

Additional files 1

Table S1 The samples and GenBank accession numbers used in this study.

Table S2 The distribution, climatic zone, phenology, and habitat of species in this study.

Table S3 The species distribution data used in this study.

Table S4 Niche PCA loadings.

Table S1. The samples and GenBank accession numbers used in this study.

Species	ITS	<i>atpI-H</i>	<i>matK</i>	<i>psbA-trnH</i>	<i>psbM-trnD</i>	<i>rbcL</i>	<i>rps19-rpl22</i>	<i>trnL-F</i>
<i>Gastrochilus acaulis</i>	KM583455	-	KM583465	-	-	KM583460	-	-
<i>Gastrochilus acinacifolius</i>	MK357118	KJ733334	MK357139	KJ733492	MK357217	-	MK357161	KJ733649
<i>Gastrochilus acutifolius</i>	MT225573	-	MK357140	-	MK357230	MN239898	MK357162	-
<i>Gastrochilus affinis</i>	-	-	MK357141	-	MK357227	-	MK357163	-
<i>Gastrochilus alatus</i>	-	-	-	-	MK357228	-	-	-
<i>Gastrochilus bellinus</i>	MK357123	MN124427	MK357142	MN124427	MK357240	MN124427	MK357165	MK357202
<i>Gastrochilus bigibbus</i>	MN124439	MN124439	MN124439	MN124439	MN124439	MN124439	MN124439	MN124439
<i>Gastrochilus calceolaris</i>	MK357125	KJ733335	MK357144	KF545865	MK357232	KX527436	MK357169	KJ733650
<i>Gastrochilus changjiangensis</i>	MK357124	-	-	-	MK357236	-	MK357166	-
<i>Gastrochilus ciliaris</i>	-	-	MK357148	-	MK357225	-	MK357173	-
<i>Gastrochilus dasypogon</i>	MK357129	-	MK357149	-	MK357219	-	MK357181	MK357197
<i>Gastrochilus deminutus</i>	KY966600	-	KY966887	-	-	-	-	-
<i>Gastrochilus distichus</i>	KJ733414	KJ733336	KJ733571	KJ733494	-	-	-	KJ733651
<i>Gastrochilus fargesii</i>	KJ733415	KJ733337	KJ733572	-	-	-	-	KJ733652
<i>Gastrochilus formosanus</i>	KJ733416	KJ733338	KJ733573	KJ733495	MK357226	JQ933340	MK357174	KJ733653
<i>Gastrochilus fuscopunctatus</i>	MK317970	NC 035830	MK357150	NC 035830	MK357231	NC 035830	MK357171	MK357192
<i>Gastrochilus guangtungensis</i>	KJ733417	KJ733339	KJ733574	KJ733496	MN124428	MN124428	MN124428	KJ733654
<i>Gastrochilus gongshanensis</i>	-	MN124438	MN124438	MN124438	MN124438	MN124438	MN124438	MN124438
<i>Gastrochilus intermedius</i>	MK357121	-	MK357151	-	MK357213	-	MK357172	MK357190
<i>Gastrochilus japonicus</i>	KY966598	KJ733340	KJ733575	KJ733497	KX871236	KF296712	KX871236	KF545897
<i>Gastrochilus linearifolius</i>	MK357133	-	MK357136	-	MK357229	-	MK357187	MK357194
<i>Gastrochilus linii</i>	-	-	MK357152	-	MK357224	-	MK357176	MK357198
<i>Gastrochilus malipoensis</i>	-	-	MK357147	-	MK357235	-	MK357178	MK357200
<i>Gastrochilus matsuran</i>	KT338700	-	-	-	-	-	-	-
<i>Gastrochilus minutiflorus</i>	-	-	MK357153	-	MK357215	-	MK357179	-
<i>Gastrochilus obliquus</i>	MK357131	KJ733341	MK357137	KJ733498	MK357218	KX527435	MK357182	KJ733656
<i>Gastrochilus platycalcaratus</i>	MK357122	-	-	-	MK357222	-	MK357175	-
<i>Gastrochilus pseudodistichus</i>	MK357132	-	-	-	MK357221	-	MK357170	-

