

Appendix S2

Table S1: Summary of reviewed studies of the role of moths in pollination (see Tables S1.1–1.3).

Type of moth-pollination study	No. studies	No. ecosystems, species, or taxa
Ecosystems (Table S1.1)	14	13
Plant species (Table S1.2)	143	289
Pollinating seed parasites (Table S1.3)	11	12
Total	168	314

Table S1.1: Ecosystems in which moths have been found to be important pollinators.

In column 5 (Methods), the methods used to provide evidence for moth pollination are indicated as follows: C = contact with anthers and/or stigmas observed, D = pollen deposited on and/or removed from stigmas, E = experimental exclusion of diurnal and nocturnal pollinators, I = inferred by pollination syndrome, P = pollen present on captured moths, R = literature review, S = moth scales or hairs present on stigmas, VF = flower visitation determined by fluorescent markers deposited by visiting moths, VO = flower visitation determined by observations, VR = flower visitation determined by video recordings U = unspecified/unavailable.

Climate	System	Location	% of plants moth-pollinated	Methods	Notes	Reference
Temperate	Coniferous forest	Scotland		P	~25% of moths were carrying pollen.	Devoto <i>et al.</i> (2011)
	Various	South-eastern Africa		R	Moth pollination is relatively common in some areas as bee diversity is low.	Johnson (2004)
	Meadow	Portugal		P	~39% of moths were carrying pollen representing 36 plant taxa.	Banza (2011)
	Xeric sandhill	Florida, USA		P, VO, VR		Atwater (2013)
Tropical	Bush-savannah	Kenya	~4.6	I, VO	Sphingidae only investigated.	Martins and Johnson (2013)
	Grassland	Venezuela	6	C, P, VO	Moth-pollinated plants the second most abundant	Ramirez (2004)

					animal-pollinated group.	
Lowland dry forest	Costa Rica	~10	P, VO		Sphingidae only investigated.	Haber and Frankie (1989)
Monsoon forest	Laos	6	P, VO			Kato <i>et al.</i> (2008)
Oceanic islands	Galápagos		R		Only Hymenoptera more important to pollination than moths.	Chamorro <i>et al.</i> (2012)
Rainforest	Costa Rica	16	I, VO		Moth-pollinated plants the second most abundant group.	Bawa <i>et al.</i> (1985)
Rainforest	New Caledonia	20	P, VO		Moth-pollinated plants the second most abundant group.	Kato and Kawakita (2004)
Savannah	Brazil	14	I, VO		Woody plants only; moths were third most important pollinators.	Oliveira <i>et al.</i> (2004), Martins and Batalha (2006)
Wet evergreen forest	India		C, VO		Moths are third most important pollinators.	Devy and Davidar (2003)

Table S1.2: Examples of plants found to be pollinated by moths.

In column 3 (Prediction of moth pollination): E = explicit (stated) prediction of pollination by hawkmoths (Sphingidae), I = implicit prediction of pollination by hawkmoths (eg. introductory discussion of characteristics of sphingophilous flowers), N = prediction of no pollination by moths, O = prediction of pollination by moths other than hawkmoths, U = prediction of pollination by general or unspecified moths, and X = no clear prediction made.

In column 4 (Moth pollinators): C = Cosmopterigidae, Cr = Crambidae, Ct = Ctenuchidae, E = Erebiidae, Ge = Gelechiidae, G = Geometridae, Gl = Glyphipterigidae, Gr = Gracillariidae, L = Lasiocampidae, M = Micropterigidae, N = Noctuidae, No = Nolidae, Pr = Prodoxidae, Pt = Pterophoridae, P = Pyralidae, Sa = Saturniidae, Se = Sesiidae, S = Sphingidae, Th = Thyrididae, T = Tortricidae, U = Uranidae, X = unspecified/unknown. For studies where exact pollinating moth species or genera are given, this is detailed in column 7 (Notes).

In column 6 (Methods), the methods used to provide evidence for moth pollination are indicated as follows: C = contact with anthers and/or stigmas observed, D = pollen deposited on stigmas and/or removed from anthers, E = plants pollinated when experimentally exposed only to visits by moths, I = inferred by pollination syndrome, P = pollen present on captured moths, S = moth scales or hairs present on stigmas, VF = flower visitation determined by fluorescent markers transferred by visiting moths, VO = flower visitation determined by observations, VR = flower visitation determined by video recordings, VT = flower visitation determined by flower-visitor trapping, U = unspecified/unavailable.

Plant Family	Plant species	Prediction of moth pollination	Moth pollinators	Other pollinators?	Methods	Notes	References
Adoxaceae	<i>Adoxa moschatellina</i> L.	N	N	Various Diptera	P	<i>Orthosia gothica</i> L. was the main nocturnal pollinator.	Holmes (2005)

							Three other <i>Orthosia</i> spp. and <i>Lithophane hepatica</i> Clerck. also recorded carrying pollen.	
Amaranthaceae	<i>Beta vulgaris</i> L.	U	X	–	P, VO			Banza (2011)
Amaryllidaceae	<i>Allium cepa</i> L.	U	X	–	P, VO			Banza (2011)
	<i>Ammocharis tinneana</i> (Kotschy & Peyr.) Milne-Redh. & Schweick.	E	S	–	VO			Martins and Johnson (2013)
	<i>Crinum flaccidum</i> Herb.	E	S	None	I			Howell and Prakash (1990)
	<i>Crinum jagus</i> (J. Thomps.) Dandy	E	S	None	C, VO	Only Sphingidae considered as potential pollinators		Brantjes and Bos (1980)
	<i>Crinum macowanii</i> Baker	E	S	–	VO			Martins and Johnson (2013)
	<i>Hymenocallis coronaria</i> (Leconte) Kunth	E	N, S	Hymenoptera, Trochilidae	C, VO			Graham (2010)

	<i>Hymenocallis occidentalis</i> (Leconte) Kunth	E	E, N, S	None	C, VO	Graham (2010)
	<i>Narcissus papyraceus</i> Ker Gawl.	E	S, X	Syrphid flies (Diptera)	P	Pérez-Barrales <i>et al.</i> (2007)
	<i>Narcissus viridiflorus</i> Schousb.	O	X	None	I	Vogel and Mueller-Doblies (1975)
	<i>Pancratium maritimum</i> L.	I	S	None	P, VF, VO	Eisikowitch and Galil (1971)
Anacardiaceae	<i>Schinus terebinthifolia</i> Raddi	X	X	Hymenoptera	VO	Kato and Kawakita (2004)
Apiaceae	<i>Daucus carota</i> L.	U	X	–	P, VO	Banza (2011)
Apocynaceae	<i>Acokanthera schimperi</i> (A.DC.) Schweinf.	E	S	–	VO	Martins and Johnson (2013)
	<i>Alstonia costata</i> (G.Forst.) R.Br.	X	X	None	VO	Kato and Kawakita (2004)

<i>Asclepias syriaca</i> L.	U	E, G, N	<i>Bombus</i> spp. (Hymenoptera: Apidae)	P, VO		Jennersten and Morse (1991)
<i>Asclepias verticillata</i> L.	U	G, N	<i>Bombus</i> spp.	P, VO		Bertin and Willson (1980)
<i>Aspidosperma macrocarpon</i> Mart.	U	X	None	I, VO	Not Sphingidae	Oliveira <i>et al.</i> (2004), Martins and Batalha (2006)
<i>Aspidosperma nobile</i> Müll.Arg.	U	X	—	I		Martins and Batalha (2006)
<i>Aspidosperma polyneuron</i> Müll.Arg.	U	X	—	I		Martins and Batalha (2006)
<i>Aspidosperma quebracho-blanco</i> Schltdl.	U	N, P	None	C, VO		Lin and Bernardello (1999)
<i>Aspidosperma tomentosum</i> Mart.	U	X	None	I, VO	Not Sphingidae	Oliveira <i>et al.</i> (2004), Martins and Batalha (2006)
<i>Carissa spinarum</i> L.	E	S	—	VO		Martins and Johnson (2013)
<i>Cerbera manghas</i>	X	S	None	VO		Kato and Kawakita (2004)

L.

<i>Chonemorpha fragrans</i> (Moon) Alston	X	S	None	VO		Kato <i>et al.</i> (2008)
<i>Hancornia speciosa</i> Gomes	U	S	None	I, VO		Oliveira <i>et al.</i> (2004), Martins and Batalha (2006)
<i>Himatanthus obovatus</i> (Müll.Arg.) Woodson	U	S	None	I, VO		Oliveira <i>et al.</i> (2004), Martins and Batalha (2006)
<i>Mandevilla laxa</i> (Ruiz & Pav.) Woodson	I	S	None	P	Primarily <i>Manduca sexta</i> L.	Moré <i>et al.</i> (2007)
<i>Mandevilla longiflora</i> (Desf.) Pichon	I	S	None	P	Primarily <i>Manduca sexta</i>	Moré <i>et al.</i> (2007)
<i>Mandevilla petraea</i> (A. St.-Hil.) Pichon	I	S	None	P	Primarily <i>Manduca tucumana</i> Rothschild & Jordan	Moré <i>et al.</i> (2007)
<i>Metaplexis japonica</i> (Thunb.) Makino	U	N, P	None	P, VO		Sugiura and Yamazaki (2005)

	<i>Sarcostemma angustissimum</i> (Andersson) R.W. Holm	N	N, T	None	VO		Philipp <i>et al.</i> (2006)
	<i>Strophanthus wallichii</i> A.DC.	X	X	None	VO		Kato <i>et al.</i> (2008)
Arecaceae	<i>Elaeis guineensis</i> Jacq.	N	C	Thysanoptera	VO		Syed (1979)
Asparagaceae	<i>Agave lechuguilla</i> Torr.	N	S	Various Hymenoptera	C, VO	Primarily <i>Hyles lineata</i> Fabricius	Silva-Montellano and Eguiarte (2003)
	<i>Agave macroacantha</i> Zucc.	N	N, S, X	Bats (Chiroptera), Hymenoptera, diurnal Lepidoptera, hummingbirds (Trochilidae)	VO	Extremely dependent on nocturnal pollinators (probably Chiroptera) for reproductive success	Arizaga <i>et al.</i> (2000a, 2000b)
	<i>Agave palmeri</i> Engelm.	N	S	Bats (Chiroptera)	P		Alarcón <i>et al.</i> (2008)
	<i>Chlorogalum pomeridianum</i> (DC.) Kunth	E	S	–	P, VO		Grant (1983)
	<i>Manfreda virginica</i>	I	N, S	Large bees	C, VO	Behavioural	Groman and Pellmyr

	L. Salisb. ex Rose			(Hymenoptera)		observations indicate (1999) Noctuidae unlikely to contribute significantly to pollination	
	<i>Ornithogalum narbonense</i> L.	U	X	—	P, VO		Banza (2011)
	<i>Yucca</i> spp.	X	Pr	—	U	<i>Tegeticula</i> and <i>Parategeticula</i> spp. Obligate pollinating seed parasite mutualism	Pellmyr <i>et al.</i> (1996)
Asteraceae	<i>Ageratina aromatica</i> (L.) Spach	U	X	—	P, VO		Atwater (2013)
	<i>Balduina angustifolia</i> (Pursh) B.L.Rob.	U	X	—	P, VO		Atwater (2013)
	<i>Cirsium</i> spp.	U	N	—	P	<i>Diarsia mendica mendica</i> Fabricius. Pollen of <i>Cirsium palustre</i> (L.) Coss. ex Scop. and <i>C. arvense</i> (L.) Scop. not	Devoto <i>et al.</i> (2011)

distinguished					
<i>Espeletia grandiflora</i> Humb. & Bonpl.	N	G, N, P	<i>Bombus</i> spp. (Apidae) primarily, as well as Trochilidae, Diptera and Coleoptera	C, VO	Fagua and Gonzalez (2007)
<i>Eupatorium compositifolium</i> Walter	U	X	—	P, VO	Atwater (2013)
<i>Galactites tomentosa</i> Moench.	U	X	—	P, VO	Banza (2011)
<i>Glebionis coronaria</i> (L.) Cass. ex Spach	U	X	—	P, VO	Banza (2011)
<i>Jacobaea vulgaris</i> Gaertn.	U	G, N	—	P	Devoto <i>et al.</i> (2011)
<i>Leontodon taraxacoides</i> Hoppe & Hornsch.	U	X	—	P, VO	Banza (2011)
<i>Liatris tenuifolia</i>	U	X	—	P, VO	Atwater (2013)

