

legare produzione agricola e pastorizia, applicando la rotazione delle colture con l'introduzione dei prati artificiali e, nello stesso tempo, abbandonando la pastorizia errante a favore di allevamenti stanziali.

Vista nel suo insieme, dunque, la collezione di erbari, siano essi figurati o secchi, conservati nella Biblioteca di Napoli costituisce una straordinaria quanto sconosciuta testimonianza delle tradizioni naturalistiche napoletane ed offre agli studiosi alcune testimonianze ineditate, che certamente vanno ad arricchire il patrimonio delle conoscenze botaniche.

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Riassunto

La Biblioteca Nazionale di Napoli raccoglie un gran numero di erbari. Si tratta prevalentemente di erbari figurati di epoche diverse e di tre erbari secchi.

Tra gli erbari figurati un esemplare di enorme valore è costituito dal un Dioscoride del VII sec. secondo per antichità solamente a quello conservato nella Biblioteca Palatina di Vienna.

Tra gli erbari secchi certamente il più importante è quello composto da Ferrante Imperato tra la fine del XVI sec. e gli inizi del XVII sec. Esso faceva parte delle collezioni naturalistiche ospitate nel Museo del celebre speziale napoletano e, al di là dell'intrinseco valore scientifico, ha un grande rilievo storico per la museologia napoletana.

Pre-linnean herbaria in Bologna: some newly discovered collections from the time of Ulisse Aldrovandi

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Erbari pre-linneani a Bologna: alcune collezioni dell'epoca di Ulisse Aldrovandi recentemente scoperte. — Bologna fu uno dei centri nei quali si sviluppò, nel XVI secolo, la tecnica di realizzare erbari, grazie soprattutto all'opera di Luca Ghini (1490-1556) e Ulisse Aldrovandi (1522-1605). Varie collezioni realizzate tra il XVI e il XVIII secolo, prima fra tutte l'erbario in 16 volumi di Ulisse Aldrovandi, sono tuttora conservate a Bologna; tra queste, particolarmente interessante è un erbario anonimo databile tra la fine del XVI e l'inizio del XVII secolo, che contiene 273 piante incollate su 88 fogli rilegati. Questo erbario fu esaminato attorno al 1890 da G.E. Mattei, che lo attribuì a Giacomo Zanoni (1615-1682), curatore dell'Orto Botanico di Bologna. Anche A. Baldacci studiò approfonditamente questo erbario, senza tuttavia indicare un possibile autore. Mentre non esistono indizi che avvalorino l'ipotesi di Mattei, alcune note riportate sui fogli d'erbario paiono indicare come autori della collezione i fratelli Jean e Gaspard Bauhin. Per confermare questa ipotesi si è provveduto a confrontare le note manoscritte con le indicazioni presenti nelle principali opere di Gaspard Bauhin (*Phytopanax*, 1596; *Prodromus Theatri Botanici*, 1620; *Pinax*, 1623) e di Jean Bauhin (*Historia Plantarum*, 1650-1651). Si è inoltre confrontato il materiale presente a Bologna con le collezioni ed i manoscritti dei fratelli Bauhin conservati a Basilea.

Key-words: Bologna (BOLO), pre-linnean herbaria, Ulisse Aldrovandi.

Botanical science in its modern acception arose, in Bologna as in other centers of Italy and elsewhere in Europe, during the XVI century. Botany — mainly as a part of the medical science — had been taught in Bologna during the Middle Age by Pietro de Crescenzi and by Giovanni Cuba among others. In the first decades of the XVI century the chair of Botany was held by Nicola Leoniceo, a celebrated physician and simplicist coming from the University of Ferrara, who was the teacher of Luca Ghini. Ghini, in his turn became professor of Botany in 1528, and maintained the chair for about twenty years. This lapse of time was crucial in the history of Botany, since at that time Botany became independent of Medicine, and the art of making herbaria developed. The oldest reports of botanical excursions made with an explicit floristic and phytogeographic interest go back to that time. As an example, the excursion to Monte Baldo, celebrated for its floristic richness, was a must to all botanists who happened to come to Northern Italy. Unfortunately, no records

of those early years of botanical research in Bologna were preserved. The herbarium of Luca Ghini, which included several hundred specimens, was totally dispersed, at least in part during Ghini's lifetime.

