

Supplementary material

Appendix 1. Hummingbird species and floral resources included in the analysis, Accuracy Roc Score Kappa (ARSKappa) for each model (a number between -1 and 1 where scores above 0.8 are generally considered good agreement, zero or lower means no agreement), numbers of occurrences after geographic data cleanup (Occurrence filtering: Spatially Unique) and bioclimatic variables (WorldClim 1.0) used for modelling each species.

Hummingbirds	ARSKappa	Numbers of occurrences	Bioclimatic variables
<i>Abeillia abeillei</i>	0.923	98	Bio2, Bio3, Bio6, Bio18, Bio19
<i>Amazilia amabilis</i>	0.87	59	Bio3, Bio4, Bio6, Bio8, Bio14
<i>Amazilia beryllina</i>	0.948	94	Bio3, Bio6, Bio10, Bio15, Bio18, Bio19
<i>Amazilia candida</i>	0.898	88	Bio2, Bio4, Bio5, Bio6, Bio15, Bio18
<i>Amazilia cyanocephala</i>	0.949	89	Bio3, Bio6, Bio7, Bio8, Bio13, Bio15, Bio18
<i>Amazilia cyanura</i>	0.976	35	Bio2, Bio4, Bio5, Bio6, Bio15, Bio18
<i>Amazilia rutila</i>	0.932	91	Bio3, Bio5, Bio6, Bio8, Bio13, Bio14, Bio18, Bio19
<i>Amazilia saucerottei</i>	0.826	89	Bio2, Bio6, Bio7, Bio13, Bio15, Bio19
<i>Amazilia tzacatl</i>	0.805	82	Bio3, Bio6, Bio7, Bio13, Bio14
<i>Amazilia violiceps</i>	0.903	84	Bio2, Bio3, Bio4, Bio6, Bio8, Bio17
<i>Amazilia viridifrons</i>	0.946	50	Bio2, Bio3, Bio6, Bio18, Bio19
<i>Amazilia yucatanensis</i>	0.9	42	Bio3, Bio5, Bio7, Bio8, Bio15
<i>Anthracothorax prevostii</i>	0.928	93	Bio2, Bio3, Bio5, Bio6, Bio13, Bio14
<i>Archilochus alexandri</i>	0.876	98	Bio5, Bio6, Bio8, Bio13, Bio14
<i>Archilochus colubris</i>	0.877	195	Bio3, Bio6, Bio9, Bio10, Bio12, Bio14
<i>Atthis heloisa</i>	0.962	75	Bio4, Bio6, Bio7, Bio13, Bio15
<i>Atthis ellioti</i>	0.948	58	Bio2, Bio3, Bio4, Bio6, Bio12, Bio15
<i>Calothorax lucifer</i>	0.952	80	Bio2, Bio5, Bio6, Bio14, Bio15
<i>Calothorax pulcher</i>	0.963	23	Bio4, Bio6, Bio14, Bio15, Bio19
<i>Calypte anna</i>	0.988	96	Bio3, Bio6, Bio8, Bio9, Bio12
<i>Campylopterus curvipennis</i>	0.883	89	Bio2, Bio3, Bio6, Bio14, Bio18
<i>Campylopterus hemileucurus</i>	0.845	76	Bio3, Bio6, Bio13, Bio14, Bio18
<i>Campylopterus rufus</i>	0.901	67	Bio2, Bio4, Bio6, Bio13, Bio14
<i>Chlorostilbon auriceps</i>	0.926	62	Bio2, Bio4, Bio5, Bio6, Bio15, Bio16, Bio17, Bio19
<i>Chlorostilbon canivetii</i>	0.744	90	Bio2, Bio3, Bio6, Bio8, Bio15, Bio16, Bio18, Bio19
<i>Colibri delphinae</i>	0.928	80	Bio3, Bio6, Bio15, Bio16, Bio18
<i>Colibri thalassinus</i>	0.939	90	Bio3, Bio5, Bio6, Bio13, Bio15
<i>Cynanthus latirostris</i>	0.852	62	Bio2, Bio3, Bio4, Bio6, Bio8, Bio14
<i>Cynanthus sordidus</i>	0.932	55	Bio3, Bio4, Bio6, Bio13, Bio14, Bio15, Bio18
<i>Doricha enicura</i>	0.906	71	Bio2, Bio4, Bio6, Bio7, Bio13, Bio14
<i>Eugenes fulgens</i>	0.876	88	Bio3, Bio6, Bio8, Bio15, Bio19
<i>Eupherusa cyanophrys</i>	0.994	24	Bio2, Bio3, Bio6, Bio16, Bio18
<i>Eupherusa eximia</i>	0.938	70	Bio4, Bio6, Bio13, Bio14, Bio18

