum (on sheet) Juncus alpinus cum caude leporina | Caspar Bauhin | Cyperaceae       | Eriophorum vagnatum L. | Eriophorum vagnatum               |                              |
|         | L.2112133      | Specimen present      | Top Right          | Serapias minor rubello ni-fore-tente flore angustifolia nullis inspersis punctulis | Mathias de l'Ozel | Orchidaceae     | Orchidaceae sp.          | Orchidaceae sp.                   |                              |
| 26      | L.2112134      | Specimen & label removed | Left              |                           |                           |               |                          | (Pteridophyta sp.)               | (Pteridophyta sp.)              |
|         | L.2112135      | Specimen & label removed | Right             |                           |                           |               |                          | (Lycopodiaceae)                  | (Lycopodiaceae sp./spp.)        |
|         | L.2112137      | Specimen & label removed | Right             |                           |                           |               |                          | Jacob Breyne                     | (Pulsatilla sp.)               |
|         | L.2112138      | Specimen & label removed | Central           | Flos / Semen             | Caspar Bauhin             |               |                          | (Pulsatilla sp.)                 |                              |
|         | L.2112139      | No Specimen            | Top               | Muscus terrestris ciavatus Lycopodium s. Pes Lupi. Selago s (upside down) Lycopodium s. Pes Lupi | Ioanne Thallio |              |                          | (Rhododendron tomentosum)        | Ledum palustre                 |
| 27      | L.2112140      | No Specimen            | Bottom             |                           |                           |               |                          | (Eriaceae)                       |                               |
|         | L.2112141      | Specimen removed       | Top               | Ledon Silesiacum         | Cariolus Ciusius          |               |                          | (Pulsatilla sp.)                 |                               |
|         | L.2112142      | No Specimen            | Top               | Pulsatilla ranunculi folio obtusiore Pulsatilla folio annemoses secundae | Jacob Breyne | Ranunculaceae    | (Ranunculaceae)           | (Pulsatilla sp.)               |
|         | L.2112143      | No Specimen            | Centre Right      | Pulsatilla caerulea odoratissima |                           | Ranunculaceae | (Ranunculaceae)         | (Pulsatilla sp.)               |                              |
|         | L.2112144      | No Specimen            | Centre            | Lichen petrae: fol. superm. virid. prona parte alb: nervis nigris distinctis foliorum extremis orbiculis nigris tumidis |                           |               |                          | (lichen sp.)                     |                              |
|         | L.2112145      | No Specimen            | Bottom Left       | Pulsatilla vernatis apil folio flore majore |                           | Ranunculaceae | (Ranunculaceae)         | (Pulsatilla pratensis)           | (Asteraceae sp.)               |
|         | L.2112146      | No Specimen            | Bottom Right      | Pulsatilla flore clauso caeruleo | Johann Bauhin | Ranunculaceae | (Ranunculaceae)         | (Pulsatilla pratensis)           | (Asteraceae sp.)               |
|         | L.2112147      | No Specimen            | Bottom Left       | Gnaathium Creuctum non descriptum |                           | Asteraceae    | (Asteraceae)            | (Asteraceae sp.)               |                              |
