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The "Sereno Ameglio" Lichen collection: a virtual exploration of exsiccata conserved in the Aosta Valley Regional Natural Science Museum

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ABSTRACT
The Aosta Valley Regional Natural Science Museum, has recently made available its collections as "Virtual Museum". At this time the lichen collections have been reorganized, among them the "Sereno Ameglio" collection, these data are still unpublished; in this work 25 specimens of relevant taxa are here discussed.

Key words:
lichens herbaria, Virtual Museum, Aosta Valley.

RIASSUNTO
La collezione lichenologica "Sereno Ameglio": un'esplorazione virtuale degli exsiccata conservati al Museo Regionale di Scienze Naturali della Valle d'Aosta.

Il Museo Regionale di Scienze Naturali della Valle d'Aosta, ha recentemente reso accessibili le sue collezioni sotto forma di Museo Virtuale. In tale occasione sono anche state riorganizzate le collezioni lichenologiche, fra le quali la collezione "Sereno Ameglio" i cui dati sono totalmente inediti. Vengono qui discussi 25 campioni di taxa rilevanti.

Parole chiave:
erbari lichenologici, Museo Virtuale, Valle d'Aosta.

INTRODUCTION

Digital and online technologies are greatly increasing the value to society of small natural history museums and herbaria, e.g. by disseminating taxonomic information via the Internet and as a resource for local and regional researchers and management agencies (Snow, 2005).
The project "Bio-Montagne - Réseau d'éducation sur la biodiversité dans les zones alpines" (2007-2013 cross-border Italy-Switzerland cooperation framework) aims to (i) protect and promote biodiversity and (ii) educate both visitors and the local community to valorise biodiversity in the alpine environment. In particular, this virtual tool aims to spread the knowledge of Natural Sciences and allows to make accessible data from collections to researchers and the wider public: the Virtual Museum of the Aosta Valley Regional Natural Science Museum, available from the website: www.digitalnature.it, is a part of the project "Bio-Montagne". As the exhibition centre is currently closed to the public for restoration, the Virtual Museum is not just a digital version of the real Museum, but the only way to explore its collections. This tool allows indeed a rapid search of all the samples, reporting related information and high resolution images.
Preliminary activities were performed for preparing and organizing the collections and in order to create the Virtual Museum itself (design and creation of an information system, digitalization of the collections, creation of summary descriptions of the items and additional associated information). A multidisciplinary group has contributed to the realization of the Virtual Museum which includes all the museum collections: Herbaria, bryophytes, lichens, entomology, petrographic and mineralogic collections, stuffed mammals, birds, reptiles, amphibians and fishes along with the collections of eggs and nests. All the samples have been patiently organized and the data entered into functional databases, including images in digital format.

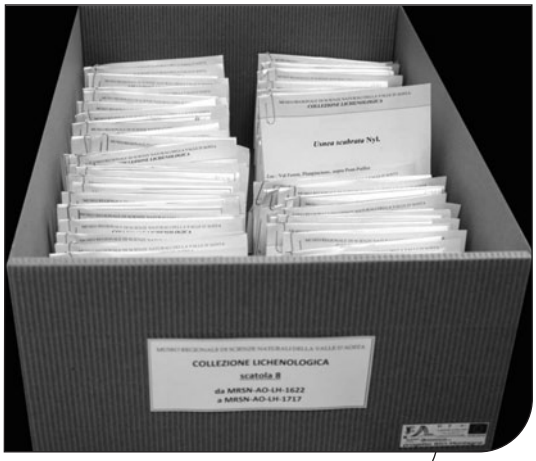

Fig. 1. A box of new envelopes of the MRNS – AO Lichen collection

Most of the collections held at the Museum are the result of donations by specialists in the various sectors of natural science and loans from institutions or private individuals. Most of items date back to the 20th century and to the second half of the previous century. This work deals with the Sereno Ameglio collection, a lichen collection that constitutes one of three cores of the lichenological collection of the Museum.

LICHEN EXSICCATA IN HERBARIUM AO

The Museum's lichen collection is composed of: (i) the Henry collection, (ii) the Ameglio collection, (iii) and the current collection, including 1552 recent samples (1979-2013) collected in the Aosta Valley by the staff of the Laboratory of Lichenology of the University of Turin.

The ancient nucleus belongs to historical specimens (n = 156) attributable to Abbé Joseph-Marie Henry (1870–1947), the curate of Valpelline who had a passion for alpinism, botany and entomology and published, between 1910 and 1920, several papers on the lichen flora of Aosta Valley. This collection was damaged over time and much of the information was lost, seriously compromising its scientific value (Piervittori et al., 1988). On the other hand, its historical value remains intact, as it represents the first significant lichenological collection exclusively collected in the Aosta Valley territory.