<i>Eupherusa poliocerca</i>	0.909	41	Bio6, Bio7, Bio14, Bio15, Bio18, Bio19
<i>Heliomaster constantii</i>	0.913	80	Bio5, Bio6, Bio13, Bio14, Bio15, Bio18, Bio19
<i>Heliomaster longirostris</i>	0.870	89	Bio2, Bio4, Bio5, Bio6, Bio15, Bio16, Bio18, Bio19
<i>Klais guimeti</i>	0.930	75	Bio3, Bio4, Bio6, Bio16, Bio17, Bio19
<i>Lampornis amethystinus</i>	0.894	85	Bio3, Bio6, Bio7, Bio13, Bio15, Bio18
<i>Lampornis clemenciae</i>	0.886	79	Bio2, Bio3, Bio6, Bio8, Bio15, Bio17, Bio18
<i>Lampornis sybillae</i>	0.939	24	Bio3, Bio6, Bio13, Bio15, Bio17
<i>Lampornis viridipallens</i>	0.938	54	Bio2, Bio3, Bio6, Bio13, Bio14
<i>Lamprolaima rhami</i>	0.868	59	Bio2, Bio3, Bio6, Bio14, Bio16, Bio18
<i>Lophornis brachylophus</i>	0.956	8	Bio2, Bio6, Bio7, Bio15, Bio19
<i>Lophornis helenae</i>	0.830	59	Bio3, Bio6, Bio13, Bio18, Bio19
<i>Phaeochroa cuvierii</i>	0.886	58	Bio2, Bio4, Bio6, Bio13, Bio14
<i>Phaethornis longirostris</i>	0.867	89	Bio3, Bio5, Bio6, Bio8, Bio15, Bio18, Bio19
<i>Phaethornis striigularis</i>	0.842	93	Bio2, Bio3, Bio5, Bio6, Bio13, Bio17
<i>Selasphorus platycercus</i>	0.842	96	Bio2, Bio3, Bio5, Bio6, Bio12, Bio13, Bio19
<i>Selasphorus rufus</i>	0.874	146	Bio2, Bio6, Bio10, Bio16, Bio18
<i>Selasphorus sasin</i>	0.948	70	Bio3, Bio6, Bio7, Bio12, Bio14, Bio15, Bio18
<i>Selasphorus calliope</i>	0.878	94	Bio5, Bio6, Bio7, Bio8, Bio9, Bio13, Bio14
<i>Thalurania colombica</i>	0.879	74	Bio4, Bio6, Bio7, Bio13, Bio15, Bio18, Bio19
<i>Thalurania ridgwayi</i>	0.908	25	Bio2, Bio3, Bio6, Bio13, Bio14
<i>Threnetes ruckeri</i>	0.848	65	Bio2, Bio3, Bio4, Bio6, Bio13, Bio14, Bio18
<i>Tilmatura dupontii</i>	0.916	68	Bio2, Bio4, Bio6, Bio13, Bio14, Bio18
<i>Hylocharis leucotis</i>	0.975	237	Bio5, Bio6, Bio16, Bio17, Bio18