	Nutt.						
	<i>Pityopsis graminifolia</i> (Michx.) Nutt.	U	X	–	P, VO		Atwater (2013)
	<i>Senecio vulgaris</i> L.	U	X	–	P, VO		Banza (2011)
	<i>Tithonia diversifolia</i> (Hemsl.) A.Gray	E	S	–	VO		Martins and Johnson (2013)
Balsaminaceae	<i>Impatiens coelotropis</i> Fischer	X	S	Diurnal Lepidoptera, Hymenoptera and Diptera	C, P, VO		Sreekala <i>et al.</i> (2008)
	<i>Impatiens cuspidata</i> Wight & Arn.	X	S	Diurnal Lepidoptera, Hymenoptera and Diptera	C, P, VO		Sreekala <i>et al.</i> (2011)
Bignoniaceae	<i>Catalpa speciosa</i> (Warder ex Barney) Warder ex Engelm.	U	E, G, L, N	Hymenoptera	S, VO		Stephenson and Thomas (1977)
	<i>Pyrostegia millingtonioides</i> Sandwith	U	X	None	I	Flowers fit moth- pollination syndrome and are most likely	Pool (2008)

moth-pollinated							
	<i>Sphingiphila tetramera</i> A. Gentry	X	S	None	I		Gentry (1990)
Boraginaceae	<i>Cordia revoluta</i> Hook.f.	N	P, X	None	VO		Philipp <i>et al.</i> (2006)
	<i>Cynoglossum creticum</i> Mill.	U	X	–	P, VO		Banza (2011)
	<i>Macromeria viridiflora</i> A. DC.	E	S	Trochilidae	D, VO	Primarily by Trochilidae	Boyd (2004)
	<i>Tournefortia rufo-sericea</i> Hook. f.	U	N, P	Ants (Hymenoptera) and Coleoptera	P, VO	Ants are primary pollinators	McMullen (2007)
Brassicaceae	<i>Maerua decumbens</i> (Brongn.) DeWolf	E	S	–	VO		Martins and Johnson (2013)
	<i>Raphanus raphanistrum</i> L.	U	X	–	P, VO		Banza (2011)
	<i>Rapistrum</i>	U	X	–	P, VO		Banza (2011)

	<i>rugosum</i> (L.) All.						
Cactaceae	<i>Cereus repandus</i> (L.) Mill.	X	S	None	I, VO	<i>Agrius cingulata</i> Fabricius and <i>Manduca rustica</i> Fabricius	Silva and Sazima (1995)
	<i>Echinopsis</i> <i>ancistrophora</i> Speg.	E	S	Solitary bees (Hymenoptera)	P, S	Populations with long flower tubes moth- pollinated; populations with short flower tubes bee-pollinated	Schlumpberger <i>et al.</i> (2009)
	<i>Echinopsis</i> <i>schickendantzii</i> F.A.C. Weber	U	S	Hymenoptera	P, S, VO		Alonso-Pedano and Ortega-Baes (2012)
	<i>Echinopsis</i> <i>terscheckii</i> (Parm.) Friedrich & G.D. Rowley	U	G, N, Sa, S	Hymenoptera and Aves	P, S	Moths are the most effective pollinators	Ortega-Baes <i>et al.</i> (2011)
	<i>Lophocereus</i> <i>schottii</i> (Engelm.) Britton & Rose	X	P	–	E, VO	<i>Upiga virescens</i> Hulst. Obligate pollinating seed parasite mutualism	Fleming and Holland (1998)
	<i>Peniocereus</i> <i>striatus</i> (Brandegees) Buxb.	I	S	None	VF, VO	<i>Hyles lineata</i> and <i>Manduca</i> <i>quinquemaculata</i> Haworth	Suzán <i>et al.</i> (1994)

	<i>Selenicereus wittii</i> (K. Schum.) G.D. Rowley	X	S	None	I	Pollination by either or both of <i>Cocytius cluentus</i> Cramer and <i>Amphimoea walkeri</i> Boisduval, the only species in the plant's range with sufficiently long proboscides	Barthlott <i>et al.</i> (1997)
Capparaceae	<i>Crateva religiosa</i> G. Forst.	X	P	Hymenoptera	P, VO	<i>Achoria grisella</i> Fabricius	Sharma <i>et al.</i> (2006)
Caprifoliaceae	<i>Fedia cornucopiae</i> (L.) Gaertn.	U	X		P, VO		Banza (2011)
	<i>Lonicera japonica</i> Thunb.	I	N, S	<i>Lasioglossum</i> spp. (Hymenoptera: Halictidae)	D, VO	Primarily <i>Theretra japonica</i> Boisduval (Sphingidae)	Miyake and Yahara (1998)
	<i>Valerianella discoidea</i> (L.) Loisel.	U	X	–	P, VO		Banza (2011)
Caricaceae	<i>Jacaratia spinosa</i> (Aubl.) A. DC.	I	X	Diurnal Lepidoptera	I, VO	Moths are primary pollinators	Piratelli <i>et al.</i> (1998)
Caryocaraceae	<i>Caryocar brasiliense</i> A. St.-Hil.	I	S	Chiroptera	P, VO	Chiroptera are major pollinators	Gribel and Hay (1993)
Caryophyllaceae	<i>Dianthus</i>	U	N, S	Diurnal	VO		Erhardt (1990)

<i>gratianopolitanus</i> Vill.				Lepidoptera			
<i>Dianthus superbus</i> L.	I	N, S	None	VO			Erhardt (1991)
<i>Dianthus sylvestris</i> Wulfen	O	N, S	Hymenoptera, Diptera	VO	<i>Hadena compta</i> Denis & Schiffermüller (Noctuidae), <i>Macroglossum</i> <i>stellatarum</i> L. (Sphingidae). Pollinating seed parasite mutualism with <i>H. compta</i>		Collin <i>et al.</i> (2002)
<i>Saponaria</i> <i>officinalis</i> L.	I	N, S	None	VO			Wolff <i>et al.</i> (2006)
<i>Schiedea lydgatei</i> Hillebr.	N	P	Wind	P, VO			Norman <i>et al.</i> (1997)
<i>Silene dioica</i> (L.) Clairv.	O	G	–	P, VO	<i>Perizoma affinitatum</i> Stephens. Pollinating seed parasite mutualism		Westerbergh (2004)
<i>Silene latifolia</i> Poir.	I	N, S	Thysanoptera	U	Generally pollinated by moths, which are the best pollinators of this species		McNeill (1977), Young (2002)

	<i>Silene sennenii</i> Pau	U	Cr, G, N, S	Various Hymenoptera and Diptera	VO	Pollination shown to occur mainly at night	Martinell <i>et al.</i> (2010)
	<i>Silene stellata</i> (L.) W.T. Aiton	O	N	–	D	<i>Hadena ectypa</i> Morrison. Pollinating seed parasite mutualism	Kula <i>et al.</i> (2013)
	<i>Silene succulenta</i> Forssk.	I	S	None	P, VF	Not the focal species of this study	Eisikowitch and Galil (1971)
	<i>Silene viscaria</i> (L.) Jess.	N	G, N, S	Various Hymenoptera and Diptera	VO	Primarily <i>Deilephila</i> <i>porcellus</i> L. (Sphingidae)	Jennersten (1988)
	<i>Silene vulgaris</i> (Moench) Garcke	U	N, S	Various Hymenoptera and Diptera	P, VO	24 spp. Noctuidae and 2 spp. Sphingidae	Pettersson (1991)
Cleomaceae	<i>Cleome gynandra</i> L.	E	S	–	VO		Martins and Johnson (2013)
Convolvulaceae	<i>Convolvulus</i> <i>althaeoides</i> L.	U	X	–	P, VO		Banza (2011)
	<i>Ipomoea</i> <i>ampullacea</i> Fernald	X	X	None	I		Wilkin (1995)

	<i>Ipomoea habeliana</i> Oliv.	I	S	None	P, VF, VO	Though other taxa are flower visitors, only Sphingidae are effective pollinators	McMullen (2009)
	<i>Merremia palmeri</i> (Hallier) Hallier f.	E	S	None	D, VO		Willmott and Burquez (1996)
Crassulaceae	<i>Crassula fascicularis</i> Lam.	X	G	None	P		Johnson <i>et al.</i> (1993)
Cucurbitaceae	<i>Lagenaria siceraria</i> (Molina) Standl.	X	N, S	Diurnal Lepidoptera and <i>Apis mellifera</i>	VO	Sphingidae were primary pollinators of <i>L. siceraria</i>	Morimoto <i>et al.</i> (2004)
Dipterocarpaceae	<i>Dipterocarpus obtusifolius</i> Teijsm. ex Miq.	N	N, S	Various diurnal Lepidoptera	P, VO		Ghazoul (1997)
	<i>Dipterocarpus pachyphyllus</i> Meijer	X	G	None	VO		Harrison <i>et al.</i> (2005)
Ebenaceae	<i>Diospyros burchellii</i> Hiern.	U	X	None	I, VO	Not Sphingidae	Oliveira <i>et al.</i> (2004)
Ericaceae	<i>Dracophyllum ramosum</i> Pancher ex Brongn. & Gris	X	X	None	VO		Kato and Kawakita (2004)
	<i>Erica</i> spp.	U	G, N	—	P	Pollen of <i>Erica</i>	Devoto <i>et al.</i> (2011)

						<i>cinerea</i> L. and <i>E. tetralix</i> L. not distinguished
	<i>Rhododendron occidentale</i> (Torr. & A. Gray)	E	S	Diurnal Lepidoptera	C, VO	Grant (1983)
	<i>Vaccinium angustifolium</i> Aiton	N	G, N, P, S, X	Various bees (Hymenoptera)	P	Cutler <i>et al.</i> (2012), Manning and Cutler (2013)
Escalloniaceae	<i>Escallonia myrtoidea</i> Bertero ex DC.	U	G	Various Hymenoptera, diurnal Lepidoptera, Diptera and Coleoptera	VO	Valdivia and Niemeyer (2006)
Euphorbiaceae	<i>Cnidoscolus texanus</i> (Müll.Arg.) Small	X	S	–	P, VO	Perkins <i>et al.</i> (1975)
	<i>Croton dichogamus</i> Pax	E	S	–	VO	Martins and Johnson (2013)
	<i>Croton megalocarpus</i> Hutch.	E	S	–	VO	Martins and Johnson (2013)
	<i>Mallotus barbatus</i>	X	S	Hymenoptera,	VO	Kato <i>et al.</i> (2008)

