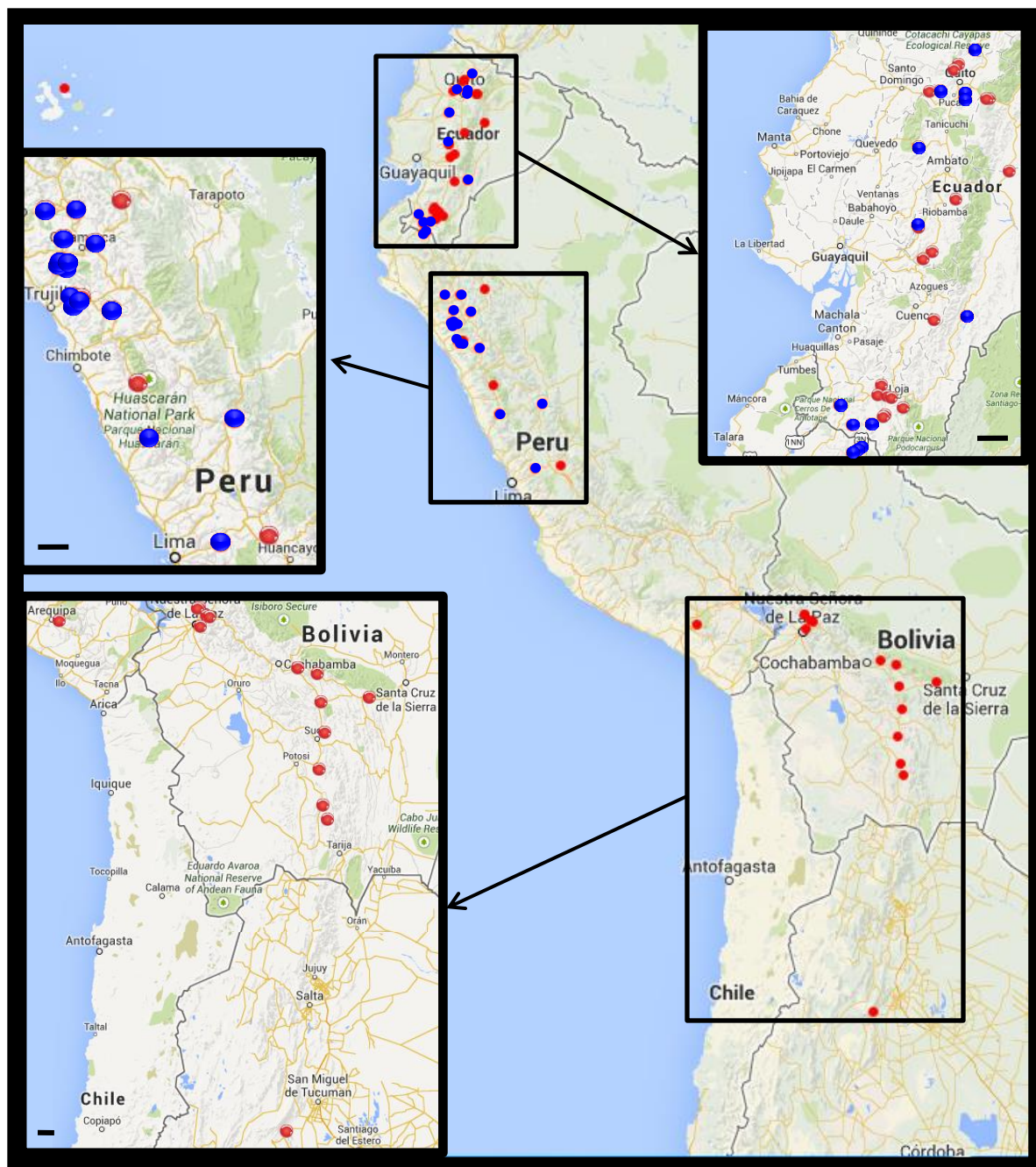
