

**Table S2.** Additional information to the First Catalog of natural enemies of rust fungi from field sites and preserved specimens at the Arthur Fungarium. The asterisk (\*) indicates available DNA sequences; new reports are written in **bold red**; a dagger (†) indicates fresh specimens; NA: data not available; latitude and longitude are approximations.

PUR Catalog Number	Natural enemy	Natural enemy Symptoms and Remarks	Natural Enemy Scientific Name	Host Rust Species	Country	Collection Year	Host Plant Family	Latitude	Longitude	ITS rDNA	LSU rDNA	TEF-1	RPB2	COI mtDNA (primers: LCO1490/HCO2198)	COI mtDNA (primers: UEAS/UEA6)	16S mtDNA
PURF18316	Fungi	Ascomycetes	<i>Trochila uredinophila</i>	<i>Cerotelium fici</i>	Trinidad	1912	Moraceae	10.5	-61.25	*						
PUR11683	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Uromyces graminicola</i>	USA	1922	Poaceae	25.78165	-80.21667	*						
PUR2041	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora medusae</i>	USA	1883	Salicaceae	43.07305	-89.40123	*						
PUR2047	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora medusae</i>	USA	1919	Salicaceae	43.07305	-89.40123	*			*			
PUR2129	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora medusae</i>	USA	1916	Salicaceae	42.282331	-83.794288	*						
PUR23925	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Puccinia montanensis</i>	USA	1896	Poaceae	40.41667	-86.87528	*						
PUR32274	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Puccinia proserpinacae</i>	USA	1901	Haloragaceae	42.72613	-87.78285	*						
PUR43744	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Coleosporium helianthi</i>	USA	1916	Asteraceae	35.132995	-84.53038	*						
PUR43798	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Coleosporium helianthi</i>	USA	1934	Asteraceae	36.046732	-85.199966	*						
PUR47887	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora medusae</i>	USA	1936	Salicaceae	39.0023	-77.253243	*						
PUR56253	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Puccinia recondita</i>	USA	1958	Poaceae	39.381709	-86.736572	*						
PUR88233	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Coleosporium helianthi</i>	USA	1977	Asteraceae	34.760848	-84.093362	*						
PUR90026	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora ferrinii</i>	Brazil	1986	Salicaceae	-21.966667	-47.816667	*			*			
PUR90183	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora larici-populina</i>	Brazil	1986	Salicaceae	-18.975688	-44.483961	*	*					
PUR90242	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora epitea</i>	Brazil	1986	Salicaceae	-21.229178	-44.980742	*	*					
PURF11501	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Puccinia thaliae</i>	Venezuela	1948	Cannaceae	10.46354	-64.177501	*	*					
PURF14716	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Puccinia sorghi</i>	Ecuador	1951	Poaceae	-0.19457	-78.49301	*	*	*				
PURF16121	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Puccinia phaenosperrae</i>	Japan	1959	Poaceae	34.436717	132.444446	*	*	*				
PURF1651	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Gerwasia holwayi</i>	Peru	1927	Rosaceae	-10.576819	-75.403817	*						
PURF17310	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Puccinia caricis-japonica</i>	Japan	1939	Cyperaceae	33.483333	130.9	*						
PURF3626	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Uromyces wulfiae-stenoglossae</i>	Trinidad	1921	Asteraceae	10.5	-61.25	*						
PURF4112	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Puccinia recondita</i>	Ecuador	1920	Poaceae	-0.19457	-78.49301	*	*					
PURF5980	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Puccinia boerhaviae</i>	Ecuador	1891	Nyctaginaceae	-1.670984	-78.647124	*						
PURF7943	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Puccinia inaequata</i>	Ecuador	1920	Asteraceae	-1.670984	-78.647124	*						
PURF829	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora medusae</i>	Bolivia	1920	Salicaceae	-17.118938	-65.950439	*						
PURN12037	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora humboldtiana</i>	USA	2014	Salicaceae	29.72556	-84.98333	*	*					
PURN1206	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Uromyces minutus</i>	USA	1978	Cyperaceae	31.243787	-90.453154	*						
PURN15307(WTHC1)	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora medusae</i>	USA	2015	Salicaceae	40.434	-87.034	*	*	*	*			
PURN16392	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Uromyces yurimaguensis</i>	Peru	2016	Fabaceae	-8.53333	-74.75	*	*					
PURN16518	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora ferrinii</i>	USA	2008	Salicaceae	29.95465	-90.07507	*	*					
PURN16527	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora medusae</i>	USA	2008	Salicaceae	30.41323937	-91.18120393	*						
PURN21944	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	NA	NA	NA	NA	NA	NA	*	*					
PURN2294	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Coleosporium montanum</i>	USA	1996	Asteraceae	45.946446	-92.605168	*						
PURN2303	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Coleosporium asterum</i>	USA	1991	Asteraceae	46.482743	-94.651685	*						
PURN2314	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Coleosporium asterum</i>	USA	1994	Asteraceae	45.823565	-92.763538	*						
PURN2448	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora epitea</i>	USA	1991	Salicaceae	45.057466	-93.073831	*						
PURN3993	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora epitea</i>	Brazil	1990	Salicaceae	-21.966667	-47.816667	*	*					
PURN3995	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora ferrinii</i>	Argentina	1993	Salicaceae	-28.24258	-59.454445	*						
PURN3996	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora epitea</i>	Argentina	1993	Salicaceae	-24.785299	-65.424469	*	*					
PURN3997	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora epitea</i>	Argentina	1994	Salicaceae	-26.238136	-65.495747	*	*	*				
PURN3998	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora epitea</i>	Argentina	1994	Salicaceae	-26.80015	-65.22697	*						
PURN4001	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora epitea</i>	Argentina	1994	Salicaceae	-26.238136	-65.495747	*	*					
PURN4010	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora medusae</i>	USA	1986	Salicaceae	40.44995	-86.93464	*						
PURN4015	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora larici-populina</i>	Colombia	1989	Salicaceae	6.25184	-75.563591	*	*					
PURN4108	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora aecidioides</i>	Brazil	1989	Salicaceae	-28.758462	-51.433333	*	*	*				
PURN4109	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora larici-populina</i>	Brazil	1988	Salicaceae	-18.975688	-44.483961	*						
PURN4120	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora ferrinii</i>	Brazil	1988	Salicaceae	-22.398698	-48.864444	*						
PURN4121	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora ferrinii</i>	Brazil	1988	Salicaceae	-22.398698	-48.864444	*	*					
PURN4124	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora epitea</i>	Brazil	1984	Salicaceae	-22.512305	-48.916169	*	*					
PURN4510	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora medusae</i>	USA	1981	Salicaceae	40.42003	-86.92014	*	*					
PURN5424	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora medusae</i>	USA	2006	Salicaceae	40.45087	-86.89332	*	*	*				
PURN6730	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora medusae</i>	USA	2012	Salicaceae	40.45921	-90.6718	*	*	*				
PURN8265	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora epitea</i>	Colombia	1989	Salicaceae	6.25184	-75.569084	*						
PURN9763	Fungi	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Puccinia vernoniae-mollis</i>	Brazil	1989	Asteraceae	-21.966667	-47.816667	*	*					
MCA7075	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia aframomi</i>	Cameroon	2016	Zingiberaceae	3.3818876	12.734257084	*	*	*	*			
PAZ14rust-PURN23070	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	NA	Puerto Rico, USA	2018	NA	18.3047500	65.8328167			*	*			

Table 2.2 (Continued)