	Müll.Arg.			diurnal Lepidoptera, Diptera			
Fabaceae	<i>Bauhinia aculeata</i> L.	X	N, S	Various Hymenoptera, diurnal Lepidoptera, Coleoptera and Trochilidae	P, VO		Hokche and Ramirez (1990)
	<i>Bauhinia forficata</i> Link	I	S	None	C, P, VO	<i>M. sexta</i> is the exclusive pollinator of <i>B. forficata</i>	Neto (2013)
	<i>Browneopsis</i> <i>disepala</i> (Little) Klitg.	U	X	Chiroptera	VO	Chiroptera are more efficient pollinators	Knudsen and Klitgaard (1998)
	<i>Caesalpinia gilliesii</i> (Hook.) D. Dietr.	I	S	None	I, P, VO		Cocucci <i>et al.</i> (1992), Moré <i>et al.</i> (2006)
	<i>Dalea pinnata</i> (J.F.Gmel.) Barneby	U	X	—	P, VO		Atwater (2013)
	<i>Inga sessilis</i> (Vell.) Mart.	X	S	Birds (Aves) and Chiroptera	D, VO		Amorim <i>et al.</i> (2013)
	<i>Inga</i> spp.	X	E, G, N, P, S, U	Trochilidae and diurnal Lepidoptera	VO		Koptur (1983)

	<i>Lathyrus aphaca</i> L.	U	X	–	P, VO		Banza (2011)
	<i>Melilotus indicus</i> (L.) All.	U	X	–	P, VO		Banza (2011)
	<i>Scorpiurus muricatus</i> L.	U	X	–	P, VO		Banza (2011)
	<i>Trifolium</i> spp.	U	X	–	P, VO		Banza (2011)
	<i>Zapoteca</i> spp.	I	G, N, P	None	C, VO	All <i>Zapoteca</i> species are moth-pollinated	Hernández (1989)
Geraniaceae	<i>Erodium malacoides</i> (L.) L'Hér.	U	X	–	P, VO		Banza (2011)
Gesneriaceae	Various	N	X	Primarily Trochilidae and Chiroptera	C, VO, VR	Several pollination syndromes exist among this family, including moth pollination	Martén-Rodríguez <i>et al.</i> (2009)
Gnetaceae	<i>Gnetum gnemon</i> Linné var. <i>tenerum</i> Markgraf	X	G, P	None	P, VO		Kato <i>et al.</i> (1995)

Hyacinthaceae	<i>Dipcadi brevifolium</i> (Thunb.) Fourc.	O	N	None	P, VO	<i>Cornutiplusia circumflexa</i> L.	Manning <i>et al.</i> (2012)
Hypericaceae	<i>Hypericum pulchrum</i> L.	U	N	–	P	<i>Diachrysia chrysistis</i> L.	Devoto <i>et al.</i> (2011)
Iridaceae	<i>Gladiolus candidus</i> (Rendle) Goldblatt	E	S	–	VO		Martins and Johnson (2013)
	<i>Gladiolus longicollis</i> Baker	E	S	None	P	Primarily <i>Agrius convolvuli</i> L.	Alexandersson and Johnson (2002)
	<i>Gladiolus</i> spp.	U	N, S, X	Various	C, P, VO	Moth pollination has evolved six times independently within this genus	Goldblatt and Manning (2002)
	Various	U	G, N, S, X	Various	I, VO	Moth pollination strategies for both hovering and settling moths within this family	Goldblatt and Manning (2006)
Lamiaceae	<i>Oxera neriifolia</i> (Montrouz.) Beauvis.	X	S	None	VO		Kato and Kawakita (2004)
	<i>Plectranthus</i>	E	S	–	VO		Martins and Johnson (2013)

<i>pubescens</i> Baker							
Lecythidaceae	<i>Napoleonaea vogelii</i> Hook. & Planch.	X	GI	Various Thysanoptera, Coleoptera and Hymenoptera	P, VO		Frame and Durou (2001)
Lentibulariaceae	<i>Utricularia graminifolia</i> Vahl	X	N, P, S, U	Various Hymenoptera and diurnal Lepidoptera	D, VO		Hobbhahn <i>et al.</i> (2006)
Liliaceae	<i>Lilium auratum</i> Lindl.	X	S, X	<i>Papilio bianor</i> Cramer (Lepidoptera: Papilionidae)	U		Morinaga <i>et al.</i> (2009)
	<i>Lilium formosanum</i> Wallace	E	S, X	<i>Cyrtothyrea marginalis</i> Swartz (Coleoptera)	P, S, VO	Primarily <i>Agrius convolvuli</i>	Rodger <i>et al.</i> (2010)
	<i>Lilium japonicum</i> Thunb. var. <i>japonicum</i>	I	G, N, P, S	None	VR		Yokota and Yahara (2012)
	<i>Lilium martagon</i> L.	E	S	None	C, VO	Only Sphingidae considered as potential pollinators	Brantjes and Bos (1980)
Linaceae	<i>Linum tenue</i> Desf.	U	X	—	P		Banza (2011)

Loasaceae	<i>Mentzelia laevicaulis</i> (Douglas) Torr. & A. Gray	E	S	Hymenoptera	VO		Grant (1983)
Loganiaceae	<i>Antonia ovata</i> Pohl.	U	X	None	I, VO	Not Sphingidae	Oliveira <i>et al.</i> (2004)
	<i>Strychnos pseudoquina</i> A. St.-Hil.	U	X	None	I, VO	Not Sphingidae	Oliveira <i>et al.</i> (2004), Martins and Batalha (2006)
Malvaceae	<i>Luehea candida</i> (Moc. & Sessé ex DC.) Mart.	I	N, P, S, U	None	VO		Haber and Frankie (1982)
	<i>Tilia</i> spp.	X	Ct, E, G, N, P, Se, S	Hymenoptera and Diptera	P, VO		Anderson (1976)
Meliaceae	<i>Turraea mombassana</i> C. DC.	E	S	–	VO		Martins and Johnson (2013)
Myrtaceae	<i>Syzygium fastigiatum</i> (Blume) Merr. & L.M.Perry	X	Ct	Diurnal Lepidoptera, Hymenoptera, Coleoptera,	VO	Primarily Coleoptera	Kato <i>et al.</i> (2008)

	<i>Syzygium tierneyanum</i> (F. Muell.) T.G. Hartley & L.M. Perry	I	S, U	Aves, diurnal Lepidoptera, Hymenoptera, Diptera and Chiroptera	C, VO		Hopper (1980)
Nepenthaceae	<i>Nepenthes vieillardii</i> Hook.	X	X	Coleoptera	VO		Kato and Kawakita (2004)
Nyctaginaceae	<i>Abronia ammophila</i> Greene	X	N, S	Diurnal Lepidoptera and bumblebees (Hymenoptera: Apidae)	P, VO	Noctuidae were most abundant pollinators	Saunders and Sipes (2006)
	<i>Abronia macrocarpa</i> L.A. Galloway	X	N, S	None	P, VO		Williamson <i>et al.</i> (1994)
	<i>Mirabilis jalapa</i> L.	I	S	None	C, D, VO	<i>Erinnyis ello</i> L. and <i>Hyles lineata</i>	Martinez del Rio and Burquez (1986)
	<i>Mirabilis longiflora</i> L.	E	N, S	<i>Apis mellifera</i> (Hymenoptera: Apidae)	VO	<i>Manduca quinquemaculata</i> is the most important pollinator	Grant and Grant (1983a)
	<i>Mirabilis multiflora</i> (Torr.) A. Gray	E	S	None	VF, VO	<i>Hyles lineata</i>	Hodges (1995)
Oleaceae	<i>Jasminum</i>	X	S	None	VO		Kato <i>et al.</i> (2008)

	<i>coarctatum</i> Roxb.						
	<i>Jasminum fluminense</i> Vell.	E	S	–	VO		Martins and Johnson (2013)
	<i>Jasminum grandiflorum</i> subsp. <i>floribundum</i> (R.Br. ex Fresen.) P.S.Green	E	S	–	VO		Martins and Johnson (2013)
Onagraceae	<i>Calylophus hartwegii</i> subsp. <i>filifolia</i> (Eastw.) Towner & Raven	I	N, P, S	Hymenoptera	P, VO	Moths account for 65% of flower visitors	Clinebell <i>et al.</i> (2004)
	<i>Gaura coccinea</i> Nutt. ex Pursh	O	G, N, P, S, X	Negligible	P, VO	Moths carry 99% of gross pollen load	Clinebell <i>et al.</i> (2004)
	<i>Gaura villosa</i> Torr. subsp. <i>villosa</i>	O	E, G, N, P, S, X	Neuroptera; Hymenoptera	P, VO	Moths account for 63% of flower visitors	Clinebell <i>et al.</i> (2004)
	<i>Oenothera biennis</i> L.	E	S	None	C, VO		Graham (2010)
	<i>Oenothera drummondii</i> Hook.	I	S	None	P, VF	Not the focal species of this study	Eisikowitch and Galil (1971)

	<i>Oenothera grandiflora</i> L'Hér.	E	N, S	None	C, VO		Graham (2010)
	<i>Oenothera macrocarpa</i> Nutt.	E	S	None	VO		Moody-Weis and Heywood (2001)
	<i>Oenothera rhombipetala</i> Nutt. ex Torr. & A. Gray	N	N, S		VO	Anecdotal evidence only	Clinebell <i>et al.</i> (2004)
Orchidaceae	<i>Aerangis brachycarpa</i> (A. Rich.) Durand & Schinz	E	S	None	VO		Martins and Johnson (2007, 2013)
	<i>Aerangis confusa</i> J. Stewart	E	S	None	VO		Martins and Johnson (2007)
	<i>Aerangis ellisii</i> (B.S. Williams) Schltr.	I	S	None	I, S	<i>Agrius convolvuli</i> and <i>Panogena lingens</i> Butler	Nilsson and Rabakonandrianina (1988)
	<i>Aerangis kotschyana</i> (Rchb.f.) Schltr.	E	S	None	VO		Martins and Johnson (2007)
	<i>Aerangis thomsonii</i> (Rolfe) Schltr.	E	S	None	VO		Martins and Johnson (2007)

<i>Angraecum arachnites</i> Schltr.	E	S	None	VO	<i>Panogena lingens</i> is the exclusive pollinator of <i>A. arachnites</i>	Nilsson <i>et al.</i> (1985)
<i>Angraecum compactum</i> Schltr.	E	S	None	P, VO, VR	<i>Coelonia solani</i> Boisduval, <i>Panogena lingens</i> , and <i>Xanthopan morganii praedicta</i> Rothschild and Jordan	Wasserthal (1997)
<i>Angraecum sesquipedale</i> Thouars	E	S	None	P, VO, VR	<i>Xanthopan morganii praedicta</i>	Wasserthal (1997)
<i>Angraecum sororium</i> Schltr.	E	S	None	P, VO, VR	<i>Coelonia solani</i>	Wasserthal (1997)
<i>Bonatea speciosa</i> (L.f.) Willd.	I	S	None	P, VO	<i>Theretra capensis</i> L. and <i>Hyles livornica</i> Esper.	Johnson and Liltved (1997)
<i>Brachycorythis helferi</i> (Rchb.f.) Summerh.	X	X	None	VO		Kato <i>et al.</i> (2008)
<i>Disa cooperi</i> Rchb. f.	I	S	None	P, VO	<i>Basiothia schenki</i> Moschler is the exclusive pollinator of <i>D. cooperi</i>	Johnson (1995a)

