

TAXON

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Whole-genome triplication and species radiation in the southern African tribe Heliophileae (Brassicaceae)

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Taxon 61: 989–1000

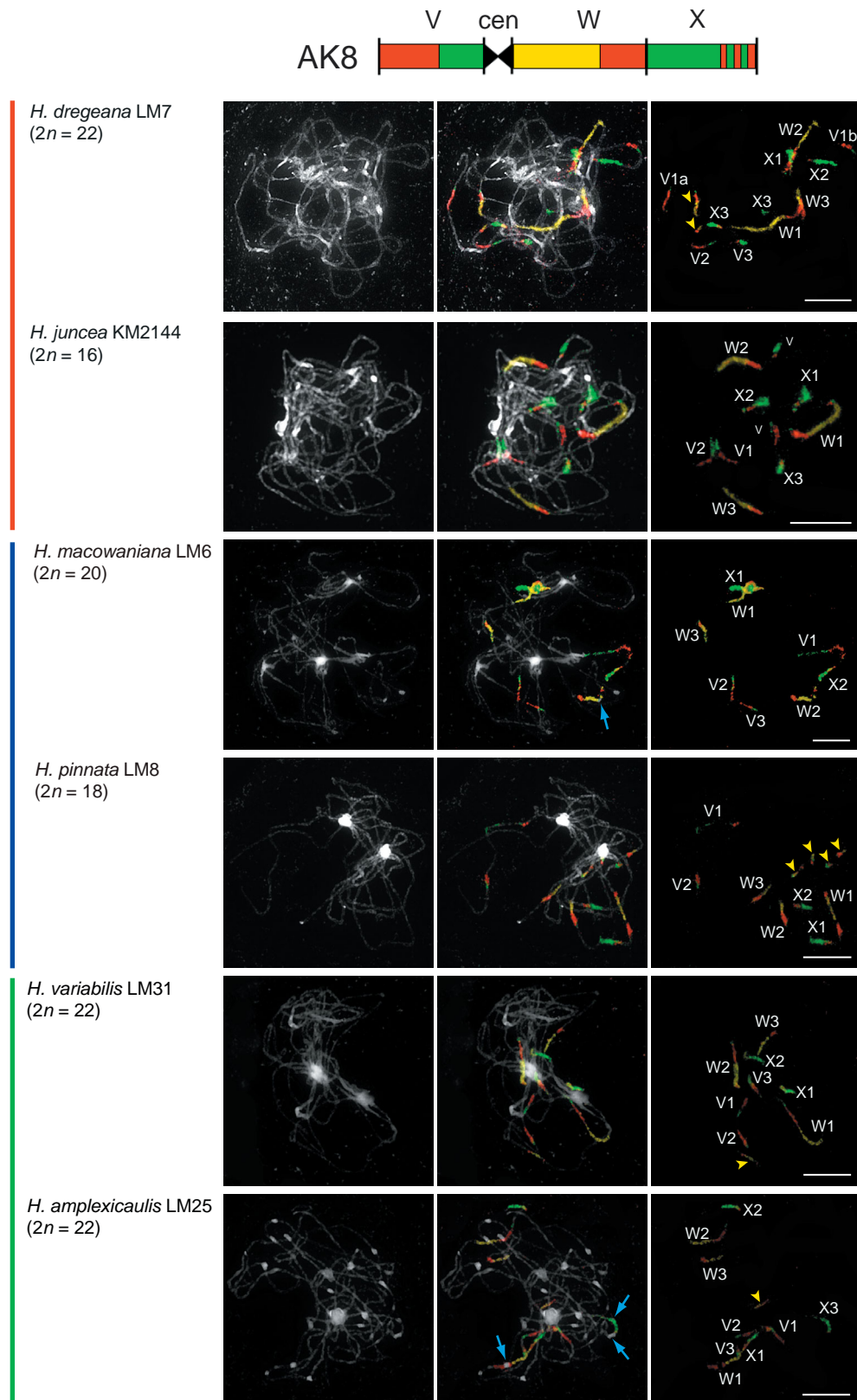


Fig. S1. Comparative chromosome painting of AK8 homeologues in *Heliophila* species with different chromosome numbers ($2n = 16\text{--}22$) and from the three infratribal clades (A–C). *Arabidopsis thaliana* BAC contigs corresponding to AK8-specific genomic blocks V, W and X were differentially labeled and polarized, and used as painting probes on pachytene bivalents. Triplicated GBs were tentatively assigned, for example, as V1, V2, and V3. Small capitals refer to rearranged/split blocks. Blue arrows mark heterochromatic knobs, yellow arrowheads indicate extra copies of block W and X. Chromosomes were counterstained with DAPI. Scale bars = 10 μm .

Table S1. Collection data and GenBank accession numbers of Southern African endemic Brassicaceae species studied. Nomenclature follows Marais (1970), Jordaan (1993), and Al-Shehbaz & Mummenhoff (2005).

