Supplementary Information for:

Co-evolution of *Iolana* blues with their hostplants and the higher phylogeny of subtribe Scolitantidina (Lepidoptera, Lycaenidae)

Vazrick Nazari, Sergio Montagud Alario, Loukia Spilani, Vlad Dincă, Alireza Naderi, Wolfgang ten Hagen, Roger Vila

Diversity Special Issue: Speciation, Phylogenetics and Taxonomy of Lepidoptera (2024)

Table of contents:

Table S1. Primers and PCR protocols used for the amplification of COI (DNA barcode region), ND1, ITS2 and CAD. Note that DNA barcodes were obtained using two different primer pairs.

Table S2. Material examined and sequences used in this study. *= Substituted sequences (see Material and Methods); †= Sample ID for the COI-COII sequence on GenBank. ♂ ♀ = Specimens dissected for this study.

Table S3. Sequences used in the reconstruction of the host plant phylogeny after Moghaddam et al (2017). Sequences marked with an asterisk were added to the latter dataset in this study.

Figure S1. Mr. Bayes reconstruction of the host plant phylogeny using a dataset composed on sequences in Table S3. Values indicate Bayesian Posterior Probabilities.

Figure S2. BEAST phylogeny of Scolitantidina combined dataset showing node posterior probabilities.

Figure S3. Maximum Likelihood reconstruction with IQtree showing support for 1000 replicates of the same dataset

Figure S4. Genitalia dissections.

Table S1. Primers and PCR protocols used for the amplification of COI (DNA barcode region), ND1, ITS2 and CAD. Note that DNA barcodes were obtained using two different primer pairs.

COI (29 sequences)	
Reagents	**µl per reaction**
Buffer 5X	5
MgCl2 (25 mM)	2
dNTPs (10mM)	0.5
LCO1490 (10µM)	0.5
Nancy (10µM)	0.5
H2O	14.4
Taq polymerase (Promega)	0.1
DNA extraction	2

PCR program			
Step	**Temperature**	**Duration**	**Cycles**
1	95ºC	180 s	
2	95ºC	60 s	
3	44ºC	60 s	Steps 2-4, 40X
4	72ºC	90 s	
5	72ºC	360 s	

COI (34 sequences)	
Reagents	**µl per reaction**
Buffer 5X	5
MgCl2 (25 mM)	2
dNTPs (10mM)	0.5
LepF1 (10µM)	0.5
LepR1 (10µM)	0.5
H2O	14.4
Taq polymerase (Promega)	0.1
DNA extraction	2

PCR program			
Step	**Temperature**	**Duration**	**Cycles**
1	92ºC	60 s	
2	92ºC	15 s	
3	48ºC	45 s	Steps 2-4, 5X
4	62ºC	150 s	
5	92ºC	15 s	
6	52ºC	45 s	Steps 5-7, 35X
7	62ºC	150 s	
8	62ºC	420 s	

ND1 (59 sequences)	
Reagents	**µl per reaction**
Buffer 5X	5
MgCl2 (25 mM)	2
dNTPs (10mM)	0.5
ND1F (10µM)	0.5
ND1R (10µM)	0.5
H2O	14.4
Taq polymerase (Promega)	0.1
DNA extraction	2

PCR program			
Step	**Temperature**	**Duration**	**Cycles**
1	92ºC	60 s	
2	92ºC	15 s	
3	48ºC	45 s	Steps 2-4, 5X
4	62ºC	150 s	
5	92ºC	15 s	
6	52ºC	45 s	Steps 5-7, 35X
7	62ºC	150 s	
8	62ºC	420 s	

ITS2 (38 sequences)	
Reagents	**µl per reaction**
Buffer 5X	5
MgCl2 (25 mM)	2
dNTPs (10mM)	0.5
ITS3 (10µM)	0.5
ITS4 (10µM)	0.5
H2O	14.4
Taq polymerase (Promega)	0.1
DNA extraction	2

PCR program			
Step	**Temperature**	**Duration**	**Cycles**
1	95ºC	180 s	
2	95ºC	45 s	
3	51ºC	60 s	Steps 2-4, 40X
4	72ºC	60 s	
5	72ºC	360 s	

CAD (18 sequences)	
Reagents	**µl per reaction**
Buffer 10X	5
MgCl2 (25 mM)	2
dNTPs (10mM)	0.5
CADFa (10µM)	0.5
CADRa (10µM)	0.5
H2O	14.4
Taq polymerase (Promega)	0.1
DNA extraction	2

PCR program			
Step	**Temperature**	**Duration**	**Cycles**
1	95ºC	180 s	
2	95ºC	60 s	
3	51ºC	60 s	Steps 2-4, 40X
4	72ºC	90 s	
5	72ºC	360 s	

Primer name	Primer sequence (5' - 3')	Direction	Marker
LCO1490	GGTCAACAAATCATAAAGATATTGG	Forward	COI
Nancy	CCCGGTAAAATTAAAATATAAACTTC	Reverse	COI
LepF1	ATTCAACCAATCATAAAGATATTGG	Forward	COI
LepR1	TAAACTTCTGGATGTCCAAAAAATCA	Reverse	COI
ND1F	CTGTTCGATCATTAAAATCTTAC	Forward	ND1
ND1R	ATCAAAAGGAGCTCGATTAGTTTC	Reverse	ND1
ITS3	GCATCGATGAAGAACGCAGC	Forward	ITS2
ITS4	TCCTCCGCTTATTGATATGC	Reverse	ITS2
CADFa	GDATGGTYGATGAAAATGTTAA	Forward	CAD
CADRa	CTCATRTCGTAATCYGTRCT	Reverse	CAD

Table S2. Material examined and sequences used in this study. New sequences obtained through this study are highlighted in green.*= Substituted sequences (see Material and Methods); †= Sample ID for the COI-COII sequence on GenBank. ♂♀ = Specimens dissected for this study.