<i>Disa ophrydea</i> (Lindl.) Bolus	N	X	None	P, VO		Johnson (1995b)
<i>Gymnadenia conopsea</i> (L.) R.Br.	U	N, S	Diurnal Lepidoptera	P, VO		Huber <i>et al.</i> (2005)
<i>Gymnadenia odoratissima</i> (L.) Rich.	U	G, Pt, P, T	Diurnal Lepidoptera	P, VO		Huber <i>et al.</i> (2005)
<i>Habenaria decaryana</i> H. Perrier	O	G, N	None	P		Nilsson and Jonsson (1985)
<i>Habenaria gourlieana</i> Gillies ex Lindl.	I	S	None	P	<i>Agrius cingulata</i> and <i>Manduca sexta</i>	Singer and Cocucci (1997)
<i>Habenaria hieronymi</i> Kraenzl.	O	N	None	P	<i>Rachiplusia nu</i> Guenée	Singer and Cocucci (1997)
<i>Habenaria johannensis</i> Bard. Rodr.	U	S	None	VO, VR		Pedron <i>et al.</i> (2012)
<i>Habenaria macronectar</i> (Vell.) Heohne	U	S	None	VO, VR		Pedron <i>et al.</i> (2012)
<i>Habenaria megapotamensis</i>	U	S	None	VO, VR		Pedron <i>et al.</i> (2012)

Hoehne						
<i>Habenaria montevidensis</i> Spreng.	O	X	None	I		Singer and Cocucci (1997)
<i>Habenaria parviflora</i> Lindl.	U	P	Various Diptera	VO		Singer (2001)
<i>Habenaria pumila</i> Poepp.	O	X	None	S		Singer and Cocucci (1997)
<i>Habenaria rupicola</i> Barb.Rodr.	O	X	None	S		Singer and Cocucci (1997)
<i>Mystacidium venosum</i> Harv. Ex Rolfe	E	S	None	P, VO		Luyt and Johnson (2001)
<i>Pecteilis susannae</i> (L.) Raf.	X	X	None	VO		Kato <i>et al.</i> (2008)
<i>Platanthera bifolia</i> L. Rich	X	X	None	I	Highly specialised to pollination by moths	Nilsson (1983)
<i>Platanthera blephariglottis</i> (Willd.) Lindl.	X	Se, S	None	P, VO		Smith and Snow (1976)

<i>Platanthera chlorantha</i> (Custer) Reichb.	X	X	None	I	Highly specialised to pollination by moths	Nilsson (1983)
<i>Platanthera lacera</i> (Michx.) G. Don	I	N	None	VO	<i>Anagrapha falcifera</i> Kirby and <i>Allagrapha aerea</i> Hübner	Little <i>et al.</i> (2005)
<i>Platanthera leucophaea</i> (Nutt.) Lindl.	E	S	None	I, P, VO		Bowles (1983)
<i>Platanthera metabifolia</i> subsp. <i>extremiorientalis</i> (Nevski) Soó	U	N, S	None	P		Inoue (1986)
<i>Platanthera obtusata</i> (Banks ex Pursh) Lindl.	O	G, P	Diptera	P, VO		Voss and Riefner (1983)
<i>Platanthera praeclara</i> Sheviak & M. L. Bowles	E	S	None	P	<i>Hyles gallii</i> (Rottenburg) and <i>Sphinx drupiferarum</i> J. E. Smith	Westwood and Borkowsky (2004)
<i>Platanthera stricta</i> Lindl.	X	G, Pr	<i>Bombus</i> spp.; various Empididae (Diptera)	P, VO	<i>Eustroma fasciata</i> B. and McD. (Geometridae) and a previously undescribed <i>Greya</i> sp. (Prodoxidae)	Patt <i>et al.</i> (1989)

<i>Prescottia plantaginea</i> Lindl.	N	P	None	VO		Singer and Sazima (2001)
<i>Prescottia stachyodes</i> (Sw.) Lindl.	N	P	None	VO		Singer and Sazima (2001)
<i>Pseudorchis albida</i> (L.) Á. Löve & D. Löve	N	Pt, P	None	P, VO		Jersáková <i>et al.</i> (2011)
<i>Rangaeris amaniensis</i> (Kraenzl.) Summerh.	E	S	None	VO		Martins and Johnson (2007, 2013)
<i>Satyrium hallackii</i> subsp. <i>ocellatum</i> (Bolus) A. V. Hall	X	S	Long-tongued Diptera	P, VO	A short-spurred form, <i>S. hallackii</i> subsp. <i>hallackii</i> , is primarily pollinated by bees (Hymenoptera)	Johnson (1997)
<i>Satyrium longicauda</i> Lindl. (Orchidaceae)	X	N, S	None	VO		Jersáková and Johnson (2007), Johnson <i>et al.</i> (2009)
<i>Sauroglossum nitidum</i> (Vell.) Schltr.	U	N	None	VO		Singer (2002)

	<i>Tipularia discolor</i> (Pursh) Nutt.	N	N	None	VO	<i>Mythimna unipuncta</i> Haworth	Whigham and McWethy (1980)
	Various Angraecinae	E	S	–	P	Various Sphingidae were flower visitors of the study species, but only <i>Panogena</i> <i>lingens</i> was found to carry pollen	Nilsson <i>et al.</i> (1987)
Orobanchaceae	<i>Cycnium</i> <i>ajugifolium</i> Engl.	E	S	–	VO		Martins and Johnson (2013)
	<i>Cycnium</i> <i>tubulosum</i> (L.f.) Engl.	E	S	–	VO		Martins and Johnson (2013)
Passifloraceae	<i>Passiflora</i> <i>capsularis</i> L.	X	X	–	I		Koschnitzke and Sazima (1997)
	<i>Passiflora</i> <i>mooreana</i> Hook. f.	E	S	Various Hymenoptera	I, VO	<i>Erinnyis ello</i>	Garcia and Hoc (1998)
Phrymaceae	<i>Mimulus</i> <i>aurantiacus</i> Curtis	X	S	Trochilidae	VO	Yellow-flowered inland race of <i>M.</i> <i>aurantiacus</i> appears to be evolved to promote moth pollination by <i>Hyles</i>	Streisfeld and Kohn (2007)

<i>lineata</i>							
Phyllanthaceae	<i>Breynia fruticosa</i> (L.) Müll.Arg.	X	Gr	None	VO		Kato <i>et al.</i> (2008)
	<i>Glochidion caledonicum</i> Müll.Arg.	X	Gr	None	VO		Kato and Kawakita (2004)
	<i>Glochidion rubrum</i> Blume	X	Gr	None	VO		Kato <i>et al.</i> (2008)
	<i>Phyllanthus aeneus</i> Baill.	X	Gr	None	VO		Kato and Kawakita (2004)
	<i>Phyllanthus bourgeoisie</i> Baill.	X	Gr	None	VO		Kato and Kawakita (2004)
	<i>Phyllanthus cochinchinensis</i> Spreng.	O	Ge	None	P, VO	Obligate pollinating seed parasite mutualism	Luo <i>et al.</i> (2011)
	<i>Phyllanthus mangelotii</i> M.Schmid	X	Gr	None	VO		Kato and Kawakita (2004)
	<i>Phyllanthus</i>	X	Gr	None	VO		Kato <i>et al.</i> (2008)

	<i>reticulates</i> Poir.						
	<i>Phyllanthus rheophyticus</i> M. G. Gilbert & P. T. Li	O	Ge	None	P, VO	Obligate pollinating seed parasite mutualism	Luo <i>et al.</i> (2011)
	<i>Phyllanthus tritepalus</i> M.Schmid	X	Gr	None	VO		Kato and Kawakita (2004)
Plantaginaceae	<i>Plantago</i> spp.	U	X	–	P, VO		Banza (2011)
Polemoniaceae	<i>Navarretia brandegeei</i> (A. Gray) Kuntze	E	S	<i>Selasphorus platycercus</i> Swainson (Trochilidae)	P, VR	<i>Hyles lineata</i> and <i>H. gallii</i>	Kulbaba and Worley (2012)
Polygonaceae	<i>Eriogonum tomentosum</i> Michx.	U	X	–	P, VO		Atwater (2013)
Primulaceae	<i>Anagallis arvensis</i> L.	U	X	–	P, VO		Banza (2011)
	<i>Primula vulgaris</i> Huds.	U	X	None	E	Pollination by a moth community demonstrated but which species were	Boyd <i>et al.</i> (1990)

						involved was not established	
Proteaceae	<i>Grevillea exul</i> Lindl.	X	S, X	Coleoptera	VO		Kato and Kawakita (2004)
	<i>Roupala Montana</i> Aubl.	U	X	None	I, VO	Not Sphingidae	Oliveira <i>et al.</i> (2004), Martins and Batalha (2006)
Ranunculaceae	<i>Aquilegia caerulea</i> E. James	E	S	<i>Bombus</i> spp.	P, VO	<i>Hyles lineata</i>	Miller (1978)
	<i>Aquilegia chrysantha</i> A. Gray	E	S	None	P, VO	<i>Eumorpha achemon</i> Drury appears to be the most important pollinator. Other species of Sphingidae, including <i>Sphinx chersis</i> Hübner and <i>S. asella</i> Rothschild & Jordan, may also contribute	Miller (1985)
	<i>Aquilegia pubescens</i> Coville	I	S	Various Hymenoptera and Trochilidae	VO		Fulton and Hodges (1999)
	<i>Delphinium leroyi</i> Franch. ex Huth	E	S	None	P, VO	<i>Hippotion celerio</i> L. and possibly other Sphingidae	Johnson (2001)

	<i>Nigella damascena</i> L.	U	X	–	P, VO		Banza (2011)
Rhamnaceae	<i>Colubrina asiatica</i> (L.) Brongn.	X	X	Neuroptera, Coleoptera, Hymenoptera, Diptera	VO		Kato and Kawakita (2004)
Rosaceae	<i>Prunus</i> spp.	U	X	–	P, VO		Banza (2011)
	<i>Rubus chamaemorus</i> L.	N	X	Various Hymenoptera and Diptera	E	Nocturnal visitors, possibly moths, were capable pollinators, but less effective than diurnal pollinators	Pelletier <i>et al.</i> (2001)
Rubiaceae	<i>Alibertia edulis</i> (Rich.) A.Rich. ex DC.	U	X	None	I, VO	Not Sphingidae	Oliveira <i>et al.</i> (2004)
	<i>Catunaregam spinosa</i> (Thunb.) Tirveng.	X	S	Diurnal Lepidoptera, Hymenoptera, Coleoptera	VO		Kato <i>et al.</i> (2008)
	<i>Chomelia ribesioides</i> Benth. ex A.Gray	U	X	–	I		Martins and Batalha (2006)

<i>Conostomium quadrangulare</i> (Rendle) Cufod.	E	S	–	VO		Martins and Johnson (2013)
<i>Faramea hyacinthina</i> Mart.	U	N, S	Various Hymenoptera	VO		Maruyama <i>et al.</i> (2010)
<i>Ferdinandusa elliptica</i> Pohl.	U	S	None	I, VO		Oliveira <i>et al.</i> (2004)
<i>Meyna pubescens</i> (Kurz) Robyns	X	S	Diurnal Lepidoptera, Hymenoptera	VO		Kato <i>et al.</i> (2008)
<i>Mitragyna rotundifolia</i> (Roxb.) Kuntze	X	Ct	Hymenoptera, diurnal Lepidoptera, Hemiptera, Coleoptera	VO		Kato <i>et al.</i> (2008)
<i>Morinda citrifolia</i> L.	X	S	None	VO		Kato and Kawakita (2004)
<i>Ophiorrhiza grandiflora</i> Wight	X	S	None	C, VO		Devy and Davidar (2003, 2006)
<i>Oxyanthus pyriformis</i> subsp. <i>pyriformis</i> (Hochst.) Skeels	E	S	None	P, VO	<i>Coelonia mauritii</i> Butler, <i>Nephele accentifera</i> de Beauvois, and possibly others	Johnson (2004)

