

Note: This is Online Appendix 1 of Chatanga, P., Phoofolo, M.W. & Pitso, K.M., 2024, ‘High-altitude wetland vegetation of Bokong Nature Reserve in Matšeng Biosphere Reserve, Lesotho’, *Koedoe* 66(1), a1817. [https:// doi.org/10.4102/koedoe. v66i1.1817](https://doi.org/10.4102/koedoe.v66i1.1817)

ONLINE APPENDIX 1

TABLE 1-A1: Plant species occurring in the Bokong Nature Reserve wetlands in Matšeng Biosphere Reserve, their frequency of occurrence in the wetland and the dominance of the different plant families in terms of number of species. Species were identified using botanical field guides (Pooley 1998; Pooley 2003; van Oudtshoorn 2014).

Family	Dominance (%)	Species	Authority	Frequency (%) ^a
Aizoaceae	0.57	<i>Delosperma</i> sp		0.00
Amaryllidaceae	0.57	<i>Tulbaghia</i> sp		1.43
Apiaceae	1.71	<i>Alepidea pusilla</i>	Weim	45.71
		<i>Alepidea thodei</i>	Dümmer	4.29
		<i>Conium fontanum</i>	Hilliard & B.L. Burt	1.43
Aponogetonaceae	0.57	<i>Aponogeton junceus</i>	Lehm. ex Schldtl	0.00
Asphodelaceae	2.29	<i>Kniphofia caulescens</i>	Baker	32.86
		<i>Kniphofia northiae</i>	Baker	2.86
		<i>Kniphofia ritualis</i>	Codd	1.43
		<i>Kniphofia thodei</i>	Baker	0.00
Asteraceae	21.14	<i>Arctotis arctotoides</i>	(L.f.) O. Hoffm	1.43
		<i>Aster erucifolius</i>	Thell	4.29
		<i>Athrixia fontana</i>	MacOwan	51.43
		<i>Berkheya multijuga</i>	D.C.	27.14
		<i>Cineraria dieterlenii</i>	E. Phillips	5.71
		<i>Cotula paludosa</i>	Hilliard	7.14
		<i>Cotula socialis</i>	Hilliard	24.29
		<i>Denekia</i> sp		1.43
		<i>Eumorphia sericea</i>	J.M. Wood & M.S. Evans	14.29
		<i>Felicia rosulata</i>	Yeo	5.71
		<i>Felicia ericifolia</i>	(Forssk) Mendonça	0.00
		<i>Gazania krebsiana</i>	Less	1.43
		<i>Gazania forbesiana</i>	D.C.	2.86
		<i>Gymnopentzia bifurcata</i>	Benth	12.86
		<i>Haplocarpha nervosa</i>	Beauverd	44.29
		<i>Helichrysum auriceps</i>	Hilliard	0.00
<i>Helichrysum basalticum</i>	Hilliard	0.00		
<i>Helichrysum bellum</i>	Hilliard	12.86		
<i>Helichrysum montanum</i>	D.C.	8.57		

		<i>Helichrysum</i> sp		5.71
		<i>Helichrysum subglomeratum</i>	Less	1.43
		<i>Helichrysum tenax</i>	M.D. Hend	8.57
		<i>Helichrysum dasycephalum</i>	O. Hoffm	8.57
		<i>Helichrysum ericeteum</i>	W.M. Curtis	0.00
		<i>Hypochaeris radicata</i>	L.	1.43
		<i>Pseudognaphalium luteoalbum</i>	(L.) Hilliard & B.L. Burt	4.29
		<i>Senecio asperulus</i>	D.C.	0.00
		<i>Senecio barbatus</i>	D.C.	7.14
		<i>Senecio cryptolanatus</i>	Killick	1.43
		<i>Senecio dissimulans</i>	Hilliard & B.L. Burt	2.86
		<i>Senecio gramineus</i>	Harv	2.86
		<i>Senecio macrocephalus</i>	D.C.	54.29
		<i>Senecio polyodon</i>	D.C.	7.14
		<i>Senecio</i> sp		1.43
		<i>Senecio speciosus</i>	Willd	1.43
		<i>Senecio harveianus</i>	MacOwan	4.29
		<i>Taraxacum officinale</i>	F.H. Wigg	0.00
Boraginaceae	0.57	<i>Myosotis semiamplexicaulis</i>	D.C.	1.43
Brassicaceae	0.57	<i>Lepidium bonariense</i>	L.	4.29
		<i>Rorippa nudiuscula</i>	Thell	1.43
Campanulaceae	2.29	<i>Craterocapsa congesta</i>	Hilliard & B.L. Burt	5.71
		<i>Lobelia erinus</i>	L.	1.43
		<i>Lobelia galpinii</i>	Schltr	28.57
		<i>Wahlenbergia krebsii</i>	Cham	0.00
Caryophyllaceae	1.14	<i>Cerastium arabis</i>	E. Mey	8.57
		<i>Silene undulata</i>	Pourr. ex Willk & Lange	4.29
Colchicaceae	1.14	<i>Androcymbium striatum</i>	Hochst ex A. Rich	0.00
		<i>Wurmbea</i> sp		1.43
Crassulaceae	4.00	<i>Crassula dependens</i>	Bolus	7.14
		<i>Crassula lanceolata</i>	Endl	0.00
		<i>Crassula natalensis</i>	Schönland	18.57
		<i>Crassula natans</i>	Thunb	11.43
		<i>Crassula papillosa</i>	Schönland & F. Baker	8.57
		<i>Crassula rosularis</i>	Haw	1.43
		<i>Crassula setulosa</i>	Harv	7.14
Cyperaceae	11.43	<i>Bulbostylis humilis</i>	C.B. Clarke	10.00
		<i>Bulbostylis</i> sp		1.43
		<i>Carex cognata</i>	Kunth	14.29
		<i>Carex monotropa</i>	Nelmes	0.00
		<i>Cyperus schlechteri</i>	C.B. Clarke	2.86
		<i>Cyperus</i> sp		1.43