In this work we describe the curatorial work carried out on samples of Sereno Ameglio (born in 1922), a painter who collected lichens as models for his artistic works and who lived in the Aosta Valley between the end of 1970s and early 2000s. In 1990 he donated his samples to the Aosta Valley Regional Museum of Natural Science. Unfortunately, the samples were not associated to a catalogue. Few of them were yet identified. In most cases, they were not properly stored (e.g. attached with glue to pieces of cardboard) and in several cases the indication of herborization was lost.

In summer 2014 were performed inventory and identification activities, and data entry. A reorganization and a replacement into folded envelopes (fig. 1), following the widely adopted management practices (e.g. Obermayer, 2002), were also performed. A total of 889 samples were surveyed, at present we identified 415 samples; 200 other specimens are yet to be identified. With regard to the rest of the collection, the original labels of 224 samples have been lost, while 60 samples derived from collections carried out in other Italian regions.

Samples belong to 189 species (and 74 genera). With regard to their substratum, samples can be divided as follows: 58% saxicolous species, 25% epiphytic species, and 16% terricolous species. Samples were collected in 38 out of the 74 municipalities of the Aosta Valley, however, mostly in a limited number of municipalities: Châtillon (47 samples), Cogne (45), Saint Marcel (44) and Saint Vincent (54).

Noteworthy species (25) are listed below. We report for each record: the nomenclature following Nimis & Martellos (2008); the ID number of the specimen in the Herbarium of Aosta Valley Regional Natural Science Museum (AO); the date and locality of collection (if present on the specimens label). We also included annotations regarding previous citations for the study area and a brief discussion.

Acarospora chrysocardia Poelt & M.Steiner

- MRSN-AO-LH-2692; 04/12/91; Saint Denis, Castle of Cly.
  Rare species known in Italy only from the Western Alps; this species is listed as protected in the Regional Law for the Protection of Flora (RAVA L.R. 45/09-Annex A). This species is reported in Italy only for Aosta Valley and Piedmont; in the Aosta Valley it was formerly reported twice for Saint Nicolas (Leuckert & Buschardt, 1978; Buschart, 1979).

Acarospora peliscypha Th.Fr.

- MRSN-AO-LH-2688; 1976-1998 Saint Marcel, Servette Mines.
  Species found on siliceous, also iron-rich, rock outcrops; this species was reported once for the Aosta Valley at the beginning of XX Century (Magnusson, 1929).

Aspicilia recedens (Taylor) Arnold

- MRSN-AO-LH-2538; 10/3/90; Châtillon, Bellecombe.
  Silicicolous species, formerly known for the region for a report on the medieval Castle of Graines, Ayas Valley (Piervittori et al., 1991).

Biatora subduplex (Nyl.) Printzen

- MRSN-AO-LH-2498; 25/3/90; Châtillon, Bellecombe.
  This species growing on terricolous mosses and plant debris is certainly widespread in the Alps, but probably overlooked because of its similarity with *Biatora vernalis* (Nimis & Martellos, 2008). First record for the Aosta Valley.

Caloplaca hungarica H.Magn.

- MRSN-AO-LH-2497; 25/3/90; Châtillon, Bellecombe.
  Species growing on twigs of acid-barked trees, (including *Larix decidua* Miller) often confused with *C. ferruginea* in the past, but not common in Italy (Nimis & Martellos, 2008).

Caloplaca obliterans (Nyl.) Blomb. & Forssell

- MRSN-AO-LH-2691; 06/09/89; Saint Vincent, Fromy.
  A cool-temperate to boreal-montane species, formerly reported only by Henry, 1912 (sub *Placodium cirrochroum* var. *obliterans* Nyl.).

Candelariella coralliza (Nyl.) H.Magn.

- MRSN-AO-LH-2603; 1/12/89; Saint Denis, Cly.
  Taxon recently reported for the region in the Mont Avic National Park (Favero-Longo et al., 2006; Favero Longo & Piervittori, 2009). This is a silicicolous species, widespread in the alpine pastures, but overlooked and confused with *Candelariella vitellina* (Nimis & Martellos, 2008).

Cladonia acuminata (Ach.) Norrl.

- MRSN-AO-LH-2696; 1976-1998; Saint Vincent, Fromy.
  Terricolous species, with an optimum on calciferous humus rich soils in open situations. First record for the Aosta Valley.