Species	Locality / Herbarium / Collector's (KM = Klaus Mummenhoff; LM = Lysak & Mandáková) and number	Accession number	Used for		GenBank accession number	
			phylo- genetic analysis	chromo- some	ITS I	ITS II
<i>H. acuminata</i> (Eckl. & Zeyh.) Steud.	South Africa, Western Cape, Malmesbury, Klein Swartfontein near Moorreesburg, 33°08'S, 18°39'E / PRE / <i>Acocks 24401</i>	KM 1000	x		AJ863603	AJ864807
<i>H. africana</i> (L.) Marais	South Africa, Western Cape, Cape Town, 33°52'S, 18°31'E / NBG / <i>Steiner 1975</i>	KM 1002	x		AJ863602	AJ864808
<i>H. africana</i> (L.) Marais	South Africa, Western Cape, Darling, 3 km from Darling at the road R315 to Yzerfontein, 33°21'33.66"S, 18°20'49.83"E / - / <i>LM 1</i>	LM 1	x	x	HE806194	HE806195
<i>H. africana</i> (L.) Marais	South Africa, Western Cape, Olifants River valley, Citrusdal, gravel road Citrusdal–Algeria (parallel to N7), ca. 2.4 km S of the Patryrsberg, 32°28'20.51"S, 18°59'13.15"E / - / <i>LM 11</i>	LM 11	x	x	HE806196	HE806197
<i>H. africana</i> (L.) Marais	South Africa, Western Cape, Olifants River valley, Citrusdal, at the N7 road / - / <i>LM 35</i>	LM 35	x	x	HE806198	HE806199
<i>H. africana</i> (L.) Marais	South Africa, Western Cape, along road 364 from Butterkloof Pass to Clanwilliam, in vicinity of Brandewyn River bridge, 32°04'12"S, 19°04'34"E, 307 m alt. / - / <i>KM 2161</i>	KM 2161		x	–	–
<i>H. africana</i> (L.) Marais	South Africa, Western Cape, R 364 from Clanwilliam to Lamberts Bay, 2.3 km before Graafwater turnoff, 800 m before the Jakkasvlei turnoff, 32°09'07"S, 18°37'58"E, 93 m alt. / - / <i>KM 2166</i>	KM 2166		x	–	–
<i>H. amplexicaulis</i> L. f.	Cultivated / Botanical Garden Paris, France	KM 2174	x		HE806200	HE806201
<i>H. amplexicaulis</i> L. f.	South Africa, Western Cape, Olifants River valley, Clanwilliam, Rondegat / - / <i>LM 25</i>	LM 25	x	x	HE806202	HE806203
<i>H. amplexicaulis</i> L. f.	South Africa, Northern Cape, Namaqualand, Kamieskroon, gravel road from Kamieskroon to Skilpad, ca. 0.5 km before the gate to Namaqua N.P., 30°9'26.79"S, 17°48'39.02"E / - / <i>LM 33</i>	LM 33	x	x	HE806204	HE806205
<i>H. cf. arenaria</i> Sond.	South Africa, Western Cape, Clanwilliam, between Nardouw Pass and Brakvlei, 33°10'S, 18°55'E / PRE / <i>Marais 1436</i>	KM 1006	x		AJ863600	AJ864811
<i>H. arenaria</i> Sond. var. <i>arenaria</i>	South Africa, Western Cape, ca. 60 km S of Vanrhysdorp, along the N7 highway / - / <i>LM 16</i>	LM 16		x	–	–
<i>H. arenaria</i> Sond. var. <i>arenaria</i>	South Africa, Western Cape, Cederberg Mts., road R364 from Calvinia to Clanwilliam, ca. 45 km before Clanwilliam / - / <i>LM 21</i>	LM 21	x	x	HE806206	HE806207
<i>H. arenaria</i> var. <i>acocksii</i> Marais	South Africa, Western Cape, on the road to Clanwilliam, 1.2 km from Botterkloof Farm, 31°49'00"S, 19°15'46"E, 687 m alt. / - / <i>KM 2156</i>	KM 2156		x	–	–
<i>H. cf. arenosa</i> Schltr.	South Africa, Western Cape, road to Heuningvlei near Wuppertal, 32°14.918'S, 19°10.459'E, 837 m alt. / - / <i>KM 2160</i>	KM 2160	x	x	HE806208	HE806209
<i>H. bulbostyla</i> Barnes	South Africa, Western Cape, Olifants River valley, gravel road Citrusdal–Algeria, ca. 600 m from the bridge across the river (direction Algeria-N7), 32°21'53.3"S, 18°56'55.68"E / - / <i>LM 13</i>	LM 13	x	x	HE806210	HE806211
<i>H. bulbostyla</i> Barnes	South Africa, Western Cape, Olifants River valley, Clanwilliam, gravel road from the bridge crossing Olifants River to Rondegat, 32°21'9.69"S, 18°56'49.02"E / - / <i>LM 24</i>	LM 24	x	x	HE806212	HE806213

Table S1. Continued.