|         | L.2112148      | No Specimen            | Bottom Left       | Gnaathium maximum        | Helyochryson Orientale Caspar Bauhin |         | (Asteraceae)            | (Asteraceae sp.)               |                              |
| 2       | L.2112149      | No Specimen            | Top Left          | Gnaathium Creuctum non descriptum |                           | Asteraceae    | Helichrysum arenarium (L.) Moench | Helichrysum arenarium            |                              |
|         | L.2112150      | No Specimen            | Left Centre       | Gnaathium maximum        | Caspar Bauhin             | Asteraceae    | Helichrysum arenarium (L.) Moench | Helichrysum arenarium            |                              |
| 3       | L.2112151      | Specimen & label removed | Left              |                           |                           | Lamiaceae     | Origaniun vulgare L. | Origaniun vulgare               |                              |
|         | L.2112152      | Specimen & label removed | Centre            |                           |                           | Lamiaceae     | Origaniun vulgare L. | Origaniun vulgare               |                              |
|         | L.2112153      | Specimen present       | Right             | Steochas rubescens       |                           | Asteraceae    | Helichrysum arenarium (L.) Moench | Helichrysum arenarium            |                              |
|         | L.2112154      | Specimen & label removed | Far Right         |                           |                           | Lamiaceae     | Origaniun vulgare L. | Origaniun vulgare               |                              |
|         | L.2112155      | Specimen & label removed | Centre Top        | Origaniun speciosum sive varietas |                           | Lamiaceae     | Origaniun vulgare L. | Origaniun vulgare               |                              |
|         | L.2112156      | Specimen & label removed | Centre Bottom     |                           |                           | Lamiaceae     | Origaniun vulgare L. | Origaniun vulgare               |                              |
| Page nr. | Barcode | Specimen state | Location on sheet | Name(s) given by Breyne | Authority cited by Breyne | Species according to Van Ooststroom | Species according to De Monchy | Family | Current identification |
|----------|---------|----------------|------------------|--------------------------|--------------------------|----------------------------------|----------------------------------|--------|-----------------------|
| 4        | L.2112158 | Specimen removed | Left Top | Veronica officinalis L. | - | - | Veronica officinalis | Plantaginaceae | - |
| 5        | L.2112159 | Specimen removed | Left Bottom | Veronica officinalis L. | - | - | Veronica officinalis | Plantaginaceae | - |
| 6        | L.2112160 | Specimen removed | Centre | Veronica sylvatica L. | - | - | Veronica sylvatica | Plantaginaceae | - |
| 7        | L.2112161 | Specimen present | Right Top | Veronica officinalis | (f. albiflora (G.Don) House) | - | Veronica officinalis | Plantaginaceae | - |
| 8        | L.2112162 | Specimen removed | Right Bottom | Veronica officinalis | - | - | Veronica officinalis | Plantaginaceae | - |
| 9        | L.2112163 | Specimen removed | Left | Vaccinium uliginosum | L. | - | Vaccinium uliginosum | Ericaceae | - |
| 10       | L.2112164 | Specimen removed | Centre | Vaccinium uliginosum | L. | - | Vaccinium uliginosum | Ericaceae | - |
| 11       | L.2112165 | Specimen present | Centre | Vaccinium uliginosum | L. | - | Vaccinium uliginosum | Ericaceae | - |
| 12       | L.2112166 | Specimen present | Right | Vicia sylvatica | L. | - | Vicia sylvatica | Fabaceae | - |
| 13       | L.2112167 | Specimen present | Left | Vicia sylvatica | L. | - | Vicia sylvatica | Fabaceae | - |
| 14       | L.2112168 | Specimen present | Centre | Vicia sylvatica | L. | - | Vicia sylvatica | Fabaceae | - |