Floral resources	ARSKappa	Numbers of occurrences	Bioclimatic variables
<i>Bidens riparia</i>	0.930	53	Bio8, Bio15, Bio16, Bio18, Bio19
<i>Bomarea edulis</i>	0.902	74	Bio3, Bio5, Bio6, Bio15, Bio16, Bio18
<i>Bouvardia ternifolia</i>	0.879	74	Bio3, Bio5, Bio7, Bio11, Bio15, Bio16, Bio17
<i>Byttneria catalpifolia</i>	0.940	56	Bio3, Bio8, Bio11, Bio15, Bio16, Bio18
<i>Calliandra grandifolia</i>	0.969	11	Bio19, Bio3, Bio4, Bio13, Bio15, Bio19
<i>Castilleja arvensis</i>	0.943	74	Bio3, Bio5, Bio11, Bio15, Bio18
<i>Castilleja scorzonerifolia</i>	0.921	73	Bio2, Bio3, Bio9, Bio15, Bio18, Bio19
<i>Castilleja tenuiflora</i>	0.934	76	Bio2, Bio3, Bio6, Bio14, Bio15, Bio18
<i>Cirsium jorullense</i>	0.972	28	Bio3, Bio9, Bio13, Bio14, Bio15
<i>Cirsium subcoriaceum</i>	0.937	65	Bio3, Bio5, Bio6, Bio13, Bio15
<i>Crusea coccinea</i>	0.963	65	Bio3, Bio6, Bio13, Bio15, Bio18
<i>Cuphea jorullensis</i>	0.956	63	Bio4, Bio6, Bio13, Bio15, Bio19
<i>Fuchsia encliandra</i>	0.929	88	Bio2, Bio3, Bio9, Bio15, Bio16, Bio18, Bio19
<i>Fuchsia microphylla</i>	0.970	75	Bio3, Bio5, Bio6, Bio13, Bio15
<i>Fuchsia paniculata</i>	0.961	74	Bio3, Bio6, Bio13, Bio14, Bio15
<i>Ipomoea hederifolia</i>	0.893	77	Bio3, Bio5, Bio7, Bio11, Bio15, Bio16, Bio18
<i>Lobelia laxiflora</i>	0.868	81	Bio3, Bio5, Bio6, Bio15, Bio16, Bio18
<i>Loeselia mexicana</i>	0.933	65	Bio3, Bio5, Bio15, Bio16, Bio19
<i>Passiflora membranacea</i>	0.935	69	Bio2, Bio3, Bio9, Bio13, Bio15, Bio18

<i>Penstemon gentianoides</i>	0.940	52	Bio3, Bio9, Bio15, Bio16, Bio18, Bio19
<i>Penstemon roseus</i>	0.959	87	Bio2, Bio4, Bio6, Bio13, Bio14, Bio15
<i>Phaseolus coccineus</i>	0.944	75	Bio3, Bio6, Bio7, Bio8, Bio15, Bio16, Bio19
<i>Prunella vulgaris</i>	0.923	239	Bio3, Bio5, Bio6, Bio9, Bio15, Bio16, Bio19
<i>Psittacanthus calyculatus</i>	0.897	58	Bio2, Bio4, Bio9, Bio15, Bio18, Bio19
<i>Psittacanthus ramiflorus</i>	0.948	62	Bio4, Bio9, Bio13, Bio15, Bio18
<i>Ribes ciliatum</i>	0.961	47	Bio2, Bio4, Bio9, Bio15, Bio18, Bio19
<i>Roldana angulifolia</i>	0.931	63	Bio2, Bio4, Bio6, Bio13, Bio15, Bio18
<i>Rubus adenotrichus</i>	0.928	73	Bio3, Bio5, Bio6, Bio15, Bio16
<i>Salvia cacaliifolia</i>	0.972	15	Bio3, Bio5, Bio6, Bio7, Bio10, Bio13, Bio15
<i>Salvia cinnabarina</i>	0.943	61	Bio2, Bio3, Bio5, Bio6, Bio13, Bio15, Bio18, Bio19
<i>Salvia elegans</i>	0.956	60	Bio4, Bio9, Bio15, Bio16, Bio18, Bio19
<i>Salvia fulgens</i>	0.982	55	Bio2, Bio3, Bio13, Bio14, Bio15, Bio18
<i>Salvia iodantha</i>	0.963	81	Bio3, Bio6, Bio7, Bio13, Bio15, Bio18, Bio19
<i>Salvia mexicana</i>	0.965	69	Bio4, Bio7, Bio9, Bio13, Bio15
<i>Salvia mocinoi</i>	0.960	62	Bio3, Bio6, Bio7, Bio15, Bio16, Bio18
<i>Stachys coccinea</i>	0.884	75	Bio3, Bio6, Bio9, Bio15, Bio18, Bio19
<i>Symphoricarpos microphyllus</i>	0.964	64	Bio3, Bio7, Bio9, Bio13, Bio15, Bio19
<i>Tigridia orthantha</i>	0.966	24	Bio2, Bio3, Bio5, Bio6, Bio13, Bio15, Bio18
<i>Tillandsia guatemalensis</i>	0.936	58	Bio2, Bio3, Bio6, Bio13, Bio15, Bio18

