COLLIN, C. L., AND J. A. SHYKOFF. 2003. Outcrossing rates in the gynomonoecious-gynodioecious species *Dianthus sylvestris* (Caryophyllaceae). *American Journal of Botany* 90(4): 578-585.

Appendix. Outcrossing rates of 20 gyno(monoecious)dioecious species found in 19 studies. Outcrossing values were always estimated for the hermaphroditic (Herm.) individuals and to a less extent for the female ones (half of the studies). In only one of three studies describing gynomonoecious-gynodioecious species were outcrossing rates calculated for the mixed individuals that bear both pistillate and perfect flowers (also referred to as gynomonoecious or intermediate individuals). Mating systems are either gynodioecious (GD), gynomonoecious-gynodioecious (GM-GD) or subdioecious (SD); exclusively hermaphrodite populations are noted as H. The number of families (N_f) and the total number of progenies (N_p) analyzed for outcrossing estimations are given.

		Mating		OUTCROSSING RATES											
Species	(Family)	System	✦	**Herm.**	±	N_f	N_p	**Mixed**	±	N_f	N_p	**Females**	±	N_f	N_p	Study
Bidens cervicata	(Asteraceae)[§]	GD	°	0.608	0.078	28	344					0.833	0.121	14	116	Sun and Ganders, 1986, 1988
Bidens forbesii	(Asteraceae)[§]	GD	°	0.506	0.148	28	262					0.860	0.169	19	201	Sun and Ganders, 1986, 1988
Bidens menziesii	(Asteraceae)[§]	GD	° a)	0.450	0.098	20	306					0.755	0.155	20	176	Sun and Ganders, 1986, 1988
			b)	0.474	0.173	25	317					1.000	0.32	19	117	
B. sandvicensis confusa	(Asteraceae)[§]	GD	°	0.887	0.115	24	375					0.835	0.115	26	261	Sun and Ganders, 1986, 1988
B. sandvicensis ssp. *sandvicensis*	(Asteraceae)[§]	GD	° a)	0.877	0.18	30	249									Sun and Ganders, 1986, 1988
			b)	0.242	0.107	20	191					0.750	0.201	11	157	
			c)	0.465	0.16	16	133					1.000	0.16	11	113	
Bidens cervicata	(Asteraceae)[§]	GD	°	0.705	0.064	>30	>300									Schultz and Ganders, 1996

Species	(Family)	Mating System	✦	OUTCROSSING RATES **Herm.**	±	N_f	N_p	**Mixed**	±	N_f	N_p	**Females**	±	N_f	N_p	Study
Bidens sandvicensis	(Asteraceae)[§]	GD	° a)	0.503	0.112	>30	>300									Schultz and Ganders, 1996
			b)	0.552	0.070	>30	>300									
			c)	0.755	0.085	>30	>300									
Chionographis japonica	(Liliaceae)	GD	° R)	0.102	0.065	31	292					1.056	0.218	24	24	Maki, 1993
			S)	0.058	0.001	31	292					0.884	0.010	24	240	
		H	°	0.000	0.000	18	190									
Cucurbita foetidissima	(Cucurbitaceae)[§§]	GD	° a)	0.272	0.500	22	220					0.593	0.178	13	124	Kohn and Biardi, 1995
			b)	0.264	0.140	21	184					0.881	0.125	17	162	
Eucalyptus leucoxylon	(Myrtaceae)	GD	min	0.64								0.92				Ellis and Sedgley, 1993
			max	0.95								1.00				
			mean	0.82		10	200					0.96		10	200	
Limnanthes douglasii	(Limnanthaceae)	GD	° a)	0.750	0.030	30	>300									Kesseli and Jain, 1984
			b)	0.770	0.038	31	>310									
		H	°	0.950	0.030	34	>340									
Ocotea tenera	(Lauraceae)	GD	° 1)	1.022	0.230	7	18					0.918	0.110	8	28	Gibson and Wheelwright, 1996
			2)	1.137	0.040	5	21					0.905	0.140	8	52	