PUR Catalog Number	Natural enemy	Natural enemy Symptoms and Remarks	Natural Enemy Scientific Name	Host Rust Species	Country	Collection Year	Host Plant Family	Latitude	Longitude	ITS rDNA	LSU rDNA	TEF-1	RPB2	COI mtDNA (primers: LCO1490/HCO2198)	COI mtDNA (primers: UEA5/UEA6)	16S mtDNA
PP2004 (PURN11661)	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia philippinensis</i>	Guam	2004	Cyperaceae	13.462621	144.781067	*			*			
PUR11619	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Uromyces andropogonis</i>	USA	1908	Poaceae	32.60986	-85.48078	*						
PUR15359	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Uromyces trifolii-repentis</i>	USA	1915	Fabaceae	41.023584	-73.564651	*						
PUR31535	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia sp.</i>	USA	1913	Amaranthaceae	18.384536	-67.480371	*						
PUR3364	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Pucciniastrum hydrangeae</i>	USA	1896	Hydrangeaceae	40.41667	-86.87528	*						
PUR42807	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Crossopora hymenaeae</i>	Cuba	1915	Fabaceae	23.131944	-82.364167	*						
PUR48117	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia levis</i>	USA	1938	Poaceae	27.521427	-82.575752	*	*		*			
PUR50338	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Uromyces bonariensis</i>	Guatemala	1941	Amaranthaceae	15.593558	-90.217024	*						
PUR50994	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Uromyces sp.</i>	USA	1944	Cyperaceae	29.025819	-80.972	*						
PUR51302	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Phakopsora aurea</i>	Honduras	1946	Poaceae	14.83131	-87.88239	*	*		*			
PUR52253	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia arthurella</i>	Trinidad	1951	Asteraceae	10.688447	-61.754619	*						
PUR52702	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Phakopsora compressa</i>	Costa Rica	1949	Poaceae	9.904645	-83.802758	*						
PUR56162	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia marylandica</i>	USA	1959	Apiaceae	39.144601	-86.232574	*						
PUR58549	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia stenophri</i>	USA	1957	Poaceae	26.862136	-80.623197	*						
PUR59371	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia unica</i>	Mexico	1963	Poaceae	28.410332	-106.249246	*						
PUR60362	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia subtilipes</i>	Honduras	1950	Poaceae	14.05	-87.216667	*						
PUR62882	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia unica</i>	USA	1969	Poaceae	30.712589	-104.069311	*						
PUR64079	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Uromyces costaricensis</i>	Mexico	1971	Poaceae	20.013095	-97.531148	*						
PUR64614	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Uromyces epicampis</i>	Mexico	1971	Poaceae	24.01699	-104.49989	*						
PUR66889	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Sorataea baphiae</i>	Nigeria	1981	Fabaceae	6.785706	7.403086	*						
PUR87214	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Uromyces unioniensis</i>	Brazil	1983	Fabaceae	-21.229178	-44.980742	*	*		*			
PUR88231	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia oahuensis</i>	Brazil	1976	Poaceae	-22.512305	-48.916169	*						
PUR9003	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Catenulopsora praelonga</i>	USA	1926	Malvaceae	30.36742	-89.092816	*						
PURF10798	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Crossopora fici</i>	Uganda	1942	Moraceae	1.209301	32.476074	*						
PURF11444	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia posadensis</i>	Trinidad	1945	Poaceae	10.5	-61.25	*						
PURF11445	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia polysora</i>	St. Vincent & the Grenadines	1946	Poaceae	13.138446	-61.225557	*						
PURF11502	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia purpurea</i>	Venezuela	1947	Poaceae	10.258324	-67.611727	*						
PURF12985	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Uromyces costaricensis</i>	Trinidad	1949	Poaceae	10.5	-61.25	*						
PURF14478	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Phakopsora clemensiae</i>	India	1948	Poaceae	11.348545	76.694088	*	*		*			
PURF14635	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia nakanishikii</i>	India	1945	Poaceae	12.97706	77.58711	*						
PURF14757	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Phakopsora africana</i>	Uganda	1906	Rubiaceae	1.209301	32.476074	*						
PURF14933	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia eleocharidis</i>	Trinidad	1953	Cyperaceae	10.5	-61.25	*						
PURF14951	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Phakopsora loudetiae</i>	Kenya	1950	Poaceae	-1.283333	36.824907	*						
PURF15450	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Phakopsora pallescens</i>	Colombia	1911	Poaceae	3.5	-73	*						
PURF17943	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia duthiae</i>	India	NA	Poaceae	29.597261	79.660877	*						
PURF18709c	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Uromyces manihotis</i>	Brazil	1978	Euphorbiaceae	-20.756822	-42.876638	*						
PURF19059	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Uromyces costaricensis</i>	Brazil	1979	Poaceae	-19.466721	-44.172511	*			*			
PURF19059-2	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Uromyces costaricensis</i>	Brazil	1979	Poaceae	-19.466721	-44.172511	*			*			
PURF19505	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Uromyces linearis</i>	Nigeria	1975	Poaceae	6.8561	7.3927	*						
PURF19703	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia cenchri</i>	Nigeria	1977	Poaceae	6.8561	7.3927	*						
PURF19904	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia erythropus</i>	China	1980	Poaceae	25.760743	-117.7373	*						
PURF19927	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia paspalina</i>	China	1980	Poaceae	25.760743	-117.7373	*						
PURF19929	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia pogonatheri</i>	China	1980	Poaceae	25.760743	-117.7373	*						
PURF2490	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia infuscans</i>	Ecuador	1920	Poaceae	-0.19457	-78.49301	*						
PURF2800	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Uromyces bonariensis</i>	Venezuela	1932	Amaranthaceae	10.500139	-66.893838	*						
PURF4672	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia cacabata</i>	Brazil	1914	Poaceae	-18.975688	-44.483961	*						
PURF4770	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia levis</i>	Bolivia	1920	Poaceae	-16.5	-68.15	*						
PURF4897	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Uromyces setariae-italicae</i>	Trinidad	1921	Poaceae	10.5	-61.25	*			*			
PURF7972	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia neorotundata</i>	Peru	1924	Asteraceae	-10.046111	-76.621389	*	*		*			
PURF9841	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia thaliae</i>	Argentina	1941	Cannaceae	-27.46056	-58.983886	*						
PURN10179	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia minuta</i>	Brazil	1988	Cyperaceae	0.214677	-51.066667	*						
PURN10369	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia faceta</i>	Brazil	1982	Poaceae	-22.398698	-48.864444	*						
PURN10826	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Kweilingia divina</i>	USA	2013	Poaceae	29.9544	-90.075	*	*		*			
PURN10850	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia invenusta</i>	Guam	1981	Poaceae	13.446593	144.78656	*						
PURN11077	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Kweilingia divina</i>	Taiwan	2012	Poaceae	25.0169	121.5340667	*						
PURN1120	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Mikronegeria fagi</i>	Argentina	2001	Araucariaceae	-40.155234	-71.351015	*						
PURN11634 (PURP)	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia purpurea</i>	USA	2015	Poaceae	18.501342	-67.024439	*	*		*	*		
PURN15263	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Phakopsora sp.</i>	Taiwan	2011	Poaceae	23.8624833	120.903416	*			*	*		

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PURN15329	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Uromyces setariae-italicae</i>	Bolivia	2016	Poaceae	15.560555	-67.32166	*	*	*	*			
PURN15344	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia duthiae</i>	Guyana	2016	Poaceae	6.7845413	-58.15842525	*	*	*				
PURN15498	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Uromyces tenuiculis</i>	Guyana	2003	Poaceae	6.50357393	-58.2526539	*						
PURN15511	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia obliquo-septata</i>	Guyana	2003	Poaceae	4.7536607	-59.2415970	*	*	*				
PURN16553	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia obliquo-septata</i>	Guyana	2010	NA	4.75366077	-59.2415970	*	*	*				
PURN2908	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Phakopsora rossmanii</i>	Brazil	1983	Myrtaceae	-21.966667	-47.816667	*						
PURN4122	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Melampsora epitea</i>	Brazil	1982	Salicaceae	-21.966667	-47.816667	*	*	*				
PURN4123	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Melampsora epitea</i>	Brazil	1982	Salicaceae	-22.398698	-48.864444	*	*					
PURN5064	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Uromyces rhynchosporae</i>	Papua New Guinea	1939	Cyperaceae	-7.018232	146.94812	*						
PURN5574	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia stenotaphri</i>	Ecuador	1957	Poaceae	-0.167606	-78.45071	*						
PURN5917	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia arachidis</i>	Brazil	1980	Fabaceae	-28.758462	-51.433333	*						
PURN9602	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Chaconia ingae</i>	Brazil	1998	Fabaceae	-22.512305	-48.916169	*						
TA427	Fungi	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia cf. cyperi tegetiformis</i>	Benin	2019	Cyperaceae	9.23581104	2.290612737	*	*					
End3.1 †	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia sorghi</i>	Peru	2019	Poaceae	7.192099	78.505365	*	*	*				
PUR19637	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia graminis</i>	Canada	1911	Poaceae	50.999998	-89.977013	*						
PUR25166	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia recondita</i>	USA	1920	Poaceae	34.14806	-117.99896	*						
PUR26871	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia fuirenicola</i>	Cuba	1904	Cyperaceae	23.090246	-82.378743	*						
PUR40715	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia incondita</i>	USA	1919	Solanaceae	30.26715	-97.74306	*						
PUR41914	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia grindeliae</i>	USA	1886	Asteraceae	41.943814	-87.659081	*						
PUR55871	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia caenoniae</i>	USA	1958	Poaceae	40.756257	-86.876648	*	*	*				
PUR60157	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Ravenelia thornberiana</i>	Mexico	1963	Fabaceae	28.622859	-106.065885	*						
PUR60992	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia thaliae</i>	Paraguay	1962	Cannaceae	-26.176526	-56.436737	*						
PUR62883	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia unica</i>	Spain	1968	Poaceae	36.75034	-3.87486	*						
PUR6299	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Ravenelia cassiaeicola</i>	USA	1913	Fabaceae	18.340385	-66.007345	*						
PUR64476	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia poarum</i>	Mexico	1971	Poaceae	23.94378	-104.849816	*						
PUR69289	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	NA	NA	NA	NA	NA	NA	*	*	*	*			
PUR7334	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Uropyxis diphysae</i>	Guatemala	1916	Fabaceae	15.454542	-90.438965	*						
PUR8475	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Phragmidium guatemalense</i>	Guatemala	1904	Rosaceae	15.454542	-90.438965	*						
PUR87630	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Maravalia erythroxyli</i>	Brazil	1983	Erythroxylaceae	-18.975688	-44.483961		*					
PUR88221	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia recondita</i>	Brazil	1975	Poaceae	-5.529961	-51.878569	*		*				
PUR88382	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Uromyces silphii</i>	Canada	1925	Juncaceae	51.483333	-78.766667	*						
PUR90210	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Phakopsora coca</i>	Brazil	1986	Erythroxylaceae	-18.975688	-44.483961	*	*	*				
PURF10361	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Uromyces striatus</i>	Argentina	1941	Fabaceae	-31.621051	-60.697601	*						
PURF10651	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia brachypodii</i> var. <i>poaememoralis</i>	Colombia	1941	Poaceae	4.649178	-74.062827	*						
PURF10657	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia spilanthalicola</i>	Colombia	1941	Asteraceae	6.25184	-75.563591	*						
PURF10865	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia recondita</i>	Australia	1943	Poaceae	-28.183942	153.284041	*						
PURF10996	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Phakopsora lenticularis</i>	Venezuela	1938	Poaceae	10.349255	-67.684516	*						
PURF11699	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia graminis</i>	Argentina	1949	Poaceae	-34.921454	-57.954533	*						
PURF17655	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia brachypodii</i>	Argentina	1963	Poaceae	-34.652403	-58.637467	*						
PURF17656	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia brachypodii</i>	Venezuela	1958	Poaceae	8.533018	-71.24585	*						
PURF17814	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia polyopogonis</i>	Brazil	1966	Poaceae	-28.758462	-51.433333	*						
PURF18990	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Phakopsora coca</i>	Brazil	1976	Erythroxylaceae	-15.833275	-48.025477	*						
PURF2397	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Uromyces epicampis</i>	Ecuador	1920	Poaceae	-0.19457	-78.49301	*	*	*				
PURF2408	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Uromyces pencanus</i>	Chile	1919	Poaceae	-36.81297	-73.04846	*						
PURF2409	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Uromyces pencanus</i>	Chile	1919	Poaceae	-35.758046	-71.407898	*						
PURF3797	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia brachypodii</i> var. <i>poaememoralis</i>	Ecuador	1924	Poaceae	-0.19457	-78.49301	*	*	*				
PURF3799	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia brachypodii</i> var. <i>poaememoralis</i>	Ecuador	1920	Poaceae	-1.252369	-78.622781	*						
PURF3854	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia poarum</i>	Brazil	1922	Poaceae	-22.512305	-48.916169	*						
PURF3879	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia molinae</i>	Germany	1920	Poaceae	48.25838	11.449149	*						
PURF4648	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia aegopogonis</i>	Ecuador	NA	Poaceae	-0.19457	-78.49301	*						
PURF4891	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia substriata</i>	Bolivia	1920	Poaceae	-17.118938	-65.950439	*						
PURF6912	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia hydrocotyles</i>	Colombia	1910	Araliaceae	6.25184	-75.563591	*						
PURF8187	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia praedicta</i>	Brazil	1922	Asteraceae	-22.398698	-48.864444	*						