Appendix 1 (cont.)
| Section nr | Page nr | Barcode     | Specimen state | Location on sheet | Name(s) mentioned by Breyne                                      | Author(s) cited by Breyne | Family            | Current identification |
|-----------|---------|-------------|----------------|-------------------|----------------------------------------------------------------|--------------------------|---------------------|----------------------|
| 1         | 62      | L.2112021   | Specimen present | Central          | Viscum Viscum bacis albis Viscum foemina, putata Virga Sanguinea Viscum album L. | Johann Bauhin           | Santalaceae         | Viscum album L.      |
| 2         | 64      | L.2112022   | Specimen present | Central          | Cornus foemina, putata Virga Sanguinea Cornus foemina Frutex sanguinus Cornus sanguinea L. | Johann Bauhin           | Cornaceae           | Cornus sanguinea L.  |
| 3         | 67      | L.2112023   | Specimen present | Central          | Ledum silesiacum Mathias de l’Obel | Pierre Belon | Ericaceae          | Rhododendron tomentosum | Harmaja               |
| 4         | 68      | L.2112024   | Specimen present | Central          | Chamaerhododendros Montana Alboburgh Oleastrifolio, seu Lentisci folio minus odora Mathias de l’Obel | Ericaceae                | Andromeda polifolia L. |
| 5         | 69      | L.2112025   | Specimen present | Central          | Caryophyllata Montana tertia Carolus Clusius | | Rosaceae            | Geum rivale L. (double-flowered form) |
| 2         | 45      | L.2112027   | Specimen present | Central          | Vicia dumetorum Vicia hancpulcherinam Fabaceae Vicia sylvatica L. | Caspar Bauhin           | Fabaceae            | Vicia sylvatica L.    |
| 8         | 46      | L.2112028   | Specimen present | Central          | Vicia minima vernalis radice tuberose Fabaceae Vicia lathyroides L. | Caspar Bauhin           | Fabaceae            | Vicia lathyroides L.  |
| 10        | 49      | L.2112030   | Specimen present | Central          | Onobrychis x floribis Viciae dilute caeruleis Onobrychis quibusdam subcaeruleo flore Onobrychis Secunda | Johann Bauhin           | Fabaceae            | Astragalus arenarius L. |
| 11        | 50      | L.2112031   | Specimen present | Central          | Juncus alpinus cum cauda Leporina Juncus alpinus capitula laniugino Juncus alpinus L. | Johann Bauhin           | Juncaceae           | Luzula pilosa (L.) Willd. |
| 12        | 51      | L.2112032   | Specimen present | Central          | Gramen nemorosum hirsutum primum, sive latifolium majus Gramen rure lucidum nemorose, sive Luzulae Gramen hirsutum nemorosum | Johann Bauhin           | Juncaceae           | Luzula multiflora (Ehrh.) Lej. |
| 13        | 53      | L.2112033   | Specimen present | Central          | Gramen Sylviacu. paru. Tenuifolium rigidissiculum Gramen nemorosum glabrus Gramen nemorosum Spica rufesciente mollis Gramen nemorosum i | Johann Bauhin           | Cyperaceae           | Carex montana L.      |
| 14        | 54      | L.2112034   | Specimen present | Central          | Gramen spicatum montanum el nemorosum 4 Gramen caryophyllatum montanum Spicae varia varia Spicae varia Caspari Bauhini | Jacobus Tabernaemontanus | Cyperaceae           | Carex digitata L.     |
| 15        | 55      | L.2112035   | Specimen present | Central          | Gramen Mariae odoratum Gramen paniculatum montanum 2 Gramen paniculatum odoratum | Johann Bauhin           | Poaceae             | Anthoxanthum nitens (Weber) Y.Schouten & Veldkamp |
| 16        | 56      | L.2112036   | Specimen present | Central          | Gramen nemorale avenaeorum alterum ex fusco xerampelini et lucidum Danicum Gramen averacorum 4, sive capillaceum minoribus glumis | Adver. (?) & Johann Bauhin | Poaceae             | Avenella flexuosa (L.) Drejer |
| 17        | 57      | L.2112037   | Specimen present | Central          | Perfoliata alpina magna, longifolia Perfoliata Montana latifolia Perfoliata Montana | Johann Bauhin           | Apiaceae            | Bupleurum longifolium L. |