The oldest record of botanical research in Bologna that we can date with precision, is the herbarium of Ulisse Aldrovandi, a pupil of Ghini. This herbarium was set up from 1551 onwards. Several thousands of dried specimens are glued on the pages of sixteen volumes. Often, but not always, more than one synonym is given for the same species. There is usually no geographic indication; also, never is it indicated who collected and communicated a given specimen, although there are good reasons to believe that many of the exsiccata came to Aldrovandi as a present by corresponding botanists. Ghini's herbarium must be, at least in part, sunk into this collection.

In recent years we undertook a general survey of the historical collections preserved in our Herbarium. In this occasion we could detect some further plant collections, which can be dated to the same time as the Herbarium by Aldrovandi. Such collections are the object of the present report.

A noteworthy object is a bound volume whose binding is made up by a medieval manuscript. On its pages are glued 214 specimens, one species on each page. The handwriting suggests that this herbarium was set up in the sixteenth century. Many specimens have been preserved in excellent conditions. The author followed consistently Mattioli, the page of the 1585 edition of the *Discorsi* being regularly cited after each name. The names are almost all Italian vernacular, as in Mattioli. No synonymies are given. It seems that this herbarium was set up by a pupil or a coworker of Aldrovandi. A study on it is in progress.

Of the same age, but even more interesting, is a further bound herbarium. The handwriting on its pages lets us assume that it was also set up during the XVI century, or at the beginning of the XVII century at the latest. This volume was long overlooked, partly because of a poor binding of a later time. Only recently it has been recovered from the historical library, where it had been inserted. The volume of 31 by 21 cm is made up by 88 pages, on which 273 plants are stuck. About 10 more pages appear to have been cut off in the past. Most specimens are in fairly good conditions, while others are more or less damaged; in some cases the only print of the plant on the paper has remained. The names of the species are written directly on the sheets. The handwriting is mostly accurate, but sometimes it is rather careless, with obscure shortenings and even orthographic errors (e.g., the name «Bauhin» is often misspelled in «Bauchinus»). The synonymy is, in general, very rich. The most frequently cited author is Mattioli (66 citations), followed by Clusius (44 citations) and by Gaspard Bauhin (32 citations). Twentyfive more authors are cited at least once; some of them are relatively little known (e.g. Andrea

Lacuna or Fabio Colonna). The author appears to have had a deep knowledge of the botanical literature of his time. In one instance we find also an ecological observation, related to the polymorphism of *Thalictrum* in different habitats.

Here arises the main question: how could the same person have a thorough knowledge of the literature, and not be able of writing correct Latin; how could he misspell the names of those authors, whose books he had so carefully studied.

This herbarium was first studied and described by BALDACCI (1907). He reported that the volume was purchased occasionally at Faenza — a town of the region Romagna — about a hundred years ago, within a stock of ancient books. From a set of labels inserted among the pages we could establish that Mattei also studied this relic in the same years. Mattei was «Primo Assistente» to the Chair of Botany in Bologna around the end of the past century, while Baldacci was «Secondo Assistente». In his handwritten notes Mattei suggested that the author of the herbarium was Giacomo Zanoni, the «Sovrintendente» of the Bologna Botanical Garden from 1642 to 1682, and the author of an *Istoria Botanica*. This hypothesis was never published by Mattei, as far as we know.

In spite of Mattei's assertions, Zanoni's book does not contain any concrete evidence that he was the author of the collection. Baldacci, on the contrary, gave much weight to the errors in the handwriting, which led him to conclude that the Herbarium was the work of a «modesto autore bolognese» of the XVII century. After Mattei's and Baldacci's survey, the volume sank again into oblivion. Only recently it came to light again, in the occasion of the general survey of our historical collections. In our opinion both Mattei and Baldacci gave too little weight to some enlightening features of this herbarium.