Table 2.2 (Continued)

PUR Catalog Number	Natural enemy	Natural enemy Symptoms and Remarks	Natural Enemy Scientific Name	Host Rust Species	Country	Collection Year	Host Plant Family	Latitude	Longitude	ITS rDNA	LSU rDNA	TEF-1	RPB2	CO1 mtDNA (primers: LCO1490/HCO2198)	CO1 mtDNA (primers: UEA5/UEA6)	16S mtDNA
PURF8347	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia wedellicola</i>	Brazil	1922	Asteraceae	-22.865557	-43.42723	*						
PURF9548	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia bonariensis</i>	Argentina	1940	Acanthaceae	-34.826174	-57.964608	*	*	*				
PURN11506	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia persistens</i>	USA	1942	Poaceae	40.272015	-81.859576	*						
PURN11560	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Phakopsora apoda</i>	Peru	2014	Poaceae	-7.133333	-78.483333	*	*	*				
PURN11633	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia pygmaea</i>	USA	2014	Poaceae	40.425869	-86.908066	*	*	*	*			
PURN16382	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Tranzschelia mexicana</i>	Peru	2017	Rosaceae	-7.1561979	-78.468537	*	*	*				
PURN23084/ SP28PeruCorn †	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia sorghi</i>	Peru	2019	Poaceae	7.192099	78.505365	*	*	*	*			
PURN3032	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Puccinia fumosa</i>	Mexico	1971	Polemoniaceae	19.256734	-99.456624	*						
PURN4199	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Chaetonia brasiliensis</i>	Brazil	1978	Fabaceae	-15.833275	-48.025477	*	*	*				
PURN4207	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Chaetonia brasiliensis</i>	Brazil	1988	Fabaceae	-18.975688	-44.483961	*						
PURN4452	Fungi	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Chrysocelis muehlenbeckiae</i>	Colombia	1975	Polygonaceae	4.206944	-75.958056	*	*	*				
PURF10892	Fungi	Black fruiting bodies	<i>Sph. hakeae</i>	<i>Uromyces ehrhartae</i>	Australia	1943	Poaceae	-27.46785	153.02801	*						
PUR62890	Fungi	Black fruiting bodies	<i>Sph. filum</i>	<i>Puccinia coronata</i>	Mexico	1967	Poaceae	25.13261	-99.414014	*	*					
PURF16864/ PUR83764	Fungi	Black fruiting bodies	<i>Sph. filum</i>	<i>Tranzschelia discolor</i>	Ecuador	1962	Rosaceae	-0.935206	-78.615545	*						
PURF17349	Fungi	Black fruiting bodies	<i>Sph. filum</i>	<i>Puccinia brachypodii</i>	Chile	1897	Poaceae	-41.870699	-73.81622	*						
PURF19494	Fungi	Black fruiting bodies	<i>Sph. filum</i>	<i>Puccinia brachypodii</i>	Argentina	1970	Poaceae	-46.549717	-71.630862	*	*					
PURF3782	Fungi	Black fruiting bodies	<i>Sph. filum</i>	<i>Puccinia brachypodii</i>	Bolivia	1920	Poaceae	-16.49667	-68.13	*						
PURN12884	Fungi	Black fruiting bodies	<i>Sph. filum</i>	<i>Melampsora ferrinii</i>	Peru	2015	Salicaceae	-11.590556	-76.148889	*						
PURN16937	Fungi	Black fruiting bodies	<i>Sph. filum</i>	<i>Puccinia graminis</i>	USA	1889	Poaceae	32.609857	-85.480782	*						
PURN4541a	Fungi	Black fruiting bodies	<i>Sph. filum</i>	<i>Puccinia coronata</i>	Germany	1985	Poaceae	53.438004	13.30145	*						
PURN5297	Fungi	Black fruiting bodies	<i>Sph. filum</i>	<i>Puccinia graminis</i>	Mexico	1992	Poaceae	23	-102	*						
PAZ09/PURN23065 †	Fungi	White Mycelium	<i>Simplicillium lanosoneum</i>	<i>Phakopsora sp.</i>	Puerto Rico, USA	2018	NA	18.3047500	65.8328167	*						
PURN23060/ 8(2-1)	Fungi	White Mycelium	<i>Simplicillium lanosoneum</i>	<i>Puccinia tubulosa</i>	Puerto Rico, USA	2018	Solanaceae	18.3264	65.72875	*						
PURN3996-2	Fungi	Pink Mycelium	<i>Ramularia uredinicola</i>	<i>Melampsora epitea</i>	Argentina	1993	Salicaceae	-24.785299	-65.424469	*						
PURN4125	Fungi	Pink Mycelium and Black fruiting bodies. Symptoms of Ramularia and Sphaerellopsis sp.	<i>Ramularia sp.</i>	<i>Melampsora epitea</i>	Brazil	1988	Salicaceae	-22.398698	-48.864444							
PURN16398	Fungi	Pink Mycelium	<i>Ramularia coleosporii</i>	<i>Coleosporium plumeriae</i>	Ecuador	2016	Apocynaceae	-2.5476163	-79.518177	*						
PAZ08purple/ PURN23064 †	Fungi	Purple Mycelium and Black fruiting bodies. Symptoms of Tuberculina and Sphaerellopsis sp.	<i>Helicobasidium sp.</i>	NA	Puerto Rico, USA	2018	NA	18.3047500	65.8328167							
PURF11627	Fungi	Purple Mycelium. Macro photograph provided only due to scarce material	<i>Helicobasidium sp.</i>	<i>Prospodium bicolor</i>	Trinidad	1944	Bignoniaceae	10.5	-61.25							
PURF15153	Fungi	Purple Mycelium. Macro and Micro photographs provided only due to scarce material	<i>Helicobasidium sp.</i>	<i>Uromyces megalospermus</i>	Bolivia	1923	Asteraceae	-15.731265	-64.529297							
PURF3638	Fungi	Purple Mycelium. Macro photograph provided only due to scarce material	<i>Helicobasidium sp.</i>	<i>Uromyces colombianus</i>	Trinidad	1913	Asteraceae	10.5	-61.25							
PURF8203	Fungi	Purple Mycelium. Macro and Micro photographs provided only due to scarce material	<i>Helicobasidium sp.</i>	<i>Puccinia colosseae</i>	Bolivia	1920	Asteraceae	-16.139956	-67.724731							

Table 2.2 (Continued)

