

Ecography

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Supplementary material

Supplementary material: Appendix 1

Revealing hidden plant diversity in arid environments

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Site	Altitude (m asl)	Latitude °S	Longitude °W	Soil type	Soil eDNA, pollen rain and soil seed bank analyses? *
TLT01	4480	-23.50305	-67.72371	Alluvial, ignimbrite	No
TLT02	4370	-23.45127	-67.77322	Aeolian, volcanic	No
TLT03	4270	-23.43230	-67.77125	Sandy alluvial, ignimbrite	Yes
TLT04	4174	-23.42283	-67.78008	Colluvium, volcanic	No
TLT05	4072	-23.41518	-67.78575	Colluvium, volcanic	Yes
TLT06	3970	-23.40508	-67.79452	Sandy, colluvium	No
TLT07	3870	-23.38819	-67.80757	Sandy alluvial, volcanic	Yes
TLT08	3870	-23.32856	-67.79890	Sandy alluvial, volcanic	No
TLT09	3770	-23.32218	-67.81620	Alluvial, volcanic	Yes
TLT10	3670	-23.32268	-67.83180	Alluvial sandy, ignimbrite (thick)	No
TLT11	3570	-23.31946	-67.84906	Sandy alluvial, volcanic (thick)	Yes
TLT12	3470	-23.31766	-67.86342	Alluvial, volcanic	No
TLT13	3370	-23.31377	-67.87685	Fluvial, sandy, volcanic	Yes
TLT14	3270	-23.31291	-67.89014	Alluvial, ignimbrite	No
TLT15	3170	-23.31010	-67.90332	Alluvial, ignimbrite	Yes
TLT16	3070	-23.31005	-67.91876	Alluvial, ignimbrite	No
TLT17	2970	-23.30211	-67.93427	Alluvial, ignimbrite	Yes
TLT18	2870	-23.28868	-67.94587	Fluvial terrace (gravel, sand)	No
TLT19	2770	-23.28113	-67.95757	Alluvial, ignimbrite	Yes
TLT20	2670	-23.28023	-67.96940	Alluvial, ignimbrite	No
TLT21	2570	-23.27736	-67.98235	Alluvial sandy ignimbrite	Yes
TLT22	2470	-23.27385	-67.99930	Alluvial sandy ignimbrite	No

(Modified from Díaz *et al.* 2016)

* Vegetation surveys were done in 22 sites, whereas soil eDNA, pollen rain and soil seed bank analyses were done in some selected sites specified in this column.

Table A1: Geospatial and soil data for all sites sampled.