A floristic-chorological analysis of 259 species certainly identified gave the following result:

- A) 204 species belong to the spontaneous flora of the Po plain and of the surrounding hills;
- B) 13 species were certainly commonly cultivated throughout Europe;
- C) 7 species are orophytes of the Alps and of the northern Apennines;
- D) 5 species are Illyric or Pannonic;
- E) 4 species are exotic (American or Asiatic)
- F) 2 species were presumably obtained by the Author in the form of dry fragment.

The composition is indicative of the scientific interest of the author, that appear to be directed not only toward the plants of pharmaceutical value, but to the floristic rarities as well. However, we cannot draw from the list any information about the places where the author botanized, since the botanical gardens of that age were very rich in all sort of plants (see, for example, Aldrovandi, ms. n. 2, and Ambrosini, 1657, for Bologna, or Porro, 1591, for

Padua). The only piece of information about the floristic activity of the author is to be found on a specimen of *Campanula cochlearifolia*, where we read the words: «*Campanula minor alpina rotundioribus imis foliis Clusii de Montis Baldi*» (fig. 1). Of course, this is not enough to identify the anonymous author, as the excursion to Monte Baldo was very popular among botanists at that time; however, we shall come again on this specimen.

Two specimens deserve particular attention.

The first one is a leafy stem of Cotton (fig. 2). The note indicates that this specimen was collected in the garden of Doctor Zwinger, and says that this plant will be described in «*Historia nostra*». The author was obviously willing to publish a *Historia plantarum*. Now, in the first volume of the *Historia plantarum* by Jean Bauhin, that was published after his death by his son-in-law Johann Heinrich Cherler we find (page 346) a description of this species, with an explicit reference to the garden of Doctor Zwinger in Basel, where the plant had been observed.

A second noteworthy specimen is a sample of *Capsella bursa-pastoris* (fig. 3): here, the author briefly discusses the infraspecific variability, and then remarks that himself has drawn the attention on this variability in his *Phytopinax*, with the words «ut in Phytopinace monuimus». In the *Phytopinax* by Gaspard Bauhin there is, in fact, a short discussion of the variability in *Capsella*.

These specimens indicate that the brothers Bauhin were certainly involved in some way in the setting up of this collection.

Even the specimen of *Campanula cochlearifolia* from Monte Baldo cited above fits to an autobiographic note in the *Prodromos* by Gaspard Bauhin, where the description of the *Campanula rotundifolia minima* is followed by the words: «Hanc in Raetorum alpihus cum Italiam peteremus anno 1577, septem mense adhuc florentem inter saxa copiosissime observavimus». The citation is obviously referred to the journey to Italy, that led Gaspard to Padua and Bologna, where he was to spend almost two years. Most remarkably, the very same words can be found in the *Historia plantarum* by Jean Bauhin, who did not take part in that journey, as far as we know. The fact, that the same botanical exploration is mentioned with the same words, and using the first person, in books attributed to both brothers, indicate that it is almost impossible to separate the scientific contributions of the one from those of the other.

As to the time, when the collection was made, it was by necessity after 1596, the date of publication of *Phytopinax*. It was not made much later, since all cited works were published before that time. For instance, there is no citation of the *Historia plantarum* by J. GERARD (1597), which is remarkable in consideration of the rich synonymy that characterizes the volume. Of course, this is not an evidence, but just an indication.

