Vol. 20, No. 8, 2025

scnat
swiss academy of sciences

swiss academies communications

swiss-academies.ch

Strategy for natural history collections in Switzerland

2025–2035

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ABOUT THIS PUBLICATION

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RECOMMENDED FORM OF CITATION
Price M, Cibois A, Wandeler P, Scheidegger C, Stieger P (2025)
Strategy for natural history collections in Switzerland 2025–2035.
Swiss Academies Communications 20 (8)

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This report includes inputs from the people listed as contributors based on their returns on a survey of strategic issues that are important for Swiss natural history institutions and during a subsequent consultation period. Participants in workshops on the strategy for natural history collections in Switzerland held at the SwissCollNet Workshop on the 20th of January 2023 (Bern) and musnatcoll.ch Annual Meeting on the 6th of June 2023 (Geneva) are listed in Annex 1.

1st edition, 2025

This brochure can be obtained from SwissCollNet (SCNAT) free of charge or downloaded from scnat.ch/en/id/7PDd8.

ISSN 2297-8275 (Print)
ISSN 2297-184X (Online)

DOI: doi.org/10.5281/zenodo.17300867

With this report, the Swiss Academy of Sciences contributes to the SDGs 14 and 15.
> sustainabledevelopment.un.org
> agenda-2030.eda.admin.ch/de

Strategy for natural history collections in Switzerland

2025–2035

Content

Summary

Twenty-five natural history institutions from sixteen cantons in Switzerland co-developed a natural history collection strategy based on the six strategic pillars of 1. Standardising and implementing management practices, 2. Databasing, digitising and managing digital data, 3. Enhancing natural history collections and their scientific use, 4. Developing training, education and outreach opportunities, 5. Facilitating collaboration, exchange and networking, and 6. Consolidating and managing the network, including funding and shared resources. For each of the strategic pillars, the directors, curators, collections managers, and scientists of the contributing institutions identified a set of 52 key activities. Under each pillar the proposed activities were divided into joint actions to be undertaken collaboratively within the community or with strategic partners, and institutional actions to be undertaken by the institutions themselves, based on their available resources. This nationwide approach to supporting, maintaining, enhancing and using natural history collections, the first of its kind in Switzerland, represents a key step for both science and society. It reflects the general recognition of the importance of a coordinated and co-operative approach to natural history collections at a national level to:

- guarantee the long-term patrimonial preservation of Swiss natural history collections through the implementation of adequate management practices and standards;
- strive to digitise specimens and continue to provide physical and digital access to collections;
- maintain the infrastructure for the aggregation of and open access to data derived from natural history collections;
- promote the exchange of expertise as well as the sharing of resources and skills associated with the management, curation and digitisation of specimens;
- facilitate and undertake scientific research using natural history collections;
- enhance and develop collections through fieldwork and the exchange or acquisition of specimens, in compliance with national and international legislation or regulations;
- ensure the use of collections as educational, training and cultural resources.

Zusammenfassung

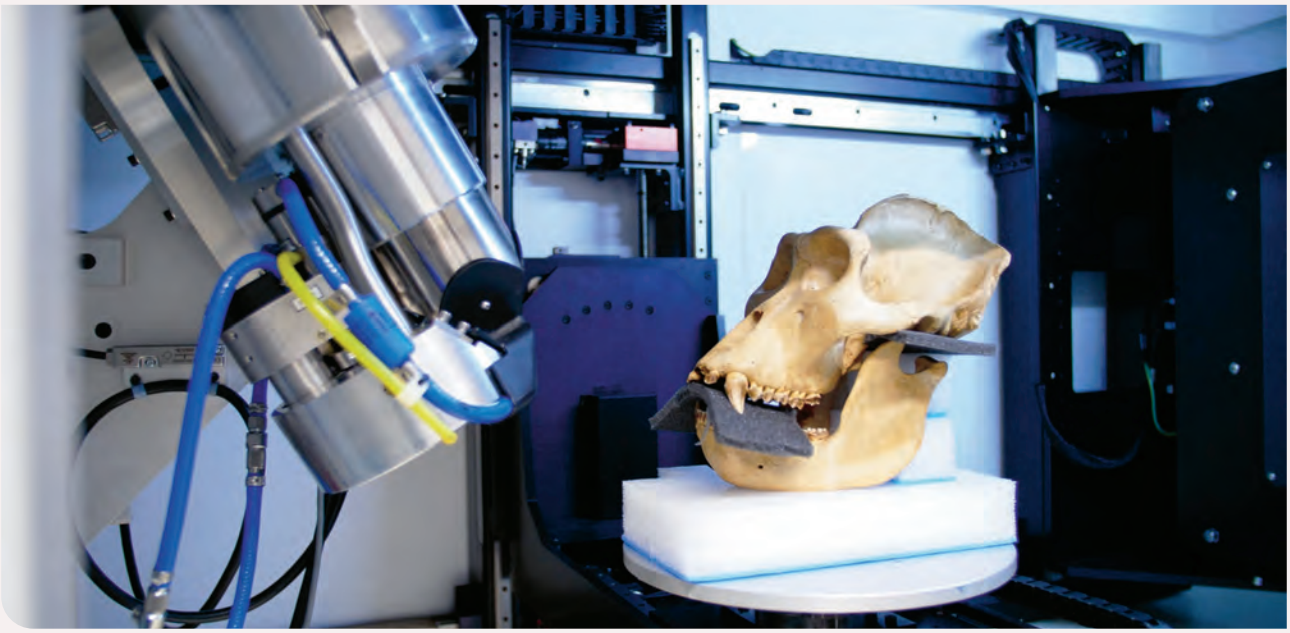
Fünfundzwanzig naturhistorische Institutionen aus sechzehn Kantonen der Schweiz haben gemeinsam eine nationale Strategie zur nachhaltigen Entwicklung von naturwissenschaftlichen Sammlungen erarbeitet. Diese basiert auf sechs strategischen Säulen: 1. Einführung und Entwicklung einheitlicher Methoden für Pflege und Verwaltung der Sammlungen, 2. Systematische Datenerfassung, Digitalisierung und Verwaltung digitaler Daten, 3. Aufwertung und wissenschaftliche Nutzung der Sammlungen, 4. Bildungs-, Schulungs- und Öffentlichkeitsarbeit, 5. Ausbau der Zusammenarbeit, des Austauschs und der Vernetzung und 6. Konsolidierung und Verwaltung des Netzwerks, einschliesslich der Finanzierung und der gemeinsamen Ressourcen. Für jede der strategischen Säulen haben die Direktorinnen und Direktoren, Kuratorinnen und Kuratoren, Verwalterinnen und Verwalter der Sammlungen sowie Wissenschaftlerinnen und Wissenschaftler der beteiligten Institutionen eine Liste von 52 Schlüsselaktivitäten festgelegt. Für jede strategische Säule wurden die vorgeschlagenen Aktivitäten unterteilt in netzwerkweite Initiativen, die innerhalb der Gemeinschaft und teilweise mit strategischen Partnern durchzuführen sind; und in institutionelle Massnahmen, welche die Institutionen individuell auf Grundlage ihrer verfügbaren Ressourcen ausführen. Dieser landesweite und für die Schweiz neue Ansatz zur Sicherung, Weiterentwicklung und Nutzung naturwissenschaftlicher Sammlungen stellt einen wichtigen Schritt für Wissenschaft und Gesellschaft dar. Er spiegelt die allgemeine Anerkennung der Bedeutung einer koordinierten und kooperativen Vorgehensweise auf nationaler Ebene wider, um:

- die langfristige Erhaltung der naturwissenschaftlichen Sammlungen in der Schweiz durch die Umsetzung angemessener Verwaltungspraktiken und -standards zu gewährleisten;
- die Digitalisierung der Sammlungsobjekte voranzutreiben und den physischen und digitalen Zugang zu den Sammlungen weiterhin zu gewährleisten;
- die Infrastruktur für die Zusammenführung von und den freien Zugang zu Daten aus naturwissenschaftlichen Sammlungen zu unterhalten;
- den Austausch von Fachwissen sowie die gemeinsame Nutzung von Ressourcen und Fähigkeiten im Zusammenhang mit der Verwaltung, Kuratierung und Digitalisierung von Exemplaren zu fördern;
- die wissenschaftliche Forschung mithilfe naturwissenschaftlicher Sammlungen zu erleichtern;
- Sammlungen unter Einhaltung nationaler und internationaler Vorschriften durch Objekte aus Feldforschung, Austausch und Erwerb zu erweitern und auszubauen;
- die Nutzung der Sammlungen als Bildungs-, Ausbildungs- und Kulturressourcen sicherzustellen.

Résumé

Vingt-cinq institutions d'histoire naturelle de seize cantons suisses ont développé conjointement une stratégie pour les collections d'histoire naturelle basée sur les six piliers stratégiques suivants : 1. normalisation et mise en œuvre des pratiques de gestion, 2. enregistrement, numérisation et gestion des données numériques, 3. valorisation des collections d'histoire naturelle et de leur utilisation scientifique, 4. développement des opportunités de formation, d'éducation et de sensibilisation, 5. facilitation de la collaboration, de l'échange et du réseautage, et 6. consolidation et gestion du réseau, y compris le financement et les ressources partagées. Pour chacun de ces piliers stratégiques, les directrices et directeurs, conservatrices et conservateurs, responsables de collections et scientifiques des institutions participantes ont défini un ensemble de 52 activités clés. Pour chaque pilier, les activités proposées ont été réparties entre des actions conjointes, à entreprendre en collaboration au sein de la communauté ou avec des partenaires stratégiques, et des actions institutionnelles, à entreprendre par les institutions elles-mêmes en fonction de leurs ressources disponibles. Cette approche nationale en matière de soutien, de préservation, d'amélioration et d'utilisation des collections d'histoire naturelle, la première du genre en Suisse, constitue une avancée majeure tant pour la science que pour la société. Elle reflète la reconnaissance générale de l'importance d'une approche coordonnée et coopérative des collections d'histoire naturelle à l'échelle nationale pour :

- assurer la conservation à long terme des collections de sciences naturelles en Suisse par la mise en œuvre de pratiques et de normes de gestion appropriées ;
- faire progresser la numérisation des spécimens et continuer à garantir l'accès physique et numérique aux collections ;
- maintenir l'infrastructure pour la mise en commun et le libre accès aux données des collections de sciences naturelles ;
- encourager l'échange d'expertise et le partage des ressources et des compétences liées à la gestion et à la numérisation des spécimens ;
- faciliter et entreprendre des recherches scientifiques fondées sur les collections d'histoire naturelle ;
- élargir et développer les collections par des activités de terrain et par l'échange ou l'acquisition de spécimens, conformément aux lois et aux réglementations nationales et internationales ;
- garantir l'utilisation des collections comme ressources éducatives, de formation et culturelles.