			(Svenson) L.J. Harms	0.00
			<i>Eleocharis verrucosa</i>	
			<i>Isolepis angelica</i>	1.43
			<i>Schoenoxiphium</i> sp	4.29
			<i>Schoenoxiphium</i> sp 1	4.29
			<i>Schoenoxiphium</i> sp 2	7.14
			<i>Scirpus falsus</i>	22.86
			Sedge sp 1	2.86
			Sedge sp 2	14.29
			<i>Tetraria cuspidata</i>	7.14
			(Rottb) C.B. Clarke	
			<i>Isolepis costata</i>	0.00
			Hochst ex A. Rich	
			<i>Isolepis fluitans</i>	25.71
			(L.) R.Br.	
			<i>Isolepis</i> sp	1.43
			<i>Kyllinga erecta</i>	21.43
			Schumach	
			<i>Kyllinga</i> sp	2.86
Dipsacaceae	0.57		<i>Scabiosa columbaria</i>	14.29
			L.	
Ericaceae	2.29		<i>Erica aestiva</i>	7.14
			Markötter	
			<i>Erica alopecuroides</i>	5.71
			J.C. Wendl	
			<i>Erica alopecurus</i>	0.00
			Harv	
			<i>Erica dominans</i>	0.00
			Killick	
Eriocaulaceae	0.57		<i>Eriocaulon dregei</i>	27.14
			Hochst	
Euphorbiaceae	0.57		<i>Euphorbia cyparissias</i>	8.57
			L.	
Gentianaceae	0.57		<i>Sebaea natalensis</i>	12.86
			Schinz	
Geraniaceae	0.57		<i>Geranium multisectum</i>	21.43
			N.E.Br.	
Hyacinthaceae	1.71		<i>Eucomis schijffii</i>	1.43
			W.F. Reyneke	
			<i>Ornithogalum paludosum</i>	0.00
			Baker	
			<i>Ornithogalum</i> sp	1.43
Iridaceae	2.86		<i>Aristea woodii</i>	15.71
			N.E.Br.	
			<i>Dierama jucundum</i>	2.86
			Hilliard	
			<i>Dierama robustum</i>	0.00
			N.E.Br.	
			<i>Hesperantha</i> sp	0.00
			<i>Moraea alticola</i>	2.86
			Goldblatt	
Juncaceae	1.14		<i>Juncus exsertus</i>	0.00
			Buchenau	
Juncaceae			<i>Luzula africana</i>	0.00
			Drège	
Lamiaceae	0.57		<i>Mentha longifolia</i>	0.00
			(L.) L.	
Leguminosae	1.71		<i>Argyrolobium marginatum</i>	2.86
			Bolus	
			<i>Argyrolobium harveyanum</i>	1.43
			Oliv	
			<i>Trifolium burchellianum</i>	5.71
			Ser	
Molluginaceae	1.14		<i>Psammotropha obtusa</i>	1.43
			Adamson	
			<i>Psammotropha myriantha</i>	1.43
			Sond.	
Moss	0.57		Moss	45.71
Orchidaceae	3.43		<i>Brownleea macroceras</i>	1.43
			Sond.	
			<i>Corycium nigrescens</i>	0.00
			Sond.	
			<i>Disa fragrans</i>	5.71
			Schltr	
			<i>Disa</i> sp	0.00

		<i>Disperis wealii</i>	Rchb. f.	0.00
		<i>Satyrium longicauda</i>	Lindl	17.14
Oxalidaceae	0.57	<i>Oxalis obliquifolia</i>	Steud ex A. Rich	58.57
Papaveraceae	0.57	<i>Papaver aculeatum</i>	Thunb	0.00
Poaceae	16.00	<i>Agrostis barbuligera</i>	Stapf	32.86
		<i>Agrostis bergiana</i>	Trin	0.00
		<i>Agrostis eriantha</i>	Hack	0.00
		<i>Agrostis lachnantha</i>	Nees	5.71
		<i>Andropogon appendiculatus</i>	Nees	1.43
		<i>Anthoxanthum ecklonii</i>	Stapf	14.29
		<i>Catalepis gracilis</i>	Stent & Stapf	0.00
		<i>Ehrharta longigluma</i>	C.E. Hubb	1.43
		<i>Ehrharta erecta</i>	Lam	14.29
		<i>Eragrostis caesia</i>	Stapf	0.00
		<i>Eragrostis curvula</i>	(Schrad) Nees	0.00
		<i>Festuca caprina</i>	Nees	42.86
		<i>Fingerhuthia sesleriiformis</i>	Nees	0.00
		Grass sp		1.43
		<i>Harpochloa falx</i>	(L.F.) Kuntze	0.00
		<i>Helictotrichon turgidulum</i>	(Stapf) Schweick	1.43
		<i>Helictotrichon longifolium</i>	(Nees) Schweick	1.43
		<i>Koeleria capensis</i>	Nees	38.57
		<i>Merxmuellera disticha</i>	(Nees) Conert	50.00
		<i>Merxmuellera grandiflora</i>	(Hochst ex A. Rich) H.P. Linder	1.43
		<i>Merxmuellera macowanii</i>	(Stapf) Conert	31.43
		<i>Merxmuellera stereophylla</i>	(J.G. Anderson) Conert	5.71
		<i>Pentaschistis airoides</i>	Stapf	5.71
		<i>Pentaschistis galpinii</i>	(Stapf) McClean	22.86
		<i>Pentaschistis setifolia</i>	(Thunb.) McClean	1.43
		<i>Pentaschistis</i> sp		0.00
		<i>Poa annua</i>	L.	10.00
		<i>Poa binata</i>	Nees	34.29
Polygalaceae	1.14	<i>Polygala rhinostigma</i>	Chodat	1.43
		<i>Rumex lanceolatus</i>	Thunb	1.43
Potamogetonaceae	1.14	<i>Potamogeton pusillus</i>	L.	1.43
		<i>Potamogeton thunbergii</i>	Cham & Schldl	1.43
Ranunculaceae	1.71	<i>Ranunculus baurii</i>	MacOwan	27.14
		<i>Ranunculus meyeri</i>	Harv	34.29
		<i>Ranunculus multifidus</i>	Forssk	1.43
Rosaceae	1.71	<i>Alchemilla woodii</i>	Kuntze	0.00
		<i>Geum capense</i>	Thunb	25.71
		<i>Geum urbanum</i>	L.	1.43
Rubiaceae	1.71	<i>Anthospermum</i> sp		4.29

		<i>Galium scabrelloides</i>	Puff	1.43
		<i>Galium</i> sp		0.00
Santalaceae	0.57	<i>Thesium</i> sp		4.29
Scrophulariaceae	5.71	<i>Diascia barberae</i>	F. Hook	4.29
		<i>Hebenstretia dura</i>	Choisy	5.71
		<i>Jamesbrittenia pristisepala</i>	(Hiern) Hilliard	0.00
		<i>Limosella africana</i>	Glück	8.57
		<i>Limosella grandiflora</i>	Benth	12.86
		<i>Limosella longiflora</i>	Kuntze	2.86
		<i>Limosella major</i>	Diels	18.57
		<i>Limosella vesiculosa</i>	Hilliard & B.L. Burt	17.14
		<i>Nemesia rupicola</i>	Hilliard	1.43
		<i>Selago flanaganii</i>	Rolfe	1.43
Thymelaeaceae	1.71	<i>Gnidia aberrans</i>	C.H. Wright	0.00
		<i>Gnidia nana</i>	Eckl & Zeyh ex Meisn	0.00
		<i>Gnidia propinqua</i>	(Hilliard) B. Peterson	1.43
Verbenaceae	0.57	<i>Lantana rugosa</i>	Thunb	1.43

^aSpecies with a zero frequency were found within the wetland but outside the plots.

TABLE 2-A1: Indicator species of the plant communities of the high-altitude palustrine wetlands of Bokong Nature Reserve, Matšeng Biosphere, Lesotho. Only species with indicator values of more than 20 and p-values less than 0.05 are presented.