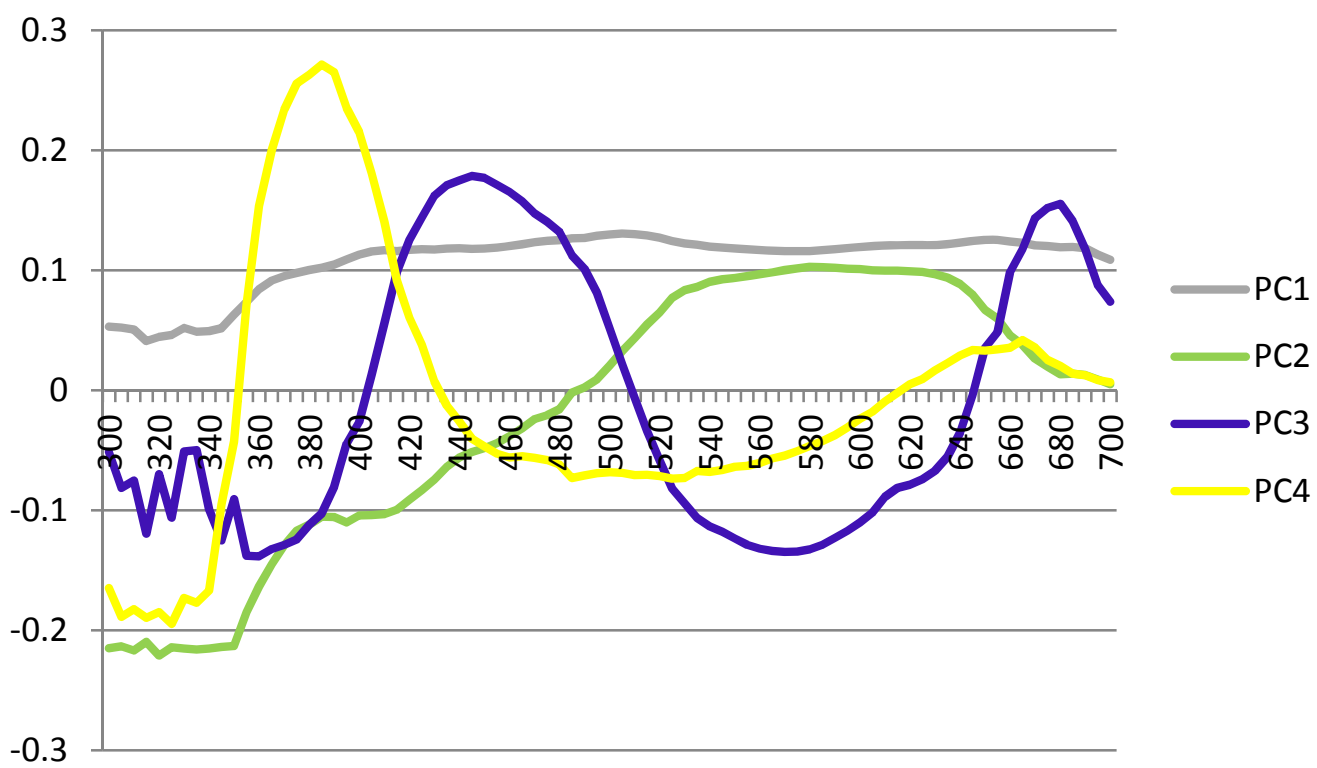