Species	Specimen ID	Locality	Lat	Lon	COI+COII	ND1	ITS2	CAD	28S	EF-1a	wingless	H3
Polyommatus icarus	MCZ:NK00P562	Kazakhstan: Altai, Oktyabrsk	49.833059	84.4974197	AY496817	OW569343	GQ129091	GQ128611	GQ128501	AY496846	GQ128891	GQ128784
Caerulea coeligena	FH05M006 †	China: Chongqing Shi, Wuxi	31.480614	108.677425	JF262051	MZ489120	-	OK743790	HQ917931	OK737040	HQ917995	HQ917963
Euphilotes enoptes	AS92Z024 †	USA: California	37.159682	-124.607481	AY675410	-	-	OK743716	GQ128533	AY675363	OK747046	GQ128815
Glaucopsyche alexis	RVcoll.06-K577	Romania: Transylvania, Cluj, Badeni	46.48	23.72	AY675413	PP169877	PP118363	-	HQ917939	AY675366	-	HQ917971
Glaucopsyche argali	2005-LOWA-654	Kazakhstan: East Kazakhstan	48.912163	81.5814205	FJ663584	-	-	-	-	-	-	-
Glaucopsyche melanops	RV08J370	Spain: Barcelona, Vallgrassa	41.286347	1.8749543	JF262055	-	-	-	HQ917937	JF271992	HQ918000	HQ917969
Glaucopsyche piasus	ADW05I825	USA: Oregon	44.03099	-125.880044	JF262056	-	-	-	HQ917938	JF271993	HQ918001	HQ917970
Glaucopsyhe lygdamus	AS922131 †	USA: California	37.159682	-124.607481	AY675411	MW677564	-	OK743503	GQ128535	OK736747	KT285981	GQ128817
Glaucopsyche charybdis	2005-LOWA-564	Uzbekistan: Amu-Rarja River, 30 km E Termez	37.25	67.6	FJ663588	-	-	-	-	-	-	-
Glaucopsyche laetifica	2005-LOWA-334	Kazakhstan: Alma-Ata region, Tashkarasu	43.783	79.45	FJ663590	-	-	-	-	-	-	-
Glaucopsyche lycormas	AD02W094	Russia: Primorski Krai, Poganichnoye	44.4	131.383333	JF262048	-	-	-	HQ917936	JF271991	HQ917999	HQ917968
Glaucopsyche paphos	EJ15001	Cyprus: Limassol, Palodeia	34.741451	32.9679375	MN829481	-	-	-	-	MN829463	-	-
Micropsyche ariana	CCNY:RI-18-W078	Afghanistan: Bamyan	34.81292	67.7387767	ON436910	-	-	OK744070	-	-	-	-
Palaeophilotes triphysina	ZSMC:NVG-22028C01	Central Asia	39.4681	75.9938	OQ311407	-	-	OK744191*	-	OK737424*	-	-
Phengaris alcon	TDA99Q985 †	Denmark	56.204928	8.8982049	AY675431	AJ505076	KF894391	-	HQ917941	HQ918091	MF372214	MF372175
Phengaris arion	RV08R116 †	Spain: Lleida, Salt de Pitx	41.618399	0.5786493	HQ918149	AJ505084	KC692332	-	GQ128541	AY675375	GQ128928	GQ128823
Phengaris atroguttata	SY02J003 †	Taiwan: Hualian, Bilu	24.180788	121.40058	HQ918162	-	-	OK743775	HQ917949	AY675377	HQ918011	HQ917981
Phengaris albida	SY03A500	China: Jiangjin	28.987598	105.887718	AY675423	-	-	-	HQ917948	AY675376	HQ918010	HQ917980
Phengaris arionides	UK99W804	Japan: Shirahone	36.150554	137.622287	AY675438	-	-	-	HQ917942	AY675391	HQ918004	HQ917974
Phengaris cyanecula	AD03B078	Russia: Altai Mts., Ongoudai	50.62008	85.9160092	AY675409	-	-	-	HQ917943	AY675362	HQ918005	HQ917975
Phengaris daitozana	SY03A503	Taiwan: Heping	24.636331	120.665282	AY675425	-	-	-	HQ917950	AY675378	HQ918012	HQ917982
Phengaris nausithous	TDA99Q966	Poland: Swidnica	50.840704	16.4514268	AY675427	AJ505078	KF918770	OK744180	HQ917944	AY675380	HQ918006	HQ917976
Phengaris teleius	UK99W809	Japan: Kuromori	39.494829	141.204585	AY675440	AJ505080	KC692336	-	HQ917946	AY675393	HQ918008	HQ917978
Philotes sonorensis	KED05I833 †	USA: California	37.159682	-124.607481	JF262057	-	-	OK744233	HQ917951	JF271994	HQ918013	HQ917983
Philotiella speciosa	KED05I834 †	USA: California	37.159682	-124.607481	JF262059	-	-	OK744181*	HQ917953	JF271996	HQ918015	HQ917985
Praephilotes anthracias	RVcoll14A951 †	Russia: Astrakhan, Krasnoyarsky distr., Dosang vill.	46.901638	47.9038263	MW503223	-	KF894395	OK744046	-	OK737293	-	-
Pseudophilotes baton	MAT99Q829 †	Spain: Urus	40.365	-3.65163	AY675416	-	MH235183	OK743243*	HQ917954	MK607353	MH249120	HQ917986
Pseudophilotes bavius	AD00P155 †	Russia: Volgograd	48.670401	44.176376	AY675405	-	MH235176	-	HQ917955	MK607360	MH249103	HQ917987
Pseudophilotes panope	BPAL3287-16 †	Kazakhstan: Koibyn	45.964589	63.3026625	OP644315	-	OP679878	-	OP678972	OP681137	OP681138	-
Scolitantides orion	VL02L518 †	Kazakhstan	46.058374	45.8307213	AY675441	-	KC692335	OK743245	HQ917959	GU372679	HQ918021	HQ917991
Shijimiaeoides divina	SY03H504 †	Japan: Aso Kyosyu	32.960365	130.933074	AY675426	-	-	OK743247	HQ917960	GU372678	HQ918022	HQ917992
Sinia leechi	DNAwthGla 044	China: Sichuan, Xinbuqiao	30.05	101.45	PP166596	-	-	-	-	-	-	-
Subsolanoides nagata	SCAUB:BN015	China: Shaanxi, Huangniupu Town, Fengxian	34.194803	106.809787	-	-	-	OK744184	-	OK737417	-	-
Turanana cytis	VL03F545	Iran: Khorasan, Kuh-e-Aladagh Mts.	37.472932	58.2908991	AY675443	-	-	-	HQ917961	AY675396	HQ918023	HQ917993
Turanana endymion	RV04G317	Turkey: Isparta, Yenisarbademli	37.709378	31.3793402	JF262050	-	KF918763	OK743806	HQ917962	JF271999	HQ918024	HQ917994
Turanana tatjana	VL02L575	Kazakhstan: Altai	49.730679	84.2157832	AY675442	-	-	-	HQ917947	AY675395	HQ918009	HQ917979
Iolana iolas	RVcoll08J648	Bulgaria: Central Pirin Mountains	42.8204	25.2517	MW378090	PP169916	PP118383	PP114042	-	-	-	-
Iolana iolas	05I827	France	45.633612	-8.0054216	MN143447	PP169883	PP118366	-	-	-	-	-
Iolana iolas	RVcoll10A413 ♂	France: Alpes-de-Haute-Provence, Digne les Bains	44.121	6.225	MN144057	PP169890	PP118370	-	-	-	-	-
Iolana iolas	RVcoll10A414	France: Alpes-de-Haute-Provence, Digne les Bains	44.121	6.225	MN143813	PP169889	PP118369	-	-	-	-	-
Iolana iolas	RVcoll10A415	France: Alpes-de-Haute-Provence, Digne les Bains	44.082	6.188	MN139711	PP169888	PP118368	-	-	-	-	-
Iolana iolas	RVcoll.09-V968	France: Provence-Alpes-Cote d'Azur, Font Blanche, Bouches d Rhone	43.245	5.662	HM901778	PP169902	-	-	-	-	-	-
Iolana iolas	RVcoll06H647	Greece: Central Macedonia, Rendina	39.253	22.223	MW378111	PP169926	-	-	-	-	-	-
Iolana iolas	RVcoll14G370	Greece: Dytiki Makedonia, Aposkepos	40.564	21.23	MW378072	-	-	-	-	-	-	-
Iolana iolas	RVcoll14H053	Greece: Dytiki Makedonia, Skiti	40.3201	21.6486	MW378106	-	-	-	-	-	-	-
Iolana iolas	RVcoll14H095	Greece: Dytiki Makedonia, Skiti	40.3201	21.6486	MW378086	-	-	-	-	-	-	-
Iolana iolas	MW15008	Greece: Ioannina, Ano Pedina	39.880056	20.7013148	MN829491	-	-	-	HQ917940	AY675367	HQ918002	HQ917972
Iolana iolas	RVcoll.09-X071	Greece: Peloponnese, Mt. Taiyetos	37.045	22.369167	-	PP169898	-	-	-	-	-	-
Iolana iolas	RVcoll14H805	Greece: Peloponnesos, Kernitsa	38.1253	22.2224	MW378107	-	-	-	-	-	-	-
Iolana iolas	LEP-SS-00568	Italy: Calabria, Timpone Montillo-Alessandria Del Carretto	39.9578	16.3754	MW378102	-	-	-	-	-	-	-
Iolana iolas	RVcoll.09-X188	Italy: Friuli-Venezia Giulia, San Giovanni di Duino	45.789167	13.590556	-	PP169893	-	-	-	-	-	-
Iolana iolas	RVcoll.09-X189 ♀	Italy: Friuli-Venezia Giulia, San Giovanni di Duino	45.789167	13.590556	-	PP169892	-	-	-	-	-	-
Iolana iolas	RVcoll16C447	Italy: Marche, Pian Dell'Elmo	43.3469	13.066	MW378128	-	-	-	-	-	-	-
Iolana iolas	LD-3474	Italy: Piemonte, Bruzolo	45.15	7.19	MN142796	-	-	-	-	-	-	-
Iolana iolas	RVcoll08J665 ♂	Italy: Piemonte, Val di Susa, Gravere (TO)	45.13	7.02	MN142151	PP169915	PP118382	PP114043	-	-	-	-
Iolana iolas	15-C105	Italy: Potenza, Foggianello	40.96	15.595	MN143447	-	-	-	-	-	-	-
Iolana iolas	TLMF_Lep_14268	Italy: South Tyrol, Suedtirol	46.686	11.159	PP166614	-	-	-	-	-	-	-
Iolana iolas	TLMF_Lep_14269	Italy: South Tyrol, Suedtirol, Etschtal, Meran/ Kuechelberg	46.686	11.159	MW501814	-	-	-	-	-	-	-
Iolana iolas	RVcoll14N517	Macedonia: Skopje, west of Skopje city	41.951	21.413	MW378130	-	-	-	-	-	-	-
Iolana iolas	RVcoll14H998	Romania: Mehedinti	45.8246	25.0942	MW378059	-	-	-	-	-	-	-
Iolana iolas	RVcoll14H999	Romania: Mehedinti	45.8246	25.0942	MW378069	-	-	-	-	-	-	-
Iolana iolas	RVcoll15C958	Romania: Mehedinti, near Svinita	45.8246	25.0942	MW378121	-	-	-	-	-	-	-
Iolana iolas	GBIFCH-BOL_LEPAA_0701	Switzerland: Valais, Fully	46.186	7.11484	MK186446	-	-	-	-	-	-	-
Iolana iolas	RVcoll08M159 ♂	Switzerland: Valais, Fully	46.14	7.12	MN144318	PP169907	PP118374	PP114048	-	-	-	-
Iolana iolas	RVcoll07C805 ♂	Switzerland: Varen IVS	46.7368	8.28693	MN142474	PP169925	PP118392	PP114037	-	-	-	-
Iolana iolas	RVcoll07C806 ♀	Switzerland: Varen IVS	46.7368	8.28693	MN143088	PP169924	PP118391	PP114038	-	-	-	-
Iolana iolas	RVcoll07C807	Switzerland: Varen IVS	46.7368	8.28693	MN139463	PP169923	PP118390	PP114039	-	-	-	-
Iolana debilitata debilitata	DNAwthGla_001	Morocco: High Atlas, Tizi-n-Test pass	30.865	-8.378	PP166611	-	-	-	-	-	-	-
Iolana debilitata debilitata	RVcoll06G597 ♂	Morocco	30.907	-8.315	PP166618	PP169931	PP118397	PP114033	-	-	-	-
Iolana debilitata debilitata	RVcoll06G598 ♀	Morocco	30.907	-8.315	PP166621	PP169930	PP118396	PP114034	-	-	-	-
Iolana debilitata debilitata	RVcoll06G599 ♂	Morocco	30.907	-8.315	PP166608	PP169929	PP118395	PP114035	-	-	-	-
Iolana debilitata debilitata	RVcoll06G600 ♂	Morocco	30.907	-8.315	PP166591	PP169928	PP118394	-	-	-	-	-
Iolana debilitata debilitata	RVcoll06G601 ♀	Morocco	30.907	-8.315	PP166602	PP169927	PP118393	PP114036	-	-	-	-
Iolana debilitata farriolsi	Rvcoll.10-B299 ♂	Spain: Andalucia, Granada, Sierra Elvia	37.231	-3.727	-	-	-	-	-	-	-	-
Iolana debilitata farriolsi	RVcoll.08-L348	Spain: Andalusia, Granada, Sierra de Huetor	37.27	-3.53	KP871120	PP169909	PP118376	PP114047	-	-	-	-