| 18        | 58      | L.2112038   | Specimen present | Central          | Meum Silesiacum, flore amethystino Cicurtia latifolia hisuta, flore amethystino Cicurtia palustris, latifolia rubra | Joachim Camerarius the Younger | Apiaceae            | Chaerophyllum hirsutum L. |
| 19        | 59      | L.2112039   | Specimen present | Central          | Apium petraeum, sive montanum album, tenuioribus foliis Johann Bauhin | Caspar Bauhin           | Apiaceae            | Seseli libanotis (L.) W.D.J.Koch |
| Section nr | Page nr (new) | Page nr (crossed out) | Barcode | Specimen state | Location on sheet | Name(s) mentioned by Breyne | Author(s) cited by Breyne | Family | Current identification |
|------------|----------------|------------------------|---------|----------------|------------------|----------------------------|-----------------------------|-------|-----------------------|
| 20         | 60             | L.2112040              | Specimen present | Central        | Apium petraeum, sive montanum album, latiore folio | Caspar Bauhin               | Apiaceae                     | Seseli libanotis (L.) W.D.J.Koch |
| 21         | 61             | L.2112041              | Specimen present | Central        | Thalictrum septimum, Thalictrum paterne angustissimo folio | Caspar Bauhin               | Ranunculaceae                 | Thalictrum lucidum L. |
| 3          | 22             | L.2112043              | Specimen present | Central        | Stoechas citrina Germanica latiore folio | Johann Bauhin, Caspar Bauhin, Leonhard Fuchs, Hieronymus Bock, Jacobus Tabernaemontanus Johann Bauhin | Asterolae | Helichrysum arenarium (L.) Moench |
| 24         | 23             | L.2112044              | Specimen present | Central        | Stoechas citrina Germanica latiore folio, squamulis corymborii Minotibus | Caspar Bauhin               | Asterolae                     | Helichrysum arenarium (L.) Moench |
| 25         | 24             | L.2112045              | Specimen present | Central        | Stoechas aurea Germanica | Caspar Bauhin               | Asterolae                     | Helichrysum arenarium (L.) Moench |
| 26         | 25             | L.2112046              | Specimen present | Left            | Stoechas suffa, sive colore igneo Casubica, Latiore folio | Caspar Bauhin               | Asterolae                     | Helichrysum arenarium (L.) Moench |
| 26         | 25             | L.2112047              | Specimen present | Middle          | Stoechas igneosens, sive ruffa Casubica Latiore folio | Caspar Bauhin               | Asterolae                     | Helichrysum arenarium (L.) Moench |
| 27         | 26             | L.2112048              | Specimen present | Right           | Stoechas suffa, sive colore igneo Casubica, Latiore folio | Caspar Bauhin               | Asterolae                     | Helichrysum arenarium (L.) Moench |
| 28         | 27             | L.2112050              | Specimen present | Central        | Gnaphalium ad Stoechadem citrinam accedens, Elachrysum Sylvestre latifolium capitulis conglobatis | Johann Bauhin | Asterolae | Helichrysum luteoalbum (L.) Rchb, Helichrysum arenarium (L.) Moench |
| 29         | 28             | L.2112051              | Specimen present | Central        | Gnaphalium medium, Gnaphalio vulgari simile, Gnaphalium 4, sive medium | Caspar Bauhin, Jacobus Tabernaemontanus | Asterolae | Filago germanica (L.) Huds. |
| 30         | 30             | L.2112052              | Specimen present | Central        | Gnaphalium montanum flore rotundore candido, Pilosella major flore candido | Caspar Bauhin, Johann Bauhin | Asterolae | Antennaria dioica (L.) Gaertn. |
| 31         | 32             | L.2112053              | Specimen present | Central        | Gnaphalium montanum flore rotundore roseo, Pilosella major flore magis purpurasimne | Caspar Bauhin, Johann Bauhin | Asterolae | Antennaria dioica (L.) Gaertn. |
| 32         | 33             | L.2112054              | Specimen present | Central        | Gnaphalium montanum longiore flore purpureo, Pilosella minor flore purpurante | Johann Bauhin | Asterolae | Antennaria dioica (L.) Gaertn. |