Sintesi

Venticinque istituzioni di storia naturale di sedici cantoni svizzeri hanno sviluppato congiuntamente una strategia per le collezioni di storia naturale basata su sei pilastri strategici: 1. standardizzazione e implementazione delle pratiche di gestione; 2. database, digitalizzazione e gestione dei dati digitali; 3. valorizzazione delle collezioni di storia naturale e del loro uso scientifico; 4. sviluppo di opportunità di formazione, educazione e divulgazione; 5. facilitazione della collaborazione, dello scambio e della creazione di reti; 6. consolidamento e gestione della rete, compresi i finanziamenti e le risorse condivise. Per ciascuno dei pilastri strategici, le direttrici e i direttori, le conservatrici e i conservatori, i e le responsabili delle collezioni e il personale scientifico delle istituzioni partecipanti hanno individuato una serie di 52 attività chiave. Nell'ambito di ciascun pilastro, le attività proposte sono state suddivise in azioni comuni da intraprendere in collaborazione all'interno della comunità o con partner strategici, e in azioni istituzionali da intraprendere dalle istituzioni stesse, in base alle risorse disponibili. Questo approccio nazionale al sostegno, alla manutenzione, alla valorizzazione e all'utilizzo delle collezioni di storia naturale, il primo del suo genere in Svizzera, rappresenta un passo fondamentale sia per la scienza sia per la società. Riflette il riconoscimento generale dell'importanza di un approccio coordinato e collaborativo alle collezioni di storia naturale a livello nazionale per:

- garantire la conservazione patrimoniale a lungo termine delle collezioni svizzere di storia naturale attraverso l'attuazione di pratiche e standard di gestione adeguati;
- progredire nella digitalizzazione degli esemplari e continuare a fornire l'accesso fisico e digitale alle collezioni;
- mantenere l'infrastruttura per l'aggregazione e l'accesso aperto ai dati derivati dalle collezioni di storia naturale;
- promuovere lo scambio di competenze e la condivisione di risorse e abilità associate alla gestione, alla cura e alla digitalizzazione degli esemplari;
- facilitare e intraprendere la ricerca scientifica utilizzando le collezioni di storia naturale;
- valorizzare e sviluppare le collezioni attraverso il lavoro sul campo e lo scambio o l'acquisizione di esemplari, in conformità con la legislazione o le normative nazionali e internazionali;
- garantire l'uso delle collezioni come risorse educative, formative e culturali.

Preamble

This *Strategy for natural history collections in Switzerland* is intended to facilitate the management, curation, enhancement, digitisation and use of the natural history collections housed in Swiss institutions that form a collaborative and coordinated distributed network. This community-developed strategic framework outlines national priorities, common objectives and targeted actions to be undertaken as well as the necessary mechanisms of political and financial support that are needed by national history institutions over the short, medium and long-term. Implementation of a strategic plan at the national level will further strengthen the distributed network of natural history collections in Switzerland, united under the Association of Natural Science Museums and Collections in Switzerland and Liechtenstein/Verband der naturwissenschaftlichen Museen und Sammlungen der Schweiz und Liechtenstein/Association des musées et collections de sciences naturelles de Suisse et du Liechtenstein/Associazione dei musei e delle collezioni di scienze naturali della Svizzera e del Liechtenstein, known in all languages as 'musnatcoll.ch'.

Vision

Swiss institutions that house natural history collections unite their strengths and expertise to manage, maintain, enhance and develop the use of the natural history specimens in their charge, promoting common standards, data accessibility and interoperability, exchange between institutions, visibility for natural history collections and unified physical and virtual access to them by Swiss and international researchers, thus contributing to scientific research and scientific excellence.

Mission

To ensure the long-term maintenance, enhancement, and accessibility of natural history collections across Switzerland and support their scientific use for research, education and societal needs.

Introduction

In Switzerland most natural history collections are housed in publicly funded natural history museums, science centres, botanical gardens or conservatories as well as in universities and similar research institutions. These institutions are usually affiliated with a cantonal or municipal administration and, their collections are thus protected by different laws, and to varying degrees. The tasks of storing, managing, curating, enhancing, and ensuring accessibility to collections are ongoing and the resources associated with the maintenance of the facilities, the collections, the specimen collecting efforts or the acquisitions, and of the collections-based staff are usually carried by the institutions or the administrations that oversee the institutions. Based on the first national survey of natural history collections in Switzerland, conducted in 2018, an estimated 60,906,373 specimens or objects are held in Swiss institutions (hereafter termed specimens), with a third of these originating from within the country itself. The size of this distributed natural history collection in Switzerland is equivalent to those held by the world's leading national natural history institutions (see Beer et al., 2019). The scientific significance of the distributed network that forms the 'One Swiss Collection' is singular, based on the biological, archaeological, anthropological, palaeontological and geological specimens it holds as well as the linguistic, cultural and historical richness of the country itself. Each natural history collection in Switzerland has unique features, with their composition based on the historical context, scientific focus and principal activities of the institutions themselves. Collections may be comprised of a set of individual private or public collections that were amassed, donated, purchased or received as part of the global specimen exchange system. Specimens may also be contributed by institutional staff via their collecting activities or amateurs linked to the institution as well as members of naturalist associations or specific projects (biological inventories, phylogenetic reconstructions) where voucher specimens are deposited in reference collections, thus ensuring scientific reproducibility.