Species	Family	Life Form	Pollination strategy	Pollen type	GenBank accession number (<i>Atacama database</i>)
<i>Adesmia atacamensis</i> Phil.	Fabaceae	Woody	Entomophilous	<i>Adesmia</i> type	
<i>Adesmia erinacea</i> Phil.	Fabaceae	Woody	Entomophilous	<i>Adesmia</i> type	MH115329
<i>Adesmia occulta</i> (R.E.Fr.)Burkart	Fabaceae	Woody	Entomophilous	<i>Adesmia</i> type	MH115330
<i>Adesmia rahmeri</i> Phil.	Fabaceae	Woody	Entomophilous	<i>Adesmia</i> type	
<i>Adesmia spinosissima</i> Vogel	Fabaceae	Woody	Entomophilous	<i>Adesmia</i> type	MH115331
<i>Allionia incarnata</i> L.	Nyctaginaceae	Perennial Herb	NA		MH115332
<i>Aloysia deserticola</i> (Phil.) Lu-Irving & O'Leary	Verbenaceae	Woody	Entomophilous	<i>Verbenaceae</i>	MH115328
<i>Ambrosia artemisioides</i> Meyen & Walp.	Asteraceae	Woody	Anemophilous	Ambrosia type	MH115333
<i>Aristida adscensionis</i> L.	Poaceae	Annual	Anemophilous	Poaceae	MH115334
<i>Atriplex imbricata</i> (Moq.) D. Dietr.	Amaranthaceae	Woody	Anemophilous	<i>Chenopodiaceae</i>	MH115335
<i>Azorella atacamensis</i> G.M.Plunkett & A.N.Nicolas	Apiaceae	Woody	Entomophilous	<i>Mulinum</i> type	MH115367
<i>Baccharis boliviensis</i> (Wedd.) Cabrera	Asteraceae	Woody	Anemophilous-Entomophilous	<i>Baccharis</i> type	MH115336
<i>Baccharis tola</i> Phil.	Asteraceae	Woody	Anemophilous-Entomophilous	<i>Baccharis</i> type	MH115337
<i>Bouteloua simplex</i> Lag.	Poaceae	Annual	Anemophilous	Poaceae	MH115338
<i>Bryantiella glutinosa</i> (Phil.) J.M.Porter	Polemoniaceae	Annual	NA		MH115339
<i>Caiophora coronata</i> (Gillies ex Arnott) Hook. & Arn.	Loasaceae	Perennial Herb	Zoophilous		
<i>Calamagrostis cabreræ</i> (Parodi.) Parodi	Poaceae	Perennial Herb	Anemophilous	Poaceae	MH115340
<i>Calamagrostis crispa</i> (Rugolo & Villav.) Govaerts	Poaceae	Perennial Herb	Anemophilous	Poaceae	MH115341
<i>Calandrinia</i> sp.	Montiaceae	NA (Annual)	NA		
<i>Chenopodium frigidum</i> Phil.	Amaranthaceae	Annual	Anemophilous	<i>Chenopodiaceae</i>	MH115342
<i>Chorizanthe commisuralis</i> J. Rémy	Polygonaceae	Annual	NA		MH115343
<i>Chuquiraga atacamensis</i> Kuntze	Asteraceae	Woody	NA		MH115344
<i>Cistanthe celosioides</i> (Phil.) Carolin ex M.A.Herskovitz	Montiaceae	Annual	Entomophilous		MH115345
<i>Cryptantha</i> sp 2.	Boraginaceae	NA (Annual)	Entomophilous	Boraginaceae	
<i>Descurainia stricta</i> (Phil.) Reiche	Brassicaceae	Annual	NA		MH115347
<i>Ephedra americana</i> Humb. & Bonpl. ex Willd.	Ephedraceae	Woody	Entomophilous	Ephedra	
<i>Euphorbia amandi</i> Oudejans	Euphorbiaceae	Annual	NA		MH115349
<i>Exodeconus integrifolius</i> (Phil.) Axelius	Solanaceae	Annual	Entomophilous	Solanaceae	MH115350