Species	Locality / Herbarium / Collector's (KM = Klaus Mummenhoff; LM = Lysak & Mandáková) and number	Accession number	Used for		GenBank accession number	
			phylo- genetic analysis	chromo- some	ITS I	ITS II
<i>H. carnos</i> (Thunb.) Steud.	South Africa, Western Cape, Ceres, Baviaansberg, 33°08'S, 19°37'E / BOL / <i>Esterhuysen 29796</i>	KM 994	x		AJ863599	AJ864805
<i>H. carnos</i> (Thunb.) Steud.	South Africa, Northern Cape, Namaqualand, Kamies- berg, 30°09'41"S, 17°58'29"E, 1100 m alt. / - / <i>KM</i> <i>1478</i>	KM 1478	x		HE806214	HE806215
<i>H. cederbergensis</i> Marais	South Africa, Western Cape, central Cederberg Mts., Clanwilliam / BOL / <i>Esterhuysen 35055</i>	KM 997	x		AJ863607	AJ864812
<i>H. collina</i> O.E. Schulz	South Africa, Northern Cape, Hantam Plateau, Nieu- woudtville, Nieuwoudtville Reserve, 31°22'06.46"S, 19°08'32.03"E / - / <i>LM 20</i>	LM 20	x	x	HE806216	HE806217
<i>H. collina</i> O.E. Schulz	South Africa, Northern Cape, Hantam Plateau, Nieu- woudtville, Nieuwoudtville Reserve, 31°22'S, 19°07'E / NBG / <i>Perry & Snijman 2199</i>	KM 999	x		AJ863598	AJ864813
<i>H. collina</i> O.E. Schulz	South Africa, Northern Cape, Richtersveld, gravel road to Lekkersing, S of Lekkersing on a hill along roadside, 29°05.470'S, 17°05.085'E, 315 m alt. / - / <i>KM 2101</i>	KM 2101		x	-	-
<i>H. collina</i> O.E. Schulz	South Africa, Northern Cape, Hantam Plateau, Nieu- woudtville Reserve, 31°21'53"S 19°08'32"E, 715 m alt. / - / <i>KM 2154</i>	KM 2154	x	x	HE806218	HE806219
<i>H. cornellsbergia</i> B.J. Piennaar & Nicholas	South Africa, Northern Cape, Richtersveld, Cornells- berg in Stinkfontein Mts., southern slopes to a neck S of top / PRE / <i>Oliver, Tölken & Venter 715</i>	KM 998	x		AJ863576	AJ864803
<i>H. cornuta</i> Sond.	South Africa, Western Cape, Zwartuggens, Groen- fontein, near Stompiesfontein, 33°05'S, 19°19'E / BOL / <i>Bean & Trinder-Smith 2686</i>	KM 985	x		AJ863597	AJ864804
<i>H. cornuta</i> Sond.	South Africa, Western Cape, between Clanwilliam and Klaver, 5 km N of Clanwilliam, 0.5 km before Seekoi River bridge, 32°05.304'S, 18°49.613'E, 91 m alt. / - / <i>KM 2094</i>	KM 2094		x	-	-
<i>H. cornuta</i> Sond.	South Africa, Northern Cape, Namaqualand, Kom- magas at foot of Bulletrap Pass W, in a dry river bed, 29°24'20.2"S, 17°39'35.4"E, 363 m alt. / - / <i>KM 2117</i>	KM 2117		x	-	-
<i>H. cornuta</i> Sond.	South Africa, Northern Cape, Namaqualand, Ka- mieskroon, road to Liliefontein, Rooifontein turnoff, 30°15'43"S, 18°03'14"E, 1145 m alt. / - / <i>KM 2134</i>	KM 2134		x	-	-
<i>H. coronopifolia</i> L.	South Africa, Western Cape, Hermanus, foot of Hoys Koppie, 34°25'S, 19°14'E / MO / <i>Williams 982</i>	KM 984	x		AJ863596	AJ864814
<i>H. coronopifolia</i> L.	Cultivated / Botanical Garden Halle, Germany	OSBU 17187	x		AJ863592	AJ864817
<i>H. coronopifolia</i> L.	Cultivated / Botanical Garden Aarhus, Denmark	OSBU 817	x		AJ863588	AJ864824
<i>H. coronopifolia</i> L.	South Africa, Western Cape, Langebaan, West Coast N.P., Postberg section, 33°06.671'S, 17°59.876'E / - / <i>LM 2</i>	LM 2	x	x	HE806220	HE806221
<i>H. crithmifolia</i> Willd.	South Africa, Western Cape, between Clanwilliam and Wuppertal, road side, 32°13'S, 19°10'E / OSBU / <i>Neuffer 9258</i>	KM 2181 = OSBU 9258	x		AJ863577	AJ864799
<i>H. crithmifolia</i> Willd.	South Africa, Western Cape, Oudtshoorn, next to turnoff to Blossoms, 33°33'S, 22°11'E / BOL / <i>Vlok</i> <i>1048</i>	KM 989	x		AJ863595	AJ864806

Table S1. Continued.