| 33         | 35             | L.2112055              | Specimen present | Central        | Pilosella minoris flore, hisutor et eliator non repens, Pilosella major erecta | Johann Bauhin, Caspar Bauhin | Asterolae | Pilosella piloselloides (Vill.) Sjäk |
| 34         | 36             | L.2112056              | Specimen present | Central        | Hieracium XXII sive muronum angustifolium non sinuatu | Caspar Bauhin               | Asterolae | Hypochaeris macula L. |
| 35         | 37             | L.2112057              | Specimen present | Central        | Hieracium caele aphyilo hirsutum | Johann Bauhin | Asterolae | Hypochaeris radicata L. |
| 36         | 39             | L.2112058              | Specimen present | Central        | Hieracium fructicosum angustifolium minimum | Johann Bauhin | Asterolae | Buphthalmum salicifolium L. |
| 37         | 40             | L.2112059              | Specimen present | Central        | Hieracium fructicosum angustifolium medium umbellatum, Hieracium fructicosum V | Johann Bauhin | Asterolae | Hieracium umbellatum L. |
| Section nr | Page nr (new) | Page nr (crossed out) | Barcode   | Specimen state | Location on sheet | Name(s) mentioned by Breyne                                                                 | Author(s) cited by Breyne | Author(s) cited by Bauhin | Family                      | Current identification     |
|------------|---------------|-----------------------|-----------|----------------|-------------------|---------------------------------------------------------------------------------------------|--------------------------|---------------------------|-----------------------------|-----------------------------|
| 38         | 41            | L.2112060             | Specimen present | Central       | Scorzonera latifolia 4, sive humilis nervosa Scorzonera humilis latifolia Pannonica 2 Tragopogons Species Scorzonera humilis latifolia | Caspar Bauhin           | Carolus Clusius            | Asteraceae                  | Scorzonera humilis L.       |
| 39         | 42            | L.2112061             | Specimen present | Central       | Scorzonera angustifolia prima Scorzonera humilis angustifolia et Pannonica tertia Tragopogonis species Scorzonera humilis angustifolia | Caspar Bauhin           | Carolus Clusius            | Asteraceae                  | Scorzonera humilis L.       |
| 40         | 44            | L.2112062             | Specimen present | Central       | Stoebe Gallica et Austriaca Stoebe foliis laxinatus 3 Stoebe Major caliculis non splendentibus Centauni majors species tenuifolia | Carolus Clusius          | Caspar Bauhin              | Asteraceae                  | Centaurea stoebe L.         |
| 4          | 42            | 1                     | L.2112064     | Specimen present | Central       | Echium montanum flore ex dilute caeruleo et albo variegato Echium montanum flore purpuro violaceo | Johann Bauhin            |                           | Boraginaceae                | Echium vulgare L.           |
| 43         | 2             | L.2112065             | Specimen present | Central       | Echium montanum flore carneo | Caspar Bauhin          |                           | Boraginaceae                | Echium vulgare L.           |
| 44         | 3             | L.2112066             | Specimen present | Central       | Alysson 2 Thlaspi Alysson dictum campestre minus Alysson minimum Thlaspi minus quibusdam, alias Alysson minus | Carolus Clusius          | Johann Bauhin              | Brassicaceae                | Alyssum alyssoides (L.) L. |
| 45         | 6             | L.2112067             | Specimen present | Central       | Alysson 2 Thlaspi Alysson dictum campestre minus Alysson minimum Thlaspi minus quibusdam, alias Alysson minus | Caspar Bauhin           | Carolus Clusius            | Brassicaceae                | Alyssum alyssoides (L.) L. |
Appendix 3 Current occurrence of species from the herbaria in Pomerania *