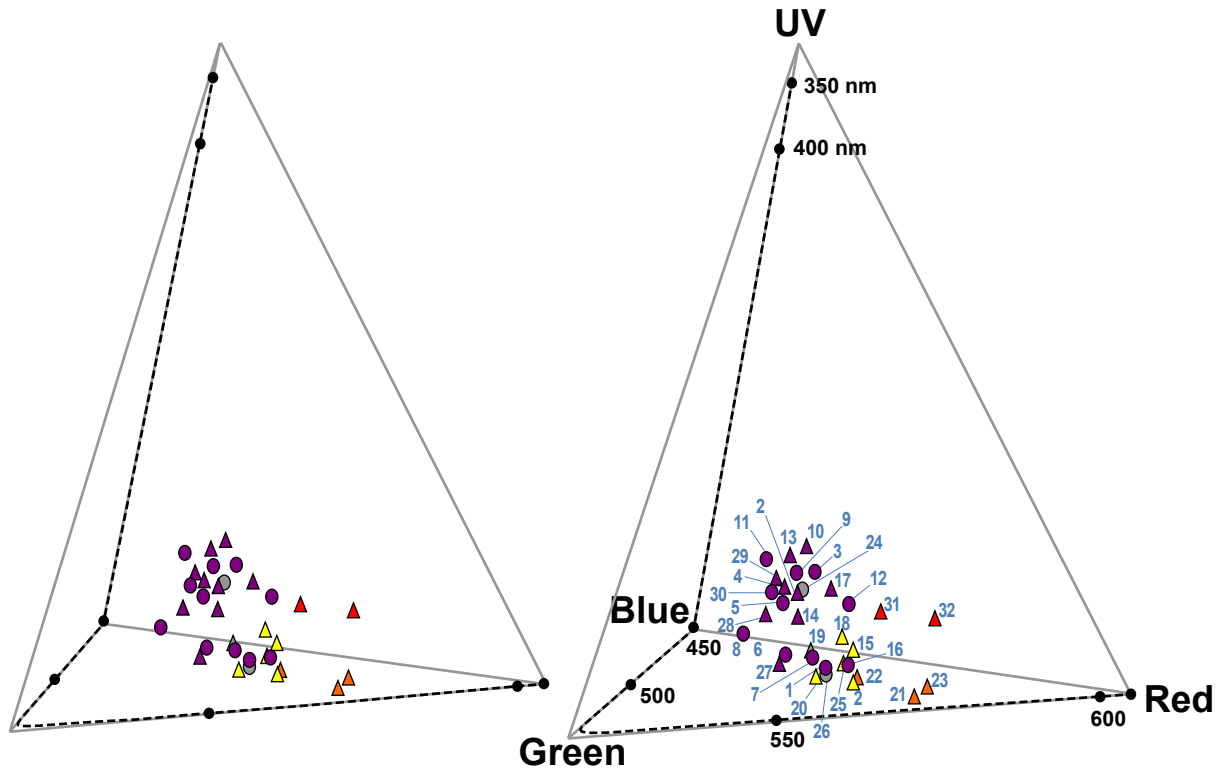


Table S1. List of study sites with the Iochromineae species that occur in each and corresponding collection numbers, sorted in alphabetical order within each country.

Site	Country	Elevation	Location	Iochromineae Species and Collection Numbers
Alluriquin	ECU	1400m	0.29321°S, 78.85376°W	<i>A. arborescens</i> (Smith 537)
Calacali	ECU	2670m	0.0214°S, 78.55106°W	<i>I. gesnerioides</i> (Smith 474)
Cariamanga	ECU	1900m	4.31674°S, 79.55161°W	<i>A. arborescens</i> (Leiva 5112), <i>I. cyaneum</i> (Leiva 5113)
Catamayo	ECU	1255m	3.983°S, 79.362°W	<i>A. arborescens</i> (Smith 222)
Chunchi	ECU	2475m	2.31973°S, 78.92679°W	<i>I. lehmannii</i> (Smith 484)
ElCisne	ECU	2325m	3.849°S, 79.427W	<i>I. cyaneum</i> (Smith 223)
Gemelos	ECU	700m	0.22038°S, 90.76278°W	<i>I. ellipticum</i> (Jaeger 622)
Gonzanama	ECU	2660m	4.2258°S, 79.4062°W	<i>I. grandiflorum</i> (Smith 252)
Guarumal	ECU	2250m	0.277740°S, 78.71354°W	<i>I. calycinum</i> (Smith 511), <i>D. solanacea</i> (Smith 211)
Lag. Papallacta	ECU	3400m	0.3824°S, 78.1600°W	<i>S. quitensis</i> (Smith 257)
LaMoya	ECU	2380m	2.23856°S, 78.81094°W	<i>I. cornifolium</i> (Smith 492)