Species	Specimen ID	Locality	Lat	Lon	COI+COII	ND1	ITS2	CAD	28S	EF-1a	wingless	H3
Iolana debilitata farriolsi	RVcoll.08-L349	Spain: Andalusia, Granada, Sierra de Huetor	37.27	-3.53	KP871104	PP169908	PP118375	-	-	-	-	-
Iolana debilitata farriolsi	RVcoll.08-J783 ♂	Spain: Aragon, Teruel, Fuente, El Vallecillo	40.246	-1.582	KP870756	PP169910	PP118377	PP114046	-	-	-	-
Iolana debilitata farriolsi	RVcoll.07-W202	Spain: Castilla y Leon, Segovia, Santibanez de Ayllon	41.33	-3.27	KP870508	PP169921	PP118388	-	-	-	-	-
Iolana debilitata farriolsi	RVcoll.07-Z062 ♂	Spain: Catalonia, Barcelona, Oristrell, Pont de Vilomara, Bages	41.679	1.857	KP871085	PP169920	PP118387	PP114041	-	-	-	-
Iolana debilitata farriolsi	RVcoll.07-Z063 ♂	Spain: Catalonia, Barcelona, Oristrell, Pont de Vilomara, Bages	41.679	1.857	KP870974	PP169919	PP118386	-	-	-	-	-
Iolana debilitata farriolsi	RVcoll.06-G517	Spain: Catalonia, Barcelona, Santuari de Puiglagulla, Vilalleons, Osona	41.884	2.324	KP870858	PP169935	PP118401	-	-	-	-	-
Iolana debilitata farriolsi	RVcoll.06-G518 ♂	Spain: Catalonia, Barcelona, Santuari de Puiglagulla, Vilalleons, Osona	41.884	2.324	KP870314	PP169934	PP118400	-	-	-	-	-
Iolana debilitata farriolsi	RVcoll.06-G519	Spain: Catalonia, Barcelona, Santuari de Puiglagulla, Vilalleons, Osona	41.884	2.324	KP870539	PP169933	PP118399	-	-	-	-	-
Iolana debilitata farriolsi	RVcoll.06-G520 ♂	Spain: Catalonia, Barcelona, Santuari de Puiglagulla, Vilalleons, Osona	41.884	2.324	KP871116	PP169932	PP118398	-	-	-	-	-
Iolana debilitata farriolsi	RVcoll.07-W087	Spain: Comunidad de Madrid	40.35	-3.41	KP870489	PP169922	PP118389	PP114040	-	-	-	-
Iolana debilitata farriolsi	RVcoll.08-J700 ♂	Spain: Comunidad Valenciana, Castellon, Alrededores de Almedijar, Almedijar	39.875	-0.416	KP870925	PP169914	PP118381	PP114044	-	-	-	-
Iolana debilitata farriolsi	RVcoll.08-J701 ♂	Spain: Comunidad Valenciana, Castellon, Alrededores de Almedijar, Almedijar	39.875	-0.416	KP870863	PP169913	PP118380	PP114045	-	-	-	-
Iolana debilitata farriolsi	RVcoll.08-J704 ♂	Spain: Comunidad Valenciana, Castellon, Alrededores de Almedijar, Almedijar	39.875	-0.416	KP870322	PP169912	PP118379	-	-	-	-	-
Iolana debilitata farriolsi	RVcoll.08-J706 ♀	Spain: Comunidad Valenciana, Castellon, Alrededores de Almedijar, Almedijar	39.875	-0.416	KP870905	PP169911	PP118378	-	-	-	-	-
Iolana debilitata farriolsi	JD-03-A505	Spain: Catalonia, Osona, Soleia de Montmany	40.365	-3.65163	AY675414	-	-	-	-	-	-	-
Iolana alfieri	DNAwthIolana010	Egypt: Siani, vic. Catharine, Katharinenkloster (Catherine monastery)	28.556	33.976	PP166604	-	-	-	-	-	-	-
Iolana alfieri	DNAwthIolana011	Egypt: Siani, vic. Catharine, Katharinenkloster (Catherine monastery)	28.556	33.976	PP166603	-	-	-	-	-	-	-
Iolana alfieri	BPAL2358-14	Israel: Avdat	30.794	34.773	OP712343	-	-	-	-	-	-	-
Iolana alfieri	BPAL2359-14	Israel: Avdat	30.794	34.773	OP712352	-	-	-	-	-	-	-
Iolana alfieri	BPAL2524-14	Israel: Avdat	30.794	34.773	OP712348	-	-	-	-	-	-	-
Iolana alfieri	BPAL2525-14	Israel: Avdat	30.794	34.773	OP712349	-	-	-	-	-	-	-
Iolana alfieri	RVcoll.09-V978 ♂	Israel: Halukin Ridge, Sde Boker, Negev	30.89092	34.79626	PP124915	PP169899	PP118373	-	-	-	-	-
Iolana alfieri	BPAL2902-15	Israel: Har-A-Negev	30.5	34.917	OP712350	-	-	-	-	-	-	-
Iolana alfieri	Benyamini01 ♀	Israel: Nahal Naval, Nitsana	30.885	34.417	-	-	-	-	-	-	-	-
Iolana alfieri	DNAwthIolana012	Jordan: S Kerak, Shobak Castle (Burgberg)	30.532	35.56	PP166605	-	-	-	-	-	-	-
Iolana alfieri	DNAwthIolana013	Jordan: S Kerak, Shobak Castle (Burgberg)	30.532	35.56	PP166593	-	-	-	-	-	-	-
Iolana lessei	AD00P243 ♀	Armenia: Meghri, Shvanidzor valley, Shvanidzor village, Transcaucasus	38.93567	46.36319	PP124905	PP169884	PP118367	-	-	-	-	-
Iolana lessei	ARLY-534b-001	Iran: East Azerbaijan, Arasbaran, Varzaghan, Chichakli to Aras river	38.786	46.537	PP166620	-	-	-	-	-	-	-
Iolana lessei	ARLY-098a-002	Iran: East Azerbaijan, Kaleibar	38.817	47.05	PP166616	-	-	-	-	-	-	-
Iolana lessei	RVcoll.12-Z374	Lebanon: Becchare	34.244658	36.054573	PP124922	-	-	-	-	-	-	-
Iolana lessei	DNAwthGla_003	Turkey: Nigde, Bolkar Daglari, Gumuskoy	37.487	34.615	PP166625	-	-	-	-	-	-	-
Iolana lessei	DNAwthGla_002	Turkey: Nigde, Bolkar Daglari, Darbogaz, Gumuskoy	37.487	34.615	PP166598	-	-	-	-	-	-	-
Iolana lessei eolus	VL01L273 ♀	Turkey: Erzincan, Munzur Daglari, 3 km NE Dagyolu	39.567	39.083	PP166600	PP169881	-	-	-	-	-	-
Iolana lessei eolus	VL01L272 ♂	Turkey: Erzincan, Munzur Daglari, 3 km NE Dagyolu	39.567	39.083	PP166612	PP169882	-	-	-	-	-	-
Iolana arjanica	RVcoll.09-T197 ♂	Iran: Fars, Dasht-e-Arzhan	29.628065	52.010047	PP124916	PP169903	-	-	-	-	-	-
Iolana arjanica	DNAwthIolana001	Iran: Fars, 2 km N Ardekan	30.2862	51.9768	PP166624	-	-	-	-	-	-	-
Iolana arjanica	DNAwthIolana002	Iran: Fars, 2 km N Ardekan	30.2862	51.9768	PP166597	-	-	-	-	-	-	-
Iolana kermani	BPAL2451-14	Iran: Kerman, 60 Km North Jiroft	29.211298	57.693138	OP712345	-	-	-	-	-	-	-
Iolana kermani	RVcoll.08-J646	Iran: Kerman, 60 Km North Jiroft	29.211298	57.693138	PP124921	PP169918	PP118385	-	-	-	-	-
Iolana kermani	RVcoll.08-J647	Iran: Kerman, 60 Km North Jiroft	29.211298	57.693138	PP124920	PP169917	PP118384	-	-	-	-	-
Iolana kermani	BPAL2450-14	Iran: Kerman, Kuh-e-Segoch, ca. 20 km E Mahan	30.072179	57.469786	OP712344	-	-	-	-	-	-	-
Iolana kermani	DNAwthIolana003	Iran: Kerman, N Jiroft, Shingara Pass	29.0883	57.5268	PP166592	-	-	-	-	-	-	-
Iolana kermani	DNAwthIolana004	Iran: Kerman, N Jiroft, Shingara Pass	29.0883	57.5268	PP166622	-	-	-	-	-	-	-
Iolana kermani	RVcoll.09-X186 ♂	Iran: Kerman, Sarbijan	29.083333	57.55	PP124912	PP169895	PP118371	-	-	-	-	-
Iolana kermani	RVcoll.09-X185 ♀	Iran: Kerman, Sarbijan	29.083333	57.55	PP124913	PP169896	PP118372	-	-	-	-	-
Iolana kermani	RVcoll.09-X184	Iran: Kerman, Sarbijan	29.083333	57.55	PP124914	PP169897	-	-	-	-	-	-
Iolana kermani	RVcoll.09-X187 ♀	Iran: Kerman, Sarbijan	29.083333	57.55	PP124911	PP169894	-	-	-	-	-	-
Iolana kermani	RVcoll.10-C239	Iran: Kerman, Sarbijan, Qohrūd Mts.	29.083333	57.55	PP124909	PP169885	-	-	-	-	-	-
Iolana kermani	RVcoll.10-C238	Iran: Kerman, Sarbijan, Qohrūd Mts.	29.083333	57.55	-	PP169886	-	-	-	-	-	-
Iolana kermani	RVcoll.10-C237	Iran: Kerman, Sarbijan, Qohrūd Mts.	29.083333	57.55	-	PP169887	-	-	-	-	-	-
Iolana gilgitica	DNAwthIolana005	Afghanistan: Panjshir, Panjshir valley, Kotal-e Shawa (=Kotal-e Khawak)	35.6633	69.7872	PP166613	-	-	-	-	-	-	-
Iolana gilgitica	DNAwthIolana006	Afghanistan: Panjshir, Panjshir valley, Kotal-e Shawa (=Kotal-e Khawak)	35.6633	69.7872	PP166607	-	-	-	-	-	-	-
Iolana gilgitica	wthGP100/2023 ♀	Afghanistan: Panjshir, Panjshir valley, Kotal-e Shawa (=Kotal-e Khawak)	35.6633	69.7872	-	-	-	-	-	-	-	-
Iolana gilgitica	RVcoll.09-V973 ♂	Pakistan: Gilgit-Baltistan, Astore National Park	35.03661	75.10603	PP166610	PP169901	-	-	-	-	-	-
Iolana gilgitica	RVcoll.09-V975	Pakistan: Gilgit-Baltistan, Satpara National Park	35.22438	75.62907	PP166619	PP169900	-	-	-	-	-	-
Iolana gigantea	DNAwthIolana007	Kyrgyzstan: 30 km S Osh, Almalyk loc.	40.309	72.799	PP166599	-	-	-	-	-	-	-
Iolana gigantea	DNAwthIolana009	Tajikistan: Fanskie Mts., Urech r., 7 km S from Madovra village, Artuch loc.	39.333	68.117	PP166595	-	-	-	-	-	-	-
Iolana gigantea	DNAwthIolana008	Uzbekistan: Jizzax Viloyati, Turkestansky Gebirge, 30km S Zamin, Zamin National Park	39.655	68.382	PP166606	-	-	-	-	-	-	-
Iolana gigantea	McGuire-592B	Uzbekistan: Kashkardarinskaya obl., Hissarski Range (West), Tamshush	38.967	67.4	FJ663680	-	-	-	-	-	-	-
Iolana gigantea	McGuire-593B	Uzbekistan: Kashkardarinskaya obl., Hissarski Range (West), Tamshush	38.967	67.4	FJ663679	-	-	-	-	-	-	-
Iolana gigantea	RVcoll.08-P548 ♂	Uzbekistan: West Ghissar Mts., Tamshush river	38.966667	67.4	-	-	-	-	-	-	-	-
Iolana gigantea	RVcoll.08-P550 ♀	Uzbekistan: West Ghissar Mts., Tamshush river	38.966667	67.4	PP124919	PP169906	-	-	-	-	-	-
Iolana gigantea	RVcoll.08-P551	Uzbekistan: West Ghissar Mts., Tamshush river	38.966667	67.4	PP124918	PP169905	-	-	-	-	-	-
Iolana gigantea	RVcoll.08-P552	Uzbekistan: West Ghissar Mts., Tamshush river	38.966667	67.4	PP124917	PP169904	-	-	-	-	-	-
Iolana andreasi andreasi	VL05J522 ♀	Iran: Golestan, Shahkuh	36.56629	54.497014	PP124906	PP169878	PP118364	-	-	-	-	-
Iolana andreasi andreasi	VL05J521 ♀	Iran: Golestan, Shahkuh	36.56629	54.497014	PP124907	PP169879	PP118365	PP114050	-	-	-	-
Iolana andreasi andreasi	VL05J520 ♂	Iran: Golestan, Shahkuh	36.56629	54.497014	PP124908	PP169880	-	PP114049	-	-	-	-
Iolana andreasi andreasi	ARLY-301d-001	Iran: Golestan, N. Maraveh Tapeh, Dadli Ghazneyn	38.041	56.069	PP166626	-	-	-	-	-	-	-
Iolana andreasi andreasi	LOWAM286-11	Iran: Golestan, Shahkuh	36.56629	54.497014	OP712351	-	-	-	-	-	-	-
Iolana andreasi andreasi	ARLY-112c-001	Iran: Khorasan, N. Qouchan, Allhakbar pass	37.45	58.633	PP166594	-	-	-	-	-	-	-
Iolana andreasi khayyami	BPAL2453-14	Iran: Tehran, Polur	35.848609	52.051976	OP712347	-	-	-	-	-	-	-
Iolana andreasi khayyami	RVcoll.09-X190	Iran: Teheran, Ghachsar, Elburz	36.083333	51.316667	PP124910	PP169891	-	-	-	-	-	-
Iolana andreasi khayyami	ARLY-182-001	Iran: Tehran, N. Karaj, Vardeh village	35.982	50.903	PP166609	-	-	-	-	-	-	-
Iolana andreasi khayyami	ARLY-101B-003	Iran: Mazandaran, Valiabad	36.21	51.33	PP166617	-	-	-	-	-	-	-
Iolana andreasi khayyami	ARLY-0102-001	Iran: Mazandaran, Valiabad	36.21	51.33	PP166623	-	-	-	-	-	-	-
Iolana andreasi khayyami	ARLY-182-002	Iran: Tehran, N. Karaj, Vardeh village	35.982	50.903	PP166590	-	-	-	-	-	-	-
Iolana andreasi khayyami	ARLY-386b-001	Iran: Mazandaran, Veresk	35.904	53.033	PP166615	-	-	-	-	-	-	-
Iolana andreasi khayyami	BPAL2452-14	Iran: Tehran, Polur	35.848609	52.051976	OP712346	-	-	-	-	-	-	-
Iolana andreasi ssp.	ARLY-4-001	Iran: Fars, Shiraz, Dashte Arjan	29.661	51.985	PP166601	-	-	-	-	-	-	-

Table S3. Sequences used in the reconstruction of the host plant phylogeny after Moghaddam et al (2017). Sequences marked with an asterisk were added to the latter dataset in this study.