Appendix 2. Selection of bioclimatic variables from WorldClim 1.0:

Bioclimatic variables are derived from the monthly temperature and rainfall values in order to generate more biologically meaningful variables. The bioclimatic variables represent annual trends (e.g., mean annual temperature, annual precipitation), seasonality (e.g., annual range in temperature and precipitation) and extreme or limiting environmental factors (e.g., temperature of the coldest and warmest month, and precipitation of the wet and dry quarters). A quarter is a period of three months (1/4 of the year) (Hijmans et al. 2005).

BIO1 = Annual Mean Temperature

BIO2 = Mean Diurnal Range (Mean of monthly (max temp - min temp))

BIO3 = Isothermality (BIO2/BIO7) (* 100)

BIO4 = Temperature Seasonality (standard deviation *100)

BIO5 = Max Temperature of Warmest Month

BIO6 = Min Temperature of Coldest Month

BIO7 = Temperature Annual Range (BIO5-BIO6)

BIO8 = Mean Temperature of Wettest Quarter

BIO9 = Mean Temperature of Driest Quarter

BIO10 = Mean Temperature of Warmest Quarter

BIO11 = Mean Temperature of Coldest Quarter

BIO12 = Annual Precipitation

BIO13 = Precipitation of Wettest Month

BIO14 = Precipitation of Driest Month

BIO15 = Precipitation Seasonality (Coefficient of Variation)