Community	Name	Dominants	Indicator species	Indicator value (IV)	P-value
Community 1	<i>Berkheya multijuga-Festuca caprina</i> community	<i>Festuca caprina, Berkheya multijuga, Dierama jucundum, Kniphofia northiae, Kniphofia caulescens, Merxmuellera disticha, Merxmuellera macowanii</i>	<i>Cotula socialis</i> <i>Euphorbia cyparissias</i> <i>Hebenstretia dura</i>	34.00 25.70 36.40	0.0052 0.0480 0.0128
Community 2	<i>Poa annua-Helictotrichon turgidulum</i> community	<i>Helictotrichon turgidulum, Poa annua, Helichrysum tenax</i>	<i>Senecio gramineus</i>	24.10	0.0483
Community 3	<i>Oxalis obliquifolia-Merxmuellera macowanii</i> community	<i>Merxmuellera macowanii, Oxalis obliquifolia</i>	<i>Diascia barberae</i>	31.40	0.0350
Community 4	<i>Kniphofia caulescens</i> community	<i>Kniphofia caulescens</i>	<i>Crassula dependens</i> <i>Crassula setulosa</i>	26.30 27.80	0.0412 0.0384
Community 5	<i>Scirpus falsus</i> community	<i>Scirpus falsus, Oxalis obliquifolia</i>	<i>Agrostis lachnantha</i>	24.40	0.048
Community 6 ^a	<i>Carex cognata</i> community	<i>Carex cognata</i>	–	–	–
Community 7	<i>Merxmuellera disticha</i> community	<i>Merxmuellera disticha, Aristeia woodii, Festuca caprina</i>	<i>Moraea alticola</i>	28.60	0.0310
Community 8 ^a	Mixed short high-altitude grassy sedge community	<i>Aristea woodii, Merxmuellera grandiflora, Schoenoxiphium spp, Merxmuellera macowanii, Merxmuellera disticha, Kniphofia caulescens</i>	–	–	–
Community 9	<i>Athrixia fontana-Alepidea pusilla</i> community	<i>Alepidea pusilla, Athrixia fontana, Eriocaulon dregei</i>	<i>Cyperus schlechteri</i> <i>Ehrharta erecta</i>	33.30 49.60	0.0260 0.0016
Community 10 ^a	<i>Ranunculus meyeri-Haplocarpha nervosa</i> community	<i>Haplocarpha nervosa, Ranunculus meyeri, Limosella vesiculosa, Limosella Africana, Trifolium burchellianum</i>	–	–	–

^aCommunity 6, Community 8 and Community 10 did not have any indicator species obtained from the indicator species analysis.

TABLE 3-A1: Synoptic table of plant communities occurring in Bokong Nature Reserve wetlands in Matšeng Biosphere, Lesotho. The values are the frequency data (%) of quadrats in which a particular species was occurring in each community.

Species	Plant community ^a									
	1 (11)	2 (4)	3 (5)	4 (4)	5 (5)	6 (5)	7 (7)	8 (12)	9 (6)	10 (11)
1 <i>Oxalis obliquifolia</i>	91	100	100	75	100	60	43	42	17	18
2 <i>Senecio macrocephalus</i>	91	75	80	50	60	20	57	33	17	55
3 <i>Festuca caprina</i>	82	100	100	50	20	--	43	17	50	9
4 Moss	18	25	20	75	40	60	57	42	67	64
5 <i>Athrixia fontana</i>	9	--	60	50	--	20	71	92	100	64
6 <i>Haplocarpha nervosa</i>	36	--	60	50	60	20	29	42	50	73
7 <i>Merxmullera disticha</i>	55	--	40	25	--	20	100	83	33	55
8 <i>Alepidea pusilla</i>	36	25	40	--	--	20	71	75	100	36
9 <i>Ranunculus meyeri</i>	9	--	40	50	60	60	14	17	33	73
10 <i>Kniphofia caulescens</i>	27	--	40	100	20	20	71	17	17	36
11 <i>Geum capense</i>	27	75	60	50	60	--	29	8	--	9
12 <i>Koeleria capensis</i>	64	50	--	--	--	--	57	33	50	64
13 <i>Poa binata</i>	45	50	40	25	--	--	43	17	33	64
14 <i>Merxmullera macowanii</i>	82	25	100	50	--	--	14	25	17	--
15 <i>Scirpus falsus</i>	--	50	20	25	100	60	14	8	--	18
16 <i>Berkheya multijuga</i>	55	--	60	75	--	--	14	17	33	18
17 <i>Agrostis barbuligera</i>	45	--	40	--	--	--	71	33	33	45
18 <i>Lobelia galpinii</i>	9	--	40	25	--	20	43	42	50	36
19 <i>Ranunculus baurii</i>	--	--	20	--	20	--	57	58	50	27
20 <i>Eriocaulon dregei</i>	9	--	--	--	--	--	43	25	83	64
21 <i>Cotula socialis</i>	82	--	80	25	--	--	14	--	--	18
22 <i>Isolepis fluitans</i>	--	--	20	25	20	--	43	58	17	36
23 <i>Kyllinga erecta</i>	27	25	40	--	--	--	29	25	17	27

24	<i>Geranium multisectum</i>	73	--	20	25	20	--	29	8	--	9
25	<i>Carex cognata</i>	--	--	--	25	20	100	--	8	17	9
26	<i>Pentaschistis galpinii</i>	--	--	--	--	--	--	57	42	17	55
27	<i>Crassula natalensis</i>	45	--	40	25	--	--	--	8	--	36
28	<i>Limosella vesiculosa</i>	9	--	20	25	20	--	--	8	17	55
29	<i>Eumorphia sericea</i>	36	25	20	25	20	--	14	--	--	9
30	<i>Ehrharta erecta</i>	--	25	--	--	--	--	14	--	67	36
31	<i>Satyrium longicauda</i>	45	--	20	--	--	--	14	17	33	9
32	<i>Anthoxanthum ecklonii</i>	--	--	20	--	--	--	29	--	50	36
33	<i>Scabiosa columbaria</i>	45	50	--	--	--	--	29	--	--	9
34	<i>Aristea woodii</i>	45	--	20	--	--	--	29	--	17	18
35	<i>Limosella major</i>	9	--	--	--	--	--	43	58	--	18
36	<i>Gymnopentzia bifurcata</i>	36	--	20	25	--	--	29	--	17	--
37	<i>Helichrysum bellum</i>	--	25	20	--	--	--	--	33	33	9
38	<i>Crassula natans</i>	--	--	20	25	20	--	--	8	17	27
39	<i>Sebaea natalensis</i>	55	--	20	--	20	--	14	--	--	--
40	<i>Bulbostylis humilis</i>	18	--	20	25	--	20	--	8	17	--
41	<i>Limosella grandiflora</i>	--	--	--	25	--	--	14	42	17	9
42	<i>Poa annua</i>	18	50	20	--	--	--	--	8	--	9
43	Sedge sp 2	--	--	--	--	--	--	43	42	--	18
44	<i>Cerastium arabidis</i>	18	--	--	25	20	20	--	8	--	--
45	<i>Helichrysum tenax</i>	9	25	20	--	20	--	--	8	--	9
46	<i>Crassula dependens</i>	--	--	20	50	--	--	--	8	--	9
47	<i>Helichrysum montanum</i>	--	25	20	--	--	--	14	--	--	27
48	<i>Cotula paludosa</i>	9	--	20	25	--	--	29	--	--	--
49	<i>Trifolium burchellianum</i>	--	50	--	--	--	20	--	--	--	9
50	<i>Helichrysum dasycephalum</i>	27	--	20	--	--	--	14	--	17	--
51	<i>Limosella africana</i>	--	--	--	25	--	--	--	8	17	27
52	<i>Crassula setulosa</i>	9	--	--	50	--	--	--	8	--	9
53	<i>Crassula papillosa</i>	--	--	--	25	--	--	14	25	--	9