	ITS1-ITS2	matK	rpl32
Colutea abyssinica Kunth & C.D.Bouché	GQ246039*	JQ669606*	-
Colutea arborescens L.	MT227704*	AY386874	-
Colutea armena Boiss.& Huet.	LC164568	LC164591	LC164607
Colutea atlantica Browicz	GQ246040*	JQ669607*	-
Colutea buhsei (Boiss.) Shap.	LC164569	LC085326	LC164608
Colutea cilicica Boiss. & Bal.	LC164570	LC164592	LC164609
Colutea gifana Parsa	LC164571	LC085325	LC164610
Colutea gracilis Freyn & Sint.	LC164572	-	LC164611
Colutea istria Mill.	U69544+5*	-	-
Colutea komarovii Takht.	LC164573	LC085324	LC164612
Colutea melanocalyx Boiss.& Heldr.	LC164574	LC164593	LC164613
Colutea nepalensis Sims	KP338132*	KP338510*	-
Colutea paulsenii Freyn	LC164575	LC164594	LC164614
Colutea persica Boiss.	LC164576	LC164595	LC164615
Colutea porphyrogramma Rech.f.	LC164577	LC164596	LC164616
Colutea triphylla Bunge ex Bioss.	LC164578	LC085323	LC164617
Colutea uniflora G. Beck	LC164579	-	LC164618
Sphaerophysa salsula (Pall.) DC.	LC164588	LC164603	LC164630
S. kotschyana Boiss.	LC164587	LC164602	LC164629
Lessertia capitata E. Mey	LC164583	LC164598	LC164622
L. benquellensis Baler	LC164582	LC085328	LC164621
L. annularis Burch.	LC164581	LC085327	LC164620
Eremosparton flaccidum Litw.	LC164580	LC164597	LC164619
Smirnowia turkestana Bunge	LC164586	LC164601	LC164628
Sutherlandia frutescens (L.) R. Br.	LC164589	LC164604	LC164631
Podlechiella vogelii ssp. *vogelii* (Webb)	LC164585	LC164600	LC164627
P. vogelii ssp. *fatimensis* (Chiov)	AB051911	LC164599	LC164626
Oxytropis aucheri Boiss.	AB051908	KM387602*	LC164623
O. lambertii Pursh.	L10807	AY386915	-
O. pilosa (L.)DC.	AF121759	AY920452	KM071855*
O. deflexa (Pallas) DC.	L10804	AY386878	-
O. szovitsii Boiss. & Buhse	AB051909	-	LC164624
Astragalus sinicus L.	AB051985	AY920450*	AB908471
A. canadensis L.	U50496	AY386875	-
A. patagonicus Speg.	AF121746	AY920446	-
A. nothoxys A.Gray	AF121688	AY386877	-
A. peristereus Boiss. & Hausskn.	U50494	AY920449	-
A. cysticalyx Ledeb. (=*Sphaerophysa salsula*)	AF121682	AY920443	-
A. cysticalyx Ledeb.	LC164567	LC164590	LC164605
A. adsurgens Pallas	AF121674	HM049537	-
Phyllolobium chinense Fisch.	GU217602	HM049530	-
P. balfourianum (N. D. Simpson) M. L. Zhang & Podlech	LC164584	MF044354*	LC164625
Eversmania subspinosa (Fisch) B. Fedtsch.	AB329692	AB854573	LC137102
Caragana grandiflora (M.B.) DC.	AB051905	AB854564	LC164606
Carmichaelia williamsii Kirk	U50520	AY386873	-
Clianthus puniceus (G.Don) Sol. Ex Lindl.	L10800	AY386914	-
Swainsona pterostylis (DC.) Bakh. f.	U56007	AF142735	-

Figure S1. Mr. Bayes reconstruction of the host plant phylogeny using a dataset composed on sequences in Table S3. Values indicate Bayesian Posterior Probabilities.

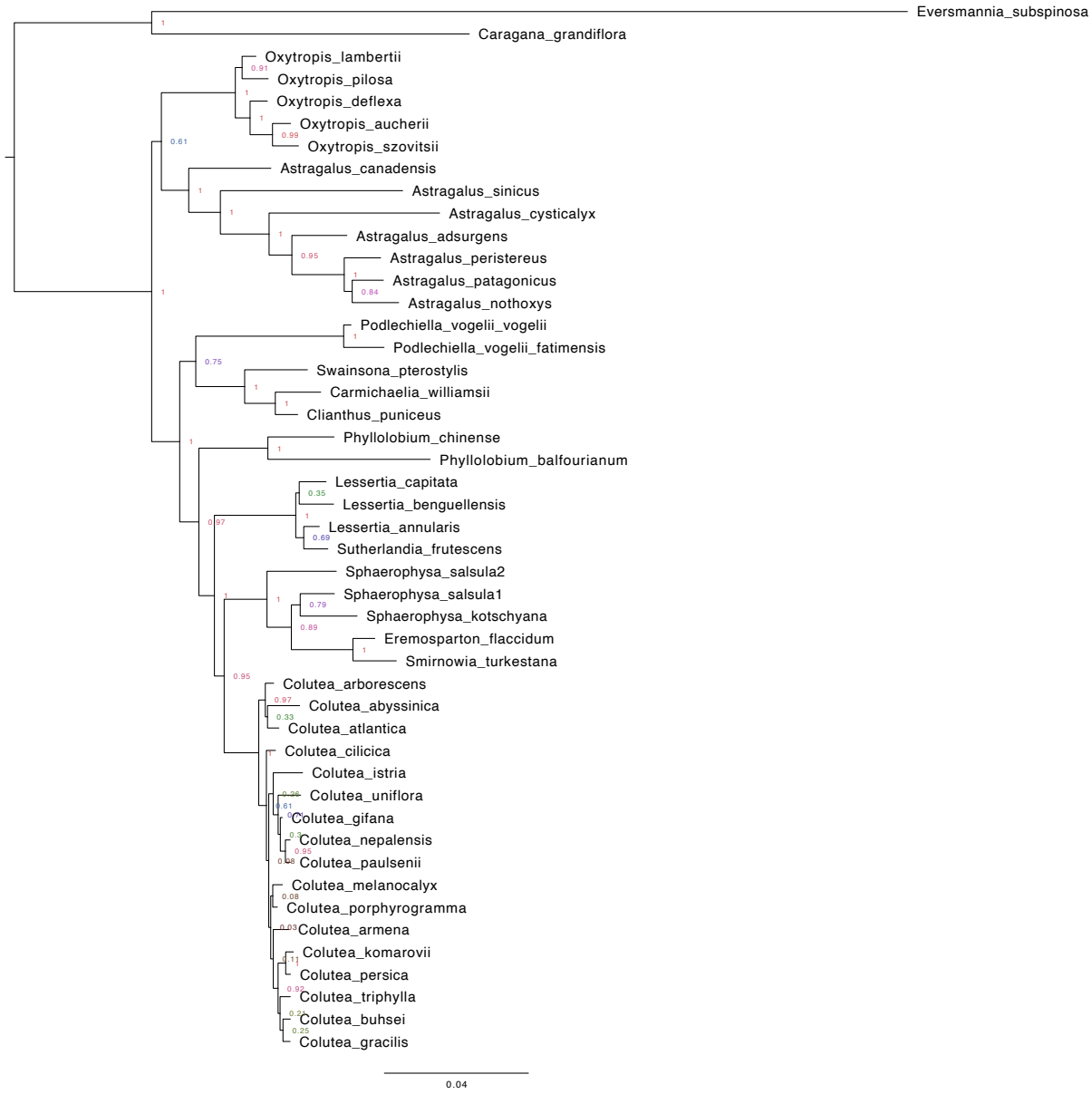


Figure S2. BEAST phylogeny of Scolitantidina combined dataset showing node posterior probabilities.

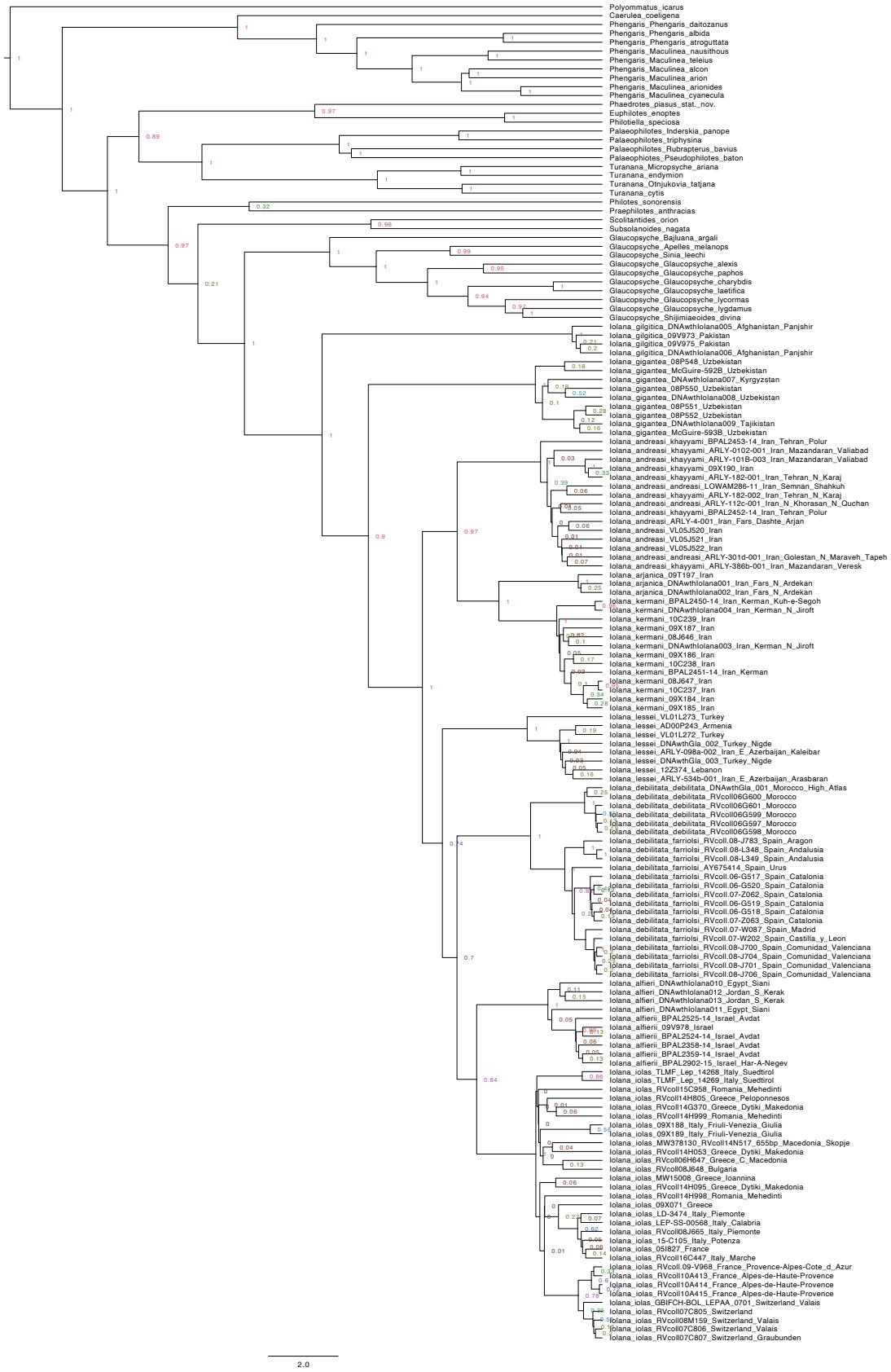


Figure S3. Maximum Likelihood reconstruction with IQtree showing support for 1000 replicates of the same dataset.