<i>Fabiana bryoides</i> Phil.	Solanaceae	Woody	Entomophilous	Solanaceae	MH115351
<i>Fabiana denudata</i> Miers	Solanaceae	Woody	Entomophilous	Solanaceae	MH115352
<i>Fabiana ramulosa</i> (Wedd.) Hunz. & Barboza	Solanaceae	Woody	Entomophilous	Solanaceae	MH115353
<i>Fagonia chilensis</i> Hook & Arn.	Zygophyllaceae	Woody	NA		MH115354
<i>Festuca chrysophylla</i> Phil.	Poaceae	Perennial Herb	Anemophilous	Poaceae	
<i>Haplopappus rigidus</i> Phil.	Asteraceae	Woody	NA		MH115355
<i>Hoffmannseggia doelli</i> Phil.	Fabaceae	Perennial Herb	NA		MH115356
<i>Jarava frigida</i> (Phil.) F.Rojas	Poaceae	Perennial Herb	Anemophilous	Poaceae	MH115358
<i>Junellia pappigera</i> (Phil.) N. O'Leary & P. Peralta	Verbenaceae	Woody	Entomophilous	Verbenaceae	MH115359
<i>Junellia seriphioides</i> (Gillies & Hook.) Moldenke	Verbenaceae	Woody	Entomophilous	Verbenaceae	MH115360
<i>Krameria lappacea</i> (Dombey) Burdet & B.B. Simpson	Krameriaceae	Woody	NA		
<i>Lenzia chamaepitys</i> Phil.	Montiaceae	Perennial Herb	Entomophilous	Montiaceae	
<i>Lepidium rahmeri</i> Phil.	Brassicaceae	Annual	NA		MH115361
<i>Lupinus oreophilus</i> Phil.	Fabaceae	Woody	NA		MH115362
<i>Lupinus subinflatus</i> C.P. Sm.	Fabaceae	Perennial Herb	NA		MH115363
<i>Maihueniopsis</i> spp.	Cactaceae	Woody	NA		MH115364
<i>Mastigostyla cyrtophylla</i> I.M.Johnst.	Iridaceae	Perennial Herb	NA		
<i>Montiopsis cumingii</i> (Hook. & Arn.) D. I. Ford	Montiaceae	Annual	NA		MH115365
<i>Moschopsis monocephala</i> (Phil.) Reiche	Calyceraceae	Perennial Herb	NA		MH115366
<i>Munroa decumbens</i> Phil.	Poaceae	Annual	Anemophilous	Poaceae	MH115368
<i>Nama dichotomum</i> (Ruiz & Pav.) Choisy	Boraginaceae	Annual	Entomophilous	Boraginaceae	MH115369
<i>Nassella nardoides</i> (Phil.) Barkworth	Poaceae	Perennial Herb	Anemophilous	Poaceae	MH115370
<i>Neuontobotrys tarapacana</i> (Phil.) Al-Shehbaz	Brassicaceae	Perennial Herb	NA		MH115371
<i>Nototriche auricoma</i> A.W. Hill	Malvaceae	Perennial Herb	Entomophilous	Malvaceae	
<i>Nototriche diminutiva</i> (F. Phil.) I.M.Johnst.	Malvaceae	Annual	Entomophilous	Malvaceae	MH115385
<i>Oxalis</i> sp.	Oxalidaceae	Perennial Herb	Entomophilous	Oxalis type	
<i>Pappostipa chrysophylla</i> (É.Desv.) Romasch.	Poaceae	Perennial Herb	Anemophilous	Poaceae	
<i>Parastrephia quadrangularis</i> (Meyen) Cabr.	Asteraceae	Woody	Anemophilous-Entomophilous	Parastrephia type	MH115373
<i>Pectocarya linearis</i> (Ruiz & Pav.) DC.	Boraginaceae	Perennial Herb	Entomophilous	Boraginaceae	
<i>Perezia atacamensis</i> (Phil.) Reiche	Asteraceae	Woody	NA		MH115374

<i>Phacelia pinnatifida</i> Griseb. Ex Wedd	Boraginaceae	Annual	Entomophilous	Boraginaceae	MH115375
<i>Pycnophyllum bryoides</i> (Phil.) Rohrb.	Caryophyllaceae	Perennial Herb	NA		MH115376
<i>Pycnophyllum molle</i> Remy	Caryophyllaceae	Perennial Herb	NA		
<i>Schkuhria multiflora</i> Hook. & Arn.	Asteraceae	Annual	NA		
<i>Senecio atacamensis</i> Phil.	Asteraceae	Woody	Anemophilous- Entomophilous	<i>Senecio type</i>	MH115378
<i>Senecio puchii</i> Phil.	Asteraceae	Woody	Anemophilous- Entomophilous	<i>Senecio type</i>	MH115379
<i>Senecio rahmeri</i> Phil.	Asteraceae	Woody	Anemophilous- Entomophilous	<i>Senecio type</i>	MH115380
<i>Senecio</i> sp 1.	Asteraceae	NA (Woody)	Anemophilous- Entomophilous	<i>Senecio type</i>	
<i>Senecio</i> sp 2.	Asteraceae	NA (Woody)	Anemophilous- Entomophilous	<i>Senecio type</i>	
<i>Solanum chilense</i> Dunal	Solanaceae	Woody	Entomophilous	Solanaceae	MH115381
<i>Solanum metarsium</i> C.V. Morton	Solanaceae	Perennial Herb	Entomophilous	<i>Solanaceae</i>	MH115382
<i>Tagetes multiflora</i> Kunth	Asteraceae	Annual	Anemophilous- Entomophilous	<i>Senecio type</i>	MH115383
<i>Tarasa operculata</i> (Kav.) Krapov	Malvaceae	Woody	Entomophilous	Malvaceae	MH115384
<i>Tiquilia atacamensis</i> (Phil.) A.T. Richardson	Boraginaceae	Woody	Entomophilous	Boraginaceae	MH115386
<i>Trichocline caulescens</i> Phil.	Asteraceae	Perennial Herb	NA		MH115387
<i>Urmenetea atacamensis</i> Phil.	Asteraceae	Perennial Herb	NA		
<i>Viola</i> sp.	Violaceae	NA (Annual)	NA		
<i>Werneria glaberrima</i> Phil.	Asteraceae	Perennial Herb	NA		MH115388
<i>Werneria</i> sp 2.	Asteraceae	NA (Perennial Herb)	NA		

