

Towards digitizing the botanical legacy of Fritz and Paul Sarasin in Basel and Zurich

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The botanical heritage of multitalented naturalists Paul Benedict (1856–1929) and Karl Friedrich (Fritz) (1859–1942) Sarasin of Basel is poorly known. The second-degree cousins from Basel inherited great wealth, which funded their expeditions to the tropics in India, Sri Lanka, Sulawesi, and New Caledonia. Both were doctors in zoology with interdisciplinary interests from geography and anthropology to botany. They mixed race theories with traditional descriptions of biodiversity, blurring boundaries between anthropology and natural sciences. With the help of the local colonial governments where they travelled, they avidly collected many thousands of natural history objects and human artefacts, now kept in institutions across Europe.

After having led a considerable part of their career and personal life as a team and a couple, they pursued different interests after they returned from their last Sri Lankan trip in 1907. Paul ended his tropical explorations and switched his focus to nature conservation and cofounded the Swiss league for nature preservation (today's Pro Natura) in 1909 (Fig. 1). Fritz kept exploring remote areas and from 1911, he travelled with the Swiss zoologist Jean Roux in New Caledonia and the Loyalty Islands, resulting in extensive collections and a series of books.

Here, we provide a first glimpse into the volume and impact of the two cousins' botanical heritage, prompted by the rediscovery of 18 boxes containing some 3000 herbarium specimens labeled „Sarasin” in the backlog of the Herbaria Basel (BAS; Table 1), that are currently being curated and digitized.

Keywords

Botanical heritage, Curation, Ferns, Herbaria, Plant collectors, Sulawesi

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Table 1. The c. 3000 rediscovered Sarasin specimens at BAS

Collector	Provenance	Description
Fritz & Paul	Sri Lanka & India (not dated)	Flowering plants, c. 300 unmounted. Sri Lankan collections partially determined by M. Gürke and K. Schumann (B)
Fritz & Paul	Sulawesi: 1893–1896, 1902–1903	Ferns, c. 700 unmounted. Mostly determined by H. Christ, some by R.E. Holttum, B.S. Parris, and Cheng-Wei Chen
Fritz & Paul	Sulawesi: 1893–1896	Flowering plants, c. 400 pocket-sized, mounted, but several plants missing, annotated on sheet. Sporadic recent determinations by A.K. Poulsen
Fritz	New Caledonia: 1911–1912	Flowering plants, c. 750 unmounted. Partially determined by H. Schinz and A. Guillaumin
Fritz	New Caledonia: 1911–1912	Fungi & Lichen, c. 300 bags. Partially determined
Fritz	New Caledonia: 1911–1912	Mosses & Ferns, c. 75 unmounted. Partially determined by R. Bonaparte
Paul	Switzerland: 1918–1926	Flowering plants, c. 560 unmounted. Determined by P. Sarasin



Fig. 1. Paul Sarasin photographed at the Val Cuozza in 1897. As the president of the Swiss Natural Research Society, Paul organised the protection of the area, which officially became the first Swiss National Park in 1914.



Fig. 2. BAS Sarasin Herbarium collection S1030 from Takale Radjo (Sulawesi) described by H. Christ in 1895 as *Nephrolepis dicksonioides* Christ and then chosen as Lectotype by Chen C.W. et al. in 2022.

The literature paints an incomplete and distorted picture of the Sarasins' botanical collections. Almost sixty species of plants commemorate their name Sarasin (incl. 47 basionyms, IPNI, July 2022) and an unknown but large number of Sarasin specimens are Types or cited in important taxonomic treatments. Most fern species named after the Sarasin cousins stem from pteridologist Hermann Christ (Basel, 1833–1933) who based several works on the Ferns of Sulawesi (1894–1904) on the BAS Sarasin collections (Fig. 2). Those Sulawesi Ferns were also partially consulted by Holttum in 1957 before he published some accounts of Flora Malesiana (Morton, 1968).

Mysteriously, however, van Steenis-Kruseman and van Steenis' (1950) Malaysian collectors and collections guide, now cited over 200 times, states that the Basel Herbarium is „of little importance“ since Christ's fern collection had been incorporated to Herb. Bonaparte before being transferred to Paris, failing to mention that the Sarasin material that Christ studied was not entirely incorporated in Herb. Christ. In fact, the BAS specimens were most likely the first set.

Overall, cross-referencing curator's knowledge, patchy available online collections, scattered literature, and herbarium backlogs (including the 3000 BAS specimens) jointly suggests that between 3500 and 4500 Sarasin plant specimens may exist. Most are today in Basel, Paris, Kew and Zurich, but an unknown number of specimens have also survived the bombing in Berlin during WWII and others are sporadically found in other institutions (BISH, L, FI).

The rediscovery of the Sarasin specimens in BAS, of which the Sulawesi ferns are probably the most valuable due to their relevance for Christ's impactful taxonomic work, prompted a collaborative project at the Herbaria Basel (BAS/BASBG) and the United Herbaria Zurich of the University and ETH Zurich (Z/ZT), that started July 2022. Inter-institutional collaboration includes using explicit and identical synonymy lists and transferring specimen metadata from duplicates across institutions, facilitated by the use of the same herbarium collection management software. So far, reassessing the Sulawesi ferns at BAS revealed that ca. 10 % of the specimens are nomenclatural Types, underscoring the importance of making them digitally available.

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