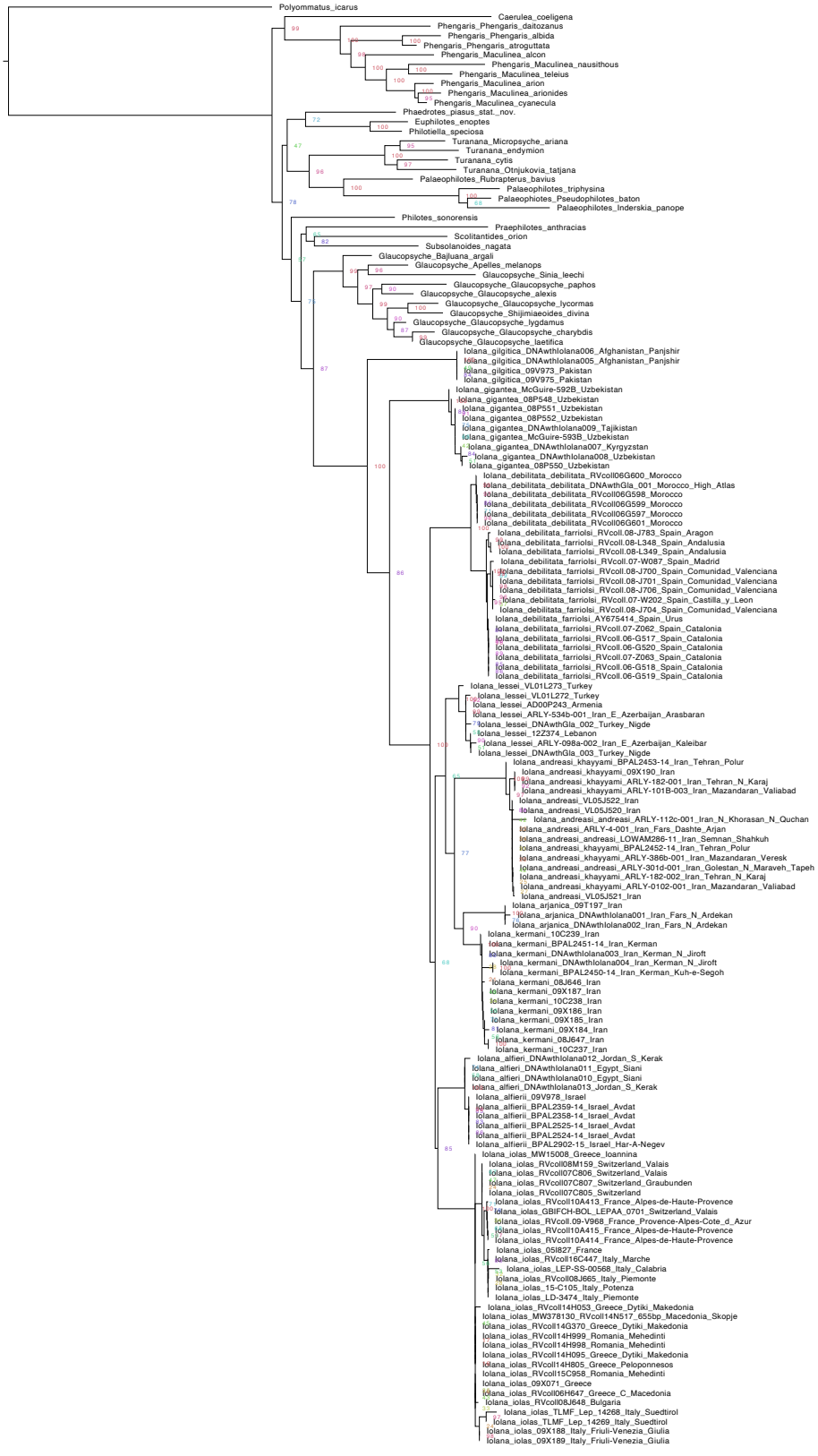
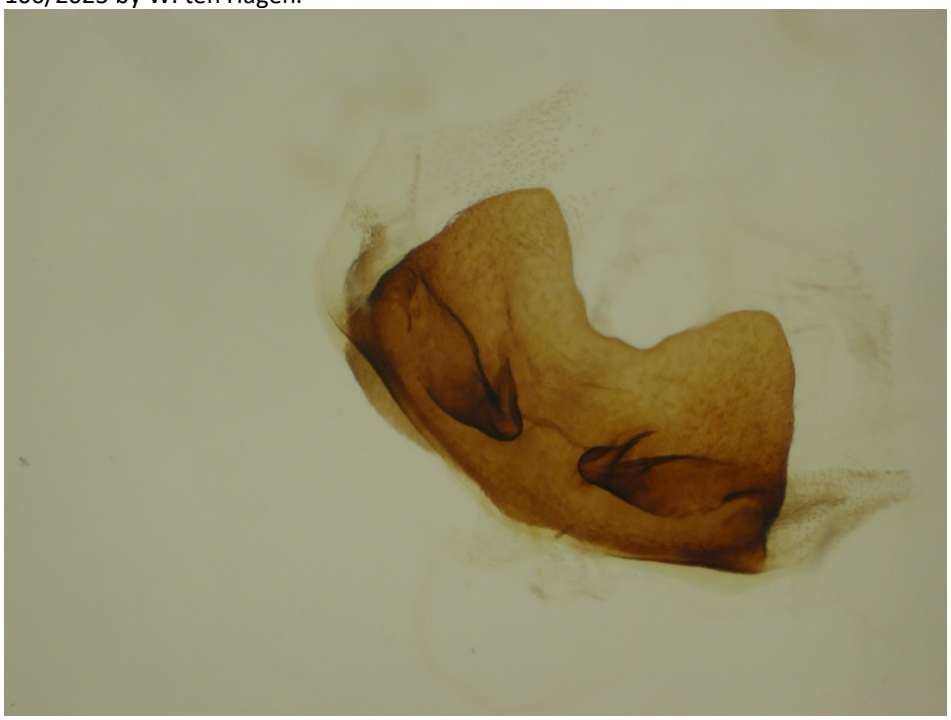
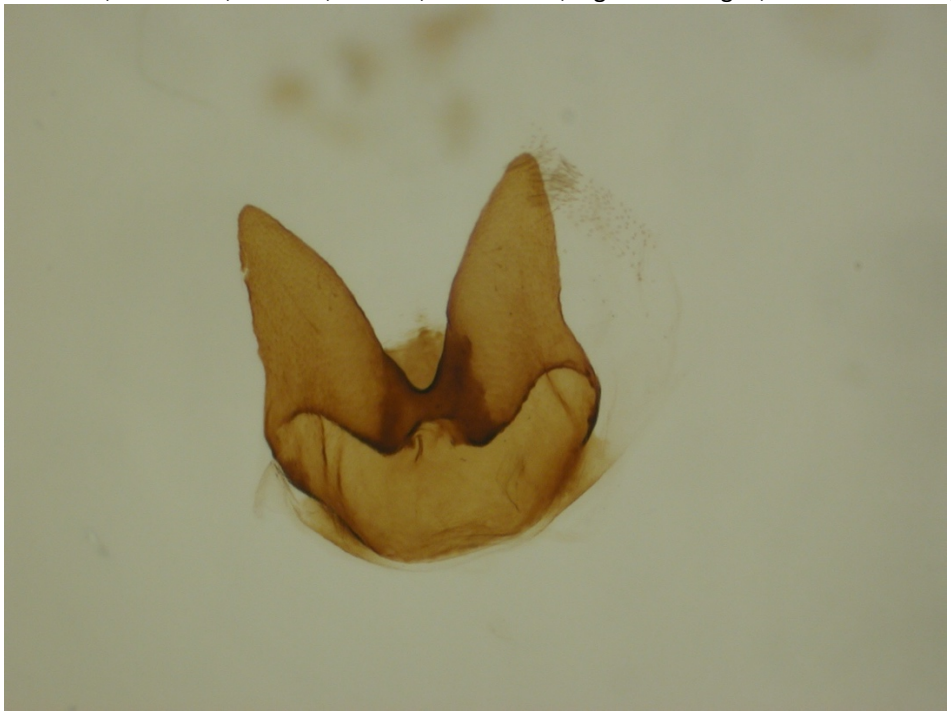


Figure S4. Genitalia dissections.

Iolana gilgitica female
Afghanistan, Panjshir valley, Kotal-e Shawa, 3500-4000 m, 5. -30. VI. 2010, leg Assad-family, dissection GP 100/2023 by W. ten Hagen.

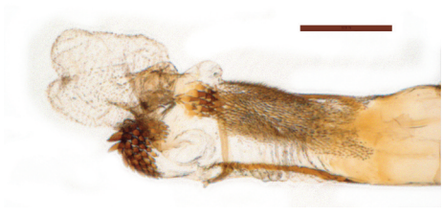


Iolana andreasi female
from Iran, Kendevan, Gachsar, 2300 m, 11. VI. 2004, leg W. ten Hagen, dissection GP 99/2023 by W. ten Hagen.



06-G599 Iolana debilitata debilitata male Tizi-n-Test, High Atlas Morocco 1790 30.V.2006
Vila, Roger 3.090.695 -831.555

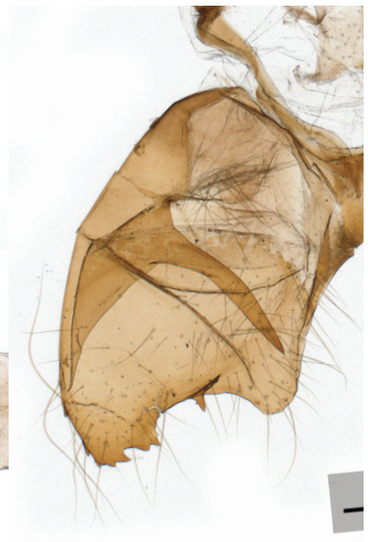




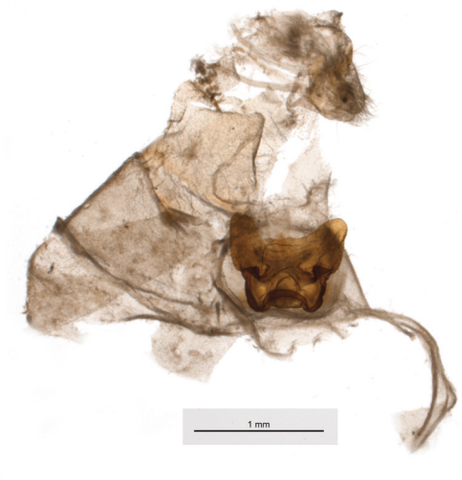
06-G600 Iolana debilitata debilitata male Tizi-n-Test, High Atlas Morocco 1790 30.V.2006
Vila, Roger 3.090.695 -831.555







06-G601 Iolana debilitata debilitata female Tizi-n-Test, High Atlas Morocco 1790 30.V.2006
Vila, Roger 3.090.695 -831.555

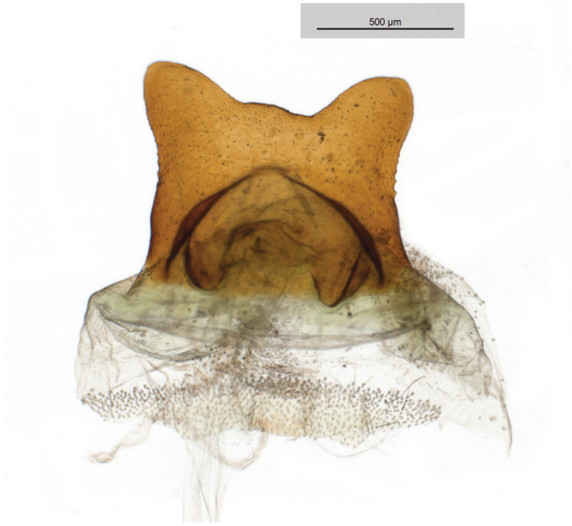




06-G597 Iolana Vila, Roger	debilitata 3.090.695	debilitata -831.555	male	Tizi-n-Test, High Atlas	Morocco 1790	30.V.2006