Table A2: Plant species observed during traditional surveys in the TLT.

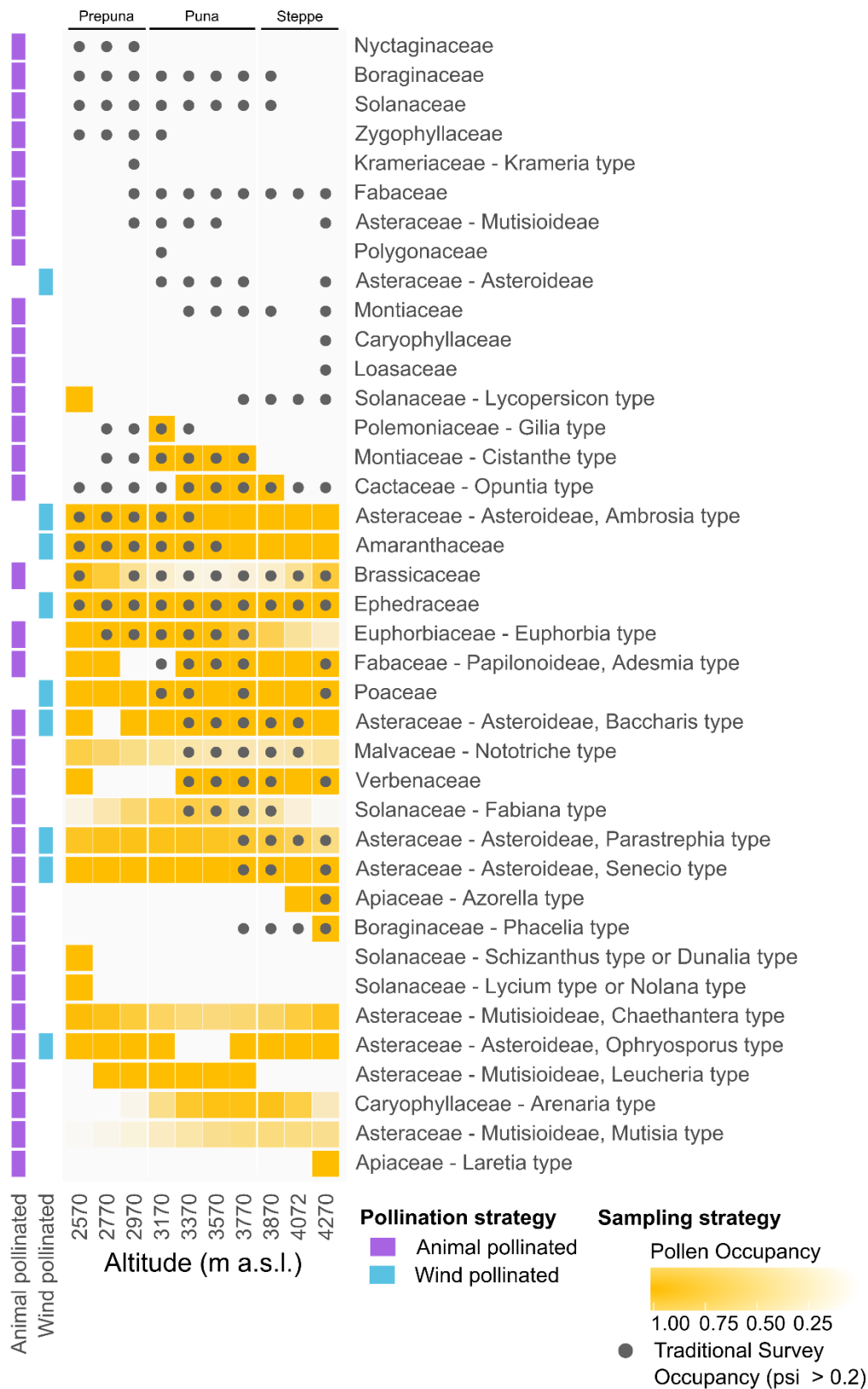


Figure A1: Plant taxa distribution occupancy along the TLT in the pollen record (yellow heatmap) compared with distributions obtained from our botanical surveys (dots). Pollination systems- either by wind (blue) or animals (purple)- are shown in the left column.