<i>Gastrochilus rantabunensis</i>	-	-	MK357155	-	MK357223	-	MK357184	MK357193
<i>Gastrochilus raraensis</i>	KJ733420	KJ733342	MK357156	KJ733499	MK357239	-	-	KJ733657
<i>Gastrochilus somae</i>	MK357128	MN124436	MN124436	MN124436	MK357220	MN124436	MK357180	MN124436
<i>Gastrochilus tianbaoensis</i>	MK357120	-	MK357157	-	MK357214	-	MK357186	MK357207
<i>Gastrochilus yunnanensis</i>	MK165469	-	MK357158	-	MK357212	-	MK357185	-
<i>Gastrochilus zhenyuanensis</i>	MK357127	-	MK357146	-	MK357237	-	MK357168	MK357199
Outgroups								
<i>Acampe ochracea</i>	AB217525	-	DQ091314	-	-	KF421859	-	DQ091438
<i>Acampe papillosa</i>	DQ091708	MN124418	DQ091315	KJ733464	MN124418	JQ933201	MN124418	MN124418
<i>Acampe rigida</i>	AB217526	KJ733307	KY966701	KJ733465	MN124419	MG905912	MN124419	KJ733622
<i>Aerangis hariotiana</i>	DQ091607	-	EF079271	MF348708	-	MF349460	DQ091467	-
<i>Aeranthus grandiflora</i>	DQ091760	KJ021013	KF557958	KJ021025	-	MT518907	JQ905513	-
<i>Aerides multiflora</i>	AY912258	-	AY557201	KJ093259	-	JN005366	-	EF670403
<i>Angraecum leonis</i>	DQ091735	-	DQ091426	-	-	MT518924	-	DQ091551
<i>Cleisostoma discolor</i>	DQ091696	-	-	-	-	-	-	-
<i>Cleisostoma gjellerupii</i>	AB217545	-	AB217721	-	-	-	-	-
<i>Cleisostoma racemiferum</i>	DQ091693	KJ733325	MK064248	-	-	MN298852	-	KJ733640
<i>Diaphananthe pellucida</i>	DQ091620	-	MT518411	-	-	MT519117	DQ091502	-
<i>Pomatocalpa diffusum</i>	EF670364	-	AB217752	-	-	-	-	EF670432
<i>Pomatocalpa spicatum</i>	EF670365	KJ733359	EF655811	KJ733518	MN124411	MN124411	MN124411	KJ733675
<i>Robiquetia cerina</i>	DQ091701	-	-	-	-	-	-	-
<i>Robiquetia spathulata</i>	DQ091702	KJ733364	KF421855	KJ733523	MN124410	KF421866	MN124410	KJ733680
<i>Stereochilus dalatensis</i>	EF670386	KJ733375	KY966958	KJ733534	MN124431	MN124431	MN124431	EF670420
<i>Trichoglottis ionosma</i>	AB217589	-	AB217765	-	-	-	-	-
<i>Trichoglottis geminata</i>	DQ091716	-	-	-	-	-	-	-
<i>Trichoglottis latisejala</i>	AB217593	MN124432	AB217769	MN124432	MN124432	MN124432	MN124432	MN124432
<i>Trichoglottis seidenfadenii</i>	DQ091714	-	MF349981	MF348713	-	-	-	-
<i>Vandopsis gigantea</i>	EF670376	KJ733381	KC823042	KJ733541	MN124403	JQ933519	MN124403	KJ733697
<i>Vandopsis lissochiloides</i>	EF670377	MN124443	EF655806	MN124443	MN124443	MN124443	MN124443	EF670418

Table S2. The distribution, climatic zone, phenology, and habitat of species in this study.