Species	(Family)	Mating System	✦	OUTCROSSING RATES **Herm.**	±	N_f	N_p	**Mixed**	±	N_f	N_p	**Females**	±	N_f	N_p	Study
			3)	0.541	0.060	4	11					0.924	0.100	14	202	
Pachycereus pringlei	(Cactaceae)[§§§]	SD	°	0.301	0.023	13	565					0.949	0.019		627	Murawski et al., 1994
Phacelia linearis	(Hydrophyllaceae)	GM-GD	° a1)	1.000	0.080	40	1080									Eckhart, 1992
			b2)	0.830	0.100	30	>180									
			c2)	1.000	0.090	30	>180									
			d2)	0.800	0.130	30	>180									
Plantago coronopus	(Plantaginaceae)	GM-GD	* a)	0.450	0.060	4	145	0.890	0.160	1	31	>1.00	0.190	1	26	Wolff et al., 1988
			b)	0.900	0.090		110	0.990	0.140		55	0.970	0.090		77	
Salvia pratensis	(Labiatae)	GD	° a)	0.669	0.079	5	137									Van Treuren et al., 1993
			b)	0.818	0.087	11	284									
			c)	0.382	0.092	11	111									
			d)	0.711	0.051	19	332									
Scabiosa columbaria	(Dipsacaceae)	GD	° a)	0.874	0.093	4	84									Van Treuren et al., 1994
			b)	1.026	0.096	4	89									
			c)	0.842	0.069	13	153									
			d)	1.120	0.110	22	293									

Species	(Family)	Mating System	✦	OUTCROSSING RATES **Herm.**	±	N_f	N_p	**Mixed**	±	N_f	N_p	**Females**	±	N_f	N_p	Study
Schiedea adamantis	(Caryophyllaceae)	GD	°	0.499	0.167							0.907	0.088			Sakai et al., 1997
Schiedea salicaria	(Caryophyllaceae)	GD	min	0.26												Norman et al., 1997
			max	0.42												
Silene vulgaris	(Caryophyllaceae)	GM-GD	° a1)	0.780	0.100	33						0.970	0.150	12		Charlesworth, unpublished
			a2)	0.690	0.160	32						1.480	0.250	13		
			a3)	0.850	0.200	27						1.120	0.250	8		
			b1)	0.510	0.180	34						1.060	0.440	25		
			b2)	0.430	0.110	35						0.820	0.160	25		
			b3)	0.660	0.190	36						0.970	0.110	25		
Thymus vulgaris	(Labiatae)	GD	° a)	0.642	0.019		78									Valdeyron et al., 1977
			b)	0.901	0.019		78									
			c)	0.513	0.048		114									
			d)	0.652	0.029		307									
Thymus vulgaris	(Labiatae)	GD	+ 1)	0.748	0.192	6	126									Brabant et al., 1980
			2)	0.710	0.163	9	479									
			3)	0.728	0.161	6	316									

Species	(Family)	Mating System	✦	OUTCROSSING RATES **Herm.**	±	N_f	N_p	**Mixed**	±	N_f	N_p	**Females**	±	N_f	N_p	Study
Trifolium hirtum	(Papilionaceae)	GD	° a3)	0.235	0.050	27	135					0.737	0.060	27	270	Molina-Freaner and Jain, 1992
			b3)	0.099	0.050	29	145					0.807	0.050	46	460	
			c3)	0.188	0.070	30	150					0.742	0.050	30	300	
		H	° a2)	0.120	0.030	80	400									
			b2)	0.160	0.020	80	400									
			c3)	0.290	0.050	40	200									
			d1)	0.100	0.020	50	250									
			d2)	0.140	0.020	80	400									
			d3)	0.250	0.050	30	150									

✦ Standard deviations (*) or standard errors (°) are given for the outcrossing rates; (+) denote a measure of dispersion not specified. Letters denote different populations, whereas numbers denote different years or periods. R) means that the outcrossing rates were estimated with Ritland and Jain's (1981) mating-system program, and S) means that multilocus estimator from Shaw, Kahler and Allard (1981) was used. If detailed data were not available, minimum, maximum, and mean values are shown when possible.

§ Asteraceae are often gynomonoecious with female ray florets and perfect disk florets; in the five GD species of *Bidens* presented here ray florets are sterile and disk florets are perfect in hermaphroditic individuals and male-sterile in female individuals.

§§ In *Cucurbita foetidissima* presenting no perfect flowers, hermaphodites are monoecious plants with staminate and pistillate flowers. The outcrossing rates were estimated on progeny arrays of pistillate flowers from monoecious and gynoecious (female) plants.

§§§ *Pachycereus pringlei* is subdioecious (= trioecious), i.e., there is coexistence of male, female, and hermaphroditic individuals.

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