54	<i>Senecio polyodon</i>	--	--	--	25	20	--	--	--	--	27
55	<i>Craterocapsa congesta</i>	9	25	20	--	--	--	--	--	17	--
56	<i>Lepidium bonariense</i>	--	25	--	25	20	--	--	--	--	--
57	<i>Agrostis lachnantha</i>	--	--	20	--	40	--	--	--	--	9
58	<i>Cineraria dieterlenii</i>	--	--	20	--	20	20	--	8	--	--
59	<i>Helichrysum</i> sp	9	25	--	25	--	--	--	--	--	9
60	<i>Euphorbia cyparissias</i>	36	--	--	--	--	--	14	--	17	--
61	<i>Pseudognaphalium luteoalbum</i>	--	25	20	--	20	--	--	--	--	--
62	<i>Pentaschistis airoides</i>	--	--	20	--	--	--	--	8	33	--
63	<i>Senecio barbatus</i>	9	25	--	--	--	--	--	8	--	18
64	<i>Felicia rosulata</i>	9	--	--	--	20	--	14	--	17	--
65	<i>Disa fragrans</i>	18	25	--	--	--	--	--	--	17	--
66	<i>Schoenoxiphium</i> sp 2	--	25	--	--	--	--	--	25	--	9
67	<i>Silene undulata</i>	9	25	--	--	20	--	--	--	--	--
68	<i>Erica alopecuroides</i>	--	--	20	--	--	--	--	17	17	--
69	<i>Schoenoxiphium</i> sp	--	--	20	--	--	--	14	--	17	--
70	<i>Aster erucifolius</i>	9	25	--	--	--	--	--	--	17	--
71	<i>Diascia barberae</i>	9	--	40	--	--	--	--	--	--	--
72	<i>Erica aestiva</i>	--	--	--	--	--	--	14	25	--	9
73	<i>Tetraria cuspidata</i>	18	--	--	--	--	--	--	17	--	9
74	<i>Senecio harveianus</i>	9	--	--	25	--	--	--	--	--	9
75	<i>Thesium</i> sp	--	--	--	--	--	--	14	8	17	--
76	<i>Alepidea thodei</i>	--	--	20	--	--	--	--	8	--	9
77	<i>Hebenstretia dura</i>	36	--	--	--	--	--	--	--	--	--
78	<i>Merxmuellera stereophylla</i>	--	--	--	--	--	--	--	8	--	27
79	<i>Kyllinga</i> sp	--	25	--	--	--	--	--	--	--	9
80	<i>Cyperus schlechteri</i>	--	--	--	--	--	--	--	--	33	--
81	<i>Senecio gramineus</i>	--	25	--	--	--	--	--	8	--	--
82	<i>Anthospermum</i> sp	18	--	--	--	--	--	14	--	--	--
83	<i>Moraea alticola</i>	--	--	--	--	--	--	29	--	--	--

84	<i>Gazania krebsiana</i>	9	--	--	--	--	--	--	--	17	--
85	<i>Senecio dissimulans</i>	9	--	--	--	--	--	--	--	17	--
86	<i>Galium scabrelloides</i>	--	25	--	--	--	--	--	--	--	--
87	<i>Helichrysum subglomeratum</i>	--	25	--	--	--	--	--	--	--	--
88	<i>Helictotrichon turgidulum</i>	--	25	--	--	--	--	--	--	--	--
89	<i>Myosotis semiamplexicaulis</i>	--	--	--	25	--	--	--	--	--	--
90	<i>Rorippa nudiuscula</i>	--	--	--	25	--	--	--	--	--	--
91	<i>Rumex lanceolatus</i>	--	25	--	--	--	--	--	--	--	--
92	<i>Schoenoxiphium</i> sp 1	--	--	--	--	--	--	--	25	--	--
93	<i>Argyrolobium marginatum</i>	9	--	--	--	--	--	14	--	--	--
94	<i>Dierama jucundum</i>	9	--	--	--	--	--	14	--	--	--
95	Sedge sp 1	--	--	--	--	--	--	14	8	--	--
96	<i>Arctotis arctotoides</i>	--	--	20	--	--	--	--	--	--	--
97	<i>Conium fontanum</i>	--	--	--	--	20	--	--	--	--	--
98	<i>Crassula rosularis</i>	--	--	--	--	20	--	--	--	--	--
99	<i>Geum urbanum</i>	--	--	--	--	20	--	--	--	--	--
100	Grass sp	--	--	--	--	20	--	--	--	--	--
101	<i>Helictotrichon longifolium</i>	--	--	--	--	20	--	--	--	--	--
102	<i>Isolepis angelica</i>	--	--	--	--	20	--	--	--	--	--
103	<i>Nemesia rupicola</i>	--	--	--	--	20	--	--	--	--	--
104	<i>Pentaschistis setifolia</i>	--	--	20	--	--	--	--	--	--	--
105	<i>Kniphofia northiae</i>	18	--	--	--	--	--	--	--	--	--
106	<i>Denekia</i> sp	--	--	--	--	--	--	--	--	17	--
107	<i>Limosella longiflora</i>	--	--	--	--	--	--	--	17	--	--
108	<i>Lobelia erinus</i>	--	--	--	--	--	--	--	--	17	--
109	<i>Polygala rhinostigma</i>	--	--	--	--	--	--	--	--	17	--
110	<i>Senecio cryptolanatus</i>	--	--	--	--	--	--	--	--	17	--
111	<i>Senecio</i> sp	--	--	--	--	--	--	--	--	17	--
112	<i>Senecio speciosus</i>	--	--	--	--	--	--	--	--	17	--
113	<i>Tulbagia</i> sp	--	--	--	--	--	--	--	--	17	--

