

Chalcoff, V. R., Aizen, M. A. and Ezcurra, C. 2012. Erosion of a pollination mutualism along an environmental gradient in a south Andean treelet, *Embothrium coccineum* (Proteaceae). – Oikos 121: 471–480.

Appendix A1

Table A1. Locations and details of the 16 populations of *Embothrium coccineum*. Name = name of the population, Code = population acronym (and reference number), Lat (S) = south latitude, Long (W) = west longitude, Elev. = elevation (meters asl), Prec. = average annual precipitation (mm; obtained from the Global Climate Worldclim GIS, Hijmans et al. 2005). Populations in bold are those where we conducted the pollen supplementation experiment (Material and methods).

Name	Code (number)	Geographical coordinates			Prec.	Country
		Lat (S)	Long (W)	Elev.		
Aduana	ADU (1)	40°40	71°44	893	1539	Argentina
Aeropuerto Bariloche	AER (2)	41°07	71°13	828	863	Argentina
Puerto Blest	BLE (3)	41°03	71°49	780	1533	Argentina
Circunvalación	CIR (4)	41°09	71°15	888	858	Argentina
Cordillera de la Costa	COR (5)	40°37	73°25	332	1750	Chile
Entrelagos	ENT (6)	40°37	72°48	129	1561	Chile
Lago Espejo	ESP (7)	40°39	71°42	860	1464	Argentina
Estación Biológica	EST (8)	41°53	73°40	12.1	2298	Chile
Gutiérrez	GUT (9)	41°10	71°25	1058	978	Argentina
Juncos	JUN (10)	41°03	71°02	995	702	Argentina
Manso	MAN (11)	41°34	71°46	460	1898	Argentina
Cerro Otto	OTT (12)	41°09	71° 19	900	902	Argentina
Paraguay	PAR (13)	41°07	73°10	300	2340	Chile
Puyehue	PUY (14)	40°40	72°09	460	2382	Chile
Lago Steffen	STE (15)	41°31	71°28	928	1043	Argentina
Colonia Suiza	SUI (16)	41°08	71°26	878	1065	Argentina

Table A2. Directional separation test (d-sep) of conditional independence implied in our conceptual model (Fig. 2). X_1 = precipitation, X_2 = pollen production, X_3 = relative proportion of visits by efficient pollinators Apodiformes, X_4 = deposited pollen, X_5 = fruit set, and the grouping variable is Population. ‘Mixed model’ refers to the associated mixed model regression for each d-sep claim using the lmer function in R to test the independence claims. The variables in bold are whose partial regression coefficients should be zero. —See Shipley 2009 for an explanation of this statistical approach.

D-sep	Mixed model	Null probability
$(X_1, X_5) \{X_4\}$	$X_5 \sim X_4 + \mathbf{X_1}$	0.99
$(X_2, X_3) \{X_1\}$	$X_3 \sim X_1 + \mathbf{X_2}$	0.38
$(X_2, X_5) \{X_1, X_4\}$	$X_5 \sim X_4 + X_1 + \mathbf{X_2}$	0.48
$(X_3, X_5) \{X_1, X_4\}$	$X_5 \sim X_4 + X_1 + \mathbf{X_3}$	0.39

Table A3. Observed presence (x) of pollinators in 16 populations of *E. coccineum*. Abbreviation of names of populations follows Table 1. The relative abundance and frequency of visits of each taxonomic order, family, and species of flower visitors respectively are given in parentheses.

Order	Family	Species	PUY	PAR	EST	MAN	COR	ENT	ADU	BLE	ESP	SUI	STE	GUT	OTT	AER	CIR	JUN	
Apodiformes (29.2%, 44.9%)	Trochilidae (29.2%, 44.9%)	<i>Sephanoides sephaniodes</i> (29.2%, 44.9%)	x	x	x	x	x		x	x	x		X	x					
Coleoptera (0.3%, 0.04%)	Buprestidae (0.3%, 0.04%)	Morphospecies 1 (0.3%, 0.04%)																x	
Diptera (11.8%, 23.02%)	Nemestrinidae (10.3%, 22.8%)	<i>Trichophthalma philippii</i> (9.7%21.7%)								x									
		<i>Trichophthalma</i> sp. (0.8%, 1.1%)								x									
	Syrphidae (1.3%, 0.22%)	<i>Syrphus octomaculata</i> (0.7%, 0.2)			x					x									
		Morphospecies 1 (0.4%, 0.01%)						x											
Hymenoptera (48.5%, 26.03%)	Apidea (10.3%, 8.61%)	<i>Apis mellifera</i> (8.7%, 4.6%)	x	x	x			x						x		x	x		
		<i>Bombus dahlbomii</i> (0.1%, 0.01%)			x														
		<i>Bombus ruderatus</i> (1.5%, 4%)		x	x								x				x		
	Colletidae (16.4%, 8.1%)	<i>Cadeguala occidentalis</i> (0.4%, 0.3%)														x			
		<i>Diphaglossa gayi</i> 16%, 7.8%)	x	x		x	x	x											
	Halictidae (12.8%, 3.7%)	<i>Corynura prothysteres</i> (12.8%, 3.7%)									x		x		x	x	x	x	X