PUR Catalog Number	Natural enemy	Natural enemy Symptoms and Remarks	Natural Enemy Scientific Name	Host Rust Species	Country	Collection Year	Host Plant Family	Latitude	Longitude	ITS rDNA	LSU rDNA	TEF-1	RPB2	CO1 mtDNA (primers: LCO1490/HCO2198)	CO1 mtDNA (primers: UEA5/UEA6)	16S mtDNA
PURN11109	Fungi	Purple Mycelium. Macro photograph provided only due to scarce material	<i>Helicobasidium sp.</i>	<i>Prospodium appendiculatum</i>	Argentina	2003	Bignoniaceae	-25.3355	-64.93772222							
PURN6633	Fungi	Purple Mycelium.	<i>Helicobasidium sp.</i>	<i>Porotenus depallens</i>	Ecuador	1918	Bignoniaceae	-3.721448	-79.621873							
PURF6375	Fungi	Purple Mycelium	<i>H. longisporum</i> Group II	<i>Puccinia arechavaletae</i>	Trinidad	1921	Sapindaceae	10.5	-61.25	*						
PURF6376	Fungi	Purple Mycelium	<i>H. longisporum</i> Group II	<i>Puccinia arechavaletae</i>	Trinidad	1921	Sapindaceae	10.5	-61.25	*						
PAZ17-5(3-1)/MCA7823 †	Fungi	White Mycelium. DNA sequences and macro photographs provided	<i>Cladosporium tenuissimum</i>	NA	Puerto Rico, USA	2018	NA	18.3047500	65.8328167	*						
PUR11667	Fungi	Black fruiting bodies		<i>Uromyces clignyi</i>	Cuba	1917	Poaceae	23.131944	-82.364167							
PUR12160	Fungi	Black fruiting bodies		<i>Uromyces dactylidis</i>	USA	1922	Poaceae	37.225573	-80.397461							
PUR1442	Fungi	Black fruiting bodies		<i>Coleosporium asterum</i>	USA	1923	Asteraceae	25.77427	-80.19366							
PUR15885	Fungi	Black fruiting bodies		<i>Uromyces neurocarpi</i>	El Salvador	1922	Fabaceae	13.844282	-89.917114							
PUR18279	Fungi	Black fruiting bodies		<i>Puccinia dolosa</i>	Cuba	1916	Poaceae	23.131944	-82.364167							
PUR18450	Fungi	Black fruiting bodies		<i>Phakopsora compressa</i>	Cuba	1917	Poaceae	22.4175	-83.698056							
PUR19458	Fungi	Black fruiting bodies		<i>Puccinia graminis</i>	USA	1916	Poaceae	33.76696	-118.18924							
PUR2045	Fungi	Black fruiting bodies		<i>Melampsora medusae</i>	USA	1905	Salicaceae	40.40814	-86.91971							
PUR2065	Fungi	Black fruiting bodies		<i>Melampsora medusae</i>	USA	1899	Salicaceae	40.41667	-86.87528							
PUR2090	Fungi	Black fruiting bodies		<i>Melampsora medusae</i>	USA	1918	Salicaceae	37.90202	-86.64265							
PUR2102	Fungi	Black fruiting bodies		<i>Melampsora medusae</i>	USA	1923	Salicaceae	37.31783	-89.43148							
PUR2143	Fungi	Black fruiting bodies		<i>Melampsora medusae</i>	USA	1914	Salicaceae	44.608888	-87.432589							
PUR2392	Fungi	Black fruiting bodies		<i>Melampsora paradoxa</i>	USA	1909	Salicaceae	42.84193	-91.80211							
PUR26778	Fungi	Black fruiting bodies		<i>Puccinia eleocharidis</i>	USA	1916	Cyperaceae	38.40776	-86.03599							
PUR2916	Fungi	Black fruiting bodies		<i>Melampsora epitea</i>	USA	1904	Salicaceae	38.834683	-79.374143							
PUR2933	Fungi	Black fruiting bodies		<i>Melampsora epitea</i>	USA	1919	Salicaceae	41.823989	-71.412834							
PUR29466	Fungi	Black fruiting bodies		<i>Puccinia dioicae</i>	USA	1915	Cyperaceae	41.13899	-72.30342							
PUR2956	Fungi	Black fruiting bodies		<i>Melampsora epitea</i>	Canada	1909	Salicaceae	42.98333	-81.25							
PUR2992	Fungi	Black fruiting bodies		<i>Melampsora epitea</i>	USA	1915	Salicaceae	42.28201	-83.79418							
PUR30117	Fungi	Black fruiting bodies		<i>Puccinia dioicae</i>	USA	1886	Cyperaceae	47.17166	-93.86594							
PUR3027	Fungi	Black fruiting bodies		<i>Melampsora epitea</i>	USA	1896	Salicaceae	32.270094	-106.800838							
PUR38665	Fungi	Black fruiting bodies		<i>Uromyces tranzscheltii</i>	USA	1908	Euphorbiaceae	39.74249	-105.51361							
PUR42945	Fungi	Black fruiting bodies		<i>Uromyces holmbergii</i>	USA	1923	Rubiaceae	18.377205	-66.042793							
PUR44002	Fungi	Black fruiting bodies		<i>Phakopsora uva</i>	USA	1920	Vitaceae	28.517825	-81.329798							
PUR49026	Fungi	Black fruiting bodies		<i>Puccinia idonea</i>	Guatemala	1939	Asteraceae	14.596667	-90.754722							
PUR49058	Fungi	Black fruiting bodies		<i>Uromyces antiguanus</i>	Guatemala	1938	Fabaceae	14.56111	-90.73444							
PUR50437	Fungi	Black fruiting bodies		<i>Uromyces scleriae</i>	Guatemala	1941	Cyperaceae	15.593558	-90.217024							
PUR51697	Fungi	Black fruiting bodies		<i>Uromyces rhynchosporae</i>	Honduras	1947	Cyperaceae	14.054836	-86.85							
PUR51738	Fungi	Black fruiting bodies		<i>Puccinia hyptidis</i>	USA	1942	Lamiaceae	29.682428	-82.360265							
PUR51997	Fungi	Black fruiting bodies		<i>Puccinia dioicae</i>	Canada	1949	Cyperaceae	63.66104	-128.65							
PUR52266	Fungi	Black fruiting bodies		<i>Uromyces commeliniae</i>	Trinidad	1951	Commelinaceae	10.5	-61.25							
PUR54761	Fungi	Black fruiting bodies		<i>Uromyces setariae-italicae</i>	USA	1956	Poaceae	29.959118	-82.928183							
PUR54820	Fungi	Black fruiting bodies		<i>Puccinia ammophilae</i>	USA	1925	Poaceae	41.755948	-124.201747							
PUR55326	Fungi	Black fruiting bodies		<i>Melampsora ribesii-purpureae</i>	USA	1955	Salicaceae	48.67553	-113.59289							
PUR55912	Fungi	Black fruiting bodies		<i>Puccinia subnitens</i>	USA	1955	Poaceae	47.830814	-114.350708							
PUR57385	Fungi	Black fruiting bodies		<i>Puccinia boutelouae</i>	Mexico	1903	Poaceae	17.850049	-100.362588							
PUR58718	Fungi	Black fruiting bodies		<i>Puccinia setariae</i>	Mexico	1898	Poaceae	19.4425	-99.253333							
PUR59405	Fungi	Black fruiting bodies		<i>Cronartium conigenum</i>	Mexico	1939	Fagaceae	28.622859	-106.065885							
PUR59587	Fungi	Black fruiting bodies		<i>Puccinia anthephorae</i>	Guatemala	1904	Poaceae	14.472031	-90.63143							
PUR60025	Fungi	Black fruiting bodies		<i>Dasyscypha mesoamericana</i>	Mexico	1944	Annonaceae	21.345649	-97.838467							
PUR60747	Fungi	Black fruiting bodies		<i>Puccinia versicolor</i>	Mexico	1963	Poaceae	22.708479	-100.346918							
PUR61858	Fungi	Black fruiting bodies		<i>Puccinia conoelinii</i>	Mexico	1967	Asteraceae	22.708479	-100.346918							
PUR65124	Fungi	Black fruiting bodies		<i>Uromyces tenuistipes</i>	Mexico	1974	Fabaceae	16.185549	-92.097961							
PUR65329	Fungi	Black fruiting bodies		<i>Puccinia obtecta</i>	USA	1890	Cyperaceae	39.745947	-75.546589							
PUR66096	Fungi	Black fruiting bodies		<i>Puccinia duthiae</i>	Mexico	1974	Poaceae	23.999997	-98.778629							

Table 2.2 (Continued)