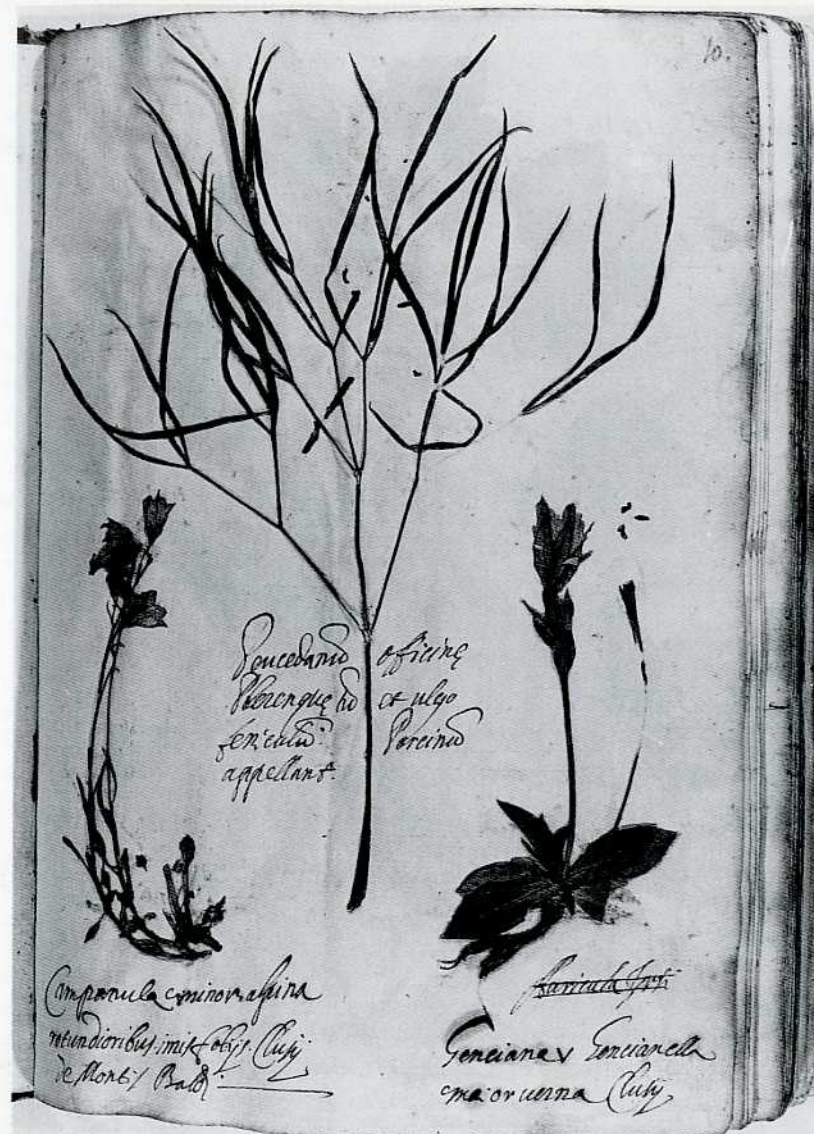


Fig. 1 - Pag. 10. Left bottom, the specimen of *Campanula cochlearifolia* with the indication «*Campanula minor alpina rotundioribus imis foliis Clusii de Montis Baldi*».



Fig. 2 - Pag. 65. The specimen of *Gossypium herbaceum* collected in the garden of Doctor Zwinger, with the indication «... cuius iconem Historia nostra exhibebit.»



Fig. 3 - Pag. 78. The specimen of *Capsella bursa-pastoris* with the indication «... ut in Phytopinace monimus.»

About the relations between the Bauhins and Bologna, both Jean and Gaspard Bauhin were in Bologna and visited Aldrovandi (FANTUZZI, 1774). Jean Bauhin (1541-1612) botanized in Veneto (SACCARDO, 1869) and visited Bologna in 1563. He kept later a strict relation with Aldrovandi and the Botanic Garden, with whom he exchanged seed for his own gardens (WHITTERIDGE, 1970). The younger Gaspard Bauhin (1560-1624) was also in Bologna during the years 1577-1578, after his excursion to the Alps mentioned above. After Saccardo (1869) he was again in Padua in 1588, and botanized on Colli Euganei, Monte Baldo and Lido di Venezia. The presence of both brothers in Italy was, in any case, preceding to the time when the herbarium was made.