Patrimonial and scientific value of Swiss natural history collections

The natural history collections in Switzerland are an intrinsic part of the 'global collection' (see Bakker et al., 2020; Johnson et al., 2023) which provides an unparalleled resource for developing our ongoing understanding of the Earth, the processes that formed it and the evolution and diversity of life on it as well as of the Universe in the case of meteorites. Research conducted on specimens and in collections contributes to the ever-growing body of biodiversity and geodiversity knowledge. Each specimen represents an authoritative record of biological and geological diversity across time and space as they are associated with information about where and when the items were collected, by whom they were collected and what taxon or entity they represent, usually given on the associated specimen labels. Biological specimens encapsulate different types of information such as chemical composition, DNA, proteins, metabolic compounds, anatomical-morphological features and parasites or pathogens, amongst others. For geological specimens, information pertains to the cosmic or stratigraphic origins, elemental and isotopic composition, mineral or chemical composition, formation patterns and processes, and structural features.

The active gathering of specimens in nature and their preservation in Swiss natural history collections date back over three centuries, and occasionally even further. From curios of the living world held in private collections to specimens housed in publicly supported institutions, collections in Switzerland's natural history institutions have been continuously expanding through exchanges, acquisitions, and donations as well as field collecting expeditions. Most modern specimens are preserved using traditional methods (mounted animals, dried plants or fungi, dried and pinned insects, ethanol- or formalin-fixed aquatic species etc.) but other methods of preservation are also used, like tissue samples that have been cryo-conserved for genetic or chemical analysis as well as DNA or seeds that are kept in specialised banks, or organisms that are maintained in live cultures (Frick & Greeff, 2021).

The continued maintenance and enhancement of collections guarantee the scientific quality of them over time, whereas increased physical and digital access to collections facilitates their scientific use (see Suarez & Tsutsui, 2004). This use can be in the traditional fields of taxonomy and systematics as well as for other research endeavours that focus on the different sorts of data that can be derived from the specimens themselves (Meineke et al., 2018; and the concept of the 'extended specimen' of Lendemer et al., 2020; Hardisty et al., 2022). The diverse types of data associated with or derived from physical specimens can be used to study a broad range of topics, from the analysis of, or changes in, genetic diversity, chemical composition or parasite load, amongst many others, to us-

ing high-resolution imaging or scanning techniques that allow researchers to gain insights into the external and internal structures of organisms or entities.

Over recent decades the relevance of natural history collections to the field of social sciences has come to the forefront. Collections are a key source of data for conducting research about the history of Switzerland, the history of science and on colonial history. Reciprocally, insights from the social sciences can help natural history institutions to gain a better understanding of their collections and the historical role of them. Sensitive collections, colonial history and restitution have emerged over recent years as major areas of interest in the international museum and heritage world (Das & Lowe, 2018) as well as in Swiss institutions (Etienne et al., 2020), especially those with ethnography holdings, and cultural politics. Swiss institutions increasingly recognise the responsibility associated with owning colonial objects or potentially sensitive collections, and the importance of proactively addressing issues surrounding them through joint activities with institutions and researchers from the countries of origin, exploring digital restitution options as well as undertaking physical restitution in the case of human remains and sacred objects.

A national initiative for natural history collections

In 2018 the Platform Biology of the Swiss Academy of Sciences (SCNAT), in collaboration with the partner organisations of musnatcoll.ch, the Swiss Systematics Society, the Swiss node of the Global Biodiversity Information Facility, and InfoSpecies oversaw the development of a national initiative for natural history collections in Switzerland, termed the Swiss Natural History Collections Network, or SwissCollNet. The initiative, based on an evaluation of the status of collections in Switzerland in the report *National significance of natural history collections in Switzerland* (Beer et al., 2019), in addition to a previous review of the importance of systematics in Switzerland (SCNAT, 2006), sought to promote the scientific potential of Swiss natural history collections for

research, education and society. Its goal was to foster the development, maintenance and financial support of natural history collections within the framework of a common and widely endorsed national strategy. In 2019, the Directors of 36 natural history collections from 33 natural history institutions and research centres across Switzerland[1] expressed their support for the SwissCollNet initiative and agreed to work together under the guidance of the SCNAT, along with specific partner organisations, to develop a funding application. A proposal was submitted to the State Secretariat for Education, Research and Innovation of the Federal Department of Economic Affairs, Education and Research in 2020. The proposal received political support. A total of 12,370,000 Swiss Francs was integrated into the Federal decree on credits for research funding institutions for the years 2021–2024 and accorded to the Swiss Academies of Arts and Sciences for the SwissCollNet initiative, overseen by the SCNAT. The institutions who participated in the SwissCollNet initiative contributed the equivalent in matching funding, bringing the total investment for conditioning, digitising and mobilising data from specimens in Swiss natural history collections to 24,740,000 Swiss Francs.

Development of a nationwide strategy for collections

The *Strategy for natural history collections in Switzerland* is based on direct contributions from the Directors and scientific staff of 25 Swiss natural history institutions (see under the impressum) with 6 strategic pillars identified: 1. Standardising and implementing management practices; 2. Databasing, digitising and managing digital data; 3. Enhancing natural history collections and their scientific use; 4. Developing training, education and outreach opportunities; 5. Facilitating collaboration, exchange and networking, and 6. Consolidating and managing the network, including funding and shared resources. These pillars englobe the long-term preservation of natural history collections (storage, staffing and funding), the databasing and digitisation of collections as well as guaranteed physical and digital access to the collections, the support of the Swiss digital specimen aggregation platform, Swiss Natural History Collections (SwissNatColl), collaborations and the sharing of technical know-how between institutions, development of a research agenda for natural history collections (scientific roadmap) as well as technical and academic training related to natural history and natural history collections. Linked to these priorities are the coordination of collection management strategies, the development of risk mitigation plans for collections, the adoption of national standards in collections management and for collections data, the curation and documenting of type and general specimens, the undertaking of a gap-analysis of the collections of and from Switzerland (taxonomic and geographic), and the raising of public awareness on the cultural, historical, educational and scientific importance of natural history collections on the local, regional, cantonal, national and international scales. Objectives were identified for each of the strategic pillars, with 52 specific key actions developed during two targeted workshops organised by SwissCollNet on the 20th of January 2023 in Bern (Uni-S) and musnatcoll.ch in Geneva (Botanical Garden of Geneva) on the 6th of June 2023 (see Annex 1 for the full participants list).