114	<i>Wahlenbergia krebssii</i>	--	--	--	--	--	--	--	--	17	--
115	<i>Gnidia propinqua</i>	--	--	--	--	--	--	14	--	--	--
116	<i>Kniphofia ritualis</i>	--	--	--	--	--	--	14	--	--	--
117	<i>Ornithogalum</i> sp	--	--	--	--	--	--	14	--	--	--
118	<i>Psammotropha myriantha</i>	--	--	--	--	--	--	14	--	--	--
119	<i>Andropogon appendiculatus</i>	--	--	--	--	--	--	--	--	--	9
120	<i>Argyrolobium harveyanum</i>	9	--	--	--	--	--	--	--	--	--
121	<i>Cyperus</i> sp	--	--	--	--	--	--	--	--	--	9
122	<i>Ehrharta longigluma</i>	9	--	--	--	--	--	--	--	--	--
123	<i>Eucomis schijffii</i>	9	--	--	--	--	--	--	--	--	--
124	<i>Gazania forbesiana</i>	9	--	--	--	--	--	--	--	--	--
125	<i>Hypochoeris radicata</i>	--	--	--	--	--	--	--	--	--	9
126	<i>Isolepis</i> sp	--	--	--	--	--	--	--	--	--	9
127	<i>Lantana rugosa</i>	9	--	--	--	--	--	--	--	--	--
128	<i>Ranunculus multifidus</i>	9	--	--	--	--	--	--	--	--	--
129	<i>Selago flanaganii</i>	9	--	--	--	--	--	--	--	--	--
130	<i>Brownleea macroceras</i>	--	--	--	--	--	--	--	8	--	--
131	<i>Bulbostylis</i> sp	--	--	--	--	--	--	--	8	--	--
132	<i>Merxmuellera grandiflora</i>	--	--	--	--	--	--	--	8	--	--
133	<i>Potamogeton pusillus</i>	--	--	--	--	--	--	--	8	--	--
134	<i>Potamogeton thunbergii</i>	--	--	--	--	--	--	--	8	--	--
135	<i>Psammotropha obtusa</i>	--	--	--	--	--	--	--	8	--	--
136	<i>Agrostis bergiana</i>	--	--	--	--	--	--	--	--	--	--
137	<i>Agrostis eriantha</i>	--	--	--	--	--	--	--	--	--	--
138	<i>Alchemilla woodii</i>	--	--	--	--	--	--	--	--	--	--
139	<i>Androcymbium striatum</i>	--	--	--	--	--	--	--	--	--	--
140	<i>Aponogeton junceus</i>	--	--	--	--	--	--	--	--	--	--
141	<i>Carex monotropa</i>	--	--	--	--	--	--	--	--	--	--
142	<i>Catalepis gracilis</i>	--	--	--	--	--	--	--	--	--	--
143	<i>Corycium nigrescens</i>	--	--	--	--	--	--	--	--	--	--

144	<i>Crassula lanceolata</i>	--	--	--	--	--	--	--	--	--	--
145	<i>Delosperma</i> sp	--	--	--	--	--	--	--	--	--	--
146	<i>Dierama robustum</i>	--	--	--	--	--	--	--	--	--	--
147	<i>Disa</i> sp	--	--	--	--	--	--	--	--	--	--
148	<i>Disperis wealii</i>	--	--	--	--	--	--	--	--	--	--
149	<i>Eleocharis verrucosa</i>	--	--	--	--	--	--	--	--	--	--
150	<i>Eragrostis caesia</i>	--	--	--	--	--	--	--	--	--	--
151	<i>Eragrostis curvula</i>	--	--	--	--	--	--	--	--	--	--
152	<i>Erica alopecurus</i>	--	--	--	--	--	--	--	--	--	--
153	<i>Erica dominans</i>	--	--	--	--	--	--	--	--	--	--
154	<i>Felicia ericifolia</i>	--	--	--	--	--	--	--	--	--	--
155	<i>Fingerhuthia sesleriiformis</i>	--	--	--	--	--	--	--	--	--	--
156	<i>Galium</i> sp	--	--	--	--	--	--	--	--	--	--
157	<i>Gnidia aberrans</i>	--	--	--	--	--	--	--	--	--	--
158	<i>Gnidia nana</i>	--	--	--	--	--	--	--	--	--	--
159	<i>Harpochloa falx</i>	--	--	--	--	--	--	--	--	--	--
160	<i>Helichrysum auriceps</i>	--	--	--	--	--	--	--	--	--	--
161	<i>Helichrysum basalticum</i>	--	--	--	--	--	--	--	--	--	--
162	<i>Helichrysum ericeteum</i>	--	--	--	--	--	--	--	--	--	--
163	<i>Hesperantha</i> sp	--	--	--	--	--	--	--	--	--	--
164	<i>Isolepis costata</i>	--	--	--	--	--	--	--	--	--	--
165	<i>Jamesbrittenia pristisepala</i>	--	--	--	--	--	--	--	--	--	--
166	<i>Juncus exsertus</i>	--	--	--	--	--	--	--	--	--	--
167	<i>Kniphofia thodei</i>	--	--	--	--	--	--	--	--	--	--
168	<i>Luzula africana</i>	--	--	--	--	--	--	--	--	--	--
169	<i>Mentha longifolia</i>	--	--	--	--	--	--	--	--	--	--
170	<i>Ornithogalum paludosum</i>	--	--	--	--	--	--	--	--	--	--
171	<i>Papaver aculeatum</i>	--	--	--	--	--	--	--	--	--	--
172	<i>Pentaschistis</i> sp	--	--	--	--	--	--	--	--	--	--
173	<i>Senecio asperulus</i>	--	--	--	--	--	--	--	--	--	--

174	<i>Taraxacum officinale</i>	--	--	--	--	--	--	--	--	--	--
175	<i>Wurmbea</i> sp	--	--	--	--	--	--	--	--	--	--

^a Numbers inside the brackets next to the community number are the number of plots in that community. Dashes (--) represent no occurrence.