LasChinchas	ECU	2350m	3.9638°S, 79.4754°W	<i>I. confertiflorum</i> (Smith 236)
Limon	ECU	3200m	3.01°S, 78.4°W	<i>I. lehmannii</i> (Clark et al. 5997), <i>S. punctata</i> (van def Werff & Palacios 10450)
Loja	ECU	2050m	3.999°S, 79.306°W	<i>I. loxense</i> (Smith 220)
Malpote	ECU	2035m	1.91365°S, 78.99632°W	<i>A. arborescens</i> (Smith 497), <i>I. confertiflorum</i> (Smith 482)
Manzanama	ECU	2570m	4.0869°S, 79.9356°W	<i>I. cornfolium</i> (Smith 242), <i>I. confertiflorum</i> (Smith 482)
Papallacta	ECU	2955m	0.37967°S, 78.12811°W	<i>I. baumii</i> (Smith 276)
Penipe	ECU	2768m	1.5985°S, 78.52715°W	<i>I. fuchsioides</i> (Smith 480)
Perugachi	ECU	2700m	0.2113°N, 78.2994°W	<i>I. gesnerioides</i> (Jaramillo et al. 1803), <i>D. solanacea</i> (Jaramillo et al. 1870)
Pilalo	ECU	2745m	0.95583°S, 78.980°W	<i>I. calycinum</i> (Smith 478), <i>D. solanacea</i> (Smith 479)
Podocarpus	ECU	3200m	4.1185°S, 79.1627°W	<i>S. punctata</i> (Smith 248)
Pululahua	ECU	2500m	0.0394°N, 78.500°W	<i>I. gesnerioides</i> (Smith 254)
Purunuma	ECU	2470m	4.20659°S, 79.39118°W	<i>I. cyaneum</i> (Smith 251)
Selvaalegre	ECU	2550m	0.35326°S, 78.41862°W	<i>I. cyaneum</i> (Smith 495), <i>I. fuchsioides</i> (Smith 496)

Sigsig	ECU	2435m	3.0569°S, 78.79554°W	<i>I. fuchsioides</i> (Smith 491)
Sozoranga	ECU	1500m	4.32876°S, 79.78141°W	<i>I. confertiflorum</i> (Leiva 5111), <i>I. cyaneum</i> (Leiva 5110)
Tablachupa	ECU	2900m	0.31667°S, 78.41667°W	<i>I. calycinum</i> (Gudino & Cuamacas 1994; Tipaz et al. 926), <i>D. solanacea</i> (Moran & Paisano 118; Ollgaard & Balsev 8737)
Tena	ECU	594m	1.26028°S, 77.88719°W	<i>A. arborescens</i> (Smith 494)
Trigoloma	ECU	2147m	1.93601°S, 78.97963°W	<i>I. confertiflorum</i> (Smith 482)
Angasmarca	PER	2780m	8.1333°S, 78.0667°W	<i>I. parvifolium</i> (Leiva 1977), <i>I. umbellatum</i> (Leiva 1978)
Ayabaca	PER	2746m	4.651445°S, 79.73615°W	<i>I. cyaneum</i> (Smith 329), <i>I. lehmannii</i> (Smith 330)
Bosquecachil	PER	2750m	7.4°S, 78.783°W	<i>I. cornifolium</i> (Sagástegui et al. 15424; also Weigend et al. 443b), <i>I. grandiflorum</i> (Sagástegui et al. 15426; also Weigend et al. 443a)
Carhuaz	PER	2650m	9.27508°S, 77.64927°W	<i>I. umbellatum</i> (Smith 516)
Cascas	PER	1780m	7.43850°S, 78.79851°W	<i>A. arborescens</i> (Weigend 97/443 (F) & Stein et al. 4055 (F)), <i>I. peruvianum</i> (Smith 327)
Chachapoyas	PER	2500m	ca. 8.01°S 78.64°W	<i>I. nitidum</i> (Smith 375)
Chiguita	PER	2923m	16.40609°S, 71.39819°W	<i>D. spinosa</i> (Smith 512)