Species	Distribution	Climatic zone	Altitude (m)	Phenology	Habitat
<i>Gastrochilus acaulis</i>	India, Sri Lanka	A	900-1550	8-10	evergreen forests
<i>G. acinacifolius</i>	China (Hainan)	A	1000-1200	9-12	montane forests
<i>G. acutifolius</i>	Nepal, Myanmar, Vietnam	A	1450-1700	11-12	evergreen broad-leaved forests
<i>G. affinis</i>	Bhutan, India, Nepal	B	2300-3000	3-4	forests
<i>G. alatus</i>	China	B	2600-2700	4-5	forests
<i>G. bellinus</i>	Burma, China, Thailand, Vietnam	AB	600-1700	3-4	forests
<i>G. bigibbus</i>	India, Malaysia	A	800-1400	9-12	dense forests
<i>G. calceolaris</i>	Bhutan, India, Nepal, Burma, China, Malaysia, Thailand, Vietnam	AB	200-2300	3-4	forests
<i>G. changjiangensis</i>	China (Hainan)	A	500-800	3-4	rainforests
<i>G. ciliaris</i>	Japan, China (Taiwan)	AB	1600-1800	4-7	forests
<i>G. dasypogon</i>	Bhutan, India, Nepal, China, Thailand, Vietnam	AB	300-1000	10	forests
<i>G. deminutus</i>	Thailand	A	1500-1600	unknown	forests
<i>G. distichus</i>	Bhutan, China, India, Nepal	AB	1520-2700	1-5	rainforests
<i>G. fargesii</i>	China	B	~2300	5-6	forests
<i>G. formosanus</i>	China	A	500-2500	1-12	forests
<i>G. fuscopunctatus</i>	China	AB	1000-2500	1-7	dense forests
<i>G. guangtungensis</i>	China	AB	~1500	10	forests
<i>G. gongshanensis</i>	China (Yunnan)	B	~3200	unknown	forests
<i>G. intermedius</i>	China, India, Thailand, Vietnam	AB	~1500	10	forests
<i>G. japonicus</i>	China, Japan	AB	200-2000	6-9	pinus, broad-leaved forests
<i>G. linearifolius</i>	China, India	B	~1600	9	forests
<i>G. linii</i>	China (Taiwan)	A	1400-2000	5	coniferous forests
<i>G. malipoensis</i>	China	AB	~1300	3-4	forests
<i>G. matsuran</i>	Japan, China (Taiwan)	AB	500-2500	1-2	forests
<i>G. minutiflorus</i>	Vietnam	A	850-900	3-5, 10	evergreen mountain forests
<i>G. obliquus</i>	Bhutan, Burma, China, India, Laos, Nepal, Thailand, Vietnam	AB	800-1400	10	montane forests
<i>G. platycalcaratus</i>	Burma, China, Thailand	AB	700-800	3	dense forests

<i>G. pseudodistichus</i>	Bhutan, China, India, Thailand, Vietnam	AB	1000-2600	6	coniferous forests
<i>G. rantabunensis</i>	China	AB	~2000	1-2 or 7	coniferous forests
<i>G. raraensis</i>	China (Taiwan)	A	1500-2200	1-2	coniferous forests
<i>G. somae</i>	China (Taiwan)	A	1000-2000	6-9	forests
<i>G. tianbaoensis</i>	China (Yunnan), Vietnam (Lao Cai)	A	1000-1100	11-12	primary forests
<i>G. yunnanensis</i>	Bangladesh, China, Thailand, Vietnam	AB	~ 1500	10	dense forests
<i>G. zhenyuanensis</i>	China	B	1290-2200	2-3	evergreen broad-leaved forests
Outgroups					
<i>Acampe ochracea</i>	Bhutan, Burma, China, India, Laos, Sri Lanka, Thailand, Vietnam	AB	700-1100	12	forests
<i>Acampe papillosa</i>	Bangladesh, Bhutan, Burma, China, Laos, Nepal, India, Thailand, Vietnam	AB	~500	11	forests
<i>Acampe rigida</i>	Bhutan, Burma, Cambodia, China, India, Malaysia, Nepal, Sri Lanka, Thailand, Vietnam	A	300-800	8-9	forests
<i>Aerangis hariatiana</i>	Comoro Islands	A	200-1600	3-5	rainforests
<i>Aerantes grandiflora</i>	Madagascar	A	0-1200	5-8	humid rainforests
<i>Aerides multiflora</i>	India, Nepal, Thailand, China, Bhutan, Cambodia, Vietnam, Myanmar	AB	0-1100	3-7	semi-deciduous/deciduous forests
<i>Angraecum leonis</i>	the Comoros Islands and Madagascar	A	200-1200	4-5	forests
<i>Cleisostoma discolor</i>	Indonesia	A	350-1500	4-5	lowland montane forests
<i>Cleisostoma gjellerupii</i>	New Guinea	A	~3000	3-4	rainforests
<i>Cleisostoma racemiferum</i>	Bhutan, Burma, China, India, Laos, Nepal, Thailand, Vietnam	AB	600-2150	5-6	forests
<i>Diaphananthe pellucida</i>	east Africa	A	600-1800	unknown	evergreen forests
<i>Pomatocalpa diffusum</i>	Indonesia, Malaysia, Philippines, Thailand, Myanmar	A	~800	2-5	rainforests
<i>Pomatocalpa spicatum</i>	Bhutan, Burma, China, India, Indonesia, Laos, Malaysia, Philippines, Sri Lanka, Thailand, Vietnam	AB	-	4	montane forests
<i>Robiquetia cerina</i>	Philippines, Indonesia	A	>350	-	forests
<i>Robiquetia spathulata</i>	Bhutan, Burma, Cambodia, China, India, Indonesia, Laos, Malaysia, Singapore, Thailand, Vietnam	AB	400-800	9-10	montane forests
<i>Stereochilus dalatensis</i>	Thailand, Vietnam	A	800-1400	4-5	forests