	<i>Palicourea faxlucens</i> (Lorence & Dwyer)	X	S	None	U	Pérez-Nasser <i>et al.</i> (1993)
	<i>Pavetta abyssinica</i> Fresen.	E	S	–	VO	Martins and Johnson (2013)
	<i>Pentanisia ouranogyne</i> S.Moore	E	S	–	VO	Martins and Johnson (2013)
	<i>Sherardia arvensis</i> L.	U	X	–	P, VO	Banza (2011)
	<i>Tocoyena formosa</i> (Cham. & Schltdl.) K.Schum.	U	S	None	I, VO	Oliveira <i>et al.</i> (2004), Martins and Batalha (2006)
Rutaceae	<i>Galipea jasminiflora</i> (A. St.-Hil.) Engl.	X	G	Diurnal Lepidoptera	VO	Piedade and Ranga (1993)
Santalaceae	<i>Exocarpos neocaledonicus</i> Schltr. & Pilg.	X	X	Neuroptera	VO	Kato and Kawakita (2004)
	<i>Exocarpos phyllanthoides</i>	X	X	None	VO	Kato and Kawakita (2004)

Endl.							
Sapotaceae	<i>Pouteria ramiflora</i> (Mart.) Radlk.	U	X	—	I		Martins and Batalha (2006)
	<i>Pouteria torta</i> (Mart.) Radlk.	U	X	—	I		Martins and Batalha (2006)
Saxifragaceae	<i>Heuchera cylindrica</i> Douglas	O	Pr	—	E, P, VO	<i>Greya enchrysa</i> Davis & Pellmyr. Pollinating seed parasite mutualism	Pellmyr <i>et al.</i> (1996)
	<i>Lithophragma</i> <i>parviflorum</i> (Hook.) Nutt.	O	Pr	—	E, VO	<i>Greya politella</i> Walsingham. Pollinating seed parasite mutualism	Thompson and Pellmyr (1992)
	<i>Mitella</i> <i>stauropetala</i> Piper	O	Pr	—	E, P, VO	<i>Greya mitellae</i> Davis & Pellmyr. Pollinating seed parasite mutualism	Pellmyr <i>et al.</i> (1996)
Scrophulariaceae	<i>Bellardia trixago</i> All.	U	X	—	P, VO		Banza (2011)

	<i>Buddleja davidii</i> Franch.	U	G, N, P, T	Various, including butterflies (Lepidoptera) and <i>Apis mellifera</i>	VT		Guédot <i>et al.</i> (2008)
Solanaceae	<i>Datura ferox</i> L.	N	S	Various Coleoptera, <i>Apis mellifera</i>	VO		Torres <i>et al.</i> (2013)
	<i>Datura innoxia</i> Mill.	E	S	None	VO	<i>Manduca sexta</i> , <i>M. quinquemaculata</i> , and <i>Hyles lineata</i>	Grant and Grant (1983b)
	<i>Datura stramonium</i> L.	E	S	–	VO		Martins and Johnson (2013)
	<i>Datura wrightii</i> Regel	I	S	None	P	<i>Manduca sexta</i> (Sphingidae)	Alarcón <i>et al.</i> (2008), Bronstein <i>et al.</i> (2009)
	<i>Nicotiana attenuata</i> Torr. ex S.Watson	E	S	–	VO		Grant (1983)
	<i>Petunia axillaris</i> (Lam.) Britton, Sterns & Poggenb.	N	S	None	VO	<i>Manduca</i> spp.	Ando <i>et al.</i> (2001)
Thymelaeaceae	<i>Aquilaria crassna</i> Pierre ex Lecomte	U	E, G, L, N, P, Th	Various Hymenoptera, Coleoptera and Diptera	P, VO	Moths (61 spp.) were the most species-rich and the most frequent flower	Tasen <i>et al.</i> (2009)

visitors						
<i>Diplomorpha ganpi</i> (Siebold & Zucc.) Nakai	O	E, G, N, P	Diurnal Lepidoptera	P, VO		Okamoto <i>et al.</i> (2008)
<i>Diplomorpha phymatoglossa</i> (Koidz.) Nakai	O	G, N, P	None	P, VO		Okamoto <i>et al.</i> (2008)
<i>Diplomorpha sikokiana</i> (Franch. & Sav.) Honda	O	G, N, No, P	Various Coleoptera, Diptera, Hymenoptera and diurnal Lepidoptera	P, VO		Okamoto <i>et al.</i> (2008)
<i>Diplomorpha trichotoma</i> (Thunb.) Nakai	O	G, P	Diptera	P, VO		Okamoto <i>et al.</i> (2008)
<i>Diplomorpha yakushimensis</i> (Makino) Masam.	O	G, P	None	P, VO		Okamoto <i>et al.</i> (2008)
<i>Struthiola ciliata</i> (L.) Lam.	O	N	None	P, VO	<i>Syngrapha circumflexa</i> L. and <i>Cucullia terensis</i> Felder and Rogenhofer	Makholela and Manning (2006)
<i>Wikstroemia indica</i> (L.) C.A. Mey.	X	X	None	VO		Kato and Kawakita (2004)

Urticaceae	<i>Urtica</i> spp.	U	X	—	P, VO		Banza (2011)
Verbenaceae	<i>Lantana camara</i> L.	E	S	None	VO		Kato and Kawakita (2004), Martins and Johnson (2013)
	<i>Lippia javanica</i> (Burm.f.) Spreng.	E	S	—	VO		Martins and Johnson (2013)
	<i>Lippia rosmarinifolia</i> Andersson	N	P, X	None	VO		Philipp <i>et al.</i> (2006)
Violaceae	<i>Viola cazorlensis</i> Gand.	X	S	None	VO	<i>Macroglossum stellatarum</i> L. (diurnal)	Herrera (1993)
Vochysiaceae	<i>Qualea grandiflora</i> Mart.	U	S	None	I, VO		Oliveira <i>et al.</i> (2004), Martins and Batalha (2006)
	<i>Salvertia convallariodora</i> A. St.-Hil.	X	S	None	I, VO	Primarily <i>Erinnyis ello</i>	Oliveira (1996), Oliveira <i>et al.</i> (2004)
	<i>Vochysia pyramidalis</i> Mart.	X	S	Various Hymenoptera	VO		Oliveira and Gibbs (1994)
	<i>Vochysia</i>	X	S	Various	VO		Oliveira and Gibbs

	<i>thyrsoidea</i> Pohl			Hymenoptera		(1994)
	<i>Vochysia tucanorum</i> Mart.	X	S	Various Hymenoptera	VO	Oliveira and Gibbs (1994)
Winteraceae	<i>Zygogynum baillonii</i> Tiegh.	X	M	None	VO	Kato and Kawakita (2004)
	<i>Zygogynum</i> spp.	X	M	None	U	<i>Sabatinca</i> spp. Thien <i>et al.</i> (1985)

Table S1.3: Examples of moths acting as pollinating seed parasites.

Plant family	Plant species	Moth species	Notes	Reference
Asparagaceae	<i>Yucca</i> spp.	<i>Tegeticula</i> spp. and <i>Parategeticula</i> spp. (Prodoxidae)	Obligate relationship	Pellmyr <i>et al.</i> (1996)
Cactaceae	<i>Lophocereus schottii</i> (Engelm.) Britton & Rose	<i>Upiga virescens</i> Hulst (Pyralidae)	<i>U. virescens</i> responsible for >90% of pollination in <i>L. schottii</i>	Fleming and Holland (1998), Holland and Fleming (1999)
Caryophyllaceae	<i>Dianthus sylvestris</i> Wulfen	<i>Hadena compta</i> Denis & Schiffermüller (Noctuidae)		Collin <i>et al.</i> (2002)
	<i>Silene dioica</i> (L.) Clairv.	<i>Perizoma affinitatum</i> Stephens (Geometridae)		Westerbergh (2004)
	<i>Silene</i> spp.	<i>Hadena</i> spp. (Noctuidae)		Kephart <i>et al.</i> (2006)
	<i>Silene stellata</i> (L.) W.T. Aiton	<i>Hadena ectypa</i> Morrison (Noctuidae)		Kula <i>et al.</i> (2013)
Phyllanthaceae	<i>Glochidion</i> spp.	<i>Epicephala</i> spp. (Gracillariidae)	Species-specific pollinating seed parasites exist for at least 3 species of <i>Glochidion</i> .	Kato <i>et al.</i> (2003), Hembry <i>et al.</i> (2013)

	<i>Phyllanthus cochinchinensis</i> Spreng.	Unknown <i>Deltaphora</i> sp. (Gelechiidae)	Luo <i>et al.</i> (2011)
	<i>Phyllanthus rheophyticus</i> M. G. Gilbert & P. T. Li	Unknown <i>Deltaphora</i> sp. (Gelechiidae)	Luo <i>et al.</i> (2011)
Saxifragaceae	<i>Heuchera cylindrica</i> Douglas	<i>Greya enchrysa</i> Davis & Pellmyr	Pellmyr <i>et al.</i> (1996)
	<i>Lithophragma parviflorum</i> (Hook.) Torr. & Gray	<i>Greya politella</i> Walsingham (Prodoxidae)	Thompson and Pellmyr (1992)
	<i>Mitella stauiopetala</i> Piper	<i>Greya mitellae</i> Davis & Pellmyr	Pellmyr <i>et al.</i> (1996)

Table S2: An examination of bias towards Sphingidae in studies of moth pollination (see Table S1.2). Studies are separated by presence or absence of a stated or implied prediction of pollination by Sphingidae (sphingophily) and by type of moth-pollination: sphingophily, phalaenophily, or both. Brackets indicate percentage of studies within the relevant prediction category. In column 2, ‘wider taxa’ includes any named group at a hierarchical level above species and below family.

Prediction of moth-pollination	No. studies	No. species or wider taxa	Studies finding Sphingidae only as pollinators (sphingophily)	Studies finding Sphingidae and other moths as pollinators	Studies finding other moths only as pollinators (phalaenophily) or unspecified
Explicit or implicit prediction of sphingophily	56	92	38 (67.8%)	15 (26.8%)	3 (5.4%)
Prediction of non-Sphingidae pollination, general/unspecified moth pollination or no explicit prediction	103	201	21 (20.4%)	29 (28.2%)	53 (51.4%)

Table S3: Studies of moths involved in pollination by family (see Table S1.2). In column 2, ‘wider taxa’ includes any named group at a hierarchical level above species and below family.