PUR Catalog Number	Natural enemy	Natural enemy Symptoms and Remarks	Natural Enemy Scientific Name	Host Rust Species	Country	Collection Year	Host Plant Family	Latitude	Longitude	ITS rDNA	LSU rDNA	TEF-1	RPB2	CO1 mtDNA (primers: LCO1490/HCO2198)	CO1 mtDNA (primers: UEAs/UEA6)	16S mtDNA
PUR66097	Fungi	Black fruiting bodies		<i>Puccinia arundiariae</i>	USA	1961	Poaceae	37.580121	-89.120605							
PUR66892	Fungi	Black fruiting bodies		<i>Puccinia galopinae</i>	Nigeria	1981	Rubiaceae	6.66737	9.17157							
PUR6931	Fungi	Black fruiting bodies		<i>Tranzschelia fusca</i>	USA	1883	Ranunculaceae	41.850033	-87.650052							
PUR7416	Fungi	Black fruiting bodies		<i>Prosopidium abortivum</i>	Barbados	1920	Bignoniaceae	13.176642	-59.539917							
PUR78615	Fungi	Black fruiting bodies		<i>Uromyces eragrostidis</i>	Argentina	1946	Poaceae	-34.921454	-57.954533							
PUR83763	Fungi	Black fruiting bodies		<i>Tranzschelia arthuri</i>	Ecuador	1962	Rosaceae	-0.687759	-78.439626							
PUR87966	Fungi	Black fruiting bodies		<i>Puccinia oahuensis</i>	Brazil	1984	Poaceae	-21.966667	-47.816667							
PUR88387	Fungi	Black fruiting bodies		<i>Puccinia bistortae</i>	USA	1975	Polygonaceae	63.085219	-151.193359							
PUR88852	Fungi	Black fruiting bodies		<i>Coleosporium asterum</i>	USA	1916	Polygonaceae	39.475056	-87.387512							
PUR88856	Fungi	Black fruiting bodies		<i>Coleosporium asterum</i>	USA	1958	Asteraceae	41.334185	-86.250427							
PUR89105	Fungi	Black fruiting bodies		<i>Uromyces clignyi</i>	Brazil	1984	Poaceae	-19.466721	-44.172511							
PURF10348	Fungi	Black fruiting bodies		<i>Melampsora larici-populina</i>	Argentina	1941	Salicaceae	-31.621051	-60.697601							
PURF10351	Fungi	Black fruiting bodies		<i>Puccinia graminis</i>	Argentina	1941	Poaceae	-31.621051	-60.697601							
PURF10356/PUR77256	Fungi	Black fruiting bodies		<i>Tranzschelia discolor</i>	Argentina	1941	Rosaceae	-31.619882	-60.702408							
PURF10358/PUR77258	Fungi	Black fruiting bodies		<i>Tranzschelia discolor</i>	Argentina	1941	Rosaceae	-31.619882	-60.702408							
PURF10380	Fungi	Black fruiting bodies		<i>Puccinia dietelii</i>	Uganda	1940	Poaceae	0.83333	31.91667							
PURF10661	Fungi	Black fruiting bodies		<i>Puccinia oxalidis</i>	Colombia	1941	Oxalidaceae	3.5	-73							
PURF10662	Fungi	Black fruiting bodies		<i>Uromyces euphorbiae</i>	Colombia	1941	Euphorbiaceae	6.25184	-75.563591							
PURF10667	Fungi	White Mycelium. Micro and Macro photographs provided		<i>Coleosporium plumeriae</i>	Colombia	1941	Apocynaceae	10	-74.5							
PURF10668	Fungi	Black fruiting bodies		<i>Puccinia graminis</i>	Colombia	1941	Poaceae	6.25184	-75.563591							
PURF10920	Fungi	Black fruiting bodies		<i>Puccinia brachypodii</i> var. <i>poaeconomalis</i>	Argentina	NA	Poaceae	-21.944671	-66.052194							
PURF10937	Fungi	Black fruiting bodies		<i>Catenulopsora praelonga</i>	Argentina	1941	Malvaceae	-27.46056	-58.983886							
PURF10942	Fungi	Black fruiting bodies		<i>Puccinia thaliae</i>	Argentina	NA	Cannaceae	-27.46056	-58.983886							
PURF10952	Fungi	Black fruiting bodies		<i>Puccinia lepturi</i>	Japan	1940	Poaceae	26.335833	127.801389							
PURF11244	Fungi	Black fruiting bodies		<i>Puccinia baccharidis</i>	Argentina	1944	Asteraceae	-27.46056	-58.983886							
PURF11270	Fungi	Black fruiting bodies		<i>Puccinia pusilla</i>	China	1921	Poaceae	23	113							
PURF11374	Fungi	Black fruiting bodies		<i>Puccinia polysora</i>	Trinidad	1948	Poaceae	10.5	-61.25							
PURF11376	Fungi	Black fruiting bodies		<i>Puccinia polysora</i>	Trinidad	1948	Poaceae	10.5	-61.25							
PURF11391	Fungi	Black fruiting bodies		<i>Catenulopsora praelonga</i>	Argentina	1941	Malvaceae	-27.46056	-58.983886							
PURF11448	Fungi	Black fruiting bodies		<i>Puccinia purpurea</i>	St. Vincent & the Grenadines	1946	Poaceae	13.128501	-61.231812							
PURF11595	Fungi	Black fruiting bodies		<i>Puccinia polysora</i>	Trinidad	1948	Poaceae	10.5	-61.25							
PURF11662	Fungi	Black fruiting bodies		<i>Puccinia cephalotes</i>	Trinidad	1945	Cyperaceae	10.5	-61.25							
PURF11695	Fungi	Black fruiting bodies		<i>Puccinia abnormis</i>	Argentina	1949	Poaceae	-27.566675	-56.914669							
PURF11696	Fungi	Black fruiting bodies		<i>Puccinia solidaginis-microglossae</i>	Argentina	1949	Asteraceae	-27.566675	-56.914669							
PURF11700	Fungi	Black fruiting bodies		<i>Puccinia graminis</i>	Argentina	1949	Poaceae	-34.921454	-57.954533							
PURF11701	Fungi	Black fruiting bodies		<i>Puccinia graminis</i>	Argentina	1947	Poaceae	-34.921454	-57.954533							
PURF11704	Fungi	Black fruiting bodies		<i>Puccinia polygoni-amphibii</i>	Argentina	1949	Polygonaceae	-27.566675	-56.914669							
PURF11715	Fungi	Black fruiting bodies		<i>Uromyces eragrostidis</i>	Argentina	1946	Poaceae	-34.921454	-57.954533							
PURF11797	Fungi	Black fruiting bodies		<i>Puccinia cacao</i>	Indonesia	1927	Poaceae	-9	120							
PURF11875	Fungi	Black fruiting bodies		<i>Puccinia polysora</i>	Colombia	1948	Poaceae	3.442371	-73.310196							
PURF11895/ (PURF16658)	Fungi	Black fruiting bodies		<i>Puccinia subtilipes</i>	Trinidad	1947	Poaceae	10.5	-61.25							
PURF11955	Fungi	Black fruiting bodies		<i>Melampsora euphorbiae-dulcis</i>	China	1932	Euphorbiaceae	29.5	115.91667							
PURF13014	Fungi	Black fruiting bodies		<i>Puccinia levis</i>	Japan	1940	Poaceae	26.229856	127.759057							
PURF13044	Fungi	Black fruiting bodies		<i>Puccinia polypogonis</i>	Argentina	1949	Poaceae	-34.921454	-57.954533							
PURF13061	Fungi	Black fruiting bodies		<i>Puccinia solidaginis-microglossae</i>	Argentina	1946	Asteraceae	-34.921454	-57.954533							
PURF1325	Fungi	Black fruiting bodies		<i>Tranzschelia discolor</i>	Ecuador	1918	Rosaceae	-1.252369	-78.622781							
PURF1326/PUR68226	Fungi	Black fruiting bodies		<i>Tranzschelia arthuri</i>	Ecuador	1924	Rosaceae	-0.2001	-78.475341							
PURF14603	Fungi	Black fruiting bodies		<i>Puccinia liberta</i>	Ecuador	1949	Cyperaceae	0.416311	-78.346451							
PURF14605	Fungi	Black fruiting bodies		<i>Puccinia sorghi</i>	Ethiopia	1950	Poaceae	8.896515	38.619837							
PURF14684	Fungi	Black fruiting bodies		<i>Uromyces scleriae</i>	Trinidad	1952	Cyperaceae	10.5	-61.25							



Table 2.2 (Continued)