<i>Trichoglottis ionosma</i>	Phillipines	A	300-1300		rainforests
<i>Trichoglottis geminata</i>	Philippines, Indonesia, Malaysia	A	~1100	3-4	rainforests
<i>Trichoglottis latisejala</i>	Philippines	A	0-1000	11-12	rainforests
<i>Trichoglottis seidenfadenii</i>	Vietnam	A	~700	-	semi-deciduous/deciduous forests
<i>Vandopsis gigantea</i>	Burma, China, Laos, Malaysia, Thailand, Vietnam	AB	300-1100	3-7	evergreen, semi-deciduous forests
<i>Vandopsis lissochiloides</i>	Indonesia, Philippines, Laos	A	~1100	7-8	evergreen forests

Note: (1) the sources of distribution information are: <https://tropicos.org>, <https://www.gbif.org>, <http://iplant.cn>, <http://powo.kew.org>, <http://www.orchidspecies.com> and Liu et al. (2019). (2) Climatic zone: A, tropical; B, subtropical.

Table S3. The species distribution data used in this study.

Species	Latitude	Longitude
<i>Gastrochilus acaulis</i>	11.65	78.166667
<i>Gastrochilus acinacifolius</i>	18.74	109.17
<i>Gastrochilus acutifolius</i>	26.921564	89.535567
<i>Gastrochilus acutifolius</i>	27.059544	90.499184
<i>Gastrochilus acutifolius</i>	27.75	88.5
<i>Gastrochilus acutifolius</i>	20.350333	105.593833
<i>Gastrochilus acutifolius</i>	27.183761	90.528824
<i>Gastrochilus acutifolius</i>	17.38944	106.21305
<i>Gastrochilus acutifolius</i>	17.6725	105.96666
<i>Gastrochilus acutifolius</i>	21.010278	104.501667
<i>Gastrochilus acutifolius</i>	20.863889	104.521389
<i>Gastrochilus acutifolius</i>	27.5544	88.4517
<i>Gastrochilus affinis</i>	27.5544	88.4517
<i>Gastrochilus alatus</i>	25.04	102.73
<i>Gastrochilus bellinus</i>	20.124292	99.179935
<i>Gastrochilus bellinus</i>	22.269167	103.242778
<i>Gastrochilus bellinus</i>	22.01071	100.799775
<i>Gastrochilus bellinus</i>	41.81027	-72.25583
<i>Gastrochilus bellinus</i>	27.5544	88.4517
<i>Gastrochilus bigibbus</i>	25.04	102.73
<i>Gastrochilus bigibbus</i>	108.34	22.82
<i>Gastrochilus bigibbus</i>	24.99	102.73
<i>Gastrochilus calceolaris</i>	35.86	104.2
<i>Gastrochilus calceolaris</i>	12.110298	108.698773
<i>Gastrochilus calceolaris</i>	27.591954	85.372023
<i>Gastrochilus calceolaris</i>	3.416667	101.783333
<i>Gastrochilus calceolaris</i>	29.32	95.33
<i>Gastrochilus calceolaris</i>	27.468209	87.703002
<i>Gastrochilus calceolaris</i>	39.732207	-104.961468
<i>Gastrochilus calceolaris</i>	23.9	99
<i>Gastrochilus calceolaris</i>	24.5	98.6
<i>Gastrochilus calceolaris</i>	27.709106	96.466142
<i>Gastrochilus calceolaris</i>	23.531078	99.411861
<i>Gastrochilus calceolaris</i>	23.473501	99.8277
<i>Gastrochilus calceolaris</i>	24.58669	98.689166
<i>Gastrochilus calceolaris</i>	27.740736	98.66582
<i>Gastrochilus calceolaris</i>	22.01071	100.799775
<i>Gastrochilus calceolaris</i>	23.880344	100.092756
<i>Gastrochilus calceolaris</i>	24.580446	99.92854
<i>Gastrochilus calceolaris</i>	27.82308	99.706013
<i>Gastrochilus calceolaris</i>	23.763342	98.82524
<i>Gastrochilus calceolaris</i>	24.615701	100.709787
<i>Gastrochilus calceolaris</i>	18.252625	109.511923