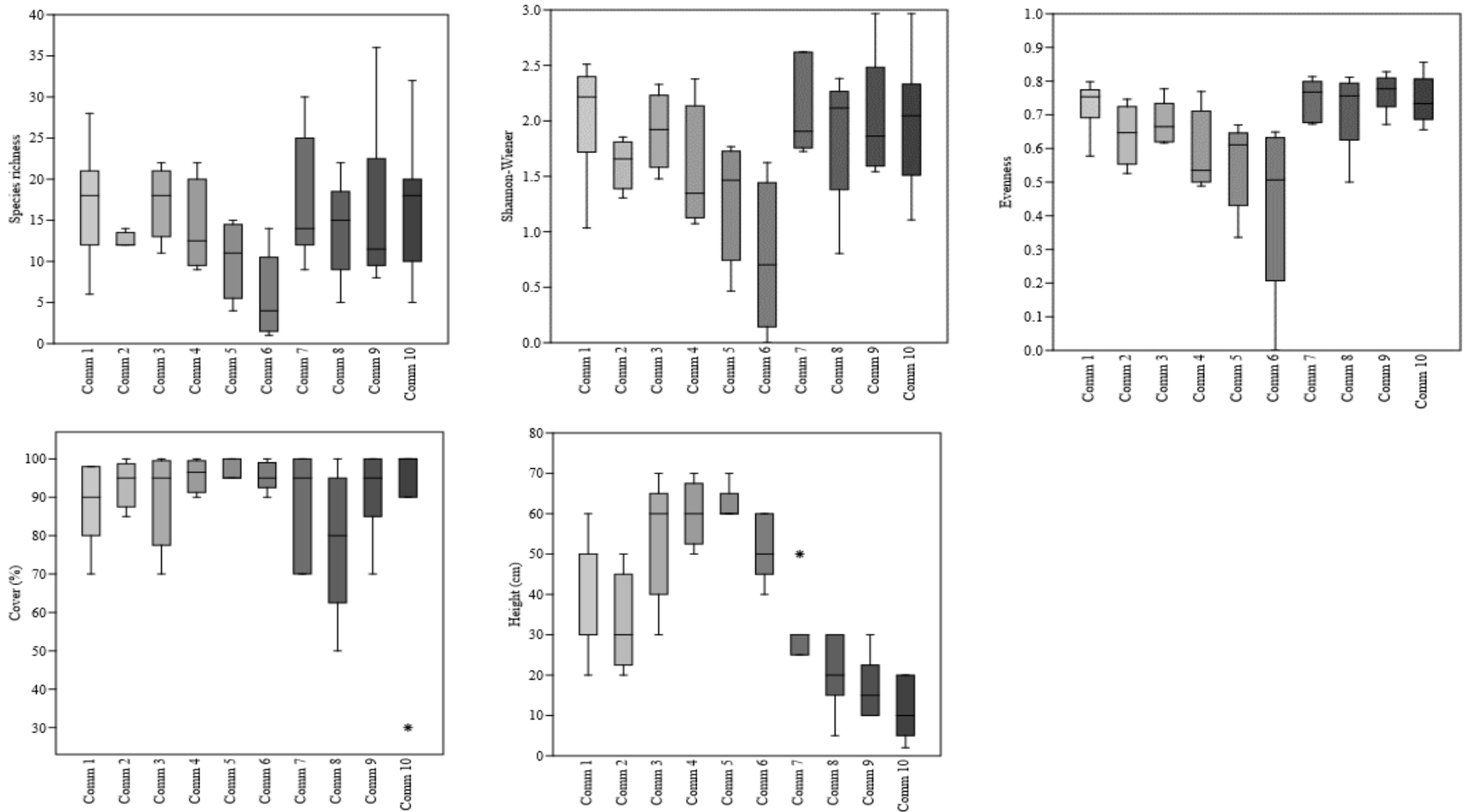


FIGURE 1-A1: Box and whisker plots comparing the ten wetland plant communities in terms of measures of plant diversity and vegetation structure, using the classification in Figure 2. Only vegetation height showed significant differences for Mann-Whitney pairwise comparison between the following: Communities 1 & 8, 1 & 10 and 7 & 10.

TABLE 4-A1: Description and environmental conditions of plant communities in the high-altitude palustrine wetlands of Bokong Nature Reserve, Matšeng Biosphere, Lesotho.

No.	Plant community	No. of plots	Community structure	Species richness ^b	Shannon ^a	Evenness ^b	Environmental conditions and other remarks
Community 1	<i>Berkheya multijuga-Festuca caprina</i> community	11	Dense, short to medium tall (20-60 cm) grassland with forbs	18 (6-28)	2.21 (1.03-2.51)	0.75 (0.58-0.80)	<ul style="list-style-type: none"> • Widely distributed in BNR • Soil depth: shallow to deep; peat or silt loam; seasonally wet; moderate levels of organic carbon; higher magnesium and phosphorus content but lower in sodium • Vegetation: mixture of grasses and forbs; <i>Berkheya multijuga</i> is a rosette-forming forb
Community 2	<i>Poa annua-Helictotrichon turgidulum</i> community	4	Dense, short to medium tall (20-50 cm) grassland with forbs	12 (12-14)	1.66 (1.31-1.85)	0.65 (0.53-0.75)	<ul style="list-style-type: none"> • Occurs in the lower-lying habitats in the northern parts of BNR • Soil depth: moderate to deep soils; peat or silt loam; seasonally wet; moderate levels of organic carbon • Vegetation: mainly grasses
Community 3	<i>Oxalis obliquifolia-Merxmuellera macowanii</i> community	5	Dense, medium tall (30-70 cm) tussock grassland	18 (11-22)	1.92 (1.48-2.33)	0.66 (0.62-0.78)	<ul style="list-style-type: none"> • Occurs in higher-lying habitats in the western parts of BNR • Soil depth: moderate to deep soils; peat or silt loam; seasonally wet; moderate levels of organic carbon, lower sodium content • Vegetation: mixture of grasses and forbs
Community 4	<i>Kniphofia caulescens</i> community	4	Dense, tall (50-70 cm) forb- dominated grassland	12.5 (9-22)	1.35 (1.07-2.38)	0.54 (0.49-0.77)	<ul style="list-style-type: none"> • Occurs in lower-lying habitats in the northern parts of BNR • Soil depth: deep soils; peat or silt loam; seasonally to permanently wet; moderate levels of organic carbon, higher magnesium and phosphorus content and lower in sodium • Vegetation: mainly forbs
Community 5	<i>Scirpus falsus</i> community	5	Dense, tall	11 (4-15)	1.46 (0.47-1.77)	0.61 (0.34-0.67)	<ul style="list-style-type: none"> • Occurs in the lower-lying habitats in the north eastern parts of BNR

			(60-70 cm) sedge dominated grassland				<ul style="list-style-type: none"> • Soil depth: moderately deep soils; peat or silt loam; seasonally to permanently wet; moderate levels of organic carbon, higher magnesium and phosphorus content and lower in sodium • Vegetation: mainly sedges
Community 6	<i>Carex cognata</i> community	5	Dense, medium tall (40-50 cm) sedgeland; low diversity	4 (1-14)	0.70 (0-1.62)	0.51 (0-0.65)	<ul style="list-style-type: none"> • Occurs in the lower-lying habitats in the eastern parts of BNR • Soil depth: moderate to deep soils; peat or silt loam; seasonally to permanently wet; moderate levels of organic carbon, higher sulphur and electrical conductivity • Vegetation: mainly sedges
Community 7	<i>Merxmuellera disticha</i> community	7	Dense, medium tall (25-50 cm) tussock grassland	14 (9-30)	1.91 (1.72-2.62)	0.77 (0.67-0.81)	<ul style="list-style-type: none"> • Occurs in the higher-lying habitats in the southern parts of BNR • Soil depth: moderate to deep soils; peat or silt loam; seasonally to permanently wet; moderate levels of organic carbon; lower magnesium and phosphorus levels • Vegetation: mainly grasses
Community 8	Mixed short high-altitude grassy sedge community	12	Open to dense, short to medium tall (25-30) sedgeland or grassland, dominated by forbs or graminoids	15 (5-22)	2.12 (0.80-2.38)	0.76 (0.50-0.81)	<ul style="list-style-type: none"> • Widely distributed but more concentrated in the higher-lying habitats in the southern parts of BNR • Soil depth: moderate to deep soils; peat or loam; seasonally to permanently wet; moderate levels of organic carbon; lower levels of magnesium and phosphorus • Vegetation: mixture of graminoids and forbs
Community 9	<i>Athrixia fontana-Alepidea pusilla</i> community	6	Dense, short (10-30 cm) grassland dominated by grasses or sedges	11.5 (8-36)	1.86 (1.54-2.97)	0.78 (0.67-0.83)	<ul style="list-style-type: none"> • Occurs in the moderate altitudes habitats in the south eastern parts of BNR • Soil depth: shallow to deep soils; peat or silt loam; seasonally to permanently wet; moderate levels of organic carbon; higher sulphur content

							and electrical conductivity and moderate levels of sodium
Community 10	<i>Ranunculus meyeri</i> - <i>Haplocarpha nervosa</i> community	11	Dense, short (2-20 cm) forb-dominated grassland	18 (5-32)	2.05 (1.11-2.97)	0.73 (0.66-0.86)	<ul style="list-style-type: none"> • Vegetation: mainly forbs • Widely distributed in the wetlands • Soil depth: shallow to deep soils; peat or silt loam; seasonally to permanently wet; moderate levels of organic carbon; higher in sodium and lower levels of magnesium and phosphorus • Vegetation: mainly forbs

^aShannon stands for Shannon-Wiener index

^{ab}Species richness, Shannon–Wiener and evenness are given as median values with their range in parenthesis.