Family	No. species or wider taxa pollinated	No. plant families pollinated
Cosmopterigidae	1	1
Crambidae	1	1
Ctenuchidae	3	3
Erebidae	8	7
Gelechiidae	2	1
Geometridae	34	18
Glyphipterigidae	1	1
Gracillariidae	8	1
Lasiocampidae	2	2
Micropterigidae	2	1
Noctuidae	62	24
Nolidae	1	1
Prodoxidae	5	3
Pterophoridae	2	1
Pyrilidae	32	15
Saturniidae	1	1
Sesiidae	2	2
Sphingidae	154	34

Thyrididae	1	1
Tortricidae	3	3
Uranidae	3	2

Additional references (cited only in supplementary information)

1. Alarcón, R., Davidowitz, G. and Bronstein, J.L. (2008) Nectar usage in a southern Arizona hawkmoth community. *Ecological Entomology*, **33**, 503–509.
2. Alexandersson, R. and Johnson, S.D. (2002) Pollinator-mediated selection on flower-tube length in a hawkmoth-pollinated *Gladiolus* (Iridaceae). *Proceedings of the Royal Society B*, **269**, 631–636.
3. Alonso-Pedano, M. and Ortega-Baes, P. (2012) Generalized and complementary pollination system in the Andean cactus *Echinopsis schickendantzii*. *Plant Systematics and Evolution*, **298**, 1671–1677.
4. Amorim, F.W., Galetto, L. and Sazima, M. (2013) Beyond the pollination syndrome: nectar ecology and the role of diurnal and nocturnal pollinators in the reproductive success of *Inga sessilis* (Fabaceae). *Plant Biology*, **15**, 317–327.
5. Anderson, G.J. (1976) The pollination biology of *Tilia*. *American Journal of Botany*, **63**, 1203–1212.
6. Ando, T., Nomura, M., Tsukahara, J., Watanabe, H., Kokubun, H., Tsukamoto, T., Hashimoto, G., Marchesi, E. and Kitching, I.J. (2001) Reproductive isolation in a native population of *Petunia sensu* Jussieu (Solanaceae). *Annals of Botany*, **88**, 403–413.
7. Arizaga, S., Ezcurra, E., Peters, E., de Arellano, F.R. and Vega, E. (2000a) Pollination ecology of *Agave macroacantha* (Agavaceae) in a Mexican tropical desert. I. Floral biology and pollination mechanisms. *American Journal of Botany*, **87**, 1004–1010.
8. Arizaga, S., Ezcurra, E., Peters, E., de Arellano, F.R. and Vega, E. (2000b) Pollination ecology of *Agave macroacantha* (Agavaceae) in a Mexican tropical desert. II. The role of pollinators. *American Journal of Botany*, **87**, 1011–1017.
9. Atwater, M.M. (2013) Diversity and nectar hosts of flower-settling moths within a Florida sandhill ecosystem. *Journal of Natural History*, doi: 10.1080/00222933.2013.791944.
10. Barthlott, W., Porembski, S., Kluge, M., Hopke, J. and Schmidt, L. (1997) *Selenicereus wittii* (Cactaceae): an epiphyte adapted to Amazonian Igapó inundation forests. *Plant Systematics and Evolution*, **206**, 175–185.
11. Bowles, M.L. (1983) The tallgrass prairie orchids *Platanthera leucophaea* (Nutt.) Lindl. and *Cypripedium candidum* Muhl. ex Willd.: some aspects of their status, biology, and ecology, and implications toward management. *Natural Areas Journal*, **3**, 14–37.
12. Boyd, A.E. (2004) Breeding system of *Macromeria viridiflora* (Boraginaceae) and geographic variation in pollinator assemblages. *American Journal of Botany*, **91**, 1809–1813.
13. Boyd, M., Silvertown, J. and Tucker, C. (1990) Population ecology of heterostyle and homostyle *Primula vulgaris*: growth, survival and reproduction in field populations. *Journal of Ecology*, **78**, 799–813.
14. Brantjes, N.B.M. and Bos, J.J. (1980) Hawkmoth behaviour and flower adaptation reducing self pollination in two Liliiflorae. *New Phytologist*, **84**, 139–143.
15. Bronstein, J.L., Huxman, T., Horvath, B., Farabee, M. and Davidowitz, G. (2009) Reproductive biology of *Datura wrightii*: the benefits of a herbivorous pollinator. *Annals of Botany*, **103**, 1435–1443.
16. Clinebell, R.R.I., Crowe, A., Gregory, D.P. & Hoch, P.C. (2004) Pollination ecology of *Gaura* and *Calylophus* (Onagraceae, tribe Onagreae) in western Texas, U.S.A. *Annals of the Missouri Botanical Garden*, **91**, 369–400.
17. Cocucci, A.A., Galetto, L. and Sersic A. (1992) The floral syndrome of *Caesalpinia gilliesii* (Fabaceae – Caesalpinioideae). *Darwiniana*, **31**, 111–135.
18. Collin, C.L., Pennings, P.S., Rueffler, C., Widmer, A. & Shykoff, J.A. (2002) Natural enemies and sex: how seed predators and pathogens contribute to sex-differential reproductive success in a gynodioecious plant. *Oecologia*, **131**, 94–102.
19. Cutler, G.C., Reeh, K.W., Sproule, J.M. & Ramanaidu, K. (2012) Berry unexpected: Nocturnal pollination of lowbush blueberry. *Canadian Journal of Plant Science*, **92**, 707–711.
20. Devy, M.S. and Davidar P. (2003) Pollination systems of trees in Kakachi, a mid-elevation wet evergreen forest in Western Ghats, India. *American Journal of Botany*, **90**, 650–657.

21. Devy, M.S. and Davidar P. (2006) Breeding systems and pollination modes of understorey shrubs in a medium elevation wet evergreen forest, southern Western Ghats, India. *Current Science*, **90**, 838–842.
22. Eisikowitch, D. and Galil, J. (1971) Effect of wind on the pollination of *Pancratium maritimum* L. (Amaryllidaceae) by hawkmoths (Lepidoptera: Sphingidae). *Journal of Animal Ecology*, **40**, 673–678.
23. Erhardt, A. (1990) Pollination of *Dianthus gratianopolitanus* (Caryophyllaceae). *Plant Systematics and Evolution*, **170**, 125–132.
24. Erhardt, A. (1991) Pollination of *Dianthus superbus* L. *Flora* **185**, 99–106.
25. Fagua, J.C. and Gonzalez, V.H. (2007) Growth rates, reproductive phenology, and pollination ecology of *Espeletia grandiflora* (Asteraceae), a giant Andean caulescent rosette. *Plant Biology*, **9**, 127–135.
26. Fleming, T.H. & Holland, J.N. (1998) The evolution of obligate pollination mutualisms: senita cactus and senita moth. *Oecologia*, **114**, 368–375.
27. Frame, D. and Durou, S. (2001) Morphology and biology of *Napoleonaea vogelii* (Lecythidaceae) flowers in relation to the natural history of insect visitors. *Biotropica*, **33**, 458–471.
28. Fulton, M. & Hodges, S.A. (1999) Floral isolation between *Aquilegia formosa* and *Aquilegia pubescens*. *Proceedings of the Royal Society B*, **266**, 2247–2252.
29. Garcia, M.T.A. and Hoc, P.S. (1998) Floral biology and reproductive system of *Passiflora mooreana* (Passifloraceae). *Darwiniana*, **35**, 9–27.
30. Gentry, A.H. (1990) *Sphingiphila* (Bignoniaceae), a new genus from the Paraguayan Chaco. *Systematic Biology*, **15**, 277–279.
31. Ghazoul, J. (1997) The pollination and breeding system of *Dipterocarpus obtusifolius* (Dipterocarpaceae) in dry deciduous forests of Thailand. *Journal of Natural History*, **31**, 901–916.
32. Goldblatt, P. & Manning, J.C. (2002) Evidence for moth and butterfly pollination in *Gladiolus* (Iridaceae – Crocoideae). *Annals of the Missouri Botanical Garden*, **89**, 110–124.
33. Goldblatt, P. and Manning, J.C. (2006) Radiation of pollination systems in the Iridaceae of sub-Saharan Africa. *Annals of Botany*, **97**, 317–344.
34. Graham, S.P. (2010) Visitors to southeastern hawkmoth flowers. *Southeastern Naturalist*, **9**, 413–426.
35. Grant, V. (1983) The systematic and geographical distribution of hawkmoth flowers in the temperate North American flora. *Botanical Gazette*, **144**, 439–449.
36. Grant, V. & Grant, K.A. (1983a) Hawkmoth pollination of *Mirabilis longiflora* (Nyctaginaceae). *Proceedings of the National Academy of Sciences*, **80**, 1298–1299.
37. Grant, V. & Grant, K.A. (1983b) Behavior of hawkmoths on flowers of *Datura meteloides*. *Botanical Gazette*, **144**, 280–284.
38. Gribel, R. and Hay, J.D. (1993) Pollination ecology of *Caryocar brasiliense* (Caryocaraceae) in central Brazil cerrado vegetation. *Journal of Tropical Ecology*, **9**, 199–211.
39. Groman, J.D. and Pellmyr, O. (1999) The pollination biology of *Manfreda virginica* (Agavaceae): relative contribution of diurnal and nocturnal visitors. *Oikos*, **87**, 373–381.
40. Guédot, C., Landolt, P.J. & Smithhisler, C.L. (2008) Odorants of the flowers of butterfly bush, *Buddleja davidii*, as possible attractants of pest species of moths. *Florida Entomologist*, **91**, 576–582.
41. Haber, W.A. and Frankie, G.W. (1982) Pollination of *Leuhea* (Tiliaceae) in Costa Rican deciduous forest. *Ecology*, **63**, 1740–1750.
42. Haber, W.A. & Frankie, G.W. (1989) A tropical hawkmoth community: Costa Rican dry forest Sphingidae. *Biotropica*, **21**, 155–172.
43. Harrison, R.D., Nagamitsu, T., Momose, K. and Inoue, T. (2005) Flowering phenology and pollination of *Dipterocarpus* (Dipterocarpaceae) in Borneo. *Malayan Nature Journal*, **57**, 67–80.
44. Hembry, D.H., Kawakita, A., Gurr, N.E., Schmaedick, M.A., Baldwin, B.G. and Gillespie, R.G. (2013) Non-congruent colonizations and diversification in a coevolving pollination mutualism on oceanic islands. *Proceedings of the Royal Society B*, **280**, 20130361.