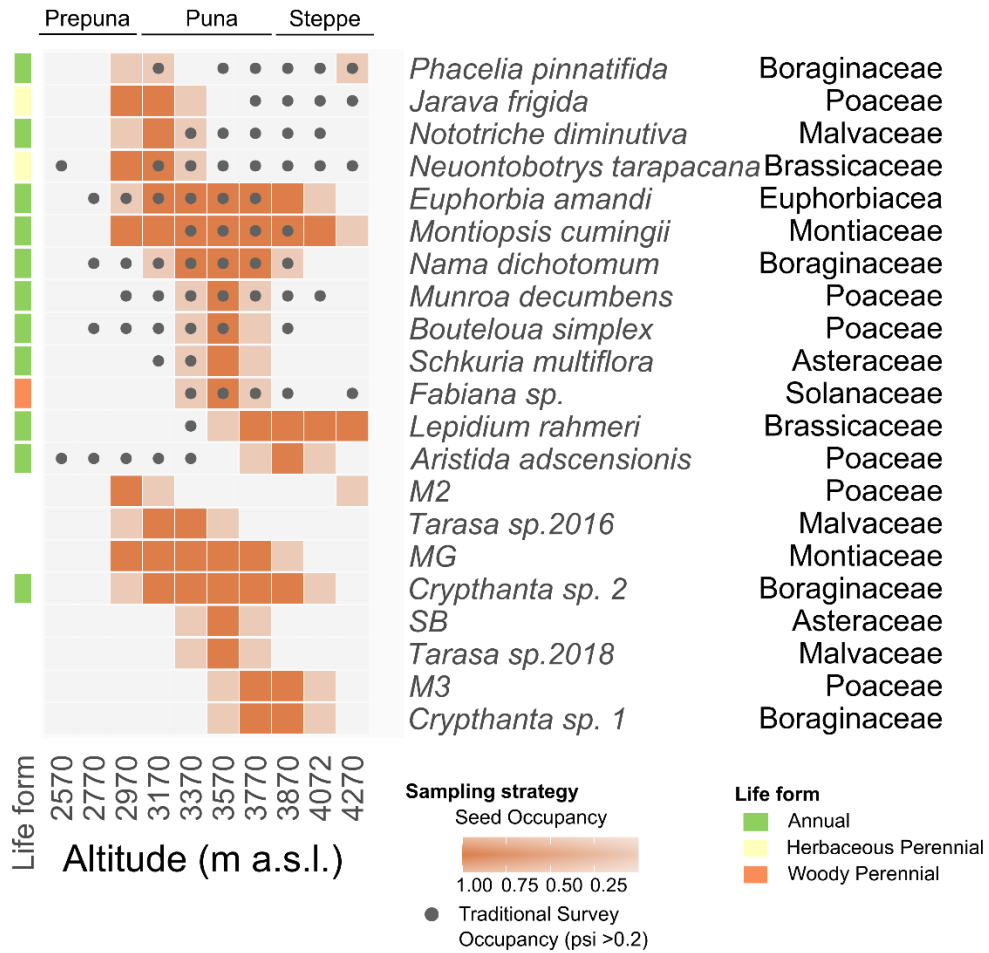


Figure A2: Plant taxa occupancy along the TLT as established by the soil seed bank (orange heatmap) compared with a distribution from botanical surveys (dots). Life cycle characteristics are shown in the left column: annual (green), herbaceous perennial (yellow) and woody perennial (orange).