The activities and undertakings (actions) are divided into two types called ‘Joint actions’ and ‘Institutional actions’. The first type, the joint actions, are collaborative ventures that are undertaken by multiple entities or small groups of entities, in collaboration with strategic partners or stakeholders, as necessary. These actions fall under the umbrella of musnatcoll.ch as they require coordination, planning and engagement. The second type, the institutional actions, fall under the functioning, activities and operations of individual entities, and are regarded as complementary to individual institutional strategies.

1 https://swisscollnet.scnat.ch/en/id/m8ee2

Strategic framework for natural history collections in Switzerland

The implementation of an agreed strategy creates a country-wide approach to natural history collections, especially their management, enhancement and financial upkeep, necessitating the establishment of a platform for coordination, communication and collaboration, under the umbrella of musnatcoll.ch. The *Strategy for natural history collections in Switzerland* has been endorsed by the Directors or senior managers from 37 Swiss institutions or entities that curate, preserve, study and enhance the natural history collections in their care. Signatory institutions commit themselves to follow the commonly agreed priorities for natural history collections, to the best of their ability, and engage in a concerted approach to natural history collection management, specimen digitisation, data availability, accessibility and interoperability, training and education, and use of collections. By adhering to this national strategy, the Swiss institutions that house collections commit themselves to supporting the curation of the collections in their charge, using internal funds or, where possible, seeking external funds to do so. Signatory institutions will participate in the implementation of the strategy itself, for both the types of actions, on a voluntary basis and according to the resources at their disposal. The adoption of a community-developed strategic framework by the signatory institutions reflects the general recognition of the importance of a coordinated, collaborative approach to natural history collections at the nationwide level to:

– guarantee the long-term patrimonial preservation of Swiss natural history collections through the implementation of adequate management practices and standards;

– strive to digitise specimens and continue to provide physical and digital access to collections;

– maintain the infrastructure for the aggregation of and open access to data derived from natural history collections;

– promote the exchange of expertise as well as the sharing of resources and skills associated with the management, curation and digitisation of specimens;

– facilitate and undertake scientific research using natural history collections;

– enhance and develop collections through fieldwork and the exchange or acquisition of specimens, in compliance with the national and international legislation or regulations;

– ensure the use of collections as educational, training and cultural resources.

This nationwide collaborative approach for natural history collections will create an internationally compatible distributed research infrastructure for natural history collections in Switzerland, thus maximising its impact for science, policymakers and society. National-level coordination and the recognition of collections as a national research infrastructure for scientific excellence are requirements for Switzerland's participation in the European Distributed System of Scientific Collections (DiSSCo)[2] that was accepted into the European Strategy Forum on Research Infrastructures Roadmap in 2018.

2 https://www.dissco.eu

Strategic pillar 1: Standardising and implementing management practices

To ensure the long-term preservation of natural history collections in Switzerland, specimens should be curated to the best possible standards and stored under adequate conditions, as outlined in the *Handbook on natural history collections management – A collaborative Swiss perspective* (Frick & Greeff, 2021). Natural history collection management best practices, storage standards, emergency planning, pest management policies and risk mitigation measures should be discussed, developed or adopted and implemented on a national scale. This will ensure the safeguarding of the patrimonial and scientific value of the holdings across Switzerland, while taking into consideration local and regional specificities.

Objective

Ensure that all natural history collections reach the national and international standards of collection management and curation, and that they are physically accessible for scientific research purposes.

Joint actions

- Continually update best practices for collections management, including for genetic, tissue and seed samples;
- facilitate exchange on risk management, pest management and emergency planning;
- coordinate a national collections scientific access programme;
- organise skill-sharing and knowledge transfer activities between institutions.

Institutional actions

- Implement recommended national and international standards for collections storage, maintenance and protection;
- adhere to national and international legislation and regulations related to collections management and to collections enhancement through field work or acquisitions.

Strategic pillar 2: Databasing, digitising and managing digital data

Databasing and imaging natural history collections require access to suitable databasing software, digitisation infrastructure, and trained personnel capable of recording specimen data, capturing scans or images, and managing digital information. To ensure that digital data from Swiss collections is of high quality, fit for use, and accessible for scientific research, it is essential to provide nationwide access to databasing tools, digitisation technologies, and reliable data storage infrastructure. These efforts should follow the FAIR Guiding Principles for scientific data management and stewardship – Findability, Accessibility, Interoperability, and Reusability (Wilkinson et al., 2016). The agreement of common goals and priorities, exchange and sharing of know-how or equipment, and the implementation of internationally compatible data standards will facilitate databasing and digitisation processes across Switzerland as well as open access to data derived from specimens in Swiss institutions. Investment is needed for coordination between the physical collections and their digital counterparts' as well as for increasing data storage and retrieval capacities.

Objective

Scale-up databasing capacities to facilitate natural history specimen digitisation while ensuring the storage of and accessibility to digital data on a nationwide scale.

Joint actions

- Recommend internationally compatible data standards and best practices;
- facilitate the use of digital data on specimens for outreach to the public;
- ensure that institutions have access to relevant Collections Management Systems (CMS) and training on their use;
- encourage the development and maintenance, or inter-institutional sharing, of in-house digitisation infrastructures.