<i>Gastrochilus calceolaris</i>	18.252013	109.504134
<i>Gastrochilus calceolaris</i>	18.516726	110.029085
<i>Gastrochilus calceolaris</i>	11.652236	116.455078
<i>Gastrochilus calceolaris</i>	17.6725	105.96666
<i>Gastrochilus calceolaris</i>	12.09222	108.37555
<i>Gastrochilus calceolaris</i>	20.73777	104.94166
<i>Gastrochilus calceolaris</i>	22.2175	106.074167
<i>Gastrochilus calceolaris</i>	22.27388	105.43277
<i>Gastrochilus calceolaris</i>	12.5	108.5
<i>Gastrochilus calceolaris</i>	20.985	104.47944
<i>Gastrochilus calceolaris</i>	23.15	104.983333
<i>Gastrochilus calceolaris</i>	12.18333	108.71666
<i>Gastrochilus calceolaris</i>	12.13333	108.65
<i>Gastrochilus calceolaris</i>	15.066667	107.983333
<i>Gastrochilus calceolaris</i>	11.731111	109.143056
<i>Gastrochilus calceolaris</i>	19.078056	104.3475
<i>Gastrochilus calceolaris</i>	19.051944	104.615833
<i>Gastrochilus calceolaris</i>	21.021389	104.513056
<i>Gastrochilus calceolaris</i>	28.253008	83.938548
<i>Gastrochilus calceolaris</i>	31.712092	88.118532
<i>Gastrochilus calceolaris</i>	22.883478	79.616202
<i>Gastrochilus calceolaris</i>	36.519977	103.891767
<i>Gastrochilus calceolaris</i>	26.886395	98.206742
<i>Gastrochilus calceolaris</i>	27.5544	88.4517
<i>Gastrochilus calceolaris</i>	19.254108	110.45517
<i>Gastrochilus calceolaris</i>	11.318545	116.562386
<i>Gastrochilus calceolaris</i>	24.399048	113.987821
<i>Gastrochilus calceolaris</i>	25.116213	99.162598
<i>Gastrochilus calceolaris</i>	26.901731	98.869207
<i>Gastrochilus calceolaris</i>	23.146851	99.246047
<i>Gastrochilus calceolaris</i>	22.555882	99.932102
<i>Gastrochilus calceolaris</i>	25.020615	98.490007
<i>Gastrochilus calceolaris</i>	25.841921	98.857727
<i>Gastrochilus calceolaris</i>	24.705249	97.931861
<i>Gastrochilus calceolaris</i>	25.285556	98.705556
<i>Gastrochilus calceolaris</i>	24.873056	98.725278
<i>Gastrochilus calceolaris</i>	25.700556	98.682778
<i>Gastrochilus calceolaris</i>	25.751944	98.706389
<i>Gastrochilus calceolaris</i>	25.294722	98.700278
<i>Gastrochilus changjiangensis</i>	19.51	109.58
<i>Gastrochilus ciliaris</i>	24.635177	121.387664
<i>Gastrochilus ciliaris</i>	24.171389	121.409444
<i>Gastrochilus ciliaris</i>	24.1	121.182222
<i>Gastrochilus ciliaris</i>	24.066667	121.166667
<i>Gastrochilus dasypogon</i>	13	102.25