Species	Locality / Herbarium / Collector's (KM = Klaus Mummehoff; LM = Lysak & Mandáková) and number	Accession number	Used for		GenBank accession number	
			phylo- genetic analysis	chromo- some	ITS I	ITS II
<i>H. crithmifolia</i> Willd.	South Africa, Western Cape, Koue Bokkeveld, Op- die-Berg, roadside of the R303, direction R355, the Morester Farm, 32°57.979'S, 19°25.579'E / - / LM 9	LM 9	x	x	HE806222	HE806223
<i>H. crithmifolia</i> Willd.	South Africa, Northern Cape, Williston, Snyderspoort through the Basterberge, 31°20'S, 20°55'E / STE / <i>Thompson 3161</i>	KM 1069	x		AJ863581	AJ864801
<i>H. crithmifolia</i> Willd.	South Africa, Northern Cape, Namaqualand, Kom- magas, at foot of Bulletrap Pass W, 29°24'20.2" S, 17°39'35.4" E, 363 m alt. / - / KM 2116	KM 2116		x	-	-
<i>H. crithmifolia</i> Willd.	South Africa, Northern Cape, Namaqualand, Kom- magas at foot of Bulletrap Pass W, 29°24'20.2" S, 17°39'35.4" E, 363 m alt. / - / KM 2119	KM 2119		x	-	-
<i>H. crithmifolia</i> Willd.	South Africa, Northern Cape, Namaqualand, Ka- mieskroon, road after junction to Lilliefontein, near radio mast, 30°19.758'S, 18°04.965'E, 1354 m alt. / - / KM 2136	KM 2136		x	-	-
<i>H. crithmifolia</i> Willd.	South Africa, Northern Cape, Calvinia, plateau of Hantamsberg, by the radio tower, 31°23'03" S 19°46'53" E, 1598 m alt. / - / KM 2147	KM 2147		x	-	-
<i>H. crithmifolia</i> Willd.	South Africa, 2.3 km after Bulletrap, among rocky hills 29°27'36.9" S 17°44'38.4" E, 800 m alt. / - / KM 2247	KM 2247		x	-	-
<i>H. cf. descurva</i> Schltr.	South Africa, Western Cape, Olifants River val- ley, gravel road Citrusdal–Algeria, ca. 600 m from the bridge across the river (direction Algeria-N7), 32°21'53.3" S, 18°56'55.68" E / - / LM 14	LM 14		x	-	-
<i>H. cf. descurva</i> Schltr.	South Africa, Western Cape, Cederberg Mts., near Wuppertal, 32°16' S, 19°13' E / OSBU / <i>Neuffer 9253</i>	OSBU 9253	x		AJ863575	AJ864815
<i>H. deserticola</i> Schltr.	Namibia, Oranjemund, 5 km N of Orange (Gariep) River near Sendelingsdrif, 28°09' S, 16°53' E / MO / <i>Giess & Müller 14375</i>	KM 977	x		AJ863594	AJ864798
<i>H. deserticola</i> Schltr.	South Africa, Northern Cape, 2 km E of Pofadder on road N14-1, 2 km E of Pofadder, 29°07.941' S 19°20.919' E, 102 m alt. / - / KM 2106	KM 2106		x	-	-
<i>H. deserticola</i> Schltr.	South Africa, Northern Cape, 12.6 km from junc- tion N14 to Onseepkans, road side, 29°01'50.2" S 19°26'30.2" E, 801 m alt. / - / KM 2108	KM 2108		x	-	-
<i>H. cf. digitata</i> L. f.	South Africa, Western Cape, Cederberg Mts., Clanwil- liam, Driehoek / - / KM 1483	KM 1483	x		HE806224	HE806225
<i>H. dregeana</i> Sond.	South Africa, Western Cape, Cederberg Mts., Kunje Farm, along the gravel road from the R303 to the Kunje cottages, 32°40'18.44" S, 19°12'59.58" E / - / LM 7	LM 7	x	x	HE806230	HE806231
<i>H. dregeana</i> Sond.	South Africa, Western Cape, Koue Bokkeveld, Elands Kloof at Twee Rivieren / MO / <i>Goldblatt 2578</i>	KM 982	x		AJ863606	AJ864818
<i>H. elata</i> Sond.	South Africa, Western Cape, along road R364 from Butterkloof Pass to Clanwilliam, 200 m W of Eliza- bethfontein junction, 32°04'41" S, 19°03'54" E, 360 m alt. / - / KM 2162	KM 2162	x	x	HE806226	HE806227

Table S1. Continued.