Institutional actions

- Supply data to the common natural history digital specimen portal SwissNatColl to provide open access to data on specimens in Swiss institutions;
- implement internationally compatible data standards and best practices (databasing, digitisation, data storage, retrieval and curation);
- establish digitisation priorities (e.g. type specimens, historically or geographically significant collections, endangered or extinct species);
- ensure the ongoing digitisation of specimens;
- ensure regular institution-level updates on the Global Registry of Scientific Collections (GRSciColl).

Strategic pillar 3: Enhancing natural history collections and their scientific use

To ensure that Swiss collections remain scientifically relevant, they should be continually curated, used and enhanced through collecting activities, donations and acquisitions. The inclusion of specimen collection strategies in research plans submitted to funding agencies to ensure specimen vouchering and tissue bank accessioning according to community established guidelines should be encouraged. Curated collections that are physically accessible and digitally available can be used for morphological, anatomical, structural, chemical, ecological or genetic analyses as well as for time-series comparisons, geographic or distribution studies and biodiversity restoration initiatives, amongst many others. Specimen derived data can contribute key information for addressing issues such as sustainable development, biodiversity conservation, ecological restoration, invasive species, emerging disease forecasting, and climate change modelling. Open access to ever increasing amounts of digital data from natural history specimens combined with increased technological capabilities provides unprecedented opportunities to understand biological and geological diversity at different scales. The development of research priorities for natural history collections, in link with the development of a research agenda and an associated research programme, facilitates scientific collaboration, training and mobility.

Objective
Ensure the continual curation and enhancement of collections, and promote research based on natural history specimens.

Joint actions

- Develop a research agenda for natural history collections to reinforce their significance as a key national research infrastructure and distributed centre of excellence for biodiversity and geodiversity knowledge;
- facilitate scientific collaborations among Swiss natural history institutions, between natural history institutions and Swiss universities or international partners;
- enhance collaborations with professional organisations such as Swiss universities, Swiss universities of applied sciences, national data centres and scientific societies;
- support the inclusion of specimen collection strategies in research plans submitted to funding agencies to ensure specimen vouchering and tissue bank accessioning, according to community established guidelines;
- undertake lobbying in support of natural history collections and their scientific importance;
- maintain a national registry of taxonomic expertise.

Institutional actions

- Ensure the continual enrichment of collections through targeted fieldwork campaigns, general collecting activities or by specimen exchanges or acquisitions;
- support scientific visits to collections;
- engage in scientific exchanges between Swiss institutions and with international partners;
- promote the taxonomic verification of collections;
- engage in the transmission of scientific expertise through university teaching and training;
- assure the tooling-up of staff to improve collecting and research capacities.

Strategic pillar 4: Developing training, education and outreach opportunities

The maintenance, curation and use of natural history collections require specialised skill sets related to the preparation of specimens, the care and management of specimens as well as the scientific use of them. To guarantee the preservation of collections over the long-term, the coordination of training initiatives, skill transfer and knowledge exchange is important to ensure that there are appropriately trained personnel to prepare specimens and work in the collections. Natural history collections are a key resource to inform and educate on the natural world as well as on the importance of biodiversity and geodiversity knowledge in understanding Earth and life on it. Exhibitions form an integral part of the mandates of natural history institutions, where they are used to highlight the natural world as well as to educate their visitors on biodiversity and the biodiversity crisis or to stimulate understanding of the environmental and sustainability challenges of the 21st century.

Objective
Ensure the use of natural history collections for outreach, education and training purposes while promoting the importance of scientific collections in understanding geological and biological diversity.

Joint actions

- Enhance collaborations between natural history institutions and education providers, such as Swiss universities, Swiss universities of applied sciences, training colleges and schools;
- support the development of a nationwide programme for organism-based courses and field or taxonomy training;
- enhance training, skills and career recognition for jobs related to natural history collections (technicians, taxidermists, collections managers, curators etc.);
- develop opportunities for skill transfer and training in collections management and curation.

Institutional actions

- Increase awareness of the scientific importance and value of natural history collections via outreach activities, exhibitions and active communications;
- use collections to inform the public about nature;
- participate and promote citizen science activities;
- engage in academic teaching and scientific training.


Biddulphia
= polyacanthos
J. Brun
3421.
Serdaï
Prof. J. BRUN. Genève
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x Heliodiscus
J. Brun

Strategic pillar 5: Facilitating collaboration, exchange and networking

The majority of cantons in Switzerland have natural history institutions that hold collections of diverse sizes, compositions, staffing levels, exhibition capacities and infrastructures. Communication, collaboration and cooperation, mediated through musnatcoll.ch, strengthens the distributed network of collections across Switzerland by providing opportunities to exchange, develop collaborations or decide on common initiatives and political actions on behalf of the community. Knowledge and skill transfer between institutions within the network ensures the unity of Swiss collections. The pooling of resources and skills from within the community permits designated groups to focus on key topics for natural history collections and the identification of emerging issues. The maintenance of a strong network ensures a collective identity for natural history collections and their representation in political spheres.

Objective

Encourage, develop and maintain opportunities for networking and exchange.

Joint actions

- Sustain a communication and exchange platform, supported by a curated website;
- organise workshops, scientific meetings and conferences;
- maintain a repository of collection management best practices, collection digitisation protocols, digital data standards and data storage/retrieval recommendations;
- facilitate discussion and community action on key topics for natural history collections;
- exchange on the handling of sensitive specimens and objects acquired in a colonial context as well as any relevant collaborations and case studies;
- respond with one voice to emerging political or strategic issues.