Chota	PER	2600m	6.54865°S, 78.64837°W	<i>I. parvifolium</i> (Ferreyra 8483), <i>I. umbellatum</i> (Stork and Horton 10048)
Chulqui	PER	1840m	9.83831°S, 76.11503°W	<i>A. arborescens</i> (Sawada 59), <i>D. spathulata</i> (Smith 454)
Contumaza	PER	3150m	7.36845°S, 78.88616°W	<i>I. grandiflorum</i> (Smith 322; also Binder et al. 99/48), <i>I. umbellatum</i> (Smith 321; also Binder et al. 99/44)
Encañada	PER	3300m	7.07364°S, 78.3373°W	<i>I. parvifolium</i> (Sagástegui et al. 12015), <i>I. umbellatum</i> (Sánchez Vega 4745)
Guzmango	PER	2600m	7.38563°S, 78.89546°W	<i>I. cornifolium</i> (Smith 314), <i>I. grandiflorum</i> (Smith 355), <i>I. peruvianum</i> (Smith 353)
Josebalta	PER	2775m	7.9477167°S, 78.56195°W	<i>I. edule</i> (Smith 305), <i>I. parvifolium</i> (Smith 303), <i>I. umbellatum</i> (Smith 301)
La Cuesta	PER	1920m	7.91667°S, 78.71667°W	<i>A. arborescens</i> (Leiva & Salinas, 1804), <i>I. edule</i> (Rodriguez & Angeludis 2377), <i>I. umbellatum</i> (Leiva & Salinas, 1996)
Llama	PER	1800m	6.53978°S, 79.11650°W	<i>I. cornifolium</i> (Sagástegui et al. 15936), <i>I. edule</i> (Sagástegui et al. 15933)
Murañe	PER	2600m	8.02084°S, 78.6530°W	<i>I. cornifolium</i> (Smith 523), <i>I. salpoanum</i> (Smith 524), <i>I. tupayachianum</i> (Smith 526), <i>I. umbellatum</i> (Smith 525)
Otuzco	PER	2550m	7.928183°W, 78.583683°S	<i>I. edule</i> (Smith 300)
Piedragorda	PER	2750m	8.00382°S, 78.64838°W	<i>I. cornifolium</i> (Leiva et al. 1200), <i>I. parvifolium</i> (Leiva 1697), <i>I. umbellatum</i> (Leiva et al. 534; Leiva 1694)
Pingola	PER	2535m	4.67323°S, 79.78202°W	<i>I. confertiflorum</i> (Smith 334), <i>I. cyaneum</i> (Smith 335)
Plazapampa	PER	1900m	7.98104°S,	<i>A. arborescens</i> (Leiva 1989), <i>I. edule</i> (Smith 302)

			78.65181°W	
Raquia	PER	2100m	10.15487°S,	<i>I. salpoanum</i> (Smith 517), <i>I. tupayachianum</i> (Smith 519),
			77.47469°W	<i>I. umbellatum</i> (Smith 533)
Samne	PER	2700m	8.00878°S,	<i>I. cornifolium</i> (Smith 365), <i>I. salpoanum</i> (Smith 364)
			78.63911°W	
Tambodeviso	PER	2700m	11.79293°S,	<i>D. obovata</i> (Smith 514), <i>I. umbellatum</i> (Smith 515)
			76.33582°W	
Tarma	PER	3518m	11.68201°S,	<i>D. obovata</i> (Smith 460)
			75.56978°W	
Taulis	PER	1800m	6.99731°S,	<i>I. cornifolium</i> (Hutchison & von Bismack 6329), <i>I.</i>
			78.84819°W	<i>grandiflorum</i> (Hutchison & von Bismark 6328)
Tingo	PER	1800m	6.37972°S,	<i>I. tingoanum</i> (Smith 370)
			77.90962°W	
Yacupampa	PER	2700m	4.619405°S,	<i>I. confertiflorum</i> (Smith 334), <i>I. cyaneum</i> (Smith 336)
			79.71061°W	
Yeton	PER	1734m	7.42776°S,	<i>A. arborescens</i> (Smith 309), <i>I. peruvianum</i> (Smith 307)
			78.90759°W	
Aiquile	BOL	2312m	18.21424°S,	<i>V. breviflora</i> (Smith 419)
			65.18834°W	
Betanzos	BOL	3160m	19.68757°S,	<i>V. fasciculata</i> (Smith 407)
			65.23930°W	
Chaco	BOL	1922m	18.89368°S,	<i>V. breviflora</i> (Smith 412)
			65.11555°W	
Chururaqui	BOL	1972m	16.11039°S,	<i>V. dichotoma</i> (Smith 445)
			68.07865°W	
Culpina	BOL	3038m	20.78477°S,	<i>I. australe</i> (Smith 390)