| Current identification       | Family         | Current occurrence in Pomerania |
|-----------------------------|----------------|---------------------------------|
| Alyssum alyssoides (L.) L.  | Brassicaceae   | n                               |
| Andromeda polifolia L.      | Ericaceae      | y                               |
| Antennaria dioica (L.) Gaertn. | Asteraceae    | n                               |
| Anthriscus ramosus L.        | Asparagaceae   | n                               |
| Anthoxanthum nitens (Weber) | Poaceae        | y                               |
| Astragalus arenarius L.      | Fabaceae       | n                               |
| Avenella flexuosa (L.) Drejer| Poaceae        | y                               |
| Buphthalmum salicifolium    | Asteraceae     | n                               |
| Bupleurum longifolium L.    | Apiaceae       | n                               |
| (Calocera viscosa (Pers.) Fr. | Dacrymycetaceae / Clavariaceae | n / n                           |
| Carex digitata L.           | Cyperaceae     | n                               |
| Carex montana L.            | Cyperaceae     | n                               |
| Centaurea stoebe L.         | Asteraceae     | n                               |
| Chaerophyllum hirsutum L.   | Apiaceae       | n                               |
| Cornus sanguinea L.         | Cornaceae      | y                               |
| (Dactylorhiza viridis (L.)  | Orchidaceae    | n                               |
| Daucus carota L.            | Apiaceae       | y                               |
| Dianthus carthusianorum L.   | Caryophyllaceae| y                               |
| Echium vulgare L.           | Boraginaceae   | y                               |
| Eriophorum vaginatum L.     | Cyperaceae     | y                               |
| Fagus sylvatica L.          | Fagaceae       | y                               |
| Filago germanica (L.) Huds. | Asteraceae     | n                               |
| (Gentiana cruciata L.)      | Gentianaceae   | n                               |
| Geum rivale L.              | Rosaceae       | y                               |
| Helianthemum nummularium (L.) Mill. | Cistaceae | n                               |
| Helichrysum arenarium (L.)  | Asteraceae     | y                               |
| Helichrysum luteoalbum (L.) Rchb. | Asteraceae   | n                               |
| Hieracium umbellatum L.     | Asteraceae     | y                               |
| Hippocrepis unisiliqua L.   | Fabaceae       | n                               |
| Huperzia selago (L.) Bernh. ex Schrank & Mart. | Lycopodiaceae | y                               |
| Hyphochaeris maculata L.    | Asteraceae     | n                               |
| Hypochaeris radicata L.     | Asteraceae     | n                               |
| Laportea canadensis (L.) Wedd. | Urticaceae   | n                               |
| Luzula multiflora (Ehrh.) Lej. | Juncaceae    | y                               |
| Luzula pilosa (L.) Willd.   | Juncaceae      | y                               |
| Lycopus europaeus L.        | Lamiaceae      | y                               |
| Myagrum perfoliatum L.      | Brassicaceae   | n                               |
| Nardus stricta L.           | Poaceae        | y                               |
| (Neottia nidus-avis (L.) Rich.) | Orchidaceae | n                               |
| Origanum vulgare L.         | Lamiaceae      | y                               |
| Phyteuma spicatum L.        | Campanulaceae  | y                               |
| Pilosella lactucaella (Walt.) P.D.Sell & C.West | Asteraceae | n                               |
| Pilosella piloselloides (Vill.) Sojak | Asteraceae | n                               |
| Pulicaria dysenterica (L.) Bernh. | Asteraceae | n                               |
| (Pulsatilla pratensis (L.) Mill.) | Ranunculaceae | y                               |
| Pyrola rotundifolia L.      | Ericaceae      | n                               |
| Ranunculus lanuginosus L.   | Ranunculaceae  | n                               |
| Rhododendron tomentosum Harmaja | Ericaceae | y                               |
| Scleranthus perennis L.     | Caryophyllaceae| n                               |
| Scorzonerum humilis L.      | Asteraceae     | n                               |
| Seseli libanotis (L.) W.D.J.Koch | Apiaceae  | n                               |
| Silphiodaucus prutenicus (L.) Spalik, Wojew., Banasiak, Piwczynski & Reduron | Apiaceae | n                               |
| Sverchia perennis L.        | Gentianaceae   | n                               |
| Teucrium fruticans L.       | Lamiaceae      | n                               |
| Thalictrum lucidum L.       | Ranunculaceae  | n                               |
| Thesium ebracteatum Hayne   | Santalaceae    | n                               |
| Vaccinium uliginosum L.     | Ericaceae      | y                               |
| Veronica officinalis L. (f. albiflora (G.Don) House) | Plantaginaceae | y                               |
| Vicia cracca L.             | Fabaceae       | y                               |
| Vicia lathyroides L.        | Fabaceae       | n                               |
| Vicia sylvatica L.          | Fabaceae       | n                               |
| Viscum album L.             | Santalaceae    | y                               |