Institutional actions

- Develop and exchange on curatorial experiences, know-how and best practices on a regular basis;
- contribute actively to the exchange platform and skill-transfer activities;
- engage in joint strategic activities proposed for the community.

Polygonum cuspidatum Sieb. et Zucc.

Wattwil: zwischen Staatsstrasse und Thur, Ruderalstelle, ca 610 m
grosse Herde.
leg. H.Oberli 12.9.1976

(Heimat Ostasien, seit über 100 Jahren in Eur.kultiviert & verwildert)

Strategic pillar 6: Consolidating and managing the network, including funding and shared resources

Implementation of a strategic framework for Swiss natural history collections takes place in two specific spheres, at the institutional level and at the level of the distributed network itself. To successfully realise the objective and actions under this pillar, a mechanism for coordination, discussion, evaluation and support is needed, with the professionalisation of musnatcoll.ch foreseen, which may fulfil this role. Important considerations are ensuring the continuation of the activities and momentum fostered under the SwissCollNet initiative and securing funding to support both the ongoing activities and the development of the network. The professionalisation of musnatcoll.ch, via the creation of a supported secretariat, provides an unprecedented opportunity to strategically develop the Swiss network of natural history collections, sustain successful community initiatives and undertake representation in a more concentrated and coherent way. Efforts are needed to coordinate and focus lobbying efforts to gain political support at different levels across Switzerland. Strong leadership is needed to drive the distributed network forward under a common vision for collection holding institutions.

Objective

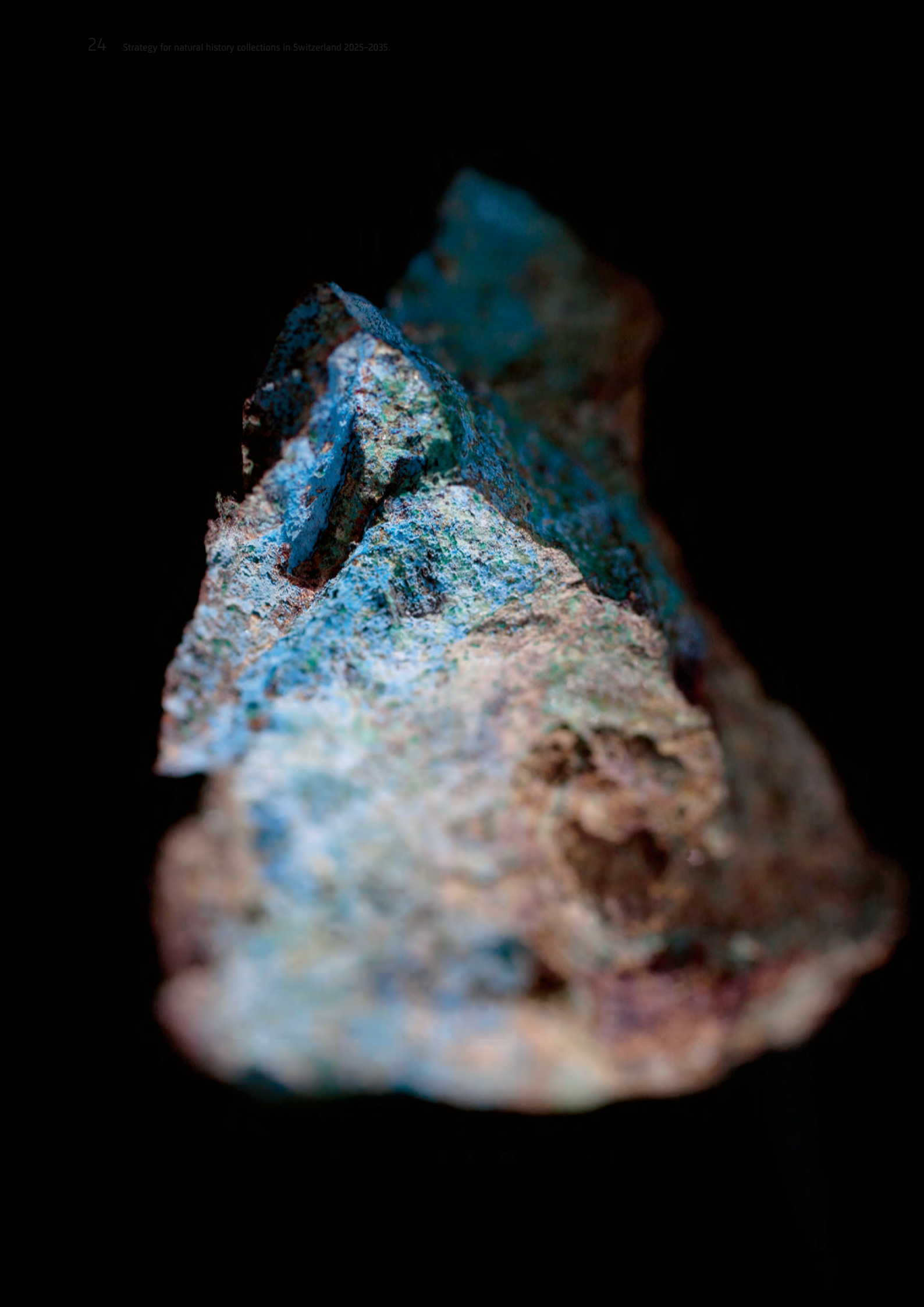
Strengthen the national network of natural history collections and support its capacity to exploit strategic and financial opportunities.