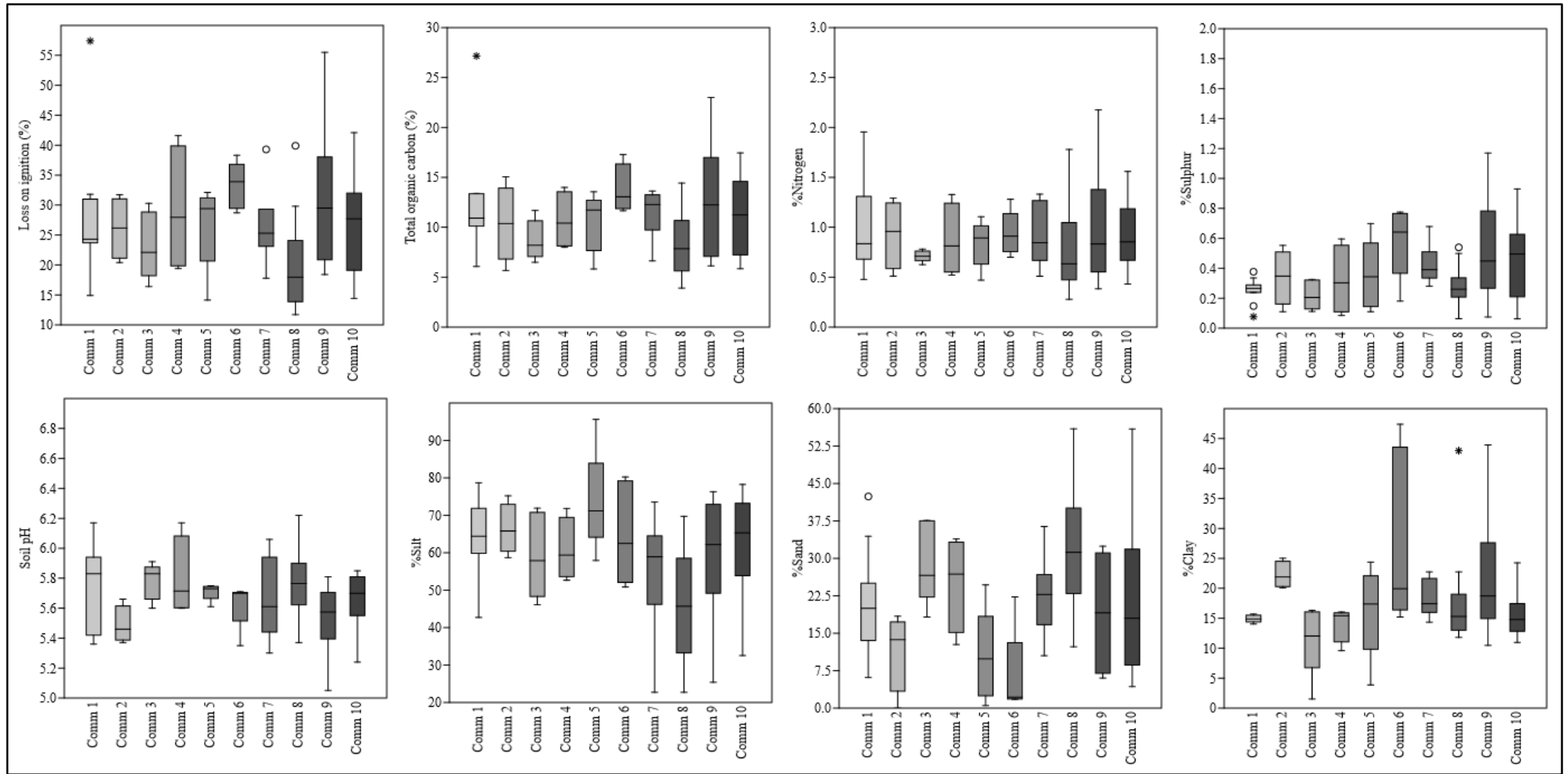
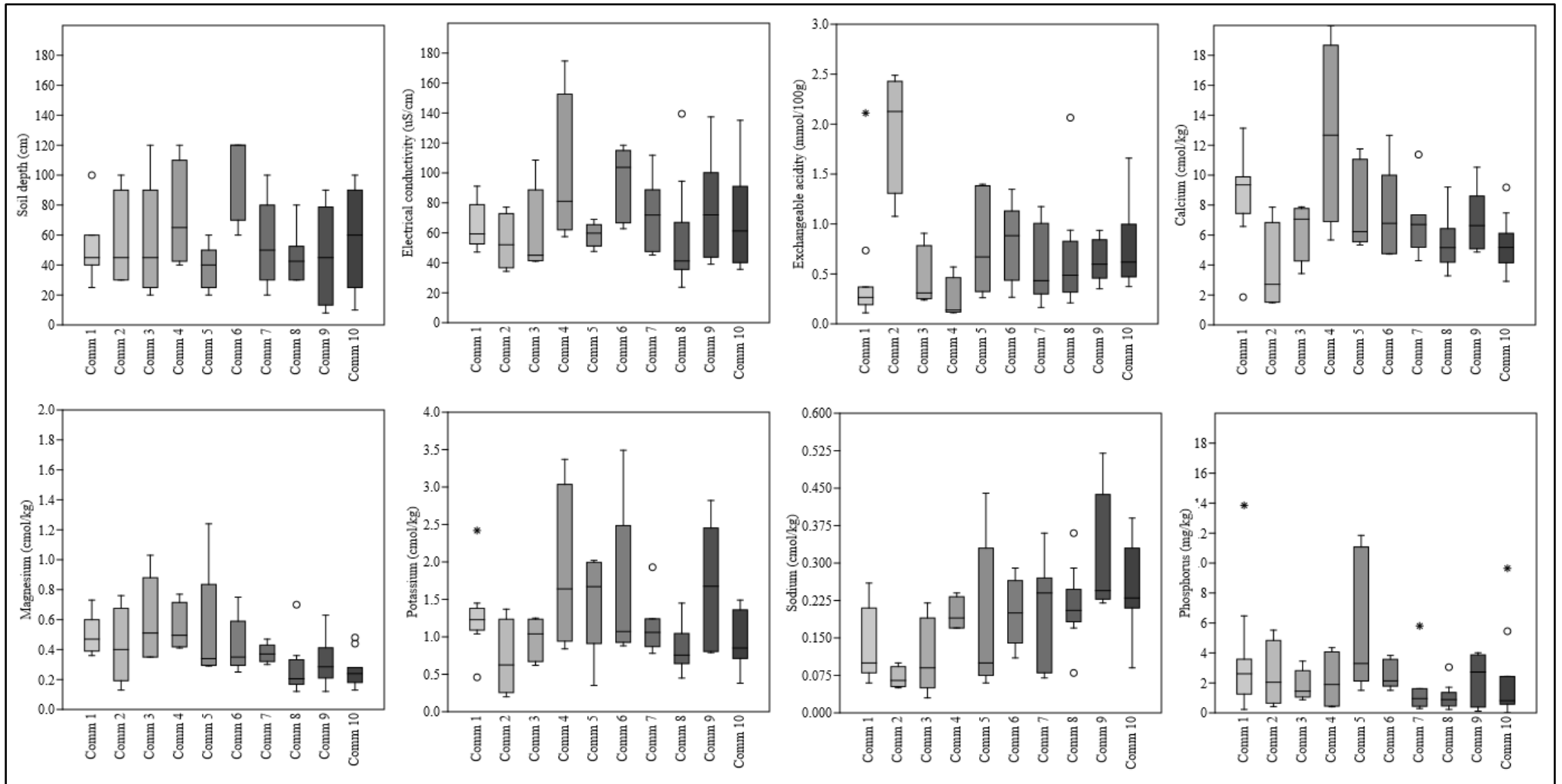