<i>Gastrochilus dasypogon</i>	18.333333	99.866667
<i>Gastrochilus dasypogon</i>	19.583333	98.833333
<i>Gastrochilus dasypogon</i>	18.116667	100.15
<i>Gastrochilus dasypogon</i>	22.01071	100.799775
<i>Gastrochilus dasypogon</i>	41.81027	-72.25583
<i>Gastrochilus deminutus</i>	108.34	22.82
<i>Gastrochilus distichus</i>	20.59	78.96
<i>Gastrochilus distichus</i>	35.86	104.2
<i>Gastrochilus distichus</i>	27.73	88.63
<i>Gastrochilus distichus</i>	25.7	100.1
<i>Gastrochilus distichus</i>	23.9	99
<i>Gastrochilus distichus</i>	24.5	98.6
<i>Gastrochilus distichus</i>	24.927222	98.7525
<i>Gastrochilus distichus</i>	25.584234	100.222124
<i>Gastrochilus distichus</i>	26.11116	99.951049
<i>Gastrochilus distichus</i>	24.58669	98.689166
<i>Gastrochilus distichus</i>	23.763342	98.82524
<i>Gastrochilus distichus</i>	27.5544	88.4517
<i>Gastrochilus distichus</i>	36.519977	103.891767
<i>Gastrochilus distichus</i>	28.253008	83.938548
<i>Gastrochilus distichus</i>	31.712092	88.118532
<i>Gastrochilus fargesii</i>	30.36	102.81
<i>Gastrochilus fargesii</i>	25.584234	100.222124
<i>Gastrochilus formosanus</i>	24.453876	121.33826
<i>Gastrochilus formosanus</i>	24.660671	121.229531
<i>Gastrochilus formosanus</i>	24.575612	121.337313
<i>Gastrochilus formosanus</i>	24.596664	120.817371
<i>Gastrochilus formosanus</i>	35.86	104.2
<i>Gastrochilus formosanus</i>	24.646985	121.24302
<i>Gastrochilus formosanus</i>	23.405975	120.93116
<i>Gastrochilus formosanus</i>	24.628637	121.205206
<i>Gastrochilus formosanus</i>	24.344579	121.302579
<i>Gastrochilus formosanus</i>	31.08	103.26
<i>Gastrochilus formosanus</i>	24.033333	121.233333
<i>Gastrochilus formosanus</i>	22.834667	121.0105
<i>Gastrochilus formosanus</i>	24.383333	121.35
<i>Gastrochilus formosanus</i>	24.754444	121.316389
<i>Gastrochilus formosanus</i>	24.65	121.433333
<i>Gastrochilus formosanus</i>	22.4	120.75
<i>Gastrochilus formosanus</i>	23.6	120.716667
<i>Gastrochilus formosanus</i>	23	120.716667
<i>Gastrochilus formosanus</i>	24.583333	121.333333
<i>Gastrochilus formosanus</i>	23.666667	121
<i>Gastrochilus formosanus</i>	24.066667	121.166667
<i>Gastrochilus formosanus</i>	23.900556	120.681389