Cladonia arbuscula subsp. *squarrosa* (Wallr.) Ruoss

- MRSN-AO-LH-2425; 1976-1998; Valtournenche.
  First record for the Aosta Valley for this subspecies belonging to the *C. arbuscula* complex; several records listed under *C. arbuscula* subsp. *arbuscula* could refer to this taxon, probably the most widespread subspecies in the Alps (Nimis & Martellos, 2008).

Cladonia ecmocyna Leight.

- MRSN-AO-LH-2522; 25/8/88; Cogne, path to Valnontey.
  Species found on organic soil and amongst bryophytes in cool depressions with a late snow lie, restricted to the Alps in Italy. Formerly cited only once in the Valpelline Valley by Henry (1910).

Hypogymnia bitteri (Lynge) Ahti

- MRSN-AO-LH-2488; 25/7/85; Morgex, path to Arpy Lake.
  First record for the Aosta Valley for this species of acid-barked tree, occasionally found also on wood or siliceous rocks (Nimis & Martellos, 2008).

Lecania cyrtella (Ach.) Th.Fr.

- MRSN-AO-LH-2426; 1976-1998; Valgrisenche.
  A widespread holarctic epiphytic lichen, found on the base-rich bark of isolated trees, recently cited for the Mont Avic National Park (Isocrono et al., 2008).

Lecanora flotowiana Spreng.

- MRSN-AO-LH-2545; 10/91; Valsavarenche, Eaux-Rousses.
  This is a species very widespread in Italy (Nimis & Martellos, 2008), but only recently cited for the Aosta Valley (Matteucci et al., 2015).

Lobaria pulmonaria (L.) Hoffm.

- MRSN-AO-LH-2410; 11/89; Cogne.
  This "flagship" species (grown on bark, epiphytic and epilithic mosses in humid forests) drastically declined in last decades (Nascimbene et al., 2007) and is extinct in the plains of the north Italy. It is a holarctic species (Nimis & Martellos, 2008). In Aosta Valley it is cited by Henry (1910; 1911), Vaccari (1914) and Tosco (1973) for the same locality.

Melanelia commixta (Nyl.) Thell

- MRSN-AO-LH-2633; 25/6/89; Challand Saint Anselme, Arbaz Mines.
  A saxicolous species, formerly reported once for the Aosta Valley sub *Platysma commixtum* (L.) Nyl. by Henry (1910) in Valpelline, Bionaz.

Peltigera didactyla var. *extenuata* (Nyl. ex Vainio) Goffinet & Hastings

- MRSN-AO-LH-2674; 1976-1998; Rhêmes Notre Dame.
  First record for the Region of this recently described subspecies (Goffinet & Hastings, 1995) on the basis of peculiar chemistry: medulla reacting C+red, KC+red (ephemeral reaction), K-, P-, cortex C-, K-,P-; soralia C+red, KC+red. This taxon was included in the Italian flora by Benesperi & Giordani (2012).

Pertusaria amara var. flotowiana (Flörke) Erichsen

- MRSN-AO-LH-2439; 1976-1998; Saint Vincent, Fromy.
  First record for the North of the Italian peninsula for this critical taxon: it may be a saxicolous form of *P. amara* (Nimis & Martellos, 2008).

Pertusaria excludens Nyl.

- MRSN-AO-LH-2625; 25/6/89; Challand Saint Anselme, Arbaz Mines.
  A suboceanic species, found in the Italian Alps only in Friuli Venezia Giulia (Tretiach & Hafellner, 2000). First record for the Italian Western Alps.

Rinodina occulta (Körb.) Sheard

- MRSN-AO-LH-2500, 1976-1998, Saint Marcel, Praz Bornaz.
  A species formerly recorded in the Aosta Valley on the medieval Castle of Graines (Piervittori 1991, sub *Buellia occulta* Korb).

Rinodina septentrionalis Malme

- MRSN-AO-LH-2491, 25/3/90,Châtillon, Bellecombe.
  A species tipically grown on *Rhododendron* shrubs in open situations (Nimis & Martellos, 2008). First record for the Aosta Valley.

Sticta sylvatica (Huds.) Ach.