FIGURE 2-A1: Box and whisker plots based environmental variables for the comparison of the ten wetland plant communities obtained from the classification of Bokong Nature Reserve wetland vegetation, using the classification in Figure 2. Comm. stands for community. Only soil magnesium content showed significant differences for Mann-Whitney pairwise comparison between the following: Communities 1 & 8, and 1 & 10.



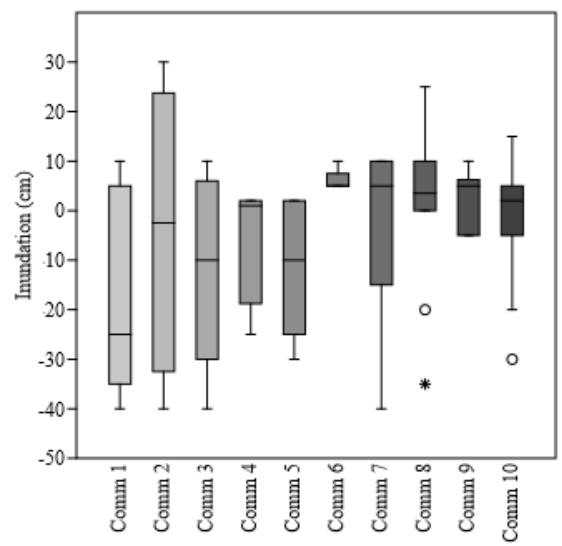
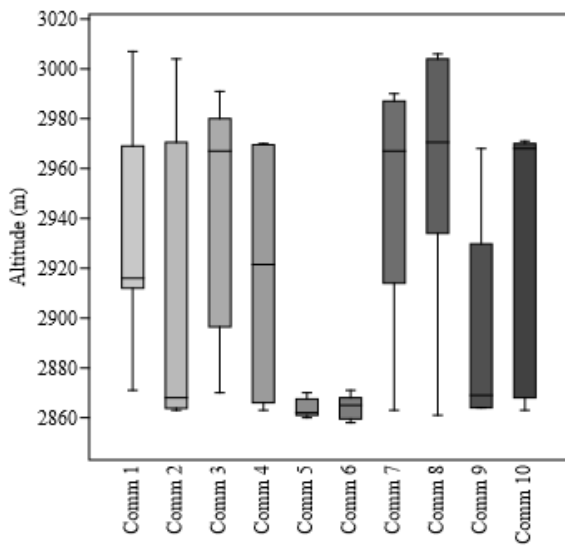
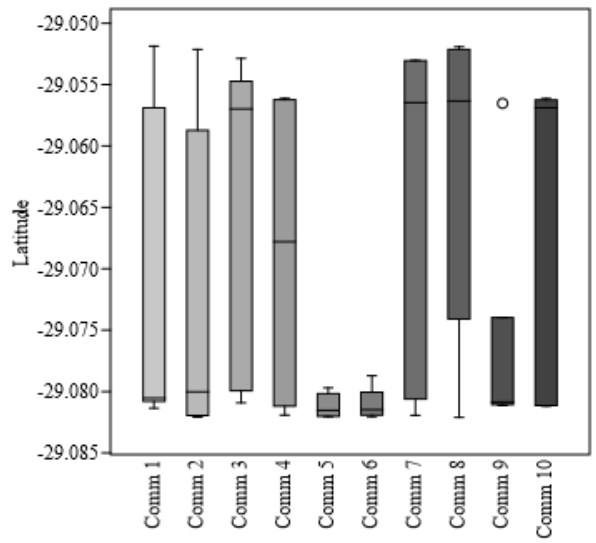
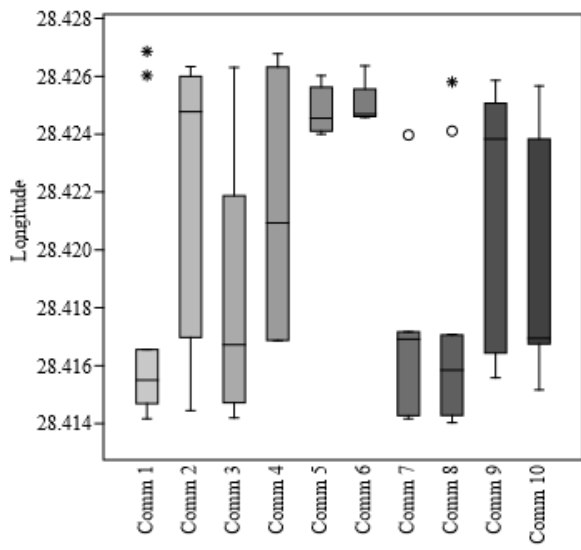


TABLE 5-A1: General environmental factors of the palustrine wetlands in Bokong Nature Reserve in Matšeng Biosphere, Lesotho.

Wetland environmental factor	Mean	Median	Minimum	Maximum	Standard deviation	Coefficient of variation (%)
Altitude (m a.s.l.)	2922.79	2919	2858	3007	53.36	1.83
Inundation (cm)^a	-4.44	2.00	-40.00	30.00	16.69	–
Soil depth (cm)	55.04	47.50	8.00	120.00	29.13	52.93
pH	5.69	5.70	5.05	6.22	0.22	3.87
EC (uS/cm)	67.98	62.40	23.70	174.70	29.55	43.47
Ex. Acid (mmol/100g)	0.68	0.51	0.11	2.49	0.55	80.88
Ca (cmol/kg)	6.91	6.22	1.48	19.99	3.21	46.45
Mg (cmol/kg)	0.39	0.35	0.12	1.24	0.21	53.85
K (cmol/kg)	1.18	1.07	0.20	3.49	0.65	55.08
Na (cmol/kg)	0.20	0.21	0.03	0.52	0.10	50.00
P (mg/kg)	2.42	1.43	0.01	13.85	2.71	111.98
LOI (%)	26.52	26.29	11.67	57.41	8.85	33.37
TOC (%)	10.87	10.79	3.91	27.16	4.04	37.17
% C leco	10.13	9.75	3.15	23.34	3.81	37.61
% N leco	0.89	0.80	0.28	2.18	0.38	42.70
%S leco	0.36	0.32	0.06	1.17	0.22	61.11
(%)Silt	59.92	62.37	22.74	95.63	14.65	24.45
(%)Sand	21.49	20.80	0.00	55.95	13.00	60.49
(%)Clay	17.64	15.71	1.51	47.38	7.67	43.48

^a The coefficient of variation was not calculated because of the negative values.