06-G598 Iolana Vila, Roger	debilitata 3.090.695	debilitata -831.555	female	Tizi-n-Test, High Atlas	Morocco 1790	30.V.2006



10-B299 / 130410FG63 Iolana debilitata MARGAfarriolsi male Sierra Elvira Granada, Andalucía Spain
20.VI.1992 S. Montagud 3.724.653 -368.589



08-J704 Iolana debilitata MARGAfarriolsi male Alrededores de Almedíjar, Almedíjar Castellón, Com. Valenciana
Spain 01.V.2008 S. Montagud, S. Teruel, M.A. Ibáñez-Orrico & M. Engra 3.987.681 -0.41119



08-J706 Iolana debilitata MARGAfarriolsi male Alrededores de Almedíjar, Almedíjar Castellón, Com. Valenciana
Spain 01.V.2008 S. Montagud, S. Teruel, M.A. Ibáñez-Orrico & M. Engra 3.987.681 -0.41119



08-J700 Iolana debilitata MARGAfarriolsi male Alrededores de Almedíjar, Almedíjar Castellón, Com. Valenciana Spain 01.V.2008 S. Montagud, S. Teruel, M.A. Ibáñez-Orrico & M. Engra 3.987.681 -0.41119



08-J701 Iolana debilitata MARGAfarriolsi male Alrededores de Almedíjar, Almedíjar Castellón, Com. Valenciana Spain 01.V.2008 S. Montagud, S. Teruel, M.A. Ibáñez-Orrico & M. Engra 3.987.681 -0.41119



08-J783 Iolana debilitata MARGAfarriolsi male Fuente, El Vallecillo Teruel, Aragón Spain 1432 21.VI.2008 S. Montagud & J.J. Herrero-Borgoñón 4.024.658 -158.181



07-Z062 Iolana debilitata MARGAfarriolsi Oristrell, Pont de Vilomara, BAGES Barcelona, Catalunya Spain 283 2007 Darlow, Tim 4.167.928 185.747



06-G520 Iolana debilitata MARGAfarriolsi male Santuari de Puiglagulla, Vilalleons, Osona Barcelona, Catalunya Spain 720 16.V.2006 Vila, Roger 4.188.437 232.422



07-Z063 Iolana debilitata MARGAfarriolsi male Oristrell, Pont de Vilomara, BAGES Barcelona, Catalunya Spain 283 2007 Darlow, Tim 4.167.928 185.747



06-G518 Iolana debilitata MARGAfarriolsi male Santuari de Puiglagulla, Vilalleons, Osona Barcelona, Catalunya Spain 720 16.V.2006 Vila, Roger 4.188.437 232.422



FIGURAS_IOLANA:Maquetación 1 15/01/12 20:05 Página 7

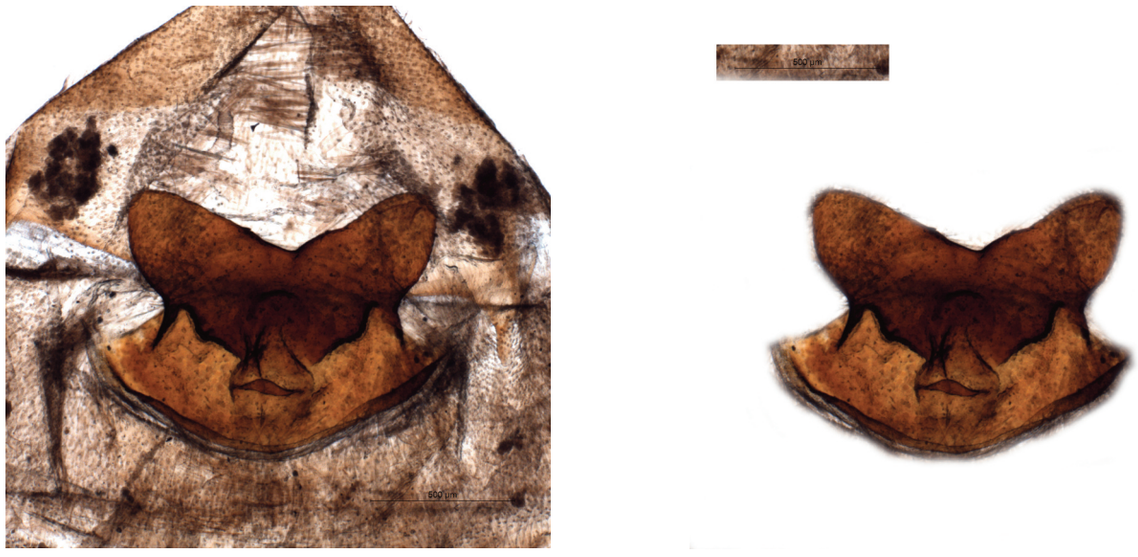
08-M159 Iolana iolas male Fully Valais Switzerland 21.VI.2008 Rowlings, M. 4.613.453 711.280



07-C805 Iolana iolas male Varen IVS Switzerland 755 23.VI.2008 Bernhard, Jost 4.631.476 760.458



07-C806 Iolana iolas female Varen IVS Switzerland 755 23.VI.2008 Bernhard, Jost 4.631.476 760.458



08-J665 Iolana iolas male Val di Susa, Gravere (TO) Piemonte Italy 675 24.V.2009
Bossi, Stefano 4.514.237 705.029



10-A413 Iolana iolas male Digne les Bains Alpes-de-Haute, Provence France 710 26.V.2010 Vila,
Hernández, Talavera & Montagud 4.412.139 622.528



09-X189 Iolana iolas female San Giovanni di Duíno Friuli-Venezia Giulia Italy 100 10.VI.2004
Costella, B. 4.581.686 1.361.125



VL-01-L272 Iolana iolas eolus MARGA lessei male Munzur Daglari, 3 km NE Dagyolu Erzincan Turkey
17.VII.2001 Lukhtanov, Vladimir 3.956.667 3.993.333



VL-01-L273 Iolana iolas eolus MARGA Munzur Daglari, 3 km NE Dagyolu Erzincan Turkey
17.VII.2001 Lukhtanov, Vladimir 3.956.667 3.993.333



AD-00-P243 Iolana iolas lessei female Meghri region, Shvanidzor valley, Shvanidzor village, Transcaucasus
Meghri Armenia 1600 19.VI.2000 Danchenko, A.V. 3.893.567 4.636.319



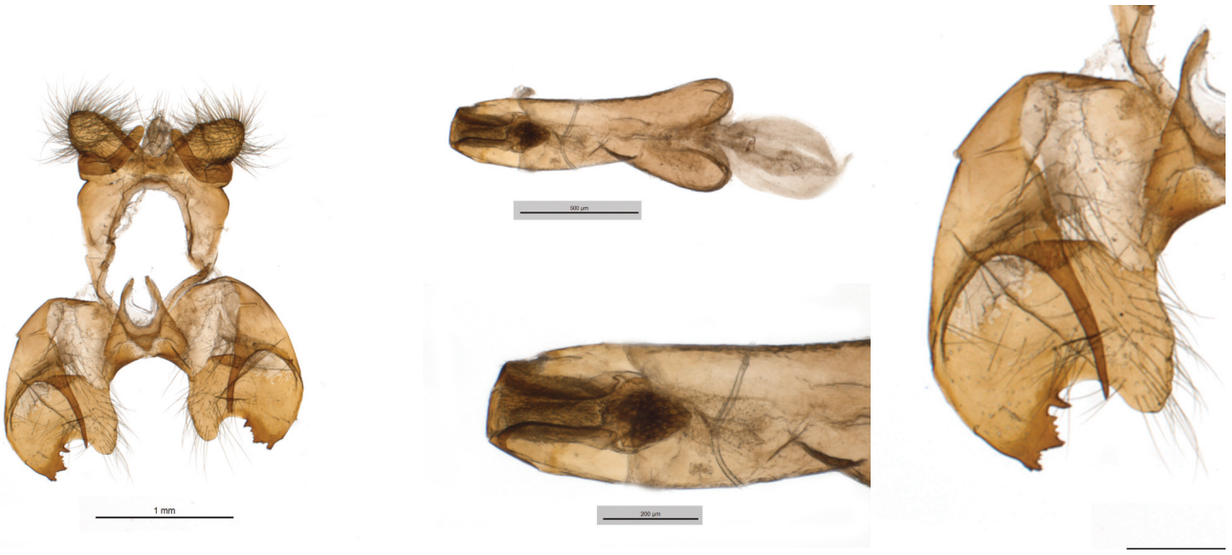
09-V978 Iolana alfierii male Halukin Ridge, Sde Boker, Negev Israel 500 21.II.2010
Feingold, Eviator & Benyamini, Dubi 3.086.889 34



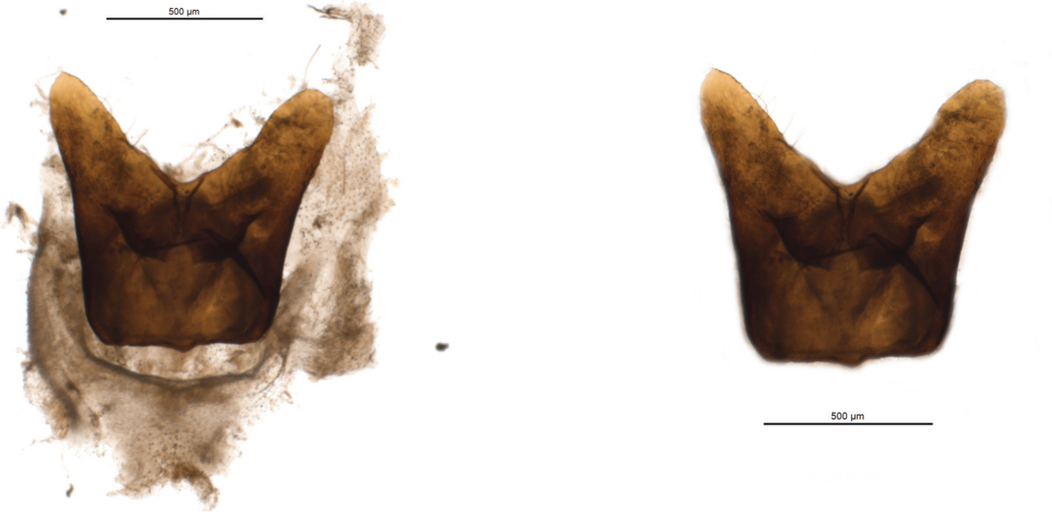
alfierii1 Iolana alfierii, female. Nahal Naval, Nitsana, ISRAEL 850 10-IV-1992 D. Benyamini



09-X186 Iolana kermani male Sarbijan Kerman Iran 2800 05.VI.2008 Major, V. 2.908.333 5.755.000