To better define the relation between our herbarium and the Bauhins, one of us visited the Herbarium of the University Basel, where herbarium and manuscripts of the Bauhins are preserved. The herbarium of Gaspard Bauhin consists of loose plants contained in unbound folded sheets. The names are written on labels, which are also loose. Its physical structure does not match with that of our herbarium. A herbarium of Jean Bauhin as such does not exist. He certainly collected and dried plants, as all botanists were doing at his time, but his plants are presumably inserted and labeled within the younger brother's herbarium (see STAFLEU and COWAN, 1976). The handwriting in our herbarium has been compared with autographic manuscripts of both brothers. It can be ruled out beyond any doubt that it belongs to either of them. On the contrary, our handwriting is rather similar to that of one of the secretaries of Aldrovandi.

The very complex and problematic situation that we have described could be explained by assuming that either one of the Bauhins sent a set of plants to Aldrovandi as a present, as it was customary at that time, perhaps as a sign of friendship, or of gratitude for the hospitality they had enjoyed in Bologna years before. The parcel should have been sent around the end of the XVI century. The herbaria of both brothers were being merged together, and the parcel contained plants collected by both of them. The worth of the collection lay not so much in the intrinsic rarity of the plants, as in the critical identification and in the exceptionally rich synonymy. Aldrovandi was usual to enclose all plants that he received into his collections: so, he might have charged his secretary of setting the specimens received from the Bauhins in the same way as he kept his own, that is on bound sheets, with the plants stuck on them and the notes copied by hand from the original labels onto the sheets. The orthographic errors should have originated during this phase. That the present volume is the result of a copying work is proved by a page, where a specimen of *Vincetoxicum hirundinaria* is identified as «*Asclepias albo flore*» and, the line below, as «*Asclepias altera flore nigro*» (fig. 4); the second name cannot refer to the same plant: it must refer to a specimen of *Vincetoxicum nigrum*. The copyist, having



Fig. 4 - Pag. 36. The specimen of *Vincetoxicum hirundinaria* identified as «*Asclepias albo flore*» and, the line below, as «*Asclepias altera flore nigro*».

little or no knowledge of botany, presumably lost the latter, and copied both labels besides the same plant.

We do not have a definite evidence to support this hypothesis. However, it seems to us the only logical way of explaining the presence in Bologna of a plant collection that certainly was set up by the Bauhins, and certainly was not arranged by them in its present form.

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Summary

The art of making herbaria had in Bologna one of its places of origin, mainly due to the teaching of Luca Ghini (1490-1556) and the activity of Ulisse Aldrovandi (1522-1605). Several collections of exsiccata from the xvi to the xvii century have been preserved, to begin with the impressive herbarium in sixteen volumes by Aldrovandi, and to end with a «Collectio Plantarum Varia sub Gaetano Laurentio Monti» in four volumes, pre-linnean in the nomenclature in spite of the date (1771-1772).

A noteworthy relic is an anonymous herbarium datable between the end of the xvi and the beginning of the xvii century, that contains 273 plants stuck on 88 bound sheets (about 10 more sheets have been cut off in the past). G.E. Mattei examined this herbarium around 1890 (mscr.), and attributed it to Giacomo Zanoni (1615-1682), curator of the Bologna Botanic garden from 1642 to his death. A. BALDACCIO (Mem. Accad. Sci. Bologna, ser. 6, 4: 147, 1907) described the herbarium in detail, but failed to indicate a possible author.

There is no evidence to support Mattei's hypothesis; on the contrary, some unequivocal autobiographic notes on the herbarium sheets lead to the brothers Bauhin. Both Jean (1541-1612) and Gaspard (1560-1624) Bauhin visited Aldrovandi in Bologna and collected plants in

northern Italy (WHITTERIDGE, G. - *Dictionary of Scientific Biography*. New York. 1: 522-527, 1970).

The paternity of the herbarium is discussed in the light of an accurate analysis of the handwritten notes to the specimens, compared with the main works by Gaspard Bauhin (*Phytopynax*, 1596; *Prodromos Theatri Botanici*, 1620; *Pinax*, 1623) and Jean Bauhin (*Historia Plantarum*, 1650-1651), and with other contemporary works. A comparison of the material in Bologna with the Bauhin herbarium and manuscripts at Basel is also discussed.