<i>Gastrochilus formosanus</i>	25	121.3
<i>Gastrochilus formosanus</i>	23.26	120.9275
<i>Gastrochilus formosanus</i>	23.266667	121.266667
<i>Gastrochilus formosanus</i>	22.621944	120.753333
<i>Gastrochilus formosanus</i>	24.25	121.633333
<i>Gastrochilus formosanus</i>	24.327222	121.112778
<i>Gastrochilus formosanus</i>	24.25	121.166667
<i>Gastrochilus formosanus</i>	24.3525	121.301944
<i>Gastrochilus formosanus</i>	23.483333	120.883333
<i>Gastrochilus formosanus</i>	24.766667	121.316667
<i>Gastrochilus formosanus</i>	24.766667	121.3
<i>Gastrochilus formosanus</i>	23.509593	120.867092
<i>Gastrochilus formosanus</i>	23.514831	120.86787
<i>Gastrochilus formosanus</i>	23.511944	120.870987
<i>Gastrochilus formosanus</i>	23.515097	120.861534
<i>Gastrochilus formosanus</i>	23.51618	120.860818
<i>Gastrochilus formosanus</i>	23.51384	120.869996
<i>Gastrochilus formosanus</i>	23.511398	120.86572
<i>Gastrochilus formosanus</i>	23.512302	120.867285
<i>Gastrochilus formosanus</i>	24.17	121.32
<i>Gastrochilus formosanus</i>	23.63	120.91
<i>Gastrochilus formosanus</i>	24.75	121.46
<i>Gastrochilus formosanus</i>	23.03	120.77
<i>Gastrochilus formosanus</i>	23.53	121.27
<i>Gastrochilus formosanus</i>	22.63	120.71
<i>Gastrochilus formosanus</i>	30.066708	102.758313
<i>Gastrochilus formosanus</i>	25.841921	98.857727
<i>Gastrochilus formosanus</i>	23.592778	120.882778
<i>Gastrochilus formosanus</i>	24.1	121.181944
<i>Gastrochilus formosanus</i>	23.5275	120.769167
<i>Gastrochilus formosanus</i>	24.463056	121.250833
<i>Gastrochilus formosanus</i>	24.146667	121.613889
<i>Gastrochilus formosanus</i>	23.9075	121.435556
<i>Gastrochilus fuscopunctatus</i>	24.783333	121.45
<i>Gastrochilus fuscopunctatus</i>	23.866667	121.55
<i>Gastrochilus fuscopunctatus</i>	24.866667	121.483333
<i>Gastrochilus fuscopunctatus</i>	23.266667	121.266667
<i>Gastrochilus fuscopunctatus</i>	24.766667	121.316667
<i>Gastrochilus fuscopunctatus</i>	23	120.716667
<i>Gastrochilus fuscopunctatus</i>	24.1	121.182222
<i>Gastrochilus fuscopunctatus</i>	24.783333	121.6
<i>Gastrochilus fuscopunctatus</i>	24.48	121.19
<i>Gastrochilus fuscopunctatus</i>	24.7875	121.475
<i>Gastrochilus guangtungensis</i>	24.399048	113.987821
<i>Gastrochilus guangtungensis</i>	27.740736	98.66582

<i>Gastrochilus gongshanensis</i>	27.74	98.66
<i>Gastrochilus intermedius</i>	29.32	95.33
<i>Gastrochilus intermedius</i>	18.252013	109.504134
<i>Gastrochilus intermedius</i>	18.516726	110.029085
<i>Gastrochilus intermedius</i>	29.351226	107.616845
<i>Gastrochilus intermedius</i>	22.555882	99.932102
<i>Gastrochilus japonicus</i>	24.944423	121.337079
<i>Gastrochilus japonicus</i>	24.963936	121.525443
<i>Gastrochilus japonicus</i>	24.985174	121.379343
<i>Gastrochilus japonicus</i>	22.416667	120.883333
<i>Gastrochilus japonicus</i>	22.633333	120.933333
<i>Gastrochilus japonicus</i>	22.616667	120.966667
<i>Gastrochilus japonicus</i>	23.916667	120.883333
<i>Gastrochilus japonicus</i>	24.639444	121.1025
<i>Gastrochilus japonicus</i>	22.728443	120.781116
<i>Gastrochilus japonicus</i>	22.730763	120.831708
<i>Gastrochilus japonicus</i>	22.733553	120.822826
<i>Gastrochilus japonicus</i>	22.88	121.17
<i>Gastrochilus japonicus</i>	34.883301	135.2
<i>Gastrochilus japonicus</i>	41.80916	-72.25416
<i>Gastrochilus linearifolius</i>	29.32	95.33
<i>Gastrochilus linearifolius</i>	27.5544	88.4517
<i>Gastrochilus linii</i>	24.15	120.67
<i>Gastrochilus malipoensis</i>	104.787778	23.131944
<i>Gastrochilus malipoensis</i>	33.2	129.3
<i>Gastrochilus malipoensis</i>	35.5	137.6
<i>Gastrochilus malipoensis</i>	37.3	140.9
<i>Gastrochilus malipoensis</i>	38.3	140.9
<i>Gastrochilus malipoensis</i>	33.5	130.9
<i>Gastrochilus malipoensis</i>	38.3	141.1
<i>Gastrochilus malipoensis</i>	23.640556	120.794167
<i>Gastrochilus malipoensis</i>	23.1518	120.805
<i>Gastrochilus malipoensis</i>	35.4	137.4
<i>Gastrochilus malipoensis</i>	38.4	141.1
<i>Gastrochilus malipoensis</i>	32.8	130.7
<i>Gastrochilus matsuran</i>	23.151844	120.805266
<i>Gastrochilus minutiflorus</i>	21.193611	106.064167
<i>Gastrochilus obliquus</i>	11.430155	107.425915
<i>Gastrochilus obliquus</i>	13.798265	100.550072
<i>Gastrochilus obliquus</i>	22.25997	96.69933
<i>Gastrochilus obliquus</i>	27.63481	97.36986
<i>Gastrochilus obliquus</i>	22.01071	100.799775
<i>Gastrochilus obliquus</i>	11.628611	105.873889
<i>Gastrochilus obliquus</i>	27.5544	88.4517
<i>Gastrochilus obliquus</i>	21.957355	100.452547