Joint actions

- Establish a suitable and sustained structure for the coordination of the network and its activities;
- support the continuation of the objectives, goals and targets of the SwissCollNet initiative;
- ensure the participation of Switzerland and Swiss institutions in international initiatives focused on collections, collections digitisation and research based on collections;
- secure financing to support natural history collections nationwide;
- undertake representation and lobbying activities on behalf of the community.

Institutional actions

- Participate in the upkeep of common services, infrastructures and tools;
- provide in-kind contributions, to the extent of available resources, to support joint actions and other relevant activities.
- foster local political relations and undertake lobbying activities.



Implementation and expectations

For the *Strategy for natural history collections in Switzerland* to be successful, it should be broadly adopted by institutions, proactively implemented and centrally coordinated. The strategy will be overseen by musnatcoll.ch that, in common agreement with the signatory institutions, will develop an implementation plan, time frame, milestones and progress tracking mechanisms. Any funding raised under the umbrella of the strategy may, by agreement, be managed by this association. The overseeing of the strategy can be more effectively carried out via the formation of a Strategy Task Force under musnatcoll.ch that will act as a coordination hub. This group will oversee communications, exchanges and joint actions, including fund raising. It will also function to ensure engagement across institutions, centralise information, encourage participation, organise common activities or events and review progress.

Conclusion

The *Strategy for natural history collections in Switzerland* provides the first common framework to guide actions, collaborations and progress on a nationwide scale. A collaborative, cooperative and coordinated approach to addressing shared issues, developing common research goals, fostering common initiatives and consolidating funding ensures that all institutions are informed of issues and activities, and can engage with nationwide actions in support of natural history collections. Institutions can choose to take part in both joint and institutional actions, according to their resources and in alignment with their own institutional practices. The *Strategy for natural history collections in Switzerland* is an instrument that can be used for raising awareness and lobbying on local, regional and national scales on behalf of natural history collections. It forms a foundation for securing and managing funding, and for creating common initiatives for the benefit of the whole community. It is also a tool that can be used by natural history institutions across Switzerland to guide their activities and may complement their own individual institutional strategies.


Sphenodon
(Gray)

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Annex 1

Participants in the workshops held on the strategy for natural history collections in Switzerland at the SwissCollNet Workshop on the 20th of January 2023 (Bern, Uni-S) and the musnatcoll.ch Annual Meeting on the 6th of June 2023 (Geneva, Geneva Botanical Garden), by alphabetical order and with affiliations as given upon registration for the event(s).

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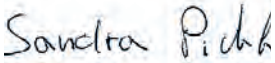

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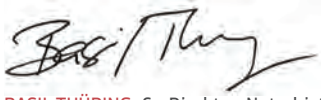

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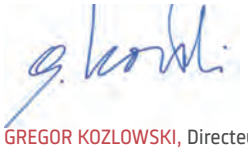

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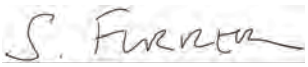

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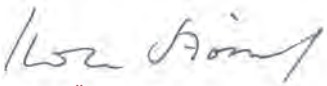

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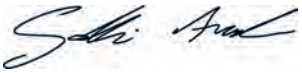

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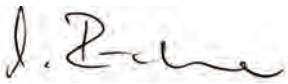

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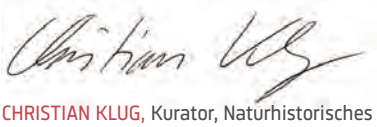

CHRISTIAN KLUG, Kurator, Naturhistorisches Museum der Universität Zürich (Paläontologische Sammlung)


naturama
BOGA
Botanischer Garten Bern
NATUR
HISTORI
SCHES
MUSEUM
BERN
MUSEUM.BL
Universität
Basel
naturhistorisches
museum
Basel
archive
des lebens
museum
FRIBOURG
FREIBURG
Bota
Bota
Jardin Botanique
de l'Université de Fribourg
Botanischer Garten
der Universität Freiburg
Conservatoire
et Jardin botaniques
Genève
mséum
genève
Bündner Naturmuseum
Museum da la natira dal Grischun
Museo della natura dei Grigioni
JURASSICA
Museum
Luzern
MUZOO
LA CHAUX-DE-FONDS
MUSÉUM
D'HISTOIRE NATURELLE
NEUCHATEL
jbn
jardin botanique
neuchâtel
Naturmuseum
St.Gallen
Museum
zu Allerheiligen
Schaffhausen
HAUS DER MUSEEN
Naturmuseum Olten
KOLLEGI
KANTONALE
MITTELSCHULE UR
NATURMUSEUMSOLOTHURN
Thurgau
Naturmuseum
MUSEO
CANTONALE
DI STORIA
NATURALE
LUGANO
NATURÉUM
MUSÉUM CANTONAL
DES SCIENCES NATURELLES
Musée de la nature
du Valais
Naturmuseum
Wallis
ETH zürich
KU LT
MUSEUM
DES
RU
AMA
MENSCHEN
NATUR
MUSEUM
WINTERTHUR
Stadt Zürich
Sukkulenten-Sammlung
Universität
Zürich UZH

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The **Swiss Natural HIstory Collections Network (SwissCollNet)** is a national initiative dedicated to mobilising and providing open access to specimen data from natural history collections across Switzerland. By promoting data harmonisation and standardisation, the initiative aims to ensure interoperability among key institutions such as natural history museums, botanical gardens, and universities.

musnatcoll.ch is the association of Natural Science Museums and Collections in Switzerland and Liechtenstein. The association aims to represent the interests of natural history museums vis-à-vis the Association of Swiss Museums, the Academy of Natural Sciences, the Swiss Confederation, politicians and the general public. Its objective is to promote the importance of scientific collections and museums as part of national and international cultural heritage.