			65.04088°W	
Cuticucho	BOL	2685m	16.13546°S,	<i>S. punctata</i> (Smith 449)
			68.11047°W	
Epizana	BOL	2800m	17.59316°S,	<i>D. spinosa</i> (Smith 428)
			65.29136°W	
LaPaz	BOL	3640m	16.53462°S,	<i>D. spinosa</i> (Smith 450)
			68.04165°W	
Mairana	BOL	2106m	18.10654°S,	<i>D. brachyantha</i> (Smith 422)
			64.04406°W	
Muyuquin	BOL	3148m	20.48617°S,	<i>V. fasciculata</i> (Smith 401)
			65.14339°W	
Tiraque	BOL	3180m	17.46477°S	<i>V. fasciculata</i> (Smith 432)
			65.75217°W	
Unduavi	BOL	3157m	16.31130°S,	<i>S. punctata</i> (Smith 443)
			67.90273°W	
VelodeNovia	BOL	2157m	16.32033°S,	<i>V. dichotoma</i> (Smith 440)
			67.82700°W	
RioPotrero	ARG	1400m	27.40566°S	<i>V. lorentzii</i> (Hunziker 10001)
			65.98316°W.	

Table S2. Phenotypic community structure for the subset of sites which contain multiple Iochrominae species (32 of our original 71 sites). Values are given for mean nearest taxon distance (MNTD) for actual and null communities and statistical significance of any deviation from null expectations. Patterns are comparable to those found in Table 1 for the full dataset.

		MNTD		P Value
		Actual	Nulls	
Morphology	Tube Length	1.35	1.38	0.86
	Leaf Length	7.15	6.66	0.53
	Petiole Length	1.62	1.66	0.76
	Pedicel Length	1.06	1.06	0.97
	Berry Width	4.33	3.93	0.27
Flower Color	1) Hummingbird Vision	0.27	0.23	0.03
	2) Bee Vision	0.29	0.26	0.14
	3) PCA			
	PC1	6.52	6.39	0.87
	PC2	4.40	5.34	0.05
	PC3	3.28	2.69	0.02
	PC4	1.60	1.72	0.42

Table S3. Phenotypic community structure for color distance calculated using models of vision that incorporate photoreceptor noise. Distance is measured as the number of ‘just noticeable differences’ between pairs of spectra. Values are given for mean nearest taxon distance (MNTD) for actual and null communities, statistical significance of any deviation from null expectations, and pattern detected (overdispersed, clustered, or random).

		MNTD			
		Actual	Nulls	P Value	Pattern
Flower Color	Hummingbird Vision	23.2	19.9	0.02	Overdispersed
	Bee Vision	8.9	7.5	0.01	Overdispersed

Table S4. Phylogenetic signal for *Iochroma* traits, including four components of flower color and four morphological measurements. For each of the 100 trees, we calculated K values and whether these differed significantly from 0 (low signal) or 1 (high signal). Here we present mean K and P values ($\pm$ SD), as well as percent significance (over the 100 trees). Since combined color can only be expressed as Euclidean color distance between pairs of species, we cannot calculate K for this trait and instead examined phylogenetic signal using Mantel tests for a correlation between phylogenetic and phenotypic distance (thus a significant value suggests $K > 0$).

Trait	K > 0?			K < 1?		Mantel Test	
	Mean	Mean		Mean		Mean	
	K (SD)	P (SD)	% Sig.	P (SD)	% Sig.	P (SD)	% Sig.
Hummingbird Vision						0.57 (0.07)	0
Bee Vision						0.42 (0.06)	0
PC1	0.11 (0.02)	0.30 (0.02)	0	0.00 (0.00)	100	0.65 (0.14)	0
PC2	0.03 (0.00)	0.57 (0.02)	0	0.00 (0.00)	100	0.06 (0.04)	49
PC3	0.04 (0.00)	0.42 (0.01)	0	0.00 (0.00)	100	0.56 (0.11)	0
PC4	0.08 (0.01)	0.30 (0.02)	0	0.00 (0.00)	100	0.58 (0.10)	0
Tube Length	0.52 (0.07)	0.00 (0.00)	100	0.08 (0.05)	36	0.05 (0.07)	63
Leaf Length	0.42 (0.06)	0.05 (0.02)	58	0.02 (0.01)	97	0.46 (0.13)	0
Petiole Length	0.40 (0.05)	0.03 (0.02)	87	0.01 (0.01)	100	0.41 (0.09)	0
Pedicel Length	0.53 (0.06)	0.00 (0.00)	100	0.08 (0.04)	21	0.02 (0.02)	99
Berry Width	0.34 (0.07)	0.04 (0.02)	66	0.00 (0.01)	100	0.39 (0.11)	0