Species	Locality / Herbarium / Collector's (KM = Klaus Mummenhoff; LM = Lysak & Mandáková) and number	Accession number	Used for		GenBank accession number	
			phylo- genetic analysis	chromo- some	ITS I	ITS II
<i>H. cf. elata</i> Sond.	South Africa, Western Cape, Clanwilliam, Nardouw Pass, 31°57'S, 18°02'E, 600 m alt. / – / KM 1487	KM 1487	x		HE806228	HE806229
<i>H. elongata</i> (Thunb.) DC.	South Africa, Western Cape, forests near Knysna, 34°01'S, 23°03'E / MO / <i>Lavranos 6203</i>	KM 1097	x		AJ628255	AJ628256
<i>H. elongata</i> (Thunb.) DC.	South Africa, Eastern Cape, Baviaanskloof, 998 m, 33°36'14.2"S, 24°30'05.3"E / – / <i>KM 1484</i>	KM 1484	x		HE806232	HE806233
<i>H. elongata</i> (Thunb.) DC.	South Africa, Eastern Cape, Baviaanskloof, 998 m, 33°36'14.2"S, 24°30'05.3"E / – / <i>KM 1488</i>	KM 1488	x		HE806234	HE806235
<i>H. ephemera</i> P.A. Bean	South Africa, Western Cape, Oudtshoorn, Swartberg Mts., northern slopes, 4 km E of Blouberg on Botha's track / MO / <i>Viviers, Vlok & Bean 1551</i>	KM 1090	x		AJ628257	AJ628258
<i>H. esterhuyseniae</i> Marais	South Africa, Western Cape, Franschhoek Mountains, Roesbos Peak, 33°54'S / 19°08'E / BOL / <i>Esterhuysen 29422</i>	KM 1104	x		AJ628259	AJ628260
<i>H. eximia</i> Marais	South Africa, Northern Cape, Richtersveld, Kodaspiek, main ridge SE of Beacon and up to summit, 28°32'S, 17°05'E / PRE / <i>Oliver, Tölken & Venter 390</i>	KM 1092	x		AJ863591	AJ864819
<i>H. gariepina</i> Schltr.	South Africa, Northern Cape, Namaqualand, at foot of Bulletrap Pass W, in a dry river bed, 29°24'20.2"S, 17°39'35.4"E, 363 m alt. / – / <i>KM 2115</i>	KM 2115		x	–	–
<i>H. gariepina</i> Schltr.	South Africa, Northern Cape, Namaqualand, near Bulletrap Pass, 29°27'56.5"S, 17°42'30.6"E, 894 m alt. / – / <i>KM 2121</i>	KM 2121		x	–	–
<i>H. gariepina</i> Schltr.	South Africa, Northern Cape, Richtersveld, Kodaspiek, main ridge SE of Beacon and up to summit, 28°32'S, 17°05'E / PRE / <i>Oliver, Tölken & Venter 476</i>	KM 1094	x		AJ863590	AJ864820
<i>H. glauca</i> Burch. ex. DC.	South Africa, Western Cape, Ladismith, Anysberg, N slopes, 33°30'S, 20°46'E / MO / <i>Esterhuysen 32859</i>	KM 1091	x		AJ863610	AJ864821
<i>H. hurkana</i> Al-Shehbaz & Mummenhoff	South Africa, Western Cape, Ceres, Zwartuggens, Groenfontein, near Stompiesfontein, 32°59'S, 19°01'E / BOL / <i>Bean & Trinder-Smith 2687</i>	KM 1014	x		AJ862709	AJ862710
<i>H. juncea</i> (P.J. Bergius) Druce	South Africa, Western Cape, Cederberg Mts., Kunje Farm, along the gravel road from the R303 to the Kunje cottages, 32°40'16.44"S, 19°12'59.56"E / – / <i>LM 5</i>	LM 5	x	x	HE806236	HE806237
<i>H. juncea</i> (P.J. Bergius) Druce	South Africa, Western Cape, Cederberg Mts, the road from Olifants River to Algeria, roadside ca. 1 km from Algeria, 32°22'14.14"S, 19°02'56.96"E / – / <i>LM 23</i>	LM 23		x	–	–
<i>H. juncea</i> (P.J. Bergius) Druce	South Africa, Western Cape, Clanwilliam, on Op-die Berg road / – / <i>KM 1009</i>	KM 1009	x		HE806238	HE806239
<i>H. juncea</i> (P.J. Bergius) Druce	South Africa, Northern Cape, road from Springbok to Kleinsee, Spektakel Pass, 2 km E of Naries Retreat, 29°42.271'S, 17°40.286'E, 703 m alt. / – / <i>KM 2129</i>	KM 2129		x	–	–
<i>H. juncea</i> (P.J. Bergius) Druce	South Africa, Western Cape, top of the Gifberg, 31°46.403'S, 18°45.676'E, 603 m alt. / – / <i>KM 2144</i>	KM 2144	x	x	HE806242	HE806243

Table S1. Continued.

Species	Locality / Herbarium / Collector's (KM = Klaus Mummenhoff; LM = Lysak & Mandáková) and number	Accession number	Used for		GenBank accession number	
			phylo- genetic analysis	chromo- some	ITS I	ITS II
<i>H. juncea</i> (P.J. Bergius) Druce	South Africa, Western Cape, road R303 from Citrusdal to Ceres, E of Middelberg Pass, turnoff to Berg-en-Dal, 300 m along the road to Berg-en-Dal, 32°40'22.1" S, 19°12'56.8" E, 724 m alt. / - / KM 2170	KM 2170	x		HE806240	HE806241
<i>H. lactea</i> Schltr.	South Africa, Northern Cape, Hantam Plateau, Calvinia, Akkerendam Nature Reserve, 1731°26'14.56" S, 19°46'44.66" E / - / LM 17	LM 17	x	x	HE806244	HE806245
<i>H. lactea</i> Schltr.	South Africa, Namaqualand, road between Springbok and Kommagas, foot on rocky hill, 29°24'16.4" S, 17°40'08.9" E, 651 m alt. / - / KM 2120	KM 2120		x	-	-
<i>H. latisiliqua</i> E. Mey. ex Sond.	South Africa, Northern Cape, Namaqualand, Springbok, at the road R355 ca. 7.5 km from the Goegap Nature Reserve, 29°43'15.74" S, 17°59'44.4" E / - / LM 34	LM 34		x	-	-
<i>H. latisiliqua</i> E. Mey. ex Sond.	South Africa, Northern Cape, road from Springbok to Kleinzee, 29°42.095' S, 17°40.290' E, 732 m alt. / - / KM 2127	KM 2127	x	x	HE806246	HE806247
<i>H. linearis</i> (Thunb.) DC. agg.	South Africa, Western Cape, Overberg, Malgas, De Hoop Nature Reserve, Circular Drive / - / LM 3A	LM 3A	x	x	HE806248	HE806249
<i>H. linearis</i> (Thunb.) DC. agg.	South Africa, Western Cape, Overberg, Malgas, De Hoop Nature Reserve, Circular Drive / - / LM 3B	LM 3B		x	-	-
<i>H. linearis</i> (Thunb.) DC. agg.	South Africa, Western Cape, Mossel Bay, between Outeniquastrand and Tergniet, 34°03' S, 22°12' E / BOL / Vlok 1949	KM 1083	x		AJ863589	AJ864822
<i>H. linoides</i> Schltr.	South Africa, Western Cape, R 364 from Clanwilliam to Lamberts Bay, 40 km after Clanwilliam along road side, 32°09'31" S, 18°41'02" E / - / KM 2163	KM 2163	x	x	HE806250	HE806251
<i>H. macowaniana</i> Schltr.	South Africa, Western Cape, Cederberg Mts., Kunje Farm, along the gravel road from the R303 to the Kunje cottages, 32°40'18.44" S, 19°12'59.58" E / - / LM 6	LM 6	x	x	HE806254	HE806255
<i>H. macowaniana</i> Schltr.	South Africa, Western Cape, Olifants River Valley, gravel road Citrusdal-Algeria, ca. 8 km S from the bridge across the Olifants River, 32°25'54.23" S 18°57'38.05" E / - / LM 12	LM 12	x	x	HE806256	HE806257
<i>H. macowaniana</i> Schltr.	South Africa, Western Cape, road from Clanwilliam and Cape Town, 20.5 km from Clanwilliam, 32°21' S, 18°56' E / PRE / Marais 1447	KM 1086	x		AJ863587	AJ864825
<i>H. macowaniana</i> Schltr.	South Africa, Western Cape, road from Vanrhynsdorp to Gifberg, 31°44.892' S, 18°47.391' E, 303 m alt. / - / KM 2140	KM 2140		x	-	-
<i>H. macowaniana</i> Schltr.	South Africa, Western Cape, road 303 from Citrusdal to Ceres, E of Middelberg Pass, turnoff to Berg-en-Dal, 300 m along the road to Berg-en-Dal, 32°40'22.1" S, 19°12'56.8" E, 724 m alt. / - / KM 2169	KM 2169	x	x	HE806252	HE806253
<i>H. macra</i> Schltr.	South Africa, Western Cape, Hermanus, Fernkloof Nature Reserve, above Northcliff, 34°25' S, 19°14' E / MO / Robertson 134	KM 1088	x		AJ863609	AJ864826
<i>H. macrosperma</i> Burch. ex DC.	South Africa, Eastern Cape, Fish River Pass, 33°17' S, 26°47' E / MO / Bayliss 2257	KM 1087	x		AJ863608	AJ864827