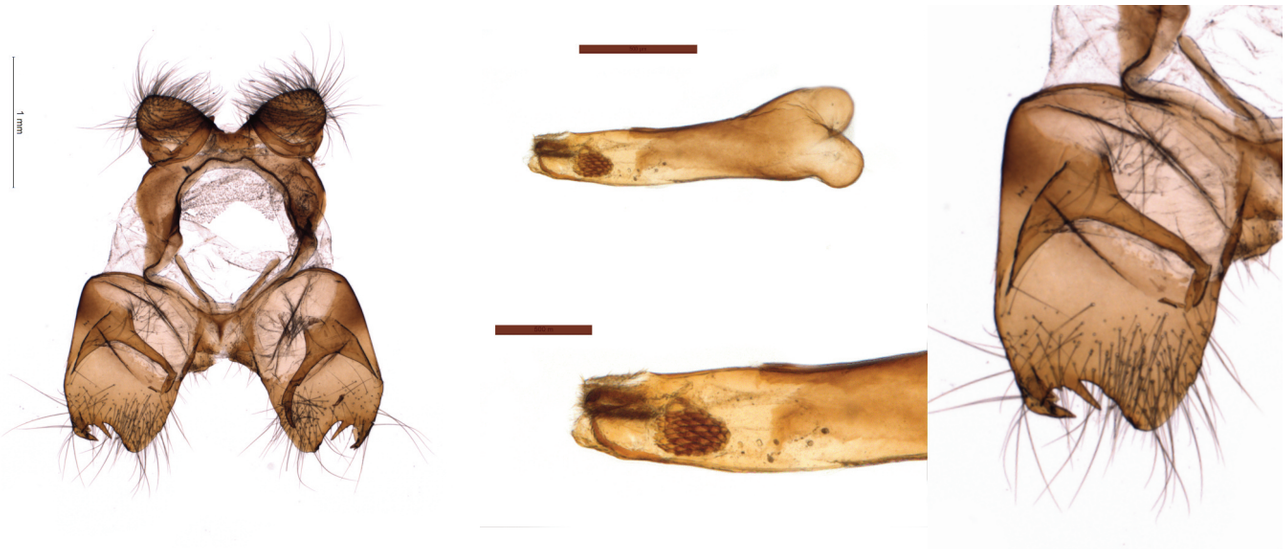
09-X185 Iolana kermani female Sarbijan Kerman Iran 2800 05.VI.2008 Major, V. 2.908.333 5.755.000



09-X187 Iolana kermani female Sarbijan Kerman Iran 2800 05.VI.2008 Major, V. 2.908.333 5.755.000



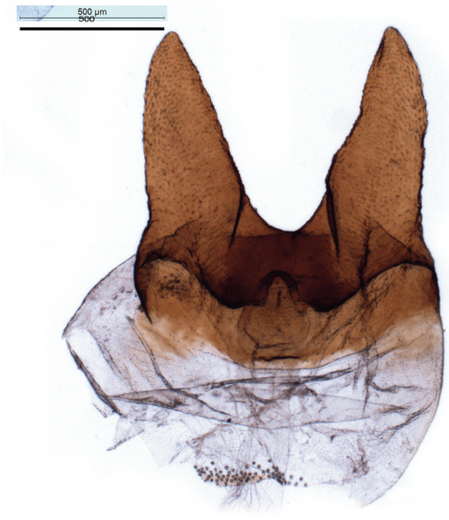
VL-05-J520 Iolana iolas andreasi male ShahkuhGolestan Iran 2100 21.VII.2005 Lukhtanov, Vladimir 3.290.882 5.056.913



VL-05-J522 Iolana iolas andreasi female MARGA ShahkuhGolestan Iran 2100 21.VII.2005 Lukhtanov, Vladimir 3.290.882 5.056.913



VL-05-J521 Iolana iolas andreasi female ShahkuhGolestan Iran 2100 21.VII.2005 Lukhtanov, Vladimir 3.290.882 5.056.913



arjanica



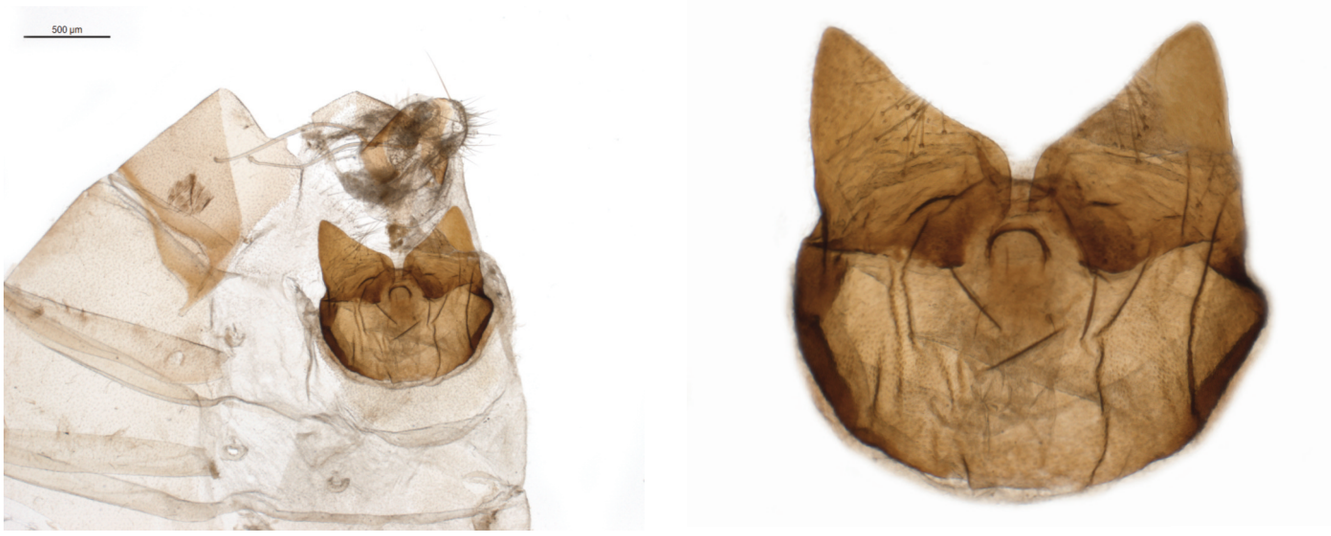
gilgitica



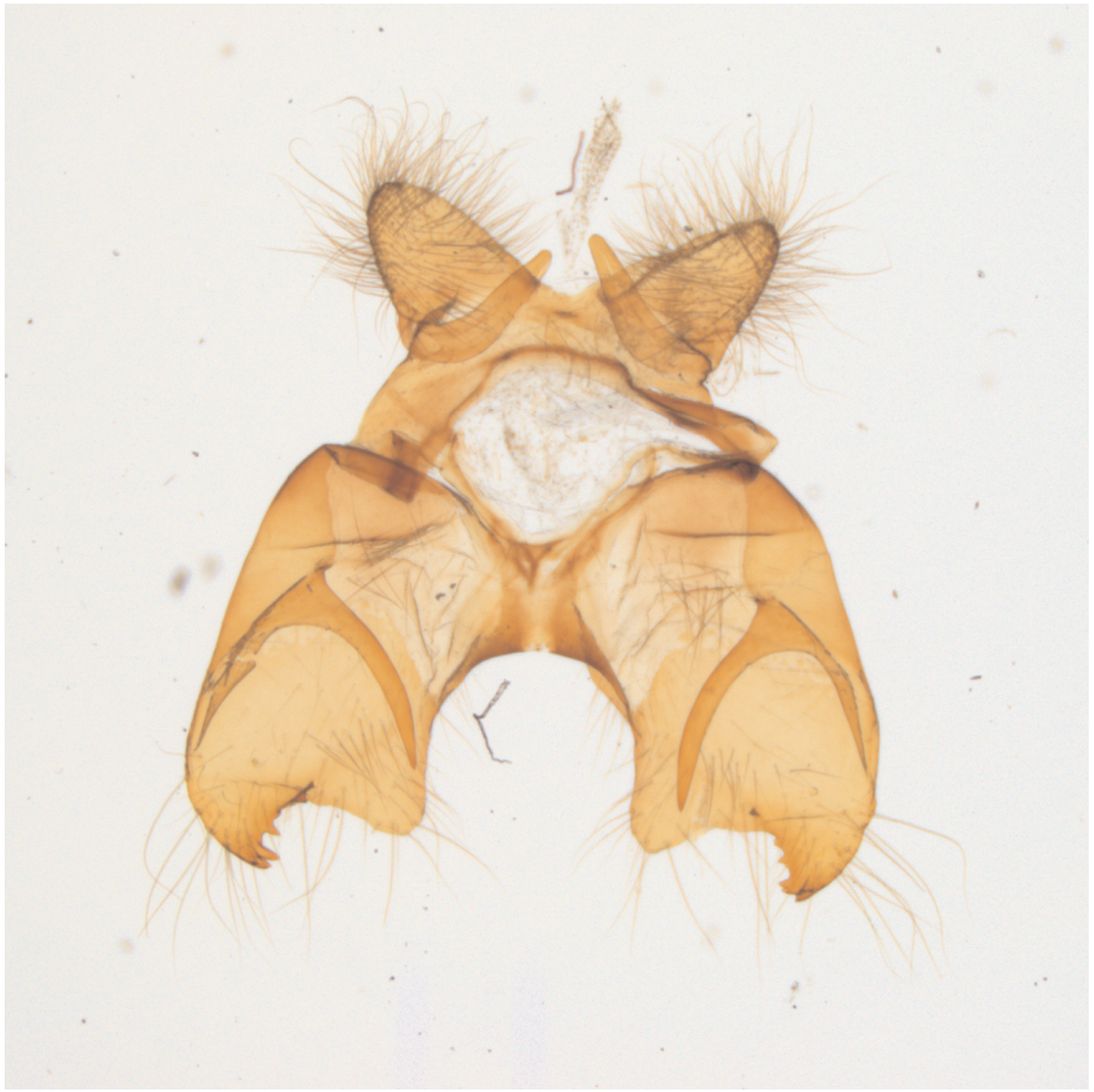
gigantea male



gigantea female

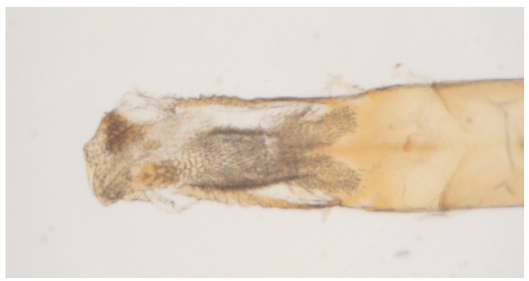


segundo_boceto_genitalias_210410.qxp:Maquetación 1 19/11/15 19:06 Page 1









06-G518 Iolana iolas stat. rev 16.V.2006 Santuari de Puiglagulla, Vilalleons, Osona Barcelona, Spain