<i>Gastrochilus obliquus</i>	21.475834	101.56752
<i>Gastrochilus obliquus</i>	13.25	101.833
<i>Gastrochilus platycalcaratus</i>	21.475834	101.56752
<i>Gastrochilus pseudodistichus</i>	24.220158	120.989057
<i>Gastrochilus pseudodistichus</i>	21.91	95.96
<i>Gastrochilus pseudodistichus</i>	15.87	100.99
<i>Gastrochilus pseudodistichus</i>	20.59	78.96
<i>Gastrochilus pseudodistichus</i>	27.73	88.63
<i>Gastrochilus pseudodistichus</i>	35.86	104.2
<i>Gastrochilus pseudodistichus</i>	25.917276	98.750319
<i>Gastrochilus pseudodistichus</i>	28	98.5
<i>Gastrochilus pseudodistichus</i>	22.983563	103.687613
<i>Gastrochilus pseudodistichus</i>	27.740736	98.66582
<i>Gastrochilus pseudodistichus</i>	23.125462	104.702829
<i>Gastrochilus pseudodistichus</i>	23.437468	104.672252
<i>Gastrochilus pseudodistichus</i>	22.555882	99.932102
<i>Gastrochilus pseudodistichus</i>	20.760278	104.893611
<i>Gastrochilus pseudodistichus</i>	20.7275	104.89527
<i>Gastrochilus pseudodistichus</i>	23.136389	105.013333
<i>Gastrochilus pseudodistichus</i>	23.115833	105.03
<i>Gastrochilus pseudodistichus</i>	23.11666	105.13333
<i>Gastrochilus pseudodistichus</i>	23.18333	105.3
<i>Gastrochilus pseudodistichus</i>	23.26666	105.36666
<i>Gastrochilus pseudodistichus</i>	15.066667	107.983333
<i>Gastrochilus pseudodistichus</i>	15.073	108.026
<i>Gastrochilus pseudodistichus</i>	22.73333	105.83333
<i>Gastrochilus pseudodistichus</i>	27.5544	88.4517
<i>Gastrochilus pseudodistichus</i>	27.75	97.75
<i>Gastrochilus pseudodistichus</i>	24.615701	100.709787
<i>Gastrochilus rantabunensis</i>	26.38	112.39
<i>Gastrochilus raraensis</i>	24.70028297	121.4795621
<i>Gastrochilus raraensis</i>	23.78333333	121.3833333
<i>Gastrochilus raraensis</i>	23.26666667	121.2666667
<i>Gastrochilus raraensis</i>	24.76666667	121.3166667
<i>Gastrochilus somae</i>	23.800864	120.847995
<i>Gastrochilus tianbaoensis</i>	22.01	100.8
<i>Gastrochilus yunnanensis</i>	23.12	104.7
<i>Gastrochilus zhenyuanensis</i>	22.78	100.97
<i>Gastrochilus zhenyuanensis</i>	26.11	99.94

Table S4. Niche PCA loadings.

Variables	PC1 loading
elevation	-0.746457137
bio2	-0.740638224
bio3	-0.480806134
bio15	-0.306077195
bio7	-0.088044733
bio11	0.054730184
bio9	0.073953394
bio1	0.157258365
bio4	0.221289862
bio6	0.264307391
bio5	0.267815789
bio10	0.36823738
bio8	0.416192786
bio14	0.472474418
bio17	0.519613426
bio19	0.551056474
bio13	0.623121951
bio18	0.637327428
bio16	0.751531592
bio12	0.876705637