Table S1. Continued.

Species	Locality / Herbarium / Collector's (KM = Klaus Mummenhoff; LM = Lysak & Mandáková) and number	Accession number	Used for		GenBank accession number	
			phylo- genetic analysis	chromo- some	ITS I	ITS II
<i>H. maraisiana</i> Al-Shehbaz & Mummenhoff	South Africa, Western Cape, Piketberg Mts., 32°53'S, 18°43'E / NBG / <i>Barker 10341</i>	KM 1015	x		AJ862711	AJ862712
<i>H. minima</i> (Stephens) Marais	South Africa, Northern Cape, Richmond, 31 km NW of Merriman Station, 30°59'S, 23°33'E / PRE / <i>Acocks</i> <i>24430</i>	KM 1057	x		AJ863586	AJ864828
<i>H. monosperma</i> Al-Shehbaz & Mummenhoff	South Africa, Western Cape, Clanwilliam, Wolfberg, northern Cederberg Mts., 32°28'S, 19°08'E / BOL / <i>Esterhuysen 29984</i>	KM 1010	x		AJ862715	AJ862716
<i>H. namaquana</i> Bolus	South Africa, Western Cape, Clanwilliam, Pienaars- vlakte between Kromrivier and Matjiesrivier / BOL / <i>Bean 1345</i>	KM 1061	x		AJ863585	AJ864802
<i>H. nigellifolia</i> Schltr.	South Africa, Northern Cape, Namaqualand, Kamies- berg, 30°09'41"S, 17°58'29"E, 1100 m / - / <i>KM 1499</i>	KM 1499	x		HE806258	HE806259
<i>H. nubigena</i> Schltr.	South Africa, Western Cape, Worcester, Keeromsberg / BOL / <i>Esterhuysen 33671</i>	KM 1060	x		AJ863613	AJ864829
<i>H. pectinata</i> Burch. ex DC.	South Africa, Western Cape, Ceres-Clanwilliam road via Groot, turnoff to farm Kleinveld, S of Blinkberg Pass / PRE / <i>Marais 1416</i>	KM 1062	x		AJ863584	AJ864830
<i>H. pinnata</i> L. f.	South Africa, Western Cape, Koue Bokkeveld, Op- die-Berg, edge of the settlements at the road R303 from Ceres to Citrusdal, 33°00'53.99"S, 19°18'27.26"E / - / <i>LM 4</i>	LM 4	x	x	HE806262	HE806263
<i>H. pinnata</i> L. f.	South Africa, Western Cape, Cederberg Mountains, Kunje Farm, ca. 8 km N from Kunje, along the road R303, 32°37'59.5"S, 19°10'57.27"E / - / <i>LM 8</i>	LM 8	x	x	HE806264	HE806265
<i>H. pinnata</i> L. f.	South Africa, Western Cape, Koue Bokkeveld, Op- die-Berg, roadside of the R303, direction R355, the Morester Farm, 32°57.979'S, 19°25.579'E / - / <i>LM 10</i>	LM 10		x	-	-
<i>H. pinnata</i> L. f.	South Africa, Western Cape, top of the Gifberg, in a small valley, 31°46.403'S, 18°45.676'E, 603 m alt. / - / <i>KM 2143</i>	KM 2143	x	x	HE806260	HE806261
<i>H. pinnata</i> L. f.	South Africa, Northern Cape, Hantam Plateau, Awontuur farm near Nieuwoudtville, road to Camel's Koppie, 31°16'22"S, 19°02'51"E, 768 m alt. / - / <i>KM</i> <i>2150</i>	KM 2150		x	-	-
<i>H. polygaloides</i> Schltr.	South Africa, Western Cape, Ceres Dist. (probably Koue Bokkeveld) / BOL / <i>Leighton 2288</i>	KM 1156	x		AJ862713	AJ862714
<i>H. pubescens</i> Burch. ex DC.	South Africa, Northern Cape, Namaqualand, Kamieskroon, road after junction to Lileifontein, near radio-antenna, 30°19.758'S, 18°04.965'E, 1354 m alt. / - / <i>KM 2137</i>	KM 2137		x	-	-
<i>H. pubescens</i> Burch. ex DC.	South Africa, Northern Cape, Calvinia, Kleinfontein, Agterkop Pk., Middelpoos, 32°01'S, 20°04'E / PRE / <i>Hanekom 2138</i>	KM 1053	x		AJ863583	AJ864831
<i>H. pusilla</i> L. f.	South Africa, Western Cape, Hermanus, Die Duine, 34°25'S, 19°14'E / PRE / <i>Williams 126</i>	KM 1049	x		AJ863582	AJ864832
<i>H. pusilla</i> L. f.	South Africa, Western Cape, Tulbagh, Romansriver, 33°28'56"S, 19°12'3"E, 340 m alt. / - / <i>KM 1497</i>	KM 1497	x		HE806266	HE806267