* This table lists the plants found in the combined Leiden Breyne herbaria, along with their current occurrence in Pomerania province, according to 'Flowering plants and pteridophytes of Poland: a checklist' (Mirek et al. 2002). Tentative identifications are listed in brackets. (y = yes, n = no).
Appendix 4  Miscellaneous remarks by Breyne.

Many specimens in both herbaria come with remarks on collecting location, flowering time, but with some specimens, Breyne placed other remarks. These are listed below. Our translations and interpretations are placed in square brackets.

In the 1659 herbarium:

Page 2, with Swertia perennis L. (Gentianaceae): Collected in 1659. There are two types, different in the ‘decency’ of the flowers. One has large and sharply pointed flowers, and was sent by ‘Your Honour’. The other grows locally, and has smaller, more bluntly tipped flowers. The colours also differ, pale, blue and brown. Clumps are usually of a single colour.

Page 5, with Hyperzia selago (L.) Bernh. ex Schrank & Mart. (Lycopodiaceae): this plant has grains [granula] between its leaves.

Page 6, with Thesium ebracteatum Hayne (Santalaceae): plants near the town of Bringenz grow up to half a cubit [i.e., c. 25 cm] in height.

Page 6, with Dianthus carthusianorum L. (Caryophyllaceae), & page 8 and 3, with Origanum vulgare L. (Lamiaceae): collected near the gallows. Both plants grow ‘in herbs’ [i.e., a herbaceous vegetation] between shrubs.

Page 8, with Epilobium angustifolium L. (Onagraceae): a white-flowered form, which is rarely found.

Page 15, with Pyrola chlorantha Sw. (Ericaceae): found in ravines ['speluca'] where ‘Calceolus mar.’ [C. marianus Mill.? = Cypripedium calceolus L. (Orchidaceae)] grows, and also found in the woods at Jasken.

Page 20, with Calocera viscosa (Pers.) Fr. (Dacrymycetaceae) or Clavulinopsis comniculata (Schaeff.) Corner (Clavariaceae): this Manninol is found in three colours: No. 1, which is this one, is yellow, No. 2 is grey and No. 3 is white [possibly three different species].

Page 23 and page 12, with Chaerophyllum hirsutum L. (Apiaceae): a nicely aromatic plant.

Page 25, with Eriophorum vaginatum L. (Cyperaceae): should know that it is not Linum pratense.

Unnumbered sheet (after page 27), with the name Pulsatila ranunculi folio obtusiore: added this year [1659]. Flowers are blue and fragrant. Flowers in the mountains around Thorunia [Torún, central Poland], and was sent to me by Jacobus Hase, under the name Pulsatilla caerulea odoratissima. Also found in the heather at Beren.

Idem, with the name Lichen petrae...: found laden with its circles [covered in fruiting bodies]?

Idem, with the name Pulsatilla flore clauso caeruleo: Also found with black-brown flowers and one which is ash-grey with the front tips of the leaves [petals?] brown.

Page 4, with Veronica officinalis L. (Plantaginaceae): the flowers are white, but turn pink during drying.

Page 6, with Vicia sylvatica L. (Fabaceae): flowers elegantly striped, ‘ut in Geranio Virgineum’ [It is unknown what Breyne meant here. He possibly compared the striation of the flowers to a plant he called Geranium Virgineum, or the collected Vicia grew in amongst such a plant].

Unnumbered sheet (after page 6), above a removed plant: When still flowering and standing at its best, this Albus avis has the same pale colour it has now, as root, stem, foliage and flower are of a single colour [this page possibly contained a specimen of Neottia nidus-avis L. (Orchidaceae)].

Page 11, next to removed plant and label: NB: this species with broader leaves Your Honour can see with Sr. Hermanus van den Burch [An as of yet unknown contact of Breyne’s].

Page 12, next to removed plant and label: NB: this species with narrow leaves Your Honour can see with my Cos. [cousin] Johan Breyne. [Jacob Breyne’s cousin Johannes Breyne].