45. Hernández, H.M. (1989) Systematics of *Zapoteca* (Leguminosae). *Annals of Missouri Botanical Garden*, **76**, 781–862.
46. Herrera, C.M. (1993) Selection on floral morphology and environmental determinants of fecundity in a hawk moth-pollinated violet. *Ecological Monographs*, **63**, 251–275.
47. Hobbhahn, N., Küchmeister, H., and Porembski, S. (2006) Pollination biology of mass flowering terrestrial *Utricularia* species (Lentibulariaceae) in the Indian Western Ghats. *Plant Biology*, **8**, 791–804.
48. Hodges, S.A. (1995) The influence of nectar production on hawkmoth behaviour, self pollination, and seed production in *Mirabilis multiflora* (Nyctaginaceae). *American Journal of Botany*, **82**, 197–204.
49. Hokche, O. and Ramirez, N. (1990) Pollination ecology of seven species of *Bauhinia* L. (Leguminosae: Caesalpinioideae). *Annals of the Missouri Botanical Garden*, **77**, 559–572.
50. Holland, J.N. & Fleming, T.H. (1999) Mutualistic interactions between *Upiga virescens* (Pyralidae), a pollinating seed-consumer, and *Lophocereus schottii* (Cactaceae). *Ecology*, **80**, 2074–2084.
51. Holmes, D.S. (2005) Sexual reproduction in British populations of *Adoxa moschatellina* L. *Watsonia*, **25**, 265–273.
52. Hopper, S.D. (1980) Pollination of the rain-forest tree *Syzygium tierneyanum* (Myrtaceae) at Kuranda, Northern Queensland. *Australian Journal of Botany*, **28**, 223–237.
53. Howell, G. and Prakash, N. (1990) Embryology and reproductive ecology of the Darling Lily, *Crinum flaccidum* Herbert. *Australian Journal of Botany*, **38**, 433–444.
54. Huber, F.K., Kaiser, R., Sauter, W. and Schiestl, F.P. (2005) Floral scent emission and pollinator attraction in two species of *Gymnadenia* (Orchidaceae). *Oecologia*, **142**, 564–575.
55. Inoue, K. (1986) Different effects of sphingid and noctuid moths on the fecundity of *Platanthera metabifolia* (Orchidaceae) in Hokkaido. *Ecological Research*, **1**, 25–36.
56. Jennersten, O. (1988) Pollination of *Viscaria vulgaris* (Caryophyllaceae): the contributions of diurnal and nocturnal insects to seed set and seed predation. *Oikos*, **52**, 319–327.
57. Jersáková, J. and Johnson, S.D. (2007) Protandry promotes male pollination success in a moth-pollinated orchid. *Functional Ecology*, **21**, 496–504.
58. Jersáková, J., Malinová, T., Jeřábková, K. and Dötterl, S. (2011) Biological flora of the British Isles: *Pseudorchis albida* (L.) Á. & D. Löve. *Journal of Ecology*, **99**, 1282–1298.
59. Johnson, S.D. (1995a) Observations of hawkmoth pollination in the South African orchid *Disa cooperi*. *Nordic Journal of Botany*, **15**, 121–125.
60. Johnson, S.D. (1995b) Moth pollination of the cryptic cape orchid *Monadenia ophrydea*. *Flora*, **190**, 105–108.
61. Johnson, S.D. (1997) Pollination ecotypes of *Satyrium hallackii* (Orchidaceae) in South Africa. *Botanical Journal of the Linnean Society*, **123**, 225–235.
62. Johnson, S.D. (2001) Hawkmoth pollination and hybridization in *Delphinium leroyi* (Ranunculaceae) on the Nyika Plateau, Malawi. *Nordic Journal of Botany*, **21**, 599–605.
63. Johnson, S.D. (2004) An overview of plant-pollinator relationships in southern Africa. *International Journal of Tropical Insect Science*, **24**, 45–54.
64. Johnson, S.D. and Liltved, W.R. (1997) Hawkmoth pollination of *Bonatea speciosa* (Orchidaceae) in a South African coastal forest. *Nordic Journal of Botany*, **17**, 5–10.
65. Johnson, S.D., Ellis, A., Carrick, P., Swift, A., Horner, N., Vanrensburg, S.J. and Bond, W.J. (1993) Moth pollination and rhythms of advertisement and reward in *Crassula fascicularis* (Crassulaceae). *South African Journal of Botany*, **59**, 511–513.
66. Johnson, S.D., Törniger, E. and Agren, J. (2009) Relationships between population size and pollen fates in a moth-pollinated orchid. *Biology Letters*, **5**, 282–285.
67. Kato, M., Takimura, A. & Kawakita, A. (2003) An obligate pollination mutualism and reciprocal diversification in the tree genus *Glochidion* (Euphorbiaceae). *Proceedings of the National Academy of Sciences*, **100**, 5264–5267.

68. Kato, M., Kosaka, Y., Kawakita, A., Okuyama, Y., Kobayashi, C., Phimminith, T. & Thongphan, D. (2008) Plant-pollinator interactions in tropical monsoon forests in Southeast Asia. *American Journal of Botany*, **95**, 1375–1394.
69. Kephart, S., Reynolds, R.J., Rutter, M.T., Fenster, C.B. & Dudash, M.R. (2006) Pollination and seed predation by moths on *Silene* and allied Caryophyllaceae: evaluating a model system to study the evolution of mutualisms. *New Phytologist*, **169**, 667–680.
70. Knudsen, J.T. and Klitgaard, B.B. (1998) Floral scent and pollination in *Browneopsis disepala* (Leguminosae: Caesalpinioideae) in western Ecuador. *Brittonia*, **50**, 174–182.
71. Koptur, S. (1983) Flowering phenology and floral biology of *Inga* (Fabaceae: Mimosoideae). *Systematic Botany*, **8**, 354–368.
72. Koschnitzke, C. and Sazima, M. (1997) Floral biology of five species of *Passiflora* L. (Passifloraceae) in a semideciduous forest. *Revista Brasileira de Botanica*, **20**, 119–126.
73. Kula, A.A.R., Dudash, M.R. and Fenster, C.B. (2013) Choices and consequences of oviposition by a pollinating seed predator, *Hadena ectypa* (Noctuidae), on its host plant, *Silene stellata* (Caryophyllaceae). *American Journal of Botany*, **100**, 1148–1154.
74. Kulbaba, M.W. and Worley, A.C. (2012) Selection on floral design in *Polemonium brandegeei* (Polemoniaceae): female and male fitness under hawkmoth pollination. *Evolution*, **66**, 1344–1359.
75. Lin, S. and Bernardello, G. (1999) Flower structure and reproductive biology in *Aspidosperma quebracho-blanco* (Apocynaceae), a tree pollinated by deceit. *International Journal of Plant Sciences*, **160**, 869–878.
76. Little, K.J., Dieringer, G. and Romano, M. (2005) Pollination ecology, genetic diversity and selection on nectar spur length in *Platanthera lacera* (Orchidaceae). *Plant Species Biology*, **20**, 183–190.
77. Luo, S., Li, Y., Chen, S., Zhang, D. & Renner, S.S. (2011) Gelechiidae moths are capable of chemically dissolving the pollen of their host plants: First documented sporopollenin breakdown by an animal. *PLOS ONE*, **6**, e19219.
78. Luyt, R. and Johnson, S.D. (2001) Hawkmoth pollination of the African epiphytic orchid *Mystacidium venosum*, with special reference to flower and pollen longevity. *Plant Systematics and Evolution*, **228**, 49–62.
79. Makholela, T. & Manning, J.C. (2006) First report of moth pollination in *Struthiola ciliata* (Thymelaeaceae) in southern Africa. *South African Journal of Botany*, **72**, 597–603.
80. Manning, P. and Cutler, G.C. (2013) Potential nocturnal insect pollinators of lowbush blueberry. *Journal of the Acadian Entomological Society*, **9**, 1–3.
81. Manning, J.C., Goldblatt, P., Parker, E. and Kaiser, R. (2012) First record of pollination in the Afro-Eurasian *Dipcadi* Medik. (Hyacinthaceae): pollination of *D. brevifolium* by the owlet moth *Syngrapha circumflexa* (Noctuidae). *South African Journal of Botany*, **81**, 15–18.
82. Martén-Rodríguez, S., Almarales-Castro, A. & Fenster, C.B. (2009) Evaluation of pollination syndromes in Antillean Gesneriaceae: evidence for bat, hummingbird and generalized flowers. *Journal of Ecology*, **97**, 348–359.
83. Martinez del Rio, C. & Burquez, A. (1986) Nectar production and temperature dependent pollination in *Mirabilis jalapa* L. *Biotropica*, **18**, 28–31.
84. Martins, F.Q. and Batalha, M.A. (2006) Pollination systems and floral traits in cerrado woody species of the Upper Taquari region (central Brazil). *Brazilian Journal of Biology*, **66**, 543–552.
85. Martins, D.J. and Johnson, S.D. (2007) Hawkmoth pollination of aerangoid orchids in Kenya, with special reference to nectar sugar concentration gradients in the floral spurs. *American Journal of Botany*, **94**, 650–659.
86. Martins, D.J. and Johnson, S.D. (2013) Interactions between hawkmoths and flowering plants in East Africa: polyphagy and evolutionary specialization in an ecological context. *Biological Journal of the Linnean Society*, **110**, 199–213.

87. Maruyama, P.K., Amorim, F.W. and Oliveira P.E. (2010) Night and day service: distyly and mixed pollination system in *Faramea cyanea* (Rubiaceae). *Flora*, **205**, 818–824.
88. McMullen, C.K. (2007) Pollination biology of the Galápagos endemic, *Tournefortia rufo-sericea* (Boraginaceae). *Botanical Journal of the Linnean Society*, **153**, 21–31.
89. McMullen, C.K. (2009) Pollination biology of a night-flowering Galápagos endemic, *Ipomoea habeliana* (Convolvulaceae). *Botanical Journal of the Linnean Society*, **160**, 11–20.
90. McNeill, J. (1977) The biology of Canadian weeds. 25. *Silene alba* (Miller) E. H. L. Krause. *Canadian Journal of Plant Science*, **57**, 1103–1114.
91. Miller, R.B. (1978) The pollination ecology of *Aquilegia elegantula* and *A. caerulea* (Ranunculaceae) in Colorado. *American Journal of Botany*, **65**, 406–414.
92. Miller, R.B. (1985) Hawkmoth pollination of *Aquilegia chrysantha* (Ranunculaceae) in southern Arizona. *The Southwestern Naturalist*, **30**, 69–76.
93. Moody-Weis, J.M. and Heywood, J.S. (2001) Pollination limitation to reproductive success in the Missouri evening primrose, *Oenothera macrocarpa* (Onagraceae). *American Journal of Botany*, **88**, 1615–1622.
94. Moré, M., Sérsic, A.N. & Cocucci, A.A. (2006) Specialized use of pollen vectors by *Caesalpinia gilliesii*, a legume species with brush-type flowers. *Biological Journal of the Linnean Society*, **88**, 579–592.
95. Moré, M., Sérsic, A.N. & Cocucci, A.A. (2007) Restriction of pollinator assemblage through flower length and width in three long-tongued hawkmoth-pollinated species of *Mandevilla* (Apocynaceae, Apocynoideae). *Annals of the Missouri Botanical Garden*, **94**, 485–504.
96. Morimoto, Y., Gikungu, M. and Maundu, P. (2004) Pollinators of the bottle gourd (*Lagenaria siceraria*) observed in Kenya. *International Journal of Tropical Insect Science*, **24**, 79–86.
97. Morinaga, S.I., Kumano, Y., Ota, A., Yamaoka, R. and Sakai, S. (2009) Day-night fluctuations in floral scent and their effects on reproductive success in *Lilium auratum*. *Population Ecology*, **51**, 187–195.
98. Neto, H.F.P. (2013) Floral biology and breeding system of *Bauhinia forficata* (Leguminosae: Caesalpinioideae), a moth-pollinated tree in southeastern Brazil. *Brazilian Journal of Botany*, **36**, 55–64.
99. Nilsson, L.A. (1983) Processes of isolation and introgressive interplay between *Platanthera bifolia* (L.) Rich and *P. chlorantha* (Custer) Reichb. (Orchidaceae). *Botanical Journal of the Linnean Society*, **87**, 325–350.
100. Nilsson, L.A. and Jonsson, L. (1985) The pollination specialization of *Habenaria decaryana* H. Perr. (Orchidaceae) in Madagascar. *Bulletin du Museum National d'Histoire Naturelle. Section B: Adansonia, Botanique, Phytochimie*, **7**, 161–166.
101. Nilsson, L.A. and Rabakonandrianina, E. (1988) Hawk-moth scale analysis and pollination specialization in the epilithic Malagasy endemic *Aerangis ellisii* (Reichenb. fil.) Schltr. (Orchidaceae). *Botanical Journal of the Linnean Society*, **97**, 49–61.
102. Nilsson, L.A., Jonsson, L., Rason, L. and Randrianjohany, E. (1985) Monophily and pollination mechanisms in *Angraecum arachnites* Schltr. (Orchidaceae) in a guild of long-tongued hawk-moths (Sphingidae) in Madagascar. *Biological Journal of the Linnean Society*, **26**, 1–19.
103. Nilsson, L.A., Johnsson, L., Ralison, L. & Randrianjohany, E. (1987) Angraecoid orchids and hawkmoths in central Madagascar: specialized pollination systems and generalist foragers. *Biotropica*, **19**, 310–318.
104. Norman, J.K., Weller, S.G. and Sakai, A.K. (1997) Pollination biology and outcrossing rates in hermaphroditic *Schiedea lydgatei* (Caryophyllaceae). *American Journal of Botany*, **84**, 641–648.
105. Okamoto, T., Kawakita, A. & Kato, M. (2008) Floral adaptations to nocturnal moth pollination in *Diplomorpha* (Thymelaeaceae). *Plant Species Biology*, **23**, 192–201.
106. Oliveira, P.E. (1996) Floral biology of *Salvertia convallariodora* (Vochysiaceae): a hawk moth pollinated species of Brazilian cerrado vegetation. *Revista Brasileira de Botanica*, **19**, 49–53.