PUR Catalog Number	Natural enemy	Natural enemy Symptoms and Remarks	Natural Enemy Scientific Name	Host Rust Species	Country	Collection Year	Host Plant Family	Latitude	Longitude	ITS rDNA	LSU rDNA	TEF-1	RPB2	CO1 mtDNA (primers: LCO1490/HCO2198)	CO1 mtDNA (primers: UE45/UEA6)	16S mtDNA
PURF14715	Fungi	Black fruiting bodies		<i>Puccinia sorghi</i>	Colombia	1951	Poaceae	3.442371	-73.310196							
PURF14840	Fungi	Black fruiting bodies		<i>Puccinia polypogonis</i>	Argentina	1949	Poaceae	-34.921454	-57.954533							
PURF14932	Fungi	Black fruiting bodies		<i>Puccinia liberta</i>	Trinidad	1953	Cyperaceae	10.5	-61.25							
PURF1511	Fungi	Black fruiting bodies		<i>Phragmidium mucronatum</i>	Germany	1895	Rosaceae	51.550515	14.712403							
PURF15111	Fungi	Black fruiting bodies		<i>Uromyces peglerae</i>	Philippines	1925	Poaceae	16.8801	120.8477							
PURF15133	Fungi	Black fruiting bodies		<i>Phakopsora setariae</i>	Malawi	1949	Poaceae	-13.5	34							
PURF15195	Fungi	Black fruiting bodies		<i>Puccinia dioicae</i>	Bolivia	1920	Cyperaceae	-16.49667	-68.13							
PURF15395	Fungi	Black fruiting bodies		<i>Puccinia opuntiae</i>	Peru	1946	Poaceae	-12.05	-77.05							
PURF15396	Fungi	Black fruiting bodies		<i>Puccinia vexans</i>	Peru	1913	Poaceae	-13.305696	-72.116109							
PURF15436	Fungi	Black fruiting bodies		<i>Puccinia levis</i>	Venezuela	1938	Poaceae	10.5	-66.85							
PURF15448	Fungi	Black fruiting bodies		<i>Puccinia opipara</i>	Peru	1929	Poaceae	-14.837747	-74.052856							
PURF15493	Fungi	Black fruiting bodies		<i>Kwelllingia wangii</i>	Taiwan	1918	Poaceae	23.5	121							
PURF15523	Fungi	Black fruiting bodies		<i>Puccinia piptochaetii</i>	Uruguay	1936	Poaceae	-32.851152	-55.963867							
PURF15524	Fungi	Black fruiting bodies		<i>Puccinia piptochaetii</i>	Uruguay	NA	Poaceae	-34.454878	-56.395767							
PURF15525	Fungi	Black fruiting bodies		<i>Puccinia piptochaetii</i>	Uruguay	NA	Poaceae	-34.933333	-55.883333							
PURF15557	Fungi	Black fruiting bodies		<i>Puccinia conspersa</i>	Argentina	1947	Lamiaceae	-34.921454	-57.954533							
PURF15576	Fungi	Black fruiting bodies		<i>Puccinia sp.</i>	Ecuador	1950	Cyperaceae	0.416311	-78.346451							
PURF15909	Fungi	Black fruiting bodies		<i>Puccinia polysora</i>	Venezuela	1944	Poaceae	10.23535	-67.591128							
PURF16253	Fungi	Black fruiting bodies		<i>Cerotelium clerodendri</i>	Ghana	1951	Lamiaceae	5.333333	-0.75							
PURF16265	Fungi	Black fruiting bodies		<i>Uromyces coronatus</i>	Japan	1958	Poaceae	34.666667	132.7							
PURF16902	Fungi	Black fruiting bodies		<i>Uromyces eragrostidis</i>	Argentina	1946	Poaceae	-34.921454	-57.954533							
PURF16914	Fungi	Black fruiting bodies		<i>Uromyces nitrotyensis</i>	Argentina	1898	Poaceae	-40.79828	-62.980972							
PURF16917	Fungi	Black fruiting bodies		<i>Uromyces viciae-fabae</i>	Ecuador	1962	Fabaceae	-0.19457	-78.49301							
PURF16951	Fungi	Black fruiting bodies		<i>Puccinia flaccida</i>	Indonesia	NA	Poaceae	-9	120							
PURF17236	Fungi	Black fruiting bodies		<i>Uromyces danthoniae</i>	New Zealand	1949	Poaceae	-44.842968	169.822021							
PURF17278	Fungi	Black fruiting bodies		<i>Puccinia recondita</i>	Chile	NA	Poaceae	-41.870699	-73.81622							
PURF17384	Fungi	Black fruiting bodies		<i>Puccinia gymnopogonis</i>	British Guiana	1919	Poaceae	6.01065	-58.310358							
PURF17386	Fungi	Black fruiting bodies		<i>Puccinia subtilipes</i>	Trinidad	1912	Poaceae	10.5	-61.25							
PURF17658	Fungi	Black fruiting bodies		<i>Puccinia brachypodii</i>	Falkland Islands	1942	Poaceae	-51.289225	-59.622356							
PURF17721	Fungi	Black fruiting bodies		<i>Puccinia chaetochloae</i>	Brazil	1966	Poaceae	-28.758462	-51.433333							
PURF17723	Fungi	Black fruiting bodies		<i>Puccinia ellisiana</i>	Brazil	1909	Poaceae	-28.758462	-51.433333							
PURF17745	Fungi	Black fruiting bodies		<i>Uromyces setariae-italicae</i>	Argentina	1885	Poaceae	-26.266307	-60.983398							
PURF17883	Fungi	Black fruiting bodies		<i>Puccinia neorotundata</i>	Venezuela	NA	Asteraceae	10.020815	-68.149815							
PURF18021	Fungi	Black fruiting bodies		<i>Puccinia polysora</i>	Colombia	1955	Poaceae	6.25184	-75.569084							
PURF18031	Fungi	Black fruiting bodies		<i>Phakopsora zeae</i>	Colombia	1957	Poaceae	6.25184	-75.569084							
PURF18135	Fungi	Black fruiting bodies		<i>Phakopsora zeae</i>	Colombia	1956	Poaceae	6.25184	-75.569084							
PURF18139	Fungi	Black fruiting bodies		<i>Puccinia polysora</i>	Colombia	1957	Poaceae	6.25184	-75.569084							
PURF18304	Fungi	Black fruiting bodies		<i>Uromyces setariae-italicae</i>	Argentina	1881	Poaceae	-26.177534	-58.178139							
PURF18480	Fungi	Black fruiting bodies		<i>Puccinia brachypodii</i> var. <i>major</i>	Chile	1968	Poaceae	-41.870699	-73.81622							
PURF18528	Fungi	Black fruiting bodies		<i>Puccinia magnusiana</i>	Australia	1965	Poaceae	-33.466	150.883							
PURF18892	Fungi	Black fruiting bodies		<i>Puccinia schileana</i>	Brazil	1976	Asteraceae	-24.630612	-53.114858							
PURF19234	Fungi	Black fruiting bodies		<i>Uredinopsis pteridis</i>	Brazil	1976	Dennstaedtiaceae	-23.19597	-46.87576							
PURF19469	Fungi	Black fruiting bodies		<i>Puccinia brachypodii</i>	Argentina	1970	Poaceae	-54.8	-68.3							
PURF19529	Fungi	Black fruiting bodies		<i>Uromyces commelinae</i>	Argentina	1969	Commelinaceae	-34.809538	-57.984552							
PURF19564	Fungi	Black fruiting bodies		<i>Melampsora aecidioides</i>	Uruguay	1960	Salicaceae	-34.87	-56.22							
PURF2358	Fungi	Black fruiting bodies		<i>Uromyces eragrostidis</i>	Bolivia	1920	Poaceae	-17.055929	-65.565918							
PURF2361	Fungi	Black fruiting bodies		<i>Uromyces eragrostidis</i>	Bolivia	1920	Poaceae	-17.055929	-65.565918							
PURF2362	Fungi	Black fruiting bodies		<i>Uromyces eragrostidis</i>	Bolivia	1920	Poaceae	-16.49667	-68.13							
PURF2366	Fungi	Black fruiting bodies		<i>Uromyces cuspidatus</i>	Bolivia	1920	Poaceae	-16.49667	-68.13							
PURF2367	Fungi	Black fruiting bodies		<i>Uromyces cuspidatus</i>	Bolivia	1920	Poaceae	-16.49667	-68.13							
PURF2381	Fungi	Black fruiting bodies		<i>Uromyces cuspidatus</i>	Bolivia	1920	Poaceae	-16.49667	-68.13							
PURF2387	Fungi	Black fruiting bodies		<i>Uromyces epicampis</i>	Chile	1919	Poaceae	-35.758046	-71.407898							
PURF2389 (PUR69289)	Fungi	Black fruiting bodies		<i>Uromyces epicampis</i>	Bolivia	1920	Poaceae	-15.76667	-68.63333							
PURF2406	Fungi	Black fruiting bodies		<i>Uromyces pencaus</i>	Chile	1919	Poaceae	-38.736248	-72.616394							
PURF2407	Fungi	Black fruiting bodies		<i>Uromyces pencaus</i>	Chile	1920	Poaceae	-41.870699	-73.81622							
PURF2416	Fungi	Black fruiting bodies		<i>Uromyces tenuiculis</i>	Chile	1919	Poaceae	-35.711578	-71.334456							
PURF2417	Fungi	Black fruiting bodies		<i>Uromyces tenuiculis</i>	Bolivia	1920	Poaceae	-17.055929	-65.565918							
PURF2418	Fungi	Black fruiting bodies		<i>Uromyces tenuiculis</i>	Bolivia	1920	Poaceae	-16.49667	-68.13							

Table 2.2 (Continued)

