

Research Article SUPPLEMENTARY MATERIAL

The invasion status of *Myriophyllum spicatum* L. in southern Africa

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Supplementary material

The following supplementary material is available for this article:

Appendix 1. A list of the *Myriophyllum spicatum* specimens and the herbaria where they are housed.

Appendix 2. Summary of all the *Myriophyllum spicatum* specific field surveys that have been conducted in southern Africa.

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Appendix 1. A list of the *Myriophyllum spicatum* specimens and the herbaria where they are housed.

Country	Collector	Collector #	Date	Locality description	Lat.	Long.	Herbarium
South Africa	Zeyher	2470	1829	Swartkops River, Uitenhage	-33.7587	25.3554	SAM
	Ecklon & Zeyher	1767	1830	Swartkops River, Uitenhage	-33.7587	25.3554	SAM
	W. Nelson	67	1877	Vaal River	-26.9374	27.0559	PRE
	H. Dolier	6834	1884	Vaal River, Barkley West	-28.46	24.38	BOL
	J. Mendely Wood	3565	1885	Mooi River	-29.22	29.98	BOL
	R. Marloth	832	1885	Vaal	-28.46	24.38	NBG, PRE
	J. Mendely Wood	3357	1885	Mooi River	-29.22	29.98	NH
	Anon.	s.n.	1885	Vaal River	-28.62	24.19	PRE
	M. Wood	5481	1894	Mooi River	-29.22	29.98	PRE
	K. Orpen	189	1897	St. Clair, Douglas	-29.054	23.817	SAM
	K. Orpen	s.n.	1897	St. Clair, Douglas	-29.081	23.829	GRA
	H.G. Hanagan	s.n.	1899	Vaal river near Hebson	-28.46	24.38	BOL
	Dr. Potts	1756	1908	Modder River	-29.03	24.59	SAM
	E. Wager	10453	1910	Vereeniging	-26.672	27.963	PRE
	J. Burth-Davey	10755	1911	Smitskraal, Boshoff	-28.5604	25.2416	PRE
	J. Burth-Davey	10901	1911	Smitskraal, Boshoff	-28.5604	25.2416	PRE
	J. Burth-Davey	10067	1911	Smitskraal, Boshoff	-28.5604	25.2416	PRE
	J. Burth-Davey	11335	1911	Smitskraal, Boshoff	-28.5604	25.2416	PRE
	J.C. Moran	16248	1919	Modder River	-29.03	24.59	BOL
	J.C. Moran	s.n.	1919	Modder River	-29.03	24.59	PRE
	A. M. Cronin	815	1919	Modder River	-29	24.63	KMG
	Unknown	29	1922	Cogmans Kloof	-33.8	20.09	BOL
	M.R. Buchell	s.n.	1922	Cogmans Kloof	-33.8	20.09	PRE
	R. Marloth	s.n.	1923	Bonnievale, Robertson	-33.95	20.1	PRE
	H.G. Fourcade	s.n.	1927	Hankey, Humansdorp	-33.83	24.87	PRE
	E.G. Byanks	734	1933	Eastern? Preiska	-29.6563	22.74602	NBG
	R.D. Bradfield	134	1934	Bronkhorstspuit	-25.897	28.692	PRE
	J.P.H. Acocks	s.n.	1936	Riet River at Blaauwkrantz, Kimberly	-29.9952	23.9443	PRE
	J.P.H. Acocks	3785	1936	Blaukrantz, Riet River, Kimberly	-29.9952	23.9443	KMG
	N.D. Pillans	8597	1938	Piquetberg, Verlorenvlei, Opp. Muis Hoek	-32.33	18.41	BOL, NBG, GRA, PRE
	D.K.H. Barnard	52779	1938	Breeder River, Swellendam	-34.067	20.4135	SAM
	K. Tinley	120	1958	Ntumbane Inlet, Zululand	-27.3504	32.6862	PRE
	V. A. Wager	s.n.	1958	Umzimkulu River. Underberg.	-29.81	29.49	PRE
	O.A. Leistner	s.n.	1963	Riet River at Richie.	-29	24.59	PRE
	S.C. Seagrief	s.n.	1964	Rooipoort, Vaal river, Near Kimberly	-28.6441	24.0835	GRA
	J. Vahrmeijer and H.R. Tolken	884	1965	Lake Sibaya	-27.3504	32.6862	PRE
	C.M. Breen	28	1966	Lake Sibaya	-27.3504	32.6862	GRA
	Sibaya Project	s.n.	1966	Lake Sibaya	-27.3504	32.6862	GRA

Appendix 1 (continued).