Table S1. Continued.

Species	Locality / Herbarium / Collector's (KM = Klaus Mummenhoff; LM = Lysak & Mandáková) and number	Accession number	Used for		GenBank accession number	
			phylo- genetic analysis	chromo- some	ITS I	ITS II
<i>H. refracta</i> Sond.	South Africa, Northern Cape, roadside of the R382 north of Port Nolloth, Muis Flakte, 29°08.906'S, 16°52.043'E, 52 m alt. / – / KM 2105	KM 2105	x		HE806268	HE806269
<i>H. rigidiuscula</i> Sond.	South Africa, Eastern Cape, Pondoland, Mkambati, road to Lupatana, 31°19'S, 29°57'E / MO / Hutchings 727	KM 1050	x		AJ863572	AJ864797
<i>H. schulzii</i> Marais	South Africa, Northern Cape, Namaqualand, Kamieskroon, road after junction to Liliefontein, near radio tower, 30°19.758'S, 18°04.965'E, 1354 m alt. / – / KM 2138	KM 2138		x	–	–
<i>H. scoparia</i> Burch. ex DC.	South Africa, Western Cape, Worcester, Hex Rivier Mts., Audensberg, 33°28'S, 19°34'E / BOL / Esterhuysen 28193	KM 1065	x		AJ863605	AJ864833
<i>H. scoparia</i> Burch. ex DC.	South Africa, Western Cape, Witzenberg, Agterwitzenberg, 33°14'05" S, 19°18'11" E, 1100 m alt. / – / KM 1480	KM 1480	x		HE806270	HE806271
<i>H. seselifolia</i> Burch. ex DC.	South Africa, Northern Cape, Hantam, Calvinia, the first gravel road off the R27 direction Brandvlei, 13.5 km N from N27, along the road, 31°22'45.13" S, 19°58'25.35" E / – / LM 18	LM 18	x	x	HE806272	HE806273
<i>H. seselifolia</i> Burch. ex DC.	South Africa, Northern Cape, Namaqualand, Kamieskroon, road to Liliefontein, 30°11.237'S, 17°59.664'E, 1088 m alt. / – / KM 2130	KM 2130		x	–	–
<i>H. seselifolia</i> Burch. ex DC.	South Africa, Northern Cape, Namaqualand, Kamieskroon, road to Liliefontein, 30°11.237'S, 17°59.664'E, 1088 m alt. / – / KM 2131	KM 2131		x	–	–
<i>H. seselifolia</i> Burch. ex DC.	South Africa, Kamieskroon, road to Liliefontein, Roofontein turnoff, 30°12.018'S 17°59.662'E, 1024 m alt. / – / KM 2133	KM 2133		x	–	–
<i>H. seselifolia</i> Burch. ex DC.	South Africa, Northern Cape, Namaqualand, Kamieskroon, road after junction to Liliefontein, near radio tower, 30°19.758'S, 18°04.965'E, 1354 m alt. / – / KM 2135	KM 2135		x	–	–
<i>H. seselifolia</i> Burch. ex DC.	South Africa, Northern Cape, Calvinia, foot of Hantamsberg, Van Rhynshoek Farm, between the farmhouse and public road to Calvinia, 31°19.390'S, 19°54.737'E, 1109 m alt. / – / KM 2148	KM 2148		x	–	–
<i>H. suavissima</i> Burch. ex DC.	South Africa, Free State, Bloemfontein, Glen Landbouwkollege / PRE / P.C. & L. Zietsman 363	KM 1073	x		AJ863574	AJ864834
<i>H. suborbicularis</i> Al-Shehbaz & Mummenhoff	South Africa, Northern Cape, Roggeveld, Sutherland, Voelfontein, valley S of farmhouse on road to mountain, 32°23'S, 20°39'E / MO / Goldblatt 6319	KM 1012	x		AJ862717	AJ862718
<i>H. suborbicularis</i> Al-Shehbaz & Mummenhoff	South Africa, Northern Cape, Calvinia, plateau of Hantamsberg, by the radio tower, 31°23'03" S, 19°46'53" E, 1598 m alt. / – / KM 2146	KM 2146	x	x	HE806274	HE806275
<i>H. subulata</i> Burch. ex DC.	South Africa, Western Cape, Stillbaai, ridge below reservoir, 34°22'S, 21°26'E / STE / Bohnen 5223	KM 1078	x		AJ863580	AJ864835
<i>H. subulata</i> Burch. ex DC.	South Africa, Western Cape, Overberg, Malgas, De Hoop Nature Reserve / – / KM 1505	KM 1505	x		HE806276	HE806277

Table S1. Continued.