- MRSN-AO-LH-2600; 1976-1998; Cogne, Lillaz.
  This is a species of Lobarion (lichen-dominated, species-rich epiphytic plant community), is a foliose cyanolichen known for its sensivity to various types of

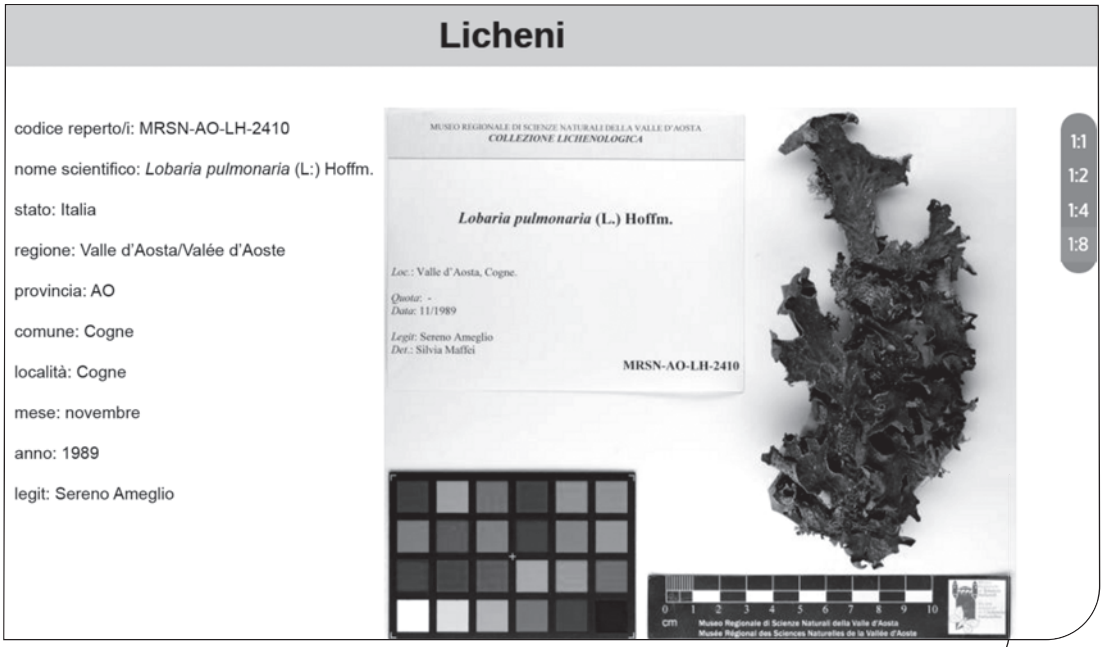

Fig. 2. The specimen of Lobaria pulmonaria collected by Sereno Ameglio in the Virtual Museum

human disturbances (Gauslaa, 1995). In Italy this species is menaced of extiction: most of the Italian records are old (Nimis & Martellos, 2008). Formerly recorded for the Aosta Valley in the Valpelline Valley (Henry, 1910).

Synalissa symphorea (Ach.) Nyl.

- MRSN-AO-LH-2613; 30/11/91; Saint Pierre, route to Vetan.
  A species found on calcareous rocks, on steeply inclined faces with periodical water seepage, widespread in Italy (Nimis & Martellos, 2008). First record for the Aosta Valley.

Xanthoparmelia glabrans (Nyl.) O.Blanco, A.Crespo, Elix, D.Hawksw. & Lumbsch

- MRSN-AO-LH-2532; 25/3/90; Châtillon, Bellecombe.
  Second record for this recently described species (Blanco et al., 2004), already reported for the Tsatelet Natural Reserve (Matteucci et al., 2013).

Xanthoparmelia sublaevis (Cout.) Hale

- MRSN-AO-LH-2614; 1976-1998; Saint Marcel, Servette Mines.
  A silicicolous species of dry alpine valleys (Nimis & Martellos, 2008) firstly reported for the Aosta Valley (Matteucci et al., 2015).

Xanthoparmelia verruculifera (Nyl.) Essl. O.Blanco, A.Crespo, Elix, D.Hawksw. & Lumbsch

- MRSN-AO-LH-2619; 1976-1998 Saint Marcel, Druges.
  First record for this recently described species (Blanco et al., 2004) characterized by divaricatic and stenosporic acids in the medulla layer (Nimis & Martellos, 2008).

CONCLUSIONS

The analysis of Sereno Ameglio collection specimens revealed the presence of nine species not yet recorded for the region and three records of very rare species: *Acarospora chrysocardia, Lobaria pulmonaria* (fig. 2) and *Sticta sylvatica*. Herbarium data can provide relevant information for conservation planners: they are informative of distribution and persistence of species, and offer descriptions of habitat affinities for each species (MacDougall et al., 1998).
Moreover, Bebber and colleagues (2010) highlighted that a large number of newly described species were found among the older specimens in different herbaria and claimed the need for widened access to global collections through the exchange and largescale digitisation of existing specimens.

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