Country	Collector	Collector #	Date	Locality description	Lat.	Long.	Herbarium
	R.G. Strey	7702	1967	Underberg "Springvale farm"	-29.3	29.98	NU, NH, UDW, PRE
	M.J. Wells	3926	1968	Klipplaat River, Rockford.	-32.49	26.95	GRA
	E.C.H. Oliver	s.n.	1970	Verlorenvlei, Elandsbaai.	-32.326	18.369	PRE
	R.E. Haynes & F.C. Viljoen	s.n.	1971	Vaal river above the Barrage. Vanderbylpark.	-26.672	27.963	PRE
	P. Linder	Unknown	1976	Piquetberg, Verlorenvlei	-32.33	18.41	BOL
	C.F. Musil	443	1976	Lake Sibaya	-27.3504	32.6862	NH
	C.F. Musil	451	1976	Lake Sibaya	-27.3504	32.6862	NH
	C.F. Musil	452	1976	Lake Sibaya	-27.3504	32.6862	NH
	C.F. Musil	459	1976	Lake Sibaya	-27.3504	32.6862	NH
	A. Bruton ex. A. Jacot Guillarmod	s.n.	1976	Lake Sibaya	-27.3504	32.6862	GRA
	A. Jacot Guillarmod	s.n.	1976	Vereeniging, Downstream of No. 2 inlet on vaal river	-26.672	27.963	GRA
	P. Linder ex A. Jacot Guillarmod	s.n.	1976	Verlorenvlei, Piquetberg	-32.326	18.369	GRA,PRE
	M.F. Thompson	3548	1977	Verorenvlei, at bridge near Bobbejaanberg	-32.326	18.369	NBG
	C.J. Ward	9418	1981	Vaal River, Schmidtsdrif	-28.71	24.07	UDW
	C.J. Ward	C 1025	1981	Schmidtsdrift	-28.71	24.07	PRE
	L.Henderson	1079	1990	Bronkhorstspuit River at bridge near Groblersdal	-25.7976	28.7482	PRE
	C.J. Cilliers	CJC 51	1994	Kromdraai, Vaal River	-26.9374	27.0559	PRE
	C.J. Cilliers	CJC 75	1994	Rocklands Farm, Hogsback	-32.49	26.95	PRE
	R. P. Glen	s.n.	1994	Verlorenvlei, near farm Bobbejaan berg	-32.326	18.369	PRE
	E.L. Stephens	s.n.	-	Cogmans Kloof, Montagu	-33.8	20.09	UDW
	P. Weyl	PW 1	2012	Lake Sibaya	-27.2796	32.68426	GRA
	P. Weyl	PW 20	2012	Vaalhaarts Weir	-28.0922	24.9686	GRA
Zimbabwe	F.A. Rodgers	s.n.	1913	Victoria Falls, Zimbabwe	-17.911	25.854	GRA
	F. Eyles	1571	1919	Salsbury, Zimbabwe	-17.83	31.05	PRE
	Pocock	129	1925	Ngambue, Zambezi River	-17.2353	24.11975	BOL
	A.O.D. Mogg	14598	1937	Zambezi River, 1 mile above the Victroia Falls, Zimbabwe	-17.911	25.854	PRE
	H. Wild	26416	1949	Zambezi River, Victroia Falls, Zimbabwe	-17.911	25.854	SRGH
Botswana	C.E. Moss	18572	1930	Chobe River, between Kasane and Kabulabula, Northern Botswana			J
	G. E. Gibbs Russell	2196	1972	Northern Botswana	-18.37	23.79	PRE, SRGH
	P. A. Smith	1168	1974	Linyanti River, Northern Botswana	-18.37	23.79	PRE, SRGH, PSUB
	D. Edwards	4388	1975	Singalamwe District	-17.7923	23.3468	PRE
Namibia	P.A. Smith	3959	1982	Linyanti River	-18.393	23.765	SRGH, PSUB
	C. Schlettwein	s.n.	1983	Singalamwe	-17.7923	23.3468	PRE
	Klaassen, E. & Austaller, S.	s.n.	1999	Caprivi strip, Namibia	-18.122	21.572	PRE
Malawi	C. Howard Williams	17	1969	Fort Johnston, Monkey Bay, Lake Malawi	-14.074	34.929	SRGH
	G. E. Gibbs Russell	2106	1972	Lake Malawi, Monkey Bay	-14.081	34.931	GRA, PRE, SRGH

Appendix 1 (continued).