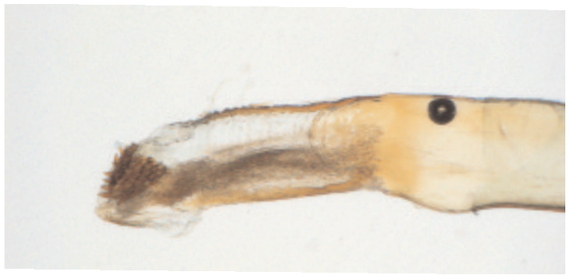
06-G520 Iolana iolas stat. rev. male 16.V.2006 Santuari de Puiglagulla, Vilalleons, Osona Barcelona, Spain

segundo_boceto_genitalias_210410.qxp:Maquetación 1 19/11/15 19:06 Page 2









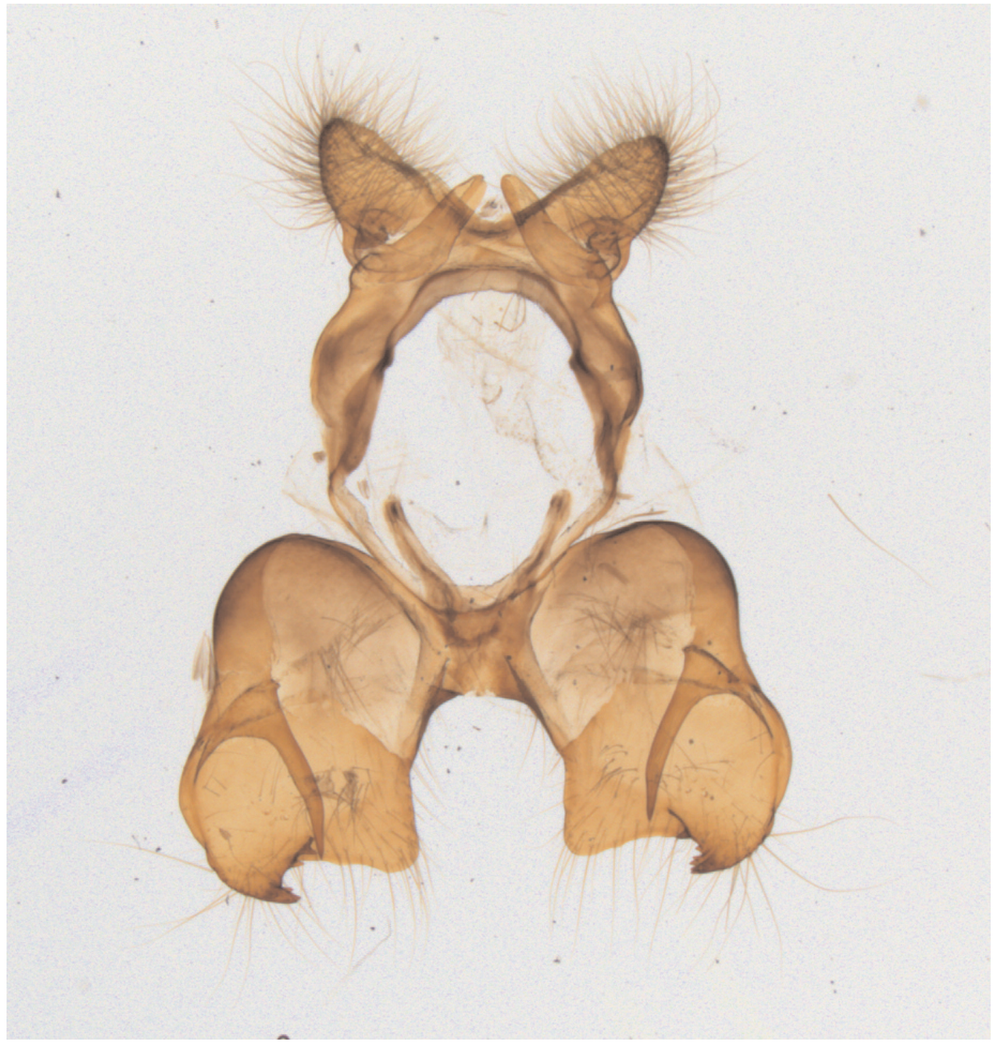
06-G597 Iolana debilitata
male 30.V.2006 Tizi-n-Test, High
Atlas Morocco Africa

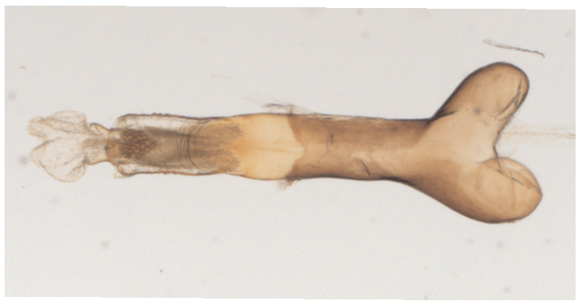




06-G599 Iolana debilitata
male 30.V.2006 Tizi-n-Test, High
Atlas Morocco Africa

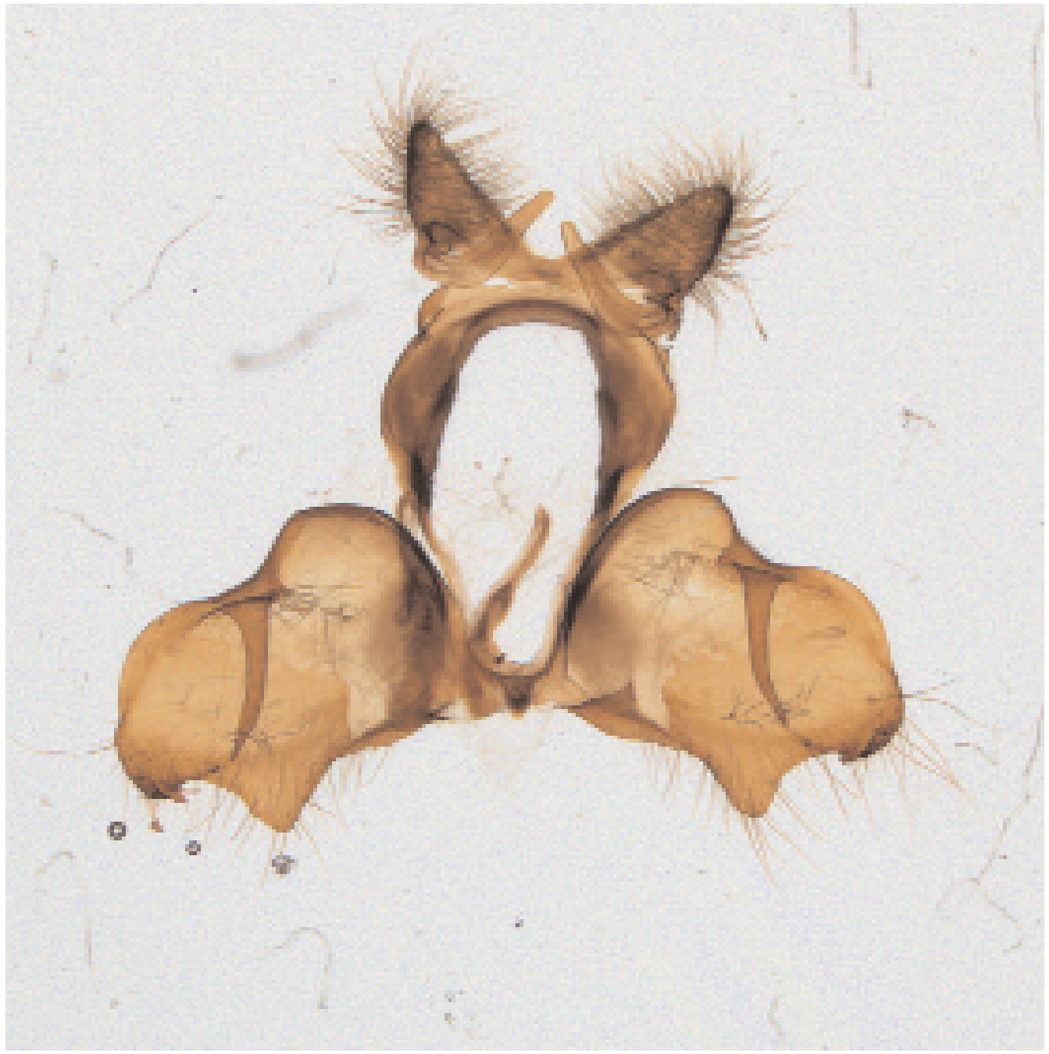
segundo_boceto_genitalias_210410.qxp:Maquetación 1 19/11/15 19:06 Page 3

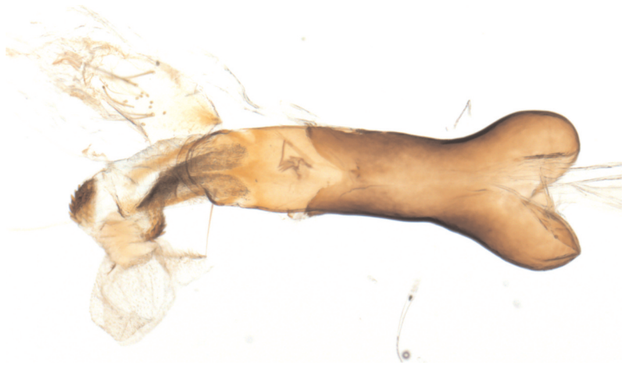






08-J700 Iolana iolas stat. rev. male 01.V.2008 Alrededores de Almedíjar, Almedíjar Castellón, Spain



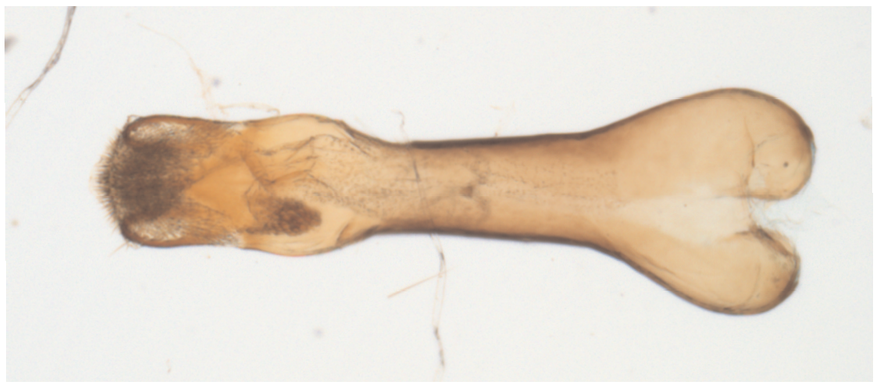




08-J783 Iolana iolas stat. rev. male 21.VI.2008 Fuente, El Vallecillo Teruel, Aragón Spain

segundo_boceto_genitalias_210410.qxp:Maquetación 1 19/11/15 19:06 Page 4





08-M159 Iolana iolas
male 21.VI.2008 Fully Valais
Switzerland Europe



07-C805 Iolana iolas
male 23.VI.2008 Varen IVS
Switzerland Europe

segundo_boceto_genitalias_210410.qxp:Maquetación 1 19/11/15 19:06 Page 5

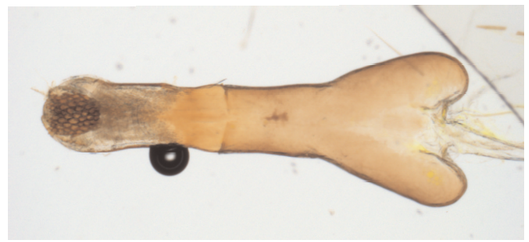


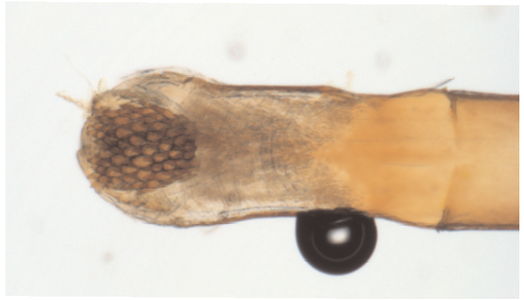






VL-05-J520 Iolana iolas andreasi
21.VII.2005 Shahkuh
Golestan Iran

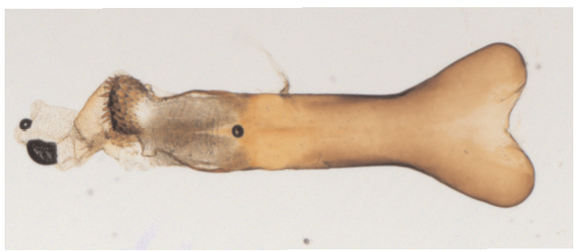




B914 Iolana alfierii Israel
Dubi Benyamini

segundo_boceto_genitalias_210410.qxp:Maquetación 1 19/11/15 19:06 Page 6







VL-01-L272 Iolana iolas
17.VII.2001
Munzur Daglari, 3 km NE Dagyolu
Erzincan, Turkey