PUR Catalog Number	Natural enemy	Natural enemy Symptoms and Remarks	Natural Enemy Scientific Name	Host Rust Species	Country	Collection Year	Host Plant Family	Latitude	Longitude	ITS rDNA	LSU rDNA	TEF-1	RPB2	CO1 mtDNA (primers: LCO1490/HCO2198)	CO1 mtDNA (primers: UEAs/UEA6)	16S mtDNA
PURF2420	Fungi	Black fruiting bodies		<i>Uromyces tenuiculis</i>	Ecuador	1920	Poaceae	-0.19457	-78.49301							
PURF2427	Fungi	Black fruiting bodies		<i>Uromyces tenuiculis</i>	Trinidad	1921	Poaceae	10.5	-61.25							
PURF2436	Fungi	Black fruiting bodies		<i>Uromyces niteroyensis</i>	Uruguay	1922	Poaceae	-34.85806	-56.17083							
PURF2452	Fungi	Black fruiting bodies		<i>Phakopsora lenticularis</i>	Trinidad	1921	Poaceae	44326	-61.25							
PURF2453	Fungi	Black fruiting bodies		<i>Uromyces setariae-italicae</i>	Peru	1914	Poaceae	-5.533333	-74.633333							
PURF2465	Fungi	Black fruiting bodies		<i>Uromyces setariae-italicae</i>	Peru	1920	Poaceae	-5.533333	-74.633333							
PURF2488	Fungi	Black fruiting bodies		<i>Puccinia infuscans</i>	Bolivia	1920	Poaceae	-17.055929	-65.565918							
PURF2491	Fungi	Black fruiting bodies		<i>Puccinia infuscans</i>	Bolivia	1920	Poaceae	-17.055929	-65.565918							
PURF2506	Fungi	Black fruiting bodies		<i>Uromyces oblectaneus</i>	Brazil	1922	Cyperaceae	-22.398698	-48.864444							
PURF2547	Fungi	Black fruiting bodies		<i>Uromyces magellanicus</i>	Chile	1906	Cyperaceae	-53.130267	-70.853963							
PURF2573	Fungi	Black fruiting bodies		<i>Uromyces junci</i>	Bolivia	1920	Juncaceae	-17.118938	-65.950439							
PURF2587	Fungi	Black fruiting bodies		<i>Uromyces silphii</i>	Chile	1919	Juncaceae	-35.758046	-71.407898							
PURF2687	Fungi	Black fruiting bodies		<i>Uromyces bunsteri</i>	Chile	1919	Iridaceae	-35.758046	-71.407898							
PURF2794	Fungi	Black fruiting bodies		<i>Uromyces iresines</i>	Ecuador	1920	Amaranthaceae	-0.19457	-78.49301							
PURF2925	Fungi	Black fruiting bodies		<i>Uromyces hedysari-paniculati</i>	Trinidad	1921	Fabaceae	10.5	-61.25							
PURF2927	Fungi	Pink Mycelium. Macro photograph provided only due to scarce material		<i>Uromyces hedysari-paniculati</i>	Ecuador	1891	Fabaceae	-1.670984	-78.647124							
PURF3131	Fungi	Black fruiting bodies		<i>Uromyces trifolii-repentis</i>	Bolivia	1920	Fabaceae	-15.76667	-68.63333							
PURF3137	Fungi	Black fruiting bodies		<i>Uromyces trifolii-repentis</i>	Bolivia	1920	Fabaceae	-16.49667	-68.13							
PURF3167	Fungi	Black fruiting bodies		<i>Uromyces trifolii</i>	Bolivia	1920	Fabaceae	-17.118938	-65.950439							
PURF3340	Fungi	Black fruiting bodies		<i>Uromyces euphorbiae</i>	Trinidad	1921	Euphorbiaceae	10.5	-61.25							
PURF3421	Fungi	Black fruiting bodies		<i>Uromyces triquetus</i>	Chile	1920	Hypericaceae	-35.758046	-71.407898							
PURF3434	Fungi	Black fruiting bodies		<i>Uromyces myrsines</i>	Bolivia	1892	Primulaceae	-15.507659	-67.88327							
PURF3437	Fungi	Black fruiting bodies		<i>Uromyces myrsines</i>	Bolivia	1920	Primulaceae	-16.139956	-67.724731							
PURF3488	Fungi	Black fruiting bodies		<i>Uromyces asclepiadis</i>	Peru	1924	Apocynaceae	-11.233333	-75.483333							
PURF3489	Fungi	Black fruiting bodies		<i>Uromyces asclepiadis</i>	Peru	1924	Apocynaceae	-10.046111	-76.621389							
PURF3629	Fungi	Black fruiting bodies		<i>Uromyces vulffiae-stenoglossae</i>	Trinidad	1913	Asteraceae	10.5	-61.25							
PURF3645	Fungi	Black fruiting bodies		<i>Uromyces bidenticola</i>	Bolivia	1920	Asteraceae	-16.49667	-68.13							
PURF3796	Fungi	Black fruiting bodies		<i>Puccinia brachypodii</i> var. <i>poaememoralis</i>	Bolivia	1929	Poaceae	-16.49667	-68.13							
PURF3810	Fungi	Black fruiting bodies		<i>Puccinia brachypodii</i>	Chile	1922	Poaceae	-53.130267	-70.853963							
PURF3820	Fungi	Black fruiting bodies		<i>Puccinia brachypodii</i> var. <i>poaememoralis</i>	Chile	1919	Poaceae	-38.719107	-72.619141							
PURF3821	Fungi	Black fruiting bodies		<i>Puccinia brachypodii</i> var. <i>poaememoralis</i>	Chile	1919	Poaceae	-41.870699	-73.81622							
PURF3862	Fungi	Black fruiting bodies		<i>Puccinia schedonnardi</i>	Bolivia	1920	Poaceae	-17.118938	-65.950439							
PURF3865	Fungi	Black fruiting bodies		<i>Puccinia coronata</i>	Bolivia	1920	Poaceae	-17.055929	-65.565918							
PURF3874	Fungi	Black fruiting bodies		<i>Puccinia brachypodii</i>	Germany	1895	Poaceae	52.455515	13.308119							
PURF3887	Fungi	Black fruiting bodies		<i>Puccinia brachypodii</i> var. <i>poaememoralis</i>	Finland	1919	Poaceae	61.166667	25.05							
PURF3897	Fungi	Black fruiting bodies		<i>Puccinia aristidae</i>	Bolivia	1920	Poaceae	-16.49667	-68.13							
PURF3904	Fungi	Black fruiting bodies		<i>Puccinia subnitens</i>	Chile	1919	Poaceae	-40.708707	-73.015402							
PURF3905	Fungi	Black fruiting bodies		<i>Puccinia subnitens</i>	Bolivia	1920	Poaceae	-17.118938	-65.950439							
PURF4088	Fungi	Black fruiting bodies		<i>Puccinia recondita</i>	Bolivia	1920	Poaceae	-17.055929	-65.565918							
PURF4089	Fungi	Black fruiting bodies		<i>Puccinia recondita</i>	Chile	1920	Poaceae	-41.870699	-73.81622							
PURF4097	Fungi	Black fruiting bodies		<i>Puccinia recondita</i>	Ecuador	1920	Poaceae	-0.194568	-78.493005							
PURF4098	Fungi	Black fruiting bodies		<i>Puccinia recondita</i>	Ecuador	1924	Poaceae	-0.19457	-78.49301							
PURF4100	Fungi	Black fruiting bodies		<i>Puccinia recondita</i>	Bolivia	1920	Poaceae	-16.49667	-68.13							
PURF4115	Fungi	Black fruiting bodies		<i>Puccinia recondita</i>	Argentina	1922	Poaceae	-31.088407	-64.489869							
PURF4235	Fungi	Black fruiting bodies		<i>Puccinia tornata</i>	Bolivia	1920	Poaceae	-16.49667	-68.13							
PURF4342	Fungi	Black fruiting bodies		<i>Puccinia graminis</i>	Germany	1892	Poaceae	52.516667	13.4							
PURF4363	Fungi	Black fruiting bodies		<i>Puccinia graminis</i>	Argentina	1894	Poaceae	-34.861863	-57.911257							
PURF4417	Fungi	Black fruiting bodies		<i>Puccinia coronata</i>	Chile	1919	Poaceae	-35.758046	-71.407898							
PURF4418	Fungi	Black fruiting bodies		<i>Puccinia coronata</i>	Chile	1919	Poaceae	-41.319461	-72.985378							
PURF4443	Fungi	Black fruiting bodies		<i>Puccinia coronata</i>	Bolivia	1920	Poaceae	-16.49667	-68.13							



Table 2.2 (Continued)

PUR Catalog Number	Natural enemy	Natural enemy Symptoms and Remarks	Natural Enemy Scientific Name	Host Rust Species	Country	Collection Year	Host Plant Family	Latitude	Longitude	ITS rDNA	LSU rDNA	TEF-1	RPB2	CO1 mtDNA (primers: LCO1490/HCO2198)	CO1 mtDNA (primers: UEA5/UEA6)	16S mtDNA
PURF4568	Fungi	Black fruiting bodies		<i>Puccinia interveniens</i>	Chile	1919	Malvaceae	-41.870699	-73.81622							
PURF4600	Fungi	Black fruiting bodies		<i>Uromyces pencanus</i>	Argentina	1922	Poaceae	-31.088407	-64.489869							
PURF4604	Fungi	Black fruiting bodies		<i>Puccinia saltensis</i>	Argentina	1922	Poaceae	-31.088407	-64.489869							
PURF4605	Fungi	Black fruiting bodies		<i>Puccinia saltensis</i>	Argentina	1922	Poaceae	-31.088407	-64.489869							
PURF4606	Fungi	Black fruiting bodies		<i>Puccinia nasellae</i>	Bolivia	1920	Poaceae	-17.055929	-65.565918							
PURF4611	Fungi	Black fruiting bodies		<i>Puccinia saltensis</i>	Bolivia	1920	Poaceae	-16.49667	-68.13							
PURF4614	Fungi	Black fruiting bodies		<i>Puccinia saltensis</i>	Argentina	1922	Poaceae	-31.088407	-64.489869							
PURF4616	Fungi	Black fruiting bodies		<i>Puccinia saltensis</i>	Bolivia	1920	Poaceae	-16.49667	-68.13							
PURF4644	Fungi	Black fruiting bodies		<i>Puccinia piptochaetii</i>	Chile	1919	Poaceae	-35.758046	-71.407898							
PURF4646	Fungi	Black fruiting bodies		<i>Puccinia piptochaetii</i>	Argentina	1894	Poaceae	-34.921454	-57.954533							
PURF4647	Fungi	Black fruiting bodies		<i>Puccinia piptochaetii</i>	Argentina	NA	Poaceae	-34.6	-58.45							
PURF4649	Fungi	Black fruiting bodies		<i>Puccinia aegopogonis</i>	Bolivia	1920	Poaceae	-15.76667	-68.63333							
PURF4769	Fungi	Black fruiting bodies		<i>Puccinia levis</i>	Bolivia	1920	Poaceae	-16.397025	-67.651947							
PURF4845	Fungi	Black fruiting bodies		<i>Phakopsora compressa</i>	Bolivia	1920	Poaceae	-16.5	-68.15							
PURF4902	Fungi	Black fruiting bodies		<i>Puccinia substriata</i>	Peru	1920	Poaceae	-5.533333	-74.633333							
PURF4937	Fungi	Black fruiting bodies		<i>Phakopsora compressa</i>	Bolivia	1920	Poaceae	-16.139956	-67.724731							
PURF4959	Fungi	Black fruiting bodies		<i>Puccinia gymnotrichis</i>	Ecuador	1891	Poaceae	-0.19457	-78.49301							
PURF4960	Fungi	Black fruiting bodies		<i>Puccinia gymnotrichis</i>	Ecuador	1920	Poaceae	-0.19457	-78.49301							
PURF4968	Fungi	Black fruiting bodies		<i>Puccinia abnormis</i>	Peru	1920	Poaceae	-5.533333	-74.633333							
PURF4973	Fungi	Black fruiting bodies. Macro and microphotographs provided		<i>Puccinia inclita</i>	Brazil	1922	Poaceae	-22.865557	-43.42723							
PURF5022	Fungi	Black fruiting bodies		<i>Puccinia posadensis</i>	Ecuador	1920	Poaceae	-1.670984	-78.647124							
PURF5024	Fungi	Black fruiting bodies		<i>Puccinia posadensis</i>	Bolivia	1920	Poaceae	-16.5	-68.15							
PURF5042	Fungi	Black fruiting bodies		<i>Puccinia erianthicola</i>	Brazil	1921	Poaceae	-22.865557	-43.42723							
PURF5113	Fungi	Black fruiting bodies		<i>Puccinia purpurea</i>	Philippines	1924	Poaceae	16.2	120.883333							
PURF5118	Fungi	Black fruiting bodies		<i>Puccinia polysora</i>	Trinidad	1938	Poaceae	10.5	-61.25							
PURF6252	Fungi	Black fruiting bodies		<i>Puccinia arachis</i>	Bolivia	1920	Fabaceae	-17.1189	-65.9504							
PURF6293	Fungi	Black fruiting bodies		<i>Puccinia oxalidis</i>	Ecuador	1920	Oxalidaceae	-1.381221	-78.608121							
PURF6425	Fungi	Black fruiting bodies		<i>Puccinia gouaniae</i>	Trinidad	1913	Rhamnaceae	10.5	-61.25							
PURF6895	Fungi	Black fruiting bodies		<i>Puccinia hydrocotyles</i>	Bolivia	1920	Araliaceae	-16.5	-68.15							
PURF6927	Fungi	Black fruiting bodies		<i>Puccinia hydrocotyles</i>	Ecuador	1920	Araliaceae	-0.19457	-78.49301							
PURF7199	Fungi	Black fruiting bodies		<i>Puccinia menthae</i>	Ecuador	1920	Lamiaceae	-1.489017	-79.433333							
PURF7408	Fungi	Black fruiting bodies		<i>Puccinia aenigmatica</i>	Bolivia	1920	Lamiaceae	-17.118938	-65.950439							
PURF7688	Fungi	Black fruiting bodies		<i>Puccinia melanosora</i>	Argentina	1880	Calyceraceae	-27.583059	-58.732228							
PURF8038	Fungi	Black fruiting bodies		<i>Puccinia eupatorii-columbiani</i>	Trinidad	1921	Asteraceae	10.5	-61.25							
PURF8092	Fungi	Black fruiting bodies		<i>Puccinia comyzae</i>	Brazil	1922	Asteraceae	-23.4434	-46.52641							
PURF8110	Fungi	Black fruiting bodies		<i>Puccinia evadens</i>	Bolivia	1920	Asteraceae	-15.731265	-64.529297							
PURF8145	Fungi	Black fruiting bodies		<i>Puccinia unicolor</i>	Bolivia	1920	Asteraceae	-15.731265	-64.529297							
PURF8153	Fungi	Black fruiting bodies		<i>Puccinia salebrata</i>	Bolivia	1920	Asteraceae	-16.5	-68.15							
PURF8154	Fungi	Black fruiting bodies		<i>Puccinia alia</i>	Brazil	1921	Asteraceae	-22.865557	-43.42723							
PURF8167	Fungi	Black fruiting bodies		<i>Puccinia praeculta</i>	Bolivia	1920	Asteraceae	-16.5	-68.15							
PURF8236	Fungi	Black fruiting bodies		<i>Puccinia cnici-oleracei</i>	Peru	1929	Asteraceae	-11.417007	-75.686686							
PURF825	Fungi	Black fruiting bodies		<i>Melampsora medusae</i>	Argentina	1923	Salicaceae	-34.921454	-57.954533							
PURF8467	Fungi	Black fruiting bodies		<i>Puccinia majuscula</i>	Bolivia	1920	Asteraceae	-16.5	-68.15							
PURF8877	Fungi	Black fruiting bodies		<i>Uromyces bonariensis</i>	Trinidad	1921	Amaranthaceae	10.5	-61.25							
PURF892	Fungi	Black fruiting bodies		<i>Melampsora altii-populina</i>	Germany	1901	Salicaceae	53.21031	12.10226							
PURF9	Fungi	Black fruiting bodies		<i>Uredinopsis pteridis</i>	Brazil	1921	Dennstaedtiaceae	-22.865557	-43.42723							
PURF9017	Fungi	Black fruiting bodies		<i>Phragmidella minuta</i>	Paraguay	1919	Bignoniaceae	-25.27742	-57.576111							
PURF9028	Fungi	Black fruiting bodies		<i>Cerotelium sabiceae</i>	Trinidad	1913	Rubiaceae	10.687634	-61.395569							
PURF9456	Fungi	Black fruiting bodies		<i>Puccinia punctiformis</i>	Latvia	1936	Asteraceae	56.966551	23.959467							
PURF9468	Fungi	Black fruiting bodies		<i>Uromyces pencanus</i>	Argentina	1937	Poaceae	-34.921454	-57.954533							
PURF9549	Fungi	Black fruiting bodies		<i>Puccinia graminis</i>	Argentina	1939	Poaceae	-35.656622	-63.756815							
PURF9792	Fungi	Black fruiting bodies		<i>Phakopsora compressa</i>	Venezuela	1939	Poaceae	10.349255	-67.684516							