Remarks from the 1673 herbarium:

Page 67, with Rhododendron tomentosum Harmaja (Ericaceae): ‘cum fructibus’ [i.e., in fruit].

Page 69, with Geum rivale L. (Rosaceae): a double-flowered form.

Page 48, with Astragulus arenarius L. (Fabaceae): rare in Austria according to Clusius. It is common in sandy locations in Cassubia.

Page 55, with Anthoxanthum nitens (Weber) Y.Schouten & Veldkamp (Poaceae): the illustration as provided by Caspar and Johannis Bauhin is not very informative. The plant has variable glumes. It is collected only in the mountains, and is often found in Prussia. In spring, bunches of the plant [its rhizomes?] are harvested because of their fragrance and given to young ladies.

Page 24, with Helichrysum arenarium (L.) Moench (Asteraceae): the colour of the plant is between the lemon-yellow of the previous and the fire-colour [orange] of the following plant.

Page 33, with Antennaria dioica (L.) Gaertn. (Asteraceae): Caspar Bauhin described it as ‘Graphalium with long flowers and narrow leaves’, but his brother Johannis thought there to be nothing special about the leaves, while the flowers are short or long, as confirmed.

Page 44, with Centaurea stoebel L. (Asteraceae): varies between locations, Clusius distinguishes a short and a tall species.
Appendix 5  Plants mentioned in Breyne’s Centuria and/or Reyger’s Tentamen *.

| Current identification       | Family               | Mentioned in Centuria | Mentioned in Tentamen |
|-----------------------------|----------------------|------------------------|------------------------|
| Alyssum alyssoides (L.) L.  | Brassicaceae         | x                      |                        |
| Antennaria dioica (L.) Gaerth. | Asteraceae         | x                      |                        |
| Avenella flexuosa (L.) Drejer | Poaceae             | ~                      |                        |
| Buphthalmum salicifolium L. | Asteraceae           | ~                      |                        |
| Bupleurum longifolium L.    | Apiaceae             | ~                      | x                      |
| Chaerophyllum hirsutum L.    | Apiaceae             | ~                      |                        |
| Cornus sanguinea L.         | Cornaceae            | x                      |                        |
| Echium vulgare L.           | Boraginaceae         | ~                      |                        |
| (Gentiana cruciata L.)      | Gentianaceae         | x                      |                        |
| Geum rivale L. (double-flowered form) | Rosaceae    | x                      | x                      |
| Hypochaeris maculata L.     | Asteraceae           | ~                      |                        |
| (Lycopodiaceae sp./spp.)    | Lycopodiaceae        | x                      |                        |
| Nardus stricta L.           | Poaceae              | ~                      |                        |
| (Neottia nidus-avis (L.) Rich.) | Orchidaceae       | x                      |                        |
| Phyteuma spicatum L.        | Campanulaceae        | x                      |                        |
| Pyrola rotundifolia L.      | Ericaceae            | x                      |                        |
| Rhododendron tomentosum Harmaja | Ericaceae        | x                      |                        |
| Scorzonera humilis L.       | Asteraceae           | x                      |                        |
| Teucrium fruticans L.       | Lamiaceae            | ~                      |                        |
| Thalictrum lucidum L.       | Ranunculaceae        | x                      |                        |
| Vaccinium uliginosum L.     | Ericaceae            | x                      |                        |
| Vicia sylvatica L.          | Fabaceae             | x                      |                        |
| Viscum album L.             | Santalaceae          | x                      |                        |

* This table lists the plants found in the combined Leiden Breyne herbaria which are listed in Breyne’s Centuria (Breyne 1674–1678) and/or Gottfried Reyger’s Tentamen (Reyger 1764). No plants from the herbaria were mentioned in Breyne’s Prodromus (Breyne 1680–1689).

(× = name by Breyne matches with name in work; ~ = name by Breyne matches partially with name in work, description points to the same or a very similar species. Names between brackets indicate tentative identifications).