Species	Locality / Herbarium / Collector's (KM = Klaus Mummenhoff; LM = Lysak & Mandáková) and number	Accession number	Used for		GenBank accession number	
			phylo- genetic analysis	chromo- some	ITS I	ITS II
<i>H. tricuspidata</i> Schltr.	South Africa, Western Cape, Rivieronderend Mts., Jonas Kop, NW of Genadendal, 34°01'S, 19°36'E / BOL / Esterhuysen 32705	KM 1071	x		AJ863612	AJ864836
<i>H. trifurca</i> Burch. ex DC.	South Africa, Northern Cape, Bushmanland, road R358, 3.8 km NE of Pofadder, 29°05.407'S 19°24.714'E, 963 m alt. / - / KM 2107	KM 2107		x	-	-
<i>H. trifurca</i> Burch. ex DC.	South Africa, Northern Cape, Namaqualand, road from Garies via eastern mountains to Springbok, 30°07'S, 17°59'E / OSBU / Neuffer 9280	OSBU 9280	x		AJ863604	AJ864800
<i>H. tulbaghensis</i> Schinz	South Africa, Western Cape, path from Franschoek Pass towards Paardekoop, near head of valley, 33°54'S, 19°09'E / BOL / Esterhuysen 35692	KM 1047	x		AJ863579	AJ864837
<i>H. variabilis</i> Burch. ex DC.	South Africa, Western Cape, Olifants River val- ley, gravel road Citrusdal–Algeria, ca. 600 m from the bridge across the river (direction Algeria-N7), 32°21'53.3"S, 18°56'55.68"E / - / LM 15	LM 15	x	x	-	-
<i>H. variabilis</i> Burch. ex DC.	South Africa, Western Cape, Cederberg Mts., road R364 from Clanwilliam, ca. 40 km before Clanwilliam / - / LM 22	LM 22		x	-	-
<i>H. variabilis</i> Burch. ex DC.	South Africa, Northern Cape, Namaqualand, Spring- bok, Goegap Nature Reserve, NE of the headquarters, 29°39'14.2"S, 18°00'52.05"E / - / LM 30	LM 30		x	-	-
<i>H. variabilis</i> Burch. ex DC.	South Africa, Northern Cape, Namaqualand, Spring- bok, roadside ca. 2 km from Okiep, direction Concor- dia, 29°34'29.14"S, 17°54'01.53"E / - / LM 31	LM 31	x	x	HE806278	HE806279
<i>H. variabilis</i> Burch. ex DC.	South Africa, Northern Cape, Namaqualand, Kamieskroon, gravel road from Kamieskroon to Skilpad, ca. 2 km before the gate to Namaqua N.P., 30°08'59.07"S, 17°49'15.14"E / - / LM 32	LM 32		x	-	-
<i>H. variabilis</i> Burch. ex DC.	South Africa, Northern Cape, Richtersveld, top of Hellskloof, road going to Springbokvlakte / STE / Nicholas 2511	KM 1046	x		AJ863578	AJ864838
<i>H. variabilis</i> Burch. ex DC.	South Africa, Northern Cape, Richtersveld, 12.6 km from turnoff from R382, gravel road to Lekkersing, S of Lekkersing, 29°12.724'S, 17°07.570'E, 207 m alt. / - / KM 2100	KM 2100		x	-	-
<i>H. variabilis</i> Burch. ex DC.	South Africa, Northern Cape, Namaqualand, 2.3 km from Bulletrap, among rocky hills, 29°27'36.9"S, 27°44'38.4"E, 818 m alt. / - / KM 2112	KM 2112		x	-	-
<i>H. variabilis</i> Burch. ex DC.	South Africa, Northern Cape, Namaqualand, at foot of Bulletrap Pass W, 29°24'20.2"S, 17°39'35.4"E, 363 m alt. / - / KM 2113	KM 2113		x	-	-
<i>H. variabilis</i> Burch. ex DC.	South Africa, Northern Cape, Kamieskroon, road from Liliefontein to Kamieskroon, 30°11.020'S, 18°00.149'E, 1078 m alt. / - / KM 2139	KM 2139		x	-	-
<i>Aethionema grandiflorum</i> Boiss. & Hohen.			x			DQ249867
<i>Alliaria petiolata</i> (M. Bieb.) Cavara & Grande			x		AJ862703	AJ862704

Table S1. Continued.

Species	Locality / Herbarium / Collector's (KM = Klaus Mummenhoff; LM = Lysak & Mandáková) and number	Accession number	Used for		GenBank accession number	
			phylo- genetic analysis	chromo- some	ITS I	ITS II
<i>Cardamine matthioli</i> Moretti			x		AF265673	AF265195
<i>Chamira circaeoides</i> (L. f.) Zahlbr.	South Africa, Western Cape, Yzerfontein, Bokbaai, 33°34'S, 18°21'E / BOL / Bean & Viviers 1901	KM 1164	x		AJ862719	AJ862720
<i>Cleome spinosa</i> Jacq.			x		GQ470549	
<i>Rorippa amphibia</i> (L.) Besser			x		AF078025	AF078026

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