Table 2.2 (Continued)

PUR Catalog Number	Natural enemy	Natural enemy Symptoms and Remarks	Natural Enemy Scientific Name	Host Rust Species	Country	Collection Year	Host Plant Family	Latitude	Longitude	ITS rDNA	LSU rDNA	TEF-1	RPB2	CO1 mtDNA (primers: LCO1490/HCO2198)	CO1 mtDNA (primers: UAE5/UAE6)	16S mtDNA
PURF9793	Fungi	Black fruiting bodies		<i>Puccinia dolosa</i>	Venezuela	1939	Poaceae	8.631097	-71.078426							
PURF9794	Fungi	Black fruiting bodies		<i>Puccinia dolosa</i>	Venezuela	1937	Poaceae	10.488011	-66.879193							
PURF9798	Fungi	Black fruiting bodies		<i>Puccinia substriata</i>	Venezuela	1938	Poaceae	10.488011	-66.879193							
PURF9799	Fungi	Black fruiting bodies		<i>Puccinia substriata</i>	Venezuela	1939	Poaceae	10.205241	-68.18187							
PURF9812	Fungi	Black fruiting bodies		<i>Phakopsora compressa</i>	Venezuela	1934	Poaceae	10.500139	-66.893838							
PURF9842	Fungi	Black fruiting bodies		<i>Puccinia substriata</i>	Argentina	1941	Poaceae	-27.46056	-58.983886							
PURF9845	Fungi	Black fruiting bodies		<i>Melampsora epitea</i>	Bolivia	1941	Salicaceae	-17.118938	-65.950439							
PURF9847	Fungi	Black fruiting bodies		<i>Uromyces crassipes</i>	Bolivia	1941	Polygonaceae	-17.055929	-65.565918							
PURN10077	Fungi	Pink Mycelium. Macro photograph provided only due to scarce material		<i>Chrysocyclus mikaniae</i>	Ecuador	1975	Asteraceae	-1.046947	-79.821388							
PURN10225	Fungi	Black fruiting bodies		<i>Phakopsora compressa</i>	Brazil	1998	Poaceae	-22.512305	-48.916169							
PURN10389	Fungi	Black fruiting bodies		<i>Puccinia sp.</i>	Venezuela	1929	Asteraceae	9.243457	-70.715374							
PURN10625	Fungi	Black fruiting bodies		<i>Tranzschelia arthurii</i>	Ecuador	1991	Rosaceae	0.35171	-78.122333							
PURN10854	Fungi	Black fruiting bodies		<i>Sphaerophragmium acaciae</i>	Northern Mariana Islands, Saipan	1982	Fabaceae	15.1927123	145.745744							
PURN1090	Fungi	Black fruiting bodies		<i>Tranzschelia mexicana</i>	Colombia	1986	Rosaceae	4.495866	-74.134521							
PURN10906	Fungi	Black fruiting bodies		<i>Puccinia chondrillina</i>	Australia	1978	Asteraceae	-33.695512	149.556007							
PURN11489	Fungi	Black fruiting bodies		<i>Puccinia levis</i>	Brazil	1921	Poaceae	-22.875113	-43.277548							
PURN11630	Fungi	White Mycelium. Macro and microphotographs provided		<i>Uromyces euphorbiae</i>	USA	2015	Euphorbiaceae	27.33597	-80.331543							
PURN15533	Fungi	Black fruiting bodies		<i>Puccinia obliquo-septata</i>	Guyana	2004	Poaceae	4.6997004	-59.21696716							
PURN16397	Fungi	Black fruiting bodies		<i>Puccinia thaliae</i>	Peru	2016	NA	-5.269968	-78.776479							
PURN2901	Fungi	Black fruiting bodies		<i>Phakopsora meibomia</i>	Brazil	1986	Fabaceae	-21.229178	-44.980742							
PURN2918	Fungi	Black fruiting bodies		<i>Puccinia lygodii</i>	Brazil	1990	Lygodiaceae	-44.842968	-39							
PURN3167	Fungi	Black fruiting bodies		<i>Puccinia thaliae</i>	Brazil	1982	Cannaceae	-21.966667	-47.816667							
PURN3172	Fungi	Black fruiting bodies		<i>Puccinia thaliae</i>	Brazil	1990	Cannaceae	0.214677	-51.066667							
PURN3260	Fungi	Black fruiting bodies		<i>Puccinia thaliae</i>	Brazil	1976	Cannaceae	-21.966667	-47.816667							
PURN3327	Fungi	Black fruiting bodies		<i>Puccinia sp.</i>	Bolivia	1920	Asteraceae	-15.731265	-64.529297							
PURN3328	Fungi	Black fruiting bodies		<i>Puccinia sp.</i>	Bolivia	1920	Asteraceae	-15.731265	-64.529297							
PURN3362	Fungi	Black fruiting bodies		<i>Puccinia sp.</i>	Ecuador	1924	Asteraceae	-0.2001	-78.475341							
PURN3684	Fungi	Black fruiting bodies		<i>Puccinia bambusarum</i>	Brazil	1988	Poaceae	0.214677	-51.066667							
PURN3744	Fungi	Black fruiting bodies		<i>Phakopsora melaena</i>	Brazil	1983	Rubiaceae	-19.118652	-54.596288							
PURN3868	Fungi	Black fruiting bodies		<i>Phakopsora gossypii</i>	India	1955	Malvaceae	9.58692	76.521324							
PURN4000	Fungi	Black fruiting bodies		<i>Melampsora epitea</i>	Argentina	1993	Salicaceae	-26.781676	-65.358442							
PURN4005	Fungi	Black fruiting bodies		<i>Melampsora epitea</i>	USA	1994	Salicaceae	40.4491	-86.93456							
PURN4017	Fungi	Black fruiting bodies		<i>Melampsora larici-populina</i>	Costa Rica	1986	Salicaceae	9.816877	-84.112852							
PURN4019	Fungi	Black fruiting bodies		<i>Chaetonia hennetii</i>	Bolivia	1920	Moraceae	-16.139956	-67.724731							
PURN4113	Fungi	Black fruiting bodies		<i>Melampsora larici-populina</i>	Brazil	1980	Salicaceae	-21.966667	-47.816667							
PURN4115	Fungi	Black fruiting bodies		<i>Melampsora larici-populina</i>	Argentina	1987	Salicaceae	-29.536049	-62.263628							
PURN5226	Fungi	Black fruiting bodies		<i>Puccinia brachypodii</i>	Chile	1920	Poaceae	-41.870