BIO16 = Precipitation of Wettest Quarter

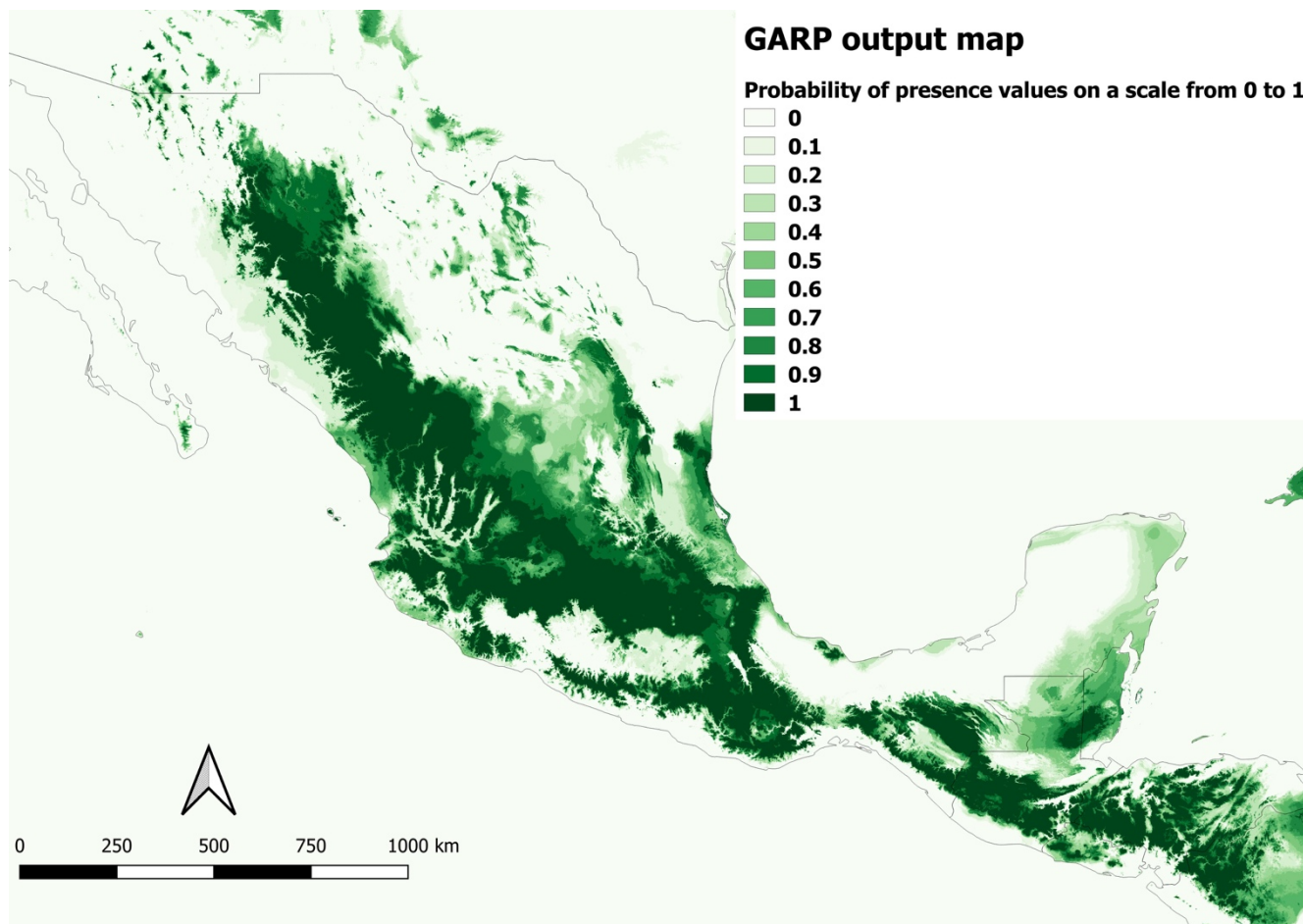
BIO17 = Precipitation of Driest Quarter

BIO18 = Precipitation of Warmest Quarter

BIO19 = Precipitation of Coldest Quarter

The information of the 19 bioclimatic variables was extracted for each record and analyzed using correlation matrices. Those variables that show collinearity ($R=0.6$) were discarded. Then, we performed a principal component analysis to identify which variables are more informative in each model. We gave higher weight to a particular variable rather than a general variable. The set of bioclimatic variables used to model modelling each species could vary, this depends on the specific importance.

Appendix 3. GARP output map of *Hylocharis leucotis*, best supported model with best subsets in Open Modeller. Consensus map of 10 best models from 100 runs. 1 represents 100% consensus among the 10 best models or the 100% of probability to presence values.



Appendix 4. Pearson correlation result from Sub-region “North to Tehuantepec Isthmus”.

Relationships between morphological variation of *H. leucotis* and local diet availability and potential competition. Proper variance summarizes phenotypic variation inside the morphological space and is not related to a) local diversity of floral resources ($R = 0.247$, $p\text{-value} = 0.254$). The relationship between morphological variation and potential competition depends on how the latter is measured, however this relationship is not significant when b) competition is measured as the number of species that coexist with *Hylocharis leucotis* ($R = 0.274$, $p\text{-value} = 0.204$) or c) competition is described as the phylogenetic similarity between *Hylocharis leucotis* and all the members of the community ($R = -0.086$, $p\text{-value} = 0.695$).