- 107.Oliveira, P.E. and Gibbs, P.E. (1994) Pollination biology and breeding systems of six *Vochysia* species (Vochysiaceae) in Central Brazil. *Journal of Tropical Ecology*, **10**, 509–522.
- 108.Oliveira, P.E., Gibbs, P.E. & Barbosa, A.A. (2004) Moth pollination of woody species in the Cerrados of Central Brazil: a case of so much owed to so few? *Plant Systematics and Evolution*, **245**, 41–54.
- 109.Ortega-Baes, P., Saravia, M., Suhring, S., Godinez-Alvarez, H. and Zamar, M. (2011) Reproductive biology of *Echinopsis terscheckii* (Cactaceae): the role of nocturnal and diurnal pollinators. *Plant Biology*, **13**, 33–40.
- 110.Patt, J.M., Merchant, M.W., Williams, D.R.E. & Meeuse, B.J.D. (1989) Pollination biology of *Platanthera stricta* (Orchidaceae) in Olympic National Park, Washington. *American Journal of Botany*, **76**, 1097–1106.
- 111.Pedron, M., Buzatto, C.R., Singer, R.B., Batista, J.A.N. and Moser, A. (2012) Pollination biology of four sympatric species of *Habenaria* (Orchidaeeae: Orchidinae) from southern Brazil. *Botanical Journal of the Linnean Society*, **170**, 141–156.
- 112.Pelletier, L., Brown, A., Otrysko, B. & McNeil, J.N. (2001) Entomophily of the cloudberry (*Rubus chamaemorus*). *Entomologia Experimentalis et Applicata*, **101**, 219–224.
- 113.Pellmyr, O., Thompson, J.N., Brown, J.M. & Harrison, R.G. (1996) Evolution of pollination and mutualism in the yucca moth lineage. *The American Naturalist*, **148**, 827–847.
- 114.Pérez-Barrales, R., Arroyo, J. and Armbruster, W.S. (2007) Differences in pollinator faunas may generate geographic differences in floral morphology and integration in *Narcissus papyraceus* (Amaryllidaceae). *Oikos*, **116**, 1904–1918.
- 115.Pérez-Nasser, N., Eguiarte, L.E. and Pinero, D. (1993) Mating system and genetic structure of the distylous tropical tree *Psychotria faxlucens* (Rubiaceae). *American Journal of Botany*, **80**, 45–52.
- 116.Perkins, G., Estes, J.R. and Thorp, R.W. (1975) Pollination of *Cnidoscolus texanus* (Euphorbiaceae) in south-central Oklahoma. *The Southwestern Naturalist*, **20**, 391–396.
- 117.Pettersson, M.W. (1991) Pollination by a guild of fluctuating moth populations: option for unspecialization in *Silene vulgaris*. *Journal of Ecology*, **79**, 591–604.
- 118.Piedade, L.H. and Ranga, N.T. (1993) The pollination ecology of *Galipea jasminiflora* Engler (Rutaceae). *Revista Brasileira de Botanica*, **16**, 151–157.
- 119.Piratelli, A.J., Pina-Rodrigues, F.C.M., Gandara, F.B., Santos, E.M.G. and Costa, L.G.S. (1998) Pollination biology of *Jacaratia spinosa* (Aubl) ADC. (Caricaceae) in a residual forest in southwest Brazil. *Revista Brasileira de Biologia*, **58**, 671–679.
- 120.Pool, A. (2008) A review of the genus *Pyrostegia* (Bignoniaceae). *Annals of the Missouri Botanical Garden*, **95**, 495–510.
- 121.Rodger, J.G., van Kleunen, M. and Johnson, S.D. (2010) Does specialized pollination impede plant invasions? *International Journal of Plant Sciences*, **171**, 382–391.
- 122.Saunders, N.E. and Sipes, S.D. (2006) Reproductive biology and pollination ecology of the rare Yellowstone Park endemic *Abronia ammophila* (Nyctaginaceae). *Plant Species Biology*, **21**, 75–84.
- 123.Schlumpberger, B.O., Cocucci, A.A., Moré, M., Sérsie, A.N. & Raguso, R.A. (2009) Extreme variation in floral characters and its consequences for pollinator attraction among populations of an Andean cactus. *Annals of Botany*, **103**, 1489–1500.
- 124.Sharma, S.B., Rana, A. and Chauhan, S.V.S. (2006) Reproductive biology of *Crataeva religiosa* Forst. *Current Science*, **90**, 716–720.
- 125.Silva, W.R. and Sazima, M. (1995) Hawkmoth pollination in *Cereus peruvianus*, a columnar cactus from southeastern Brazil. *Flora*, **190**, 339–343.
- 126.Silva-Montellano, A. and Eguiarte, L.E. (2003) Geographic patterns in the reproductive ecology of *Agave lechuguilla* (Agavaceae) in the Chihuahuan desert. I. Floral characteristics, visitors, and fecundity. *American Journal of Botany*, **90**, 377–387.
- 127.Singer, R.B. (2001) Pollination biology of *Habenaria parviflora* (Orchidaceae: Habenariinae) in southeastern Brazil. *Darwiniana*, **39**, 201–207.

128. Singer, R.B. (2002) The pollination biology of *Sauroglossum elatum* Lindl. (Orchidaceae: Spiranthinae): moth-pollination and protandry in neotropical Spiranthinae. *Botanical Journal of the Linnean Society*, **138**, 9–16.
129. Singer, R.B. and Cocucci, A.A. (1997) Eye attached hemipollinaria in the hawkmoth and settling moth pollination of *Habenaria* (Orchidaceae): a study on functional morphology in 5 species from subtropical South America. *Botanica Acta*, **110**, 328–337.
130. Singer, R.B. and Sazima, M. (2001) The pollination mechanism of three sympatric *Prescottia* (Orchidaceae: Prescottiinae) species in Southeastern Brazil. *Annals of Botany*, **88**, 999–1005.
131. Smith, G.R. and Snow, G.E. (1976) Pollination ecology of *Platanthera* (*Habenaria*) *ciliaris* and *P. blephariglottis* (Orchidaceae). *Botanical Gazette*, **137**, 133–140.
132. Sreekala, A.K., Pandurangan, A.G., Ramasubbu, R. and Kulloli, S.K. (2008) Reproductive biology of *Impatiens coelotropis* Fischer, a critically endangered balsam from the Southern Western Ghats. *Current Science*, **95**, 386–388.
133. Sreekala, A.K., Pandurangan, A.G., Ramasubbu, R. and Kulloli, S.K. (2011) Pollination biology of *Impatiens cuspidata* Wight and Arn. (Balsaminaceae), a rare and endemic balsam of the Western Ghats, India. *Journal of Threatened Taxa*, **3**, 1818–1825.
134. Stephenson, A.G. and Thomas, W.W. (1977) Diurnal and nocturnal pollination of *Catalpa speciosa* (Bignoniaceae). *Systematic Botany*, **2**, 191–198.
135. Streisfeld, M.A. and Kohn, J.R. (2007) Environment and pollinator-mediated selection on parapatric floral races of *Mimulus aurantiacus*. *Journal of Evolutionary Biology*, **20**, 122–132.
136. Sugiura, S. and Yamazaki, K. (2005) Moth pollination of *Metaplexis japonica* (Apocynaceae): pollinaria transfer on the tip of the proboscis. *Journal of Plant Research*, **118**, 257–262.
137. Suzán, H., Nabhan, G.P. and Patten, D.T. (1994) Nurse plant and floral biology of a rare night-blooming cereus, *Peniocereus striatus* (Brandegee) F. Buxbaum. *Conservation Biology*, **8**, 461–470.
138. Taseen, W., Tangmitcharoen, S., Thakeaw, M. & Ogata, K. (2009) Insect pollination of *Aquilaria crassna* (Thymelaeaceae): effect of moths for the fruit setting in Thailand. *Journal of the Faculty of Agriculture, Kyushu University*, **54**, 321–328.
139. Thien, L.B., Bernhardt, P., Gibbs, G.W., Pellmyr, O., Bergström, G., Groth, I. and McPherson, G. (1985) The pollination of *Zygogynum* (Winteraceae) by a moth, *Sabatinca* (Micropterigidae): an ancient association? *Science*, **227**, 540–543.
140. Thompson, J.N. & Pellmyr, O. (1992) Mutualism with pollinating seed parasites amid co-pollinators: constraints on specialization. *Ecology*, **73**, 1780–1791.
141. Torres, C., Mimosa, M., Ferreira, M.F. & Galetto, L. (2013) Reproductive strategies of *Datura ferox*, an abundant invasive weed in agro-ecosystems from central Argentina. *Flora*, **208**, 253–258.
142. Valdivia, C.E. and Niemeyer, H.M. (2006) Do floral syndromes predict specialisation in plant pollination systems? Assessment of diurnal and nocturnal pollination of *Escallonia myrtoidea*. *New Zealand Journal of Botany*, **44**, 135–141.
143. Vogel, S. and Mueller-Doblies, D. (1975) A night blooming autumn *Narcissus* bulb structure and flower ecology of *Narcissus viridiflorus*. *Botanische Jahrbuecher fuer Systematik Pflanzengeschichte und Pflanzengeographie*, **96**, 427–447.
144. Voss, E.G. and Riefner, R.E. (1983) A pyralid moth (Lepidoptera) as pollinator of blunt-leaf orchid. *The Great Lakes Entomologist*, **16**, 57–60.
145. Westerbergh, A. (2004) An interaction between a specialized seed predator moth and its dioecious host plant shifting from parasitism to mutualism. *Oikos*, **105**, 564–574.
146. Westwood, A.R. & Borkowsky, C.L. (2004) Sphinx moth pollinators for the endangered western prairie fringed orchid, *Platanthera praeclara* in Manitoba, Canada. *Journal of the Lepidopterists' Society*, **58**, 13–20.
147. Whigham, D.F. and McWethy, M. (1980) Studies on the pollination ecology of *Tipularia discolor* (Orchidaceae). *American Journal of Botany*, **67**, 550–555.

148. Wilkin, P. (1995) A new species of *Ipomoea* (Convolvulaceae) from Mexico State, Mexico, and its evolution. *Kew Bulletin*, **50**, 93–102.
149. Williamson, P.S., Muliani, L. and Janssen, G.K. (1994) Pollination biology of *Abronia macrocarpa* (Nyctaginaceae), an endangered Texas species. *Southwestern Naturalist*, **39**, 336–341.
150. Willmott, A.P. and Burquez, A. (1996) The pollination of *Merremia palmeri* (Convolvulaceae): can hawk moths be trusted? *American Journal of Botany*, **83**, 1050–1056.
151. Wolff, D., Witt, T., Jürgens, A. & Gottsberger, G. (2006) Nectar dynamics and reproductive success in *Saponaria officinalis* (Caryophyllaceae) in southern Germany. *Flora*, **201**, 353–364.
152. Yokota, S. and Yahara, T. (2012) Pollination biology of *Lilium japonicum* var. *abe anum* and var. *japonicum*: evidence of adaptation to the different availability of diurnal and nocturnal pollinators. *Plant Species Biology*, **27**, 96–105.