

# Exsiccatae in the bryophyte collection of the National Herbarium, Pretoria

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## ABSTRACT

Exsiccatae in the bryophyte collection of the National Herbarium in Pretoria (PRE) are catalogued for the first time. Most of the 66 series represented in PRE were issued in Europe, but the USA is the country where the largest number of exsiccatae originated. The exsiccatae span three centuries, with the earliest specimens issued in 1845 and the latest in 2009. This indicates the long-standing exchange of material and transfer of knowledge between herbaria in South Africa and countries of the northern Hemisphere. Many of the exsiccatae in PRE are incomplete and specimens were received as duplicates in exchange sets rather than exsiccatae. PRE houses a number of important African and southern hemisphere exsiccatae including two different sets of A. Rehmman's *Musci Austro-Africani* (1875–1877) and *Musci Austro-Africani cont.*, and R. Ochyra's *Bryophyta Antarctica exsiccata*.

## INTRODUCTION

The Cryptogamic Herbarium of the South African National Biodiversity Institute (SANBI), which forms part of the National Herbarium in Pretoria (PRE) (acronyms according to Holmgren *et al.* 1990), consists of three separate collections: (1) the mosses, (2) liverworts and hornworts, and (3) lichens. The PRE bryophyte collection (mosses, liverworts and hornworts), as well as other bryophyte collections in southern Africa, were described by Magill (1980). The bryophyte collections of the Rhodes University Herbarium (RUH), Compton Herbarium (NBG, including SAM), KwaZulu-Natal Herbarium (NH, on permanent loan), and Stellenbosch Herbarium (STE) were since incorporated into PRE.

The PRE bryophyte collection consists of approximately 69 000 specimens, of which 35 500 are from southern Africa (the region south of the Limpopo and Kunene rivers) and recorded in SANBI's PRECIS database (Magill *et al.* 1983). The remainder of the collection comes from many parts of the world and consists mainly of duplicate specimens received as gifts and through an intermittent exchange programme with more than 20 overseas herbaria. A substantial number of exsiccatae specimens, distributed throughout the main collection, were received through the exchange programme.

*Exsiccatae* (plural form of *exsiccata*, from the Latin *exsiccatus* for 'dried up') are series of published, uniform, numbered sets of dried specimens with printed labels (Sayre 1969; Pfister 1985; Triebel *et al.* 2004). Exsiccatae usually have descriptive titles with an indication of the editor and the place and date of issue or publication. They are distributed in several identical sets of duplicate specimens, usually accompanied by printed booklets of labels or *schedae* (e.g. Figure 1A). According to Art. 30.4 of the *International Code of Botanical Nomenclature* (McNeill *et al.* 2006), printed matter accompanying exsiccatae are, from 1 January 1953, only

effectively published if it is also distributed independently of the exsiccatae. Exsiccatae were often distributed in units of 100 specimens, a century; each century generally constituted a volume in the series.

Stafleu (1972) provided a general historical account of exsiccatae, while Triebel *et al.* (2004) discussed the historical development, scope and function of cryptogam and fungus exsiccatae. Exsiccatae of African bryophytes were summarized by Ochyra & Pócs (1992). Of the  $\pm 1$  100 cryptogam and fungus exsiccatae issued up to 2003, about 500 contain bryophytes (Triebel *et al.* 2004).

Type specimens and exsiccatae are generally regarded as the most valuable collections in a herbarium. Magill (1980) compiled a catalogue of southern African moss type specimens in PRE. The aim of this paper is to document and determine the extent of exsiccatae in the PRE bryophyte collection. Hopefully this will point to exsiccatae as well as parts of exsiccatae that are sought after by researchers.

## MATERIALS AND METHODS

Data on exsiccatae in PRE were gathered from specimens and published *schedae* in the PRE bryophyte herbarium, the series *Cryptogamae Exsiccatae* by Sayre (1969, 1971, 1975), *IndExs—Indexs of Exsiccatae*, a web-accessible database of exsiccatae established by Triebel & Scholz (2001) and maintained by staff members of the Botanische Staatssammlung München (M), as well as other publications referred to in the text and in Table 1. Terminology follows that of Triebel *et al.* (2004).

Only exsiccatae in the strict sense of Sayre (1969, 1975) are listed; therefore series in PRE that do not meet all the requirements of a published exsiccata, e.g. *Herb. Ind. Or. Hook. fil. & Thompson* (Sayre 1975: 343) and *Sammlung deutscher Laubmoose, Lebermoose und Flechten, Vol. I. Laub- und Lebermoose* by D. Dietrich, published in Jena (Germany) in 1861, which was issued

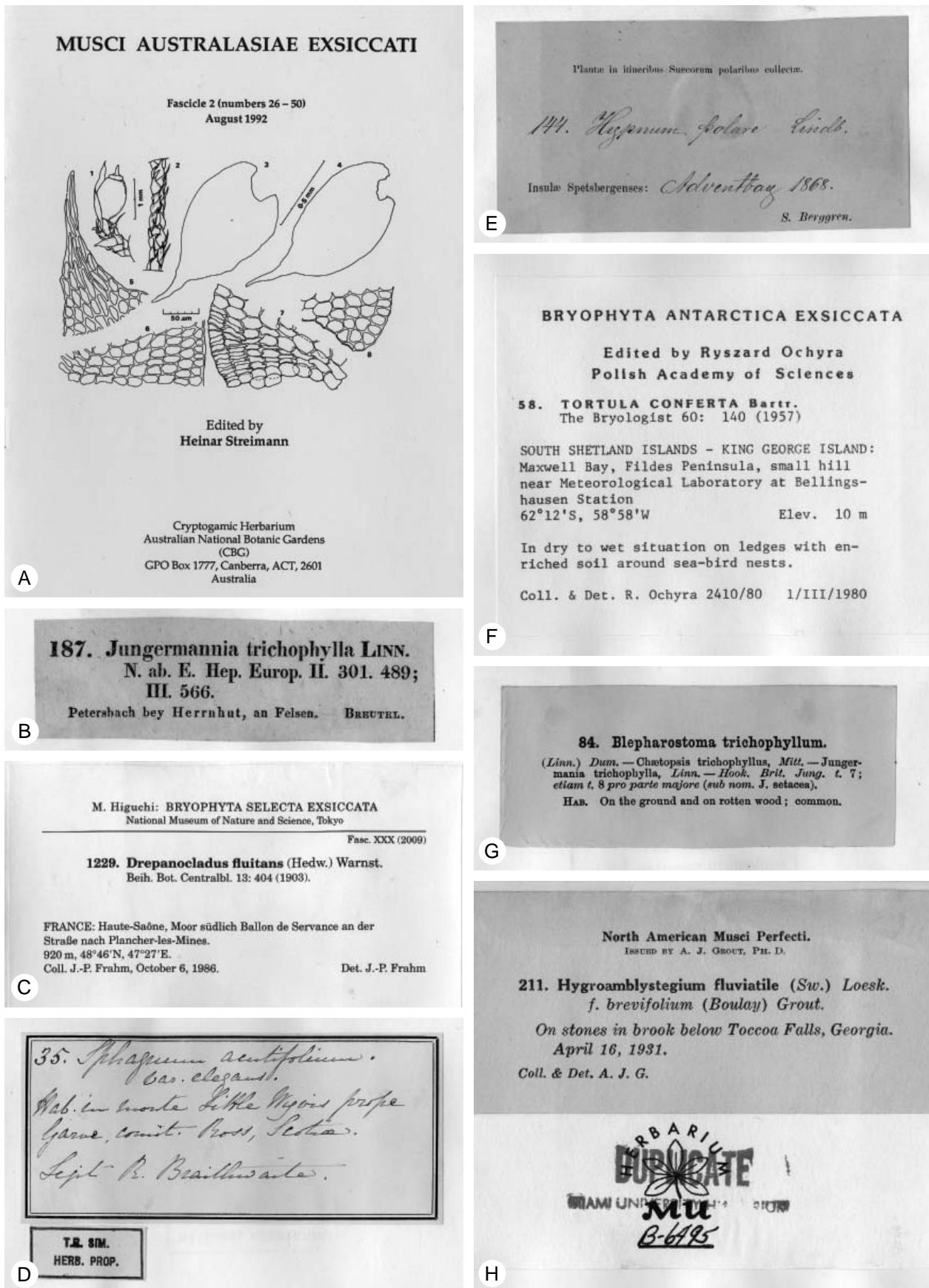


FIGURE 1.—Examples of labels of exsiccatae in the PRE bryophyte collection. A, front page of the small issue with schedae accompanying Fascicle 2 of Streimann's *Musci Australasiae exsiccati*, published in 1992; B, a specimen belonging to Century 2 of Breutel's *Flora Germanica exsiccata. Serie II. Cryptogamia*, issued in 1843; C, label of a specimen in Fascicle XXX of Higuchi's *Bryophyta selecta exsiccata*, published in 2009; D, handwritten label of *Sphagnaceae Britannicae exsiccatae*, edited R. Braithwaite, published in 1877; E, a moss distributed in Berggren's *Plantae in Itineribus Suecorum Polaribus collectae/Insulae Spitsbergenses*, published in 1874; F, specimen label of Ochyra's *Bryophyta Antarctica exsiccata*, published in 1982; G, label of *Hepaticae Boreali-Americanae exsiccatae*; or specimens of North American liverworts. Arranged by Coe Finch Austin, issued in 1873; H, no. 211 of *North American Musci perfecti*, issued by A. J. Grout Ph.D., 1931.

TABLE 1.—Exsiccatae in the PRE bryophyte collection

Full title according to IndExs	Labels in PRE (title and notes)	Parts in PRE	Numbers issued, present in PRE	Date of publication	Editor or distributor	Institution, place and country of publication
American Hepaticae. Prepared by Carolyn Coventry Haynes	Printed	Decades 1–12	1–120, incomplete	1907–1913	Haynes, C.C.	Highlands, New Jersey, USA
Bryophyta Africana Selecta	Printed	Series I–VIII	1–200	1992–1993	Ochyra, R. & Pócs, T.	W. Szafer Institute of Botany, Polish Academy of Sciences, Kraków, Poland and Department of Botany, Eszterházy Károly Teachers Training College, Eger, Hungary
Bryophyta Antarctica exsiccata	Title, editor, place of issue and name printed, rest typewritten		1–200	1982	Ochyra, R.	W. Szafer Institute of Botany, Polish Academy of Sciences, Kraków, Poland
Bryophyta Arduennae exsiccata	Fr. Verdoorn. Bryophyta Arduennae Exsiccata	Decades 1, 2 3	1–20 21–30	1927 1928	Verdoorn, F.	Utrecht, The Netherlands
Bryophyta Danica exsiccata	Printed	Parts II, III	93–283	1952, 1953	Holmen, K.A.	Botanical Museum, University of Copenhagen, Denmark
Bryophyta exsiccata Terrae-Novae et Labradorica	Typewritten	Fascicle 3	51–75, incomplete	1979	Brassard, G.R.	Memorial University of Newfoundland, St. John's, Canada
Bryophyta in itinere polari Norvegicum secundo collecta (Not listed by IndExs)	Title, headings and collector printed on brown paper, rest filled in by hand		?, scattered numbers	Collected in 1898 & 1899	Simmons, H.G.?	Sweden
Bryophyta Neotropica exsiccata	Printed	Fascicles VII, VIII	301–400	1996, 1998	Gradstein, S.R.	The University of Göttingen Herbarium (GOET), Germany
Bryophyta selecta exsiccata	H. Inoue: Bryophyta Selecta Exsiccata	Fascicle 1–?	1–?1 000, many missing	1970–?	Inoue, H.	National Science Museum, Tokyo (TNS), Japan
	M. Higuchi: Bryophyta Selecta Exsiccata	Fascicles XXI–XXX	1 001–1 250	2000–2009	Higuchi, M.	
Bryophytorum Typonum Exsiccata	Printed					
Bryotheca Bohemica. Laub- und Lebermoose aus Böhmen in getrockneten Exemplaren	Printed	Decades 1, 2	1–20	1981	Buck, W.R.	The New York Botanical Garden, USA
	Bauer, Bryotheca Bohemica, No. Exemplaren	Centuries 1–4	1–400, incomplete	1898–1904	Bauer, E.	Smirchov near Prague, Czech Republic
Bryotheca Brasiliensis, herausgegeben von Dr. C. H. Brotherus in Helsingfors, bestimmt von Carl Müller, C. H. Brotherus und C. Warnstorf	Printed	Century 3	201–240, scattered numbers	1899	Brotherus, V.F.	Helsinki, Finland; duplicates received on exchange from H
Bryotheca Europaea. Die Laubmoose Europa's unter Mitwirkung mehrerer Freunde der Botanik gesammelt und herausgegeben von Dr. L. Rabenhorst	Rabenhorst, Bryotheca europaea Printed as well as handwritten labels	Fascicles 1–27 Revised Sphagna	1–1 350 incomplete, many missing ?, scattered numbers	1858–1876 1888?	Rabenhorst, G.L.	Dresden, Germany

TABLE 1.—Exsiccatae in the PRE bryophyte collection (continue)

Full title according to IndExs	Labels in PRE (title and notes)	Parts in PRE	Numbers issued, present in PRE	Date of publication	Editor or distributor	Institution, place and country of publication
Bryotheca Fennica, editit V. F. Brotherus	V. F. Brotherus. Bryotheca Fennica	Fascicles 1–4	1–400, incomplete, many missing	1910–1916	Brotherus, V.F.	Helsinki, Finland
Printed on brownish paper						
Campylopedes Brasiliae exsiccatae	Printed	Fascicle 1	1–32	1978	Frahm, J.-P.	University of Duisburg, Germany
Campylopedes exsiccatae	Printed	Fascicles I–III	1–75	1980–1983	Frahm, J.-P.	University of Duisburg, Germany
Canadian Hepaticae, collected and distributed by John Macoun, named by W. H. Pearson	Canadian Hepaticae		1–116, scattered numbers	1891	Macoun, J.	Ottawa, Canada
	Title, locality and collector printed, rest handwritten, some without numbers					
Canadian Musci	Canadian Musci. Prepared by J. Macoun		1–670, but only No. 575 seen, changed to 23a	1889–1893 (1908?)	Macoun, J.	Ottawa, Canada
	Printed					
Flora exsiccata Austro-Hungarica, a museo botanico universitatis vindobonensis edita	Flora Exsiccata Austro-Hungarica	Fascicles 1–10, Centuries 1–20	1–2 000, incomplete, many missing	1881–1888	Kerner von Marilaun, A.	Vienna, Austria
	Printed	Fascicles 15–16, Centuries 29–32	2 801–3 600, incomplete, many missing	1898–1902	Fritsch, K.	
Flora Germanica exsiccata. Serie II. Cryptogamia	Printed, without title	Century 1 2 3	1–100 101–200 201–300 Scattered numbers	1860 1843 1849	Breutel, J.C.	Leipzig, Germany
Flora Germanica exsiccata. Serie II. Cryptogamia. Centuria I. 2te Auflage	Breutel Hepat. exsicc.		85–92	1860	Breutel, J.C.	Leipzig, Germany
	Printed					
Flora Graeca exsiccata			1–?800, at least one bryophyte (138) in PRE	1853–1862	Orphanides, T.G.	Athens, Greece
Flora Hungarica exsiccata a sectione botanica musei nationalis Hungarici edita	Sectio Botanica Musei Nationalis Hungarici. Budapest. Flora Hungarica exsiccata	Centuries I–X	1–1 000, incomplete, many missing	1912–1932	Anonymous	Sectio Botanica Musei Nationalis Hungarici, Budapest, Hungary
	Printed					
Fontinalaceae exsiccatae	Printed	Fascicles 1–4 6	1–135 159–174	1986–1994 2008	Allen, B.H.	Missouri Botanical Garden, St. Louis, USA
Grimmiae et Andreaeae exsiccatae	Printed, without title		1–50, scattered numbers	1861	Zetterstedt, J.E.	Uppsala, Sweden

TABLE 1.—Exsiccatae in the PRE bryophyte collection (continue)

Full title according to IndExs	Labels in PRE (title and notes)	Parts in PRE	Numbers issued, present in PRE	Date of publication	Editor or distributor	Institution, place and country of publication
Hepaticae Boreali-Americanae exsiccatae; or specimens of North American liverworts. Arranged by Coe Finch Austin	Printed on pale blue paper, without title		1–150, incomplete	1873	Austin, C.F.	Closter, New Jersey, USA
Hepaticae Britannicae exsiccatae	Printed on pale brown paper, without title	Fascicles I–III	1–215	1878–1883	Carrington, B. & Pearson, W.H.	Manchester, UK
Hepaticae exsiccatae S.O. Lindbergii	Printed	Fascicle I III, IV	1–230 335–568	1993 1996, 1997	Piippo, S.	Botanical Museum, University of Helsinki, Finland
Hepaticae Japonicae exsiccatae	Hepaticae Japonicae	Series I, 2	1–100, incomplete	1946, 1947	Hattori, S.	The Hattori Foundation for Botanical Research, Obi, Japan
Hepaticae macregioni meridionali Poloniae exsiccati. Liverworts of Southern Macregion of Poland	Printed					
Hepaticae macregioni meridionali Poloniae exsiccati. Liverworts of Southern Macregion of Poland	Hepaticae Macregioni Meridionali Poloniae Exsiccati. Fasc.	Fascicles I–VIII XVI, XVII	1–120 226–325	1982–1997 2002, 2004	Jędrzejko, K., Zarnowiec, J., Kłama, H. & Stebel, A., in different combinations	Herbarium of the Department of Pharmaceutical Botany (SOSN), Silesian Medical School in Katowice, Sosnowiec, Poland
Hepaticae selecti et critici, editit Fr. Verdoorn	Fasc. 1 and 2 typewritten, rest printed					
Hepaticae selecti et critici, editit Fr. Verdoorn	Hepaticae Selectae et Criticae	Series I–XI	1–550	1930–1939	Verdoorn, F.	Utrecht, The Netherlands
Herbarium normale. Herbar des plantes nouvelles peu connues et rares d'Europe principalement de France et d'Allemagne. Cryptogamie	Printed					
Herbarium normale. Herbar des plantes nouvelles peu connues et rares d'Europe principalement de France et d'Allemagne. Cryptogamie	F. Schultz et F. Winter, herbarium normale. Cryptogamia. Cent. 1		1–100, scattered numbers	1872	Schultz, F. & Winter, F.	Wissembourg, France
Herbarium normale. Herbar des plantes nouvelles peu connues et rares d'Europe principalement de France et d'Allemagne publié par F. Schultz	Printed on brown paper with black frame					
Herbarium normale. Herbar des plantes nouvelles peu connues et rares d'Europe principalement de France et d'Allemagne publié par F. Schultz	F. Schultz, herbarium normale. Cent.	Centuries 1, 2 7–12	1–200 601–1 200 Incomplete	1856 1864–1869	Schultz, F.W.	Wissembourg, France
Herbarium normale. Herbar des plantes nouvelles peu connues et rares d'Europe principalement de France et d'Allemagne publié par Dr. K. Keck et Dr. J. Scriba	Printed on brown paper with black frame					
Herbarium normale. Herbar des plantes nouvelles peu connues et rares d'Europe principalement de France et d'Allemagne publié par Dr. K. Keck et Dr. J. Scriba	F. Schultz, herbarium normale, nov. ser. Cent.	Century 4	301–400, scattered numbers	1879	Keck, K.[C.] & Scriba, J.K.	Aistersheim, Austria

TABLE 1.—Exsiccatae in the PRE bryophyte collection (continue)

Full title according to IndExs	Labels in PRE (title and notes)	Parts in PRE	Numbers issued, present in PRE	Date of publication	Editor or distributor	Institution, place and country of publication
Herbarium normale. Nov. ser. Herbier des plantes nouvelles peu connues et rares d'Europe principalement de France et d'Allemagne publié par F. Schultz	F. Schultz, herbarium normale, nov. ser. Cent. Printed on brown paper with black frame	Century 1	1–100, scattered numbers	1874	Schultz, F.W.	Wissembourg, France
Iter Faeroense 1895	H. G. Simmons, Iter faeroense 1895		?, scattered numbers	± 1896	Simmons, H.G.	Sweden
	Title, determiner and collector printed, rest handwritten					
Kryptogamae exsiccatae editae a Museo Palatino Vindobonensi	Kryptogamae exsiccatae Printed	Century 1 7	1–100, scattered numbers 601–700, scattered numbers	1894 1901	Anonymous Zahlbruckner, A.	Museum Hist. Natur. Vindobonensis, Vienna, Austria
L. Rabenhorstii Bryotheca Europaea et Extraeuropaea. Die Laubmoose Europa's (und anderer Erdteile) unter Mitwirkung mehrerer Freunde der Botanik gesammelt und herausgegeben von Dr. G. Winter	Rabenhorst – Winter, Bryotheca europaea Printed	Fascicle 28	1 351–1 400, scattered numbers	1884	Winter, G.	Dresden, Germany
Maine Mosses	Printed on yellowish paper	Fascicles 1–8	1–386, scattered numbers	1999–2007	Allen, B.H. & Pursell, R.A.	The Missouri Botanical Garden, St. Louis, USA
Mosses of Colorado. Distributed by J. M. Holzinger: collected by Carl F. Baker 1896	Mosses of Colorado Printed on brownish paper with no., name and other info handwritten		1–50, incomplete	After 1896	Holzinger, J.M.	State Teachers College, Winona, Minnesota, USA
Mosses of Minnesota. Distributed by J. M. Holzinger	Mosses of Minnesota Title and distributor printed, rest filled in by hand, without numbers		?, scattered numbers	From 1902?	Holzinger, J.M.	State Teachers College, Winona, Minnesota, USA
Mosses of the Hawaiian Islands	Printed		1–20, scattered numbers	1907?	Small, J.K.	Originally New York, USA, but received on exchange from NY
Mosses of the Southern United States, distributed from the Herbarium of Columbia College [University] by John K. Small	Mosses of the Southern United States Printed		1–51, incomplete	1897	Small, J.K.	Originally Herbarium of Columbia College (University), New York, USA., but received on exchange from MU
Musci Acrocarpi Boreali-Americani. Distributed by John M. Holzinger	Musci Acrocarpi Boreali-Americani Printed on brownish paper	Fascicles 1, 3	1–25, 51–75, incomplete	1904	Holzinger, J.M.	Originally Winona, Minnesota, USA, but received on exchange from MU

TABLE 1.—Exsiccatae in the PRE bryophyte collection (continue)

Full title according to IndExs	Labels in PRE (title and notes)	Parts in PRE	Numbers issued, present in PRE	Date of publication	Editor or distributor	Institution, place and country of publication
Musci Appalachiani, Tickets of specimens of mosses collected mostly in the eastern part of North America by C.F. Austin	Printed on pale blue paper, without title		1–450, incomplete	1870	Austin, C.F.	Closter, New Jersey, USA
Musci Australasiae exsiccati	Printed	Fascicles 1–18	1–600	1992–2000	Streimann, H.	Cryptogamic Herbarium, Australian National Botanic Gardens (CBG), and later Centre for Plant Biodiversity Research (CANB), Canberra, Australia
Musci Austro-Africani (1875–77) (Two different sets in PRE)	Original labels in NH with printed title, rest in Rehm's handwriting Sim labels in his handwriting, without title		1–424, incomplete	1878–1879	Rehmann, A	Kraków, Poland
Musci Austro-Africani cont. (Two different sets in PRE)	Original labels in NH handwritten, with title Sim labels in his handwriting, without title		425–680, incomplete	1886	Rehmann, A	? Lviv, Ukraine
Musci Briannici	W. Wilson: Musci Britannici Typewritten NY label		1–443, incomplete, many missing	After 1855	Wilson, W.	Originally Warrington, UK, but received on exchange from The New York Botanical Garden, USA
Musci et Hepaticae Italiae Sup. a F. A. Artaria coll.	Title and major locality printed, rest handwritten		Largely unnumbered, few	1898	Artaria, F.A.	? Milan, Italy
Musci Europaei exsiccati. Die Laubmoose Europas unter Mitwirkung namhafter Bryologen und Floristen	E. Bauer, Musci europaei exsiccati Some printed, others typewritten	Series 18 22–30	851–900 1 051–1 500, incomplete	1912 1915–1922	Bauer, E.	Prague, Czech Republic
Musci Europaei exsiccati et Americani exsiccati	Bauer, Musci europ. et amer. exsiccati Printed	Series 44	2 151–2 200, scattered numbers	1932	Bauer, E.	Prague, Czech Republic
Musci Galliae, herbier des mousses de France, Belgique, etc.	Husnot, Musci Galliae Most printed, others handwritten	Fascicles 1–19	1–959, incomplete, many missing	1870–1907	Husnot, P.T.	Cahan, France
Musci Japonici exsiccati	Musci Japonici Printed	Series I 2	1–50 51–100	1947 1948	Anonymous Hattori, S.	The Hattori Botanical Laboratory, Obi, Japan

TABLE 1.—Exsiccatae in the PRE bryophyte collection (continue)

Full title according to IndExs	Labels in PRE (title and notes)	Parts in PRE	Numbers issued, present in PRE	Date of publication	Editor or distributor	Institution, place and country of publication
Musci macrorregioni meridionali Poloniae exsiccati. Mosses of Southern Macrorregion of Poland	Musci Macrorregioni Meridionali Poloniae Exsiccati Fasc.	Fascicles I–XII XXXI–XLII XLIV	1–350 801–1 400 1 451–1 500	1982–1997 2002–2004 2008	Jędrzejko, K., Klama, H., Stebel, A. & Żarnowiec, J., in different combinations	Herbarium of the Department of Pharmaceutical Botany (SOSN), Medical University of Silesia in Katowice, Sosnowiec, Poland
Musci Madurenses Indiae meridionalis exsiccati, named by Jules Cardot (PRE specimens probably from a later set - see Sayre 1971: 201)	Fascicles 1–3 labels typewritten, rest printed Original label, if present, typed, with number and name only NY label typewritten, with title 'Mosses of Southern India', locality, and note 'Residue of Musci Madurenses Indiae Meridionalis Exsiccati'		1–?, scattered numbers	Later than 1929	Foreau, G.	Originally Madura, India, but 'residue' distributed by The New York Botanical Garden (NY), USA
Musci Mexicani	C. G. Pringle, Plantae Mexicanae Printed, or title printed and rest typewritten		1–?, Scattered numbers	1896–after 1908	Pringle, C.G.	USA
Musci selecti et critici, editi Fr. Verdoorn	Musci Selecti et Critici Printed	Series I–VII	1–350, incomplete numbers	1934–1940	Verdoorn, F.	Utrecht, The Netherlands
North American Musci perfecti; issued by A.J. Grout Ph. D.	North American Musci Perfecti Printed on brownish paper		1–475, scattered numbers	1925–1945	Grout, A.J.	Originally Newfane, Vermont, USA, but received on exchange from MU
Orthotrichaceae Boreali-Americanae exsiccatae	Printed	Fascicles I–III	1–30	1980–1981	Vitt, D.H.	University of Alberta, Edmonton, Canada
Plantae Graecenses, Bryophyta	Plantae Graecenses		1–?, scattered numbers	After 1908	Anonymous	Institut für Botanik, Graz, Austria
Plantae in Itineribus Succorum Polarius collectae/Insulae Spitsbergenses	Plantae in itineribus Succorum polariibus collectae Title, main locality and collector printed, rest handwritten on brown paper		1–199, scattered numbers	1874	Berggren, S.	Lund, Sweden
Schweizerische Kryptogamen. Unter Mitwirkung mehrerer Botaniker. Gesammelt und herausgegeben von Dr. B. Wartmann und B. Schenk	Wartmann und Schenk, Schweizerische Kryptogamen Printed	Century 6, Fasc. 11 & 12 Century 7, Fasc. 13 & 14	501–600, scattered numbers 601–700, scattered numbers	1866 1869	Wartmann, F.B. & Schenk, B.	St. Gallen, Switzerland



TABLE 1.—Exsiccatae in the PRE bryophyte collection (continue)

Full title according to IndExs	Labels in PRE (title and notes)	Parts in PRE	Numbers issued, present in PRE	Date of publication	Editor or distributor	Institution, place and country of publication
Société Dauphinoise	Société dauphinoise, 18...		1–?, scattered numbers	1879–?1888	Anonymous	Société Dauphinoise pour l'échange des plantes, France
	Printed					
[South America. 1895-1897]	Printed, without titles		1–877?, scattered numbers	After 1897	Dusén, P.K.H.	Sweden?
Sphagnaceae Britannicae exsiccatae, editit R. Braithwaite	Handwritten, without title, with black frame Numbers and names correspond to those of Wheldon (1919)		1–53	1877	Braithwaite, R.	London, UK

in book form with the specimens mounted on the pages next to printed names, but without numbers and localities, are excluded.

In Table 1, the bryophyte exsiccatae in PRE are listed alphabetically by full title according to IndExs. Exsiccatae in IndExs, which obviously belong to the same series, e.g. *Musci Japonici exsiccati Det. A. Noguchi* (Ser. 1, 1–50) and *Musci Japonici exsiccati det. Akira Noguchi* (Ser. 2, 51–100), were combined. The second column contains notes on the labels in PRE, e.g. the title (if different from the full title), printing and colour. This is followed by the parts present in PRE and the numbers issued in each, with an indication of the numbers present in PRE. The remaining columns contain the date, institution, place and country of editing, publication or distribution, as well as the name of the editor or distributor. The analysis of exsiccatae in the bryophyte collection is based on data in Table 1.

#### RESULTS AND DISCUSSION

The PRE bryophyte collection houses 66 exsiccatae (Table 1), which represent 6% of all cryptogam and fungus exsiccatae issued up to 2003 (Triebel *et al.* 2004) and 13% of cryptogam exsiccatae that contain bryophytes.

The majority of exsiccatae in PRE (34) were first issued in the 19th century, almost as many (32) in the 20th century, and none in the 21st century. The oldest exsiccatae specimens in PRE are from Century 2 of *Flora Germanica exsiccata. Serie II. Cryptogamia*, edited by J.C. Breutel and issued in Leipzig, Germany in 1843 (Figure 1B). The most recent specimens in PRE belong to Fascicle XXX of *Bryophyta selecta exsiccata*, edited by H. Inoue and issued in 2009 by the National Science Museum (TNS), Tokyo, Japan (Figure 1C). This indicates long-standing co-operation and exchange of scientific knowledge between herbaria in South Africa and countries of the northern Hemisphere.

Although exsiccatae usually have printed labels (see Figure 1B, C, G, H), there are series in PRE with handwritten labels, e.g. *Sphagnaceae Britannicae exsiccatae*, edited by R. Braithwaite, which was issued in 1877 (Figure 1D), typewritten labels, e.g. Fascicles 1–3 of *Musci macroregioni meridionali Poloniae exsiccati. Mosses of southern macro-region of Poland*, issued by SOSN from 1982 to 1984, and a combination of the above, e.g. S. Berggren's *Plantae in Itineribus Suecorum Polaribus collectae/Insulae Spitsbergenses* from 1874, with title, main locality and collector printed and rest handwritten (Figure 1E), and R. Ochyra's *Bryophyta Antarctica exsiccata*, issued in 1982, with the title, editor, place of issue and name printed, and the rest typewritten (Figure 1F). Several of the 19th century series have printed labels without titles, which make them difficult to recognize, e.g. C.F. Austin's *Musci Appalachiani*, as well as *Hepaticae Boreali-Americanae exsiccatae* (Figure 1G) issued in 1870 and 1873 respectively, and Carrington & Pearson's *Hepaticae Britannicae exsiccatae* of which Fascicles 1–3, issued from 1878 to 1883, are represented in PRE.

Most exsiccatae in PRE were issued in Europe (44), followed by North America (18), Asia (3) and Australasia (1). However, the United States of America (14) is the country where most exsiccatae in PRE originated from, followed by Germany with seven, Poland with six, and France and Sweden with five exsiccatae each.

The majority of bryophyte exsiccatae in PRE are incomplete (Table 1), some only represented by single specimens, which indicates that they were distributed as duplicates in exchange sets rather than exsiccatae, e.g. *North American Musci perfecti; issued by A. J. Grout Ph.D.* in Newfane, Vermont from 1925 to 1940, of which there are only a few specimens in PRE, received on exchange from the W.S. Turrell Herbarium, Miami University (MU) in 1990 (Figure 1H). Another example is *Musci Britannici*, edited by W. Wilson and originally issued in Warrington, UK after 1855, but the few scattered numbers in PRE were only received in the latter part of the 20th century through exchange with The New York Botanical Garden (NY).

PRE houses two different sets of Antoni Rehmman's *Musci Austro-Africani (1875–77)* and *Musci Austro-Africani cont.*, regarded as the most important African exsiccatae (Ochyra & Pócs 1992). One set was compiled by T.R. Sim and housed in his private herbarium, now in PRE (Magill 1980; Codd & Gunn 1982), while the other is on permanent loan from the KwaZulu-Natal Herbarium (NH). The sets contain several southern African type specimens but are incomplete (Dixon & Gepp 1923; Magill 1980; Codd & Gunn 1982; Glen & Germishuizen 2010).

Another important African exsiccata in PRE, the only to cover the whole of sub-Saharan Africa, is *Bryophyta Africana Selecta*, edited by Ryszard Ochyra and Tamás Pócs and issued jointly by the W. Szafer Institute of Botany in Kraków, Poland, and the Eszterházy Károly Teachers Training College, Eger, Hungary in 1992 and 1993. Frans Verdoorn's *Hepaticae selecti et critici*, as well as *Musci selecti et critici*, issued in the 1930's, contain bryophytes from several continents, including Africa.

PRE also contains important bryophyte exsiccatae from other parts of the southern hemisphere, e.g. *Bryophyta Antarctica exsiccata*, edited by Ryszard Ochyra and distributed by the University of Alberta, Edmonton, Canada in 1982 (Figure 1F), which is the first and only exsiccata of Antarctic bryophytes. The Australian series *Musci Australasiae exsiccatae*, edited by H. Streiman (Figure 1A), is one of the largest exsiccata in PRE with 600 specimens.

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## REFERENCES

- CODD, L.E. & GUNN, MARY. 1982. The collecting activities of Anton Rehmman (1840–1917) in South Africa. *Bothalia* 14: 1–14.
- DIXON, H.N. & GEPP, A. 1923. Rehmman's South African mosses. *Kew Bulletin* 6: 193–238.
- GLEN, H.F. & GERMISHUIZEN, G. (compilers) 2010. *Botanical exploration of southern Africa*, 2nd ed. *Strelitzia* 26. Pretoria: South African National Biodiversity Institute.
- HOLMGREN, P.K., HOLMGREN, N.H. & BARNETT, L.C. 1990. *Index Herbariorum, part 1: the herbaria of the world*. New York Botanical Garden.
- MCNEILL, J., BARRIE, F.R., BURDET, H.M., DEMOULIN, V., HAWKSWORTH, D.L., MARHOLD, K., NICOLSON, D.H., PRADO, J., SILVA, P.C., SKOG, J.E., WIERSEMA, J.H. & TURLAND, N.J. (eds) 2006. International Code of Botanical Nomenclature (Vienna Code) adopted by the seventeenth international Botanical Congress Vienna, Austria, July 2005. *Regnum Vegetabile* 146: 1–568.
- MAGILL, R.E. 1980. Musci austro-africani II. Bryophyte collections in southern Africa and southern African type specimens in the National Herbarium, Pretoria. *Bothalia* 13: 127–133.
- MAGILL, R.E., GIBBS RUSSELL, G.E., MORRIS, J.W. & GONSALVES, P. 1983. PRECIS, the Botanical Research Institute herbarium data bank. *Bothalia* 14: 481–495.
- OCHYRA R. & PÓCS, T. 1992. Bryophyta Africana Selecta: a new exsiccate from Africa. *Fragmenta Floristica et Geobotanica* 37: 379–388.
- PFISTER, D.H. 1985. A bibliographic account of the exsiccatae containing fungi. *Mycotaxon* 23: 1–139.
- SAYRE, G. 1969. Cryptogamae Exsiccatae—an annotated bibliography of published exsiccatae of algae, lichens, Hepaticae, and Musci. Introduction. *Memoirs of the New York Botanical Garden* 19,1: 1–4.
- SAYRE, G. 1971. Cryptogamae Exsiccatae—an annotated bibliography of published exsiccatae of algae, lichens, Hepaticae, and Musci. Bryophyta. *Memoirs of the New York Botanical Garden* 19,2: 175–276.
- SAYRE, G. 1975. Cryptogamae Exsiccatae—an annotated bibliography of published exsiccatae of algae, lichens, Hepaticae, and Musci. Unpublished exsiccatae. *Memoirs of the New York Botanical Garden* 19,3: 277–423.
- STAFLEU, F.A. 1972. Cryptogamae exsiccatae. *Taxon* 21: 351–354.
- TRIEBEL, D. & SCHOLZ, P. 2001 onwards. “IndExs—Index of Exsiccatae”. Botanische Staatssammlung München, Germany. <http://indexs.botanischestaatsammlung.de> (accessed June 2012).
- TRIEBEL, D., SCHOLZ, P., HAGEDORN, G. & WEISS, M. 2004. History of exsiccatal series in cryptogamic botany and mycology as reflected by the web-accessible database of exsiccatae “IndExs—Index of Exsiccatae”. In P. Döbbeler & G. Rambold (eds.), Contributions to Lichenology. Festschrift in Honour of Hannes Hertel. *Bibliotheca Lichenologica* 88: 671–690.
- WHELDON, J.A. 1919. Notes on Braithwaite's Sphagnaceae exsiccatae. *The Journal of Botany. British and Foreign. London* 57: 142–147.