Country	Collector	Collector #	Date	Locality description	Lat.	Long.	Herbarium
Malawi	J.H. Seyani	282	1975	Lake Malawi, near Samama beach, Mangochi District.	-14.373	35.208	SRGH
	R.K. Brummitt	18295	1986	Namaso Bay, Malawi.	-14.17	34.98	PRE
Zambia	P.J. Greenway & J.P.M. Brenan	8245	1947	Lake Tanganyika, Mpulungu, Abercorn Dist.	-8.77	31.11	PRE
	R.B. Drummond & A.J. Cookson	6743	1959	Mumbwa District, Kafue Hoek Pontoon, Kafue River	-15.06	26.01	PRE, SRGH
	M. Gillhem	27	1960	Kafue River, Kafwala District, Kafue National Park.	-14.798	26.193	SRGH
	J.B. Phipps and L. Fitzgerald	3038	1961	Lake Tanganyika, Mpulungu, Abercorn Dist.	-8.69	31.19	SRGH

Appendix 2. Summary of all the *Myriophyllum spicatum* specific field surveys that have been conducted in southern Africa.

Country	Region/ Province	River system	Coordinates	Dates surveyed	Records present	Established populations	Notes
South Africa	Western Cape	Verlorenvlei	-32.336°, 18.425°	Jan. 2012 Oct. 2012	Herbarium records	No individuals found	The lagoon, wetland and relevant river system were extensively surveyed during a low water period in January and during high water period when the rivers were flowing in October
		Agulas Plain	-34.336°, 19.904°	Jan. 2012 Oct. 2012	Observational and a collection records	No individuals found	The Nuwejaars River and tributaries including natural and manmade water bodies in the area were extensively surveyed during low water periods in January and again during high water periods in October
		Breede River	-33.823°, 19.865°	Jan. 2012 Oct. 2012	Herbarium records	No individuals found	The river was surveyed around the town of the Robertson during Low water periods and again during high water periods
	Eastern Cape	Klipplaat River	-32.485°, 26.947°	Feb. 2013	Herbarium records	Healthy population was found	The river was surveyed and plants were found to be growing in all areas where the substrate allowed. The plants were relatively abundant but did not reach a density that they could be considered problematic.
	Gauteng	Bronkhorstspuit River	-25.856°, 28.702°	April 2013	Herbarium records	No individuals found	The river was surveyed from bridges that cross it in the Bronkhorstspuit area.
	Northern Cape	Vaal River	-26.886°, 27.473° to -29.069°, 23.636°	2008 – April 2013	Herbarium records	Healthy population was found	The extent of the Vaal River has been surveyed annually since 2008 and <i>M. spicatum</i> has been found at several localities along the length of the river.
		Riet River	-29.141°, 24.769°	April 2012	Herbarium records	No individuals found	The Riet River a tributary of the Vaal River was surveyed.
		Modder River	-28.992°, 25.080°	April 2012	Herbarium records	No individuals found	The Modder River a tributary of the Riet River was surveyed.
		Orange River	-29.057°, 23.691°	April 2013	Herbarium records	A few individuals were found	The Orange river around the town of Prieska was surveyed and a few individuals were found in an irrigation canal coming off the main river

Appendix 2 (continued).

Country	Region/ Province	River system	Coordinates	Dates surveyed	Records present	Established populations	Notes
	Kwazulu Natal	Lake Sibaya	-27.359°, 32.683°	April 2012	Herbarium records	Healthy population was found	The lake was surveyed and a healthy population was found and covers majority of the lake where water depth and substrate allows.
		Muzi Pan, and surrounds	-27.646°, 32.403°	April 2012 Nov. 2012 April 2013	Observational records	No individuals found	The streams, rivers and pans in the surrounds of Muzi Pan, Northern KZN were surveyed.
Namibia	Caprivi Strip	Linyanti River	-17.938°, 24.340°	Aug. 2012	Herbarium records	No individuals found	20 km of the Linyanti channel that feeds into Lake Liambezi was surveyed by boat.
		Chobe River	-17.949°, 24.378°		Herbarium records	No individuals found	30 km of the Chobe River that feeds into Lake Liambezi was surveyed by boat.
		Bukalo Channel	-17.892°, 24.389°		None	No individuals found	10 km of the Bukalo Channel that feeds into Lake Liambezi was surveyed by boat.
		Quando River	-17.791°, 23.344°		Herbarium records	No individuals found	60 km of the Cuando River was surveyed by boat.
Namibia and Botswana		Kavango River	-18.256°, 21.778°		Herbarium records	No individuals found	10km of the Kavango River was surveyed on the Namibian side and 20km surveyed on the Botswana side by boat
Zambia		Kafue River	-14.913846°, 25.928701°		Herbarium records	Population was found	Surveyed 6km upstream of the Kafue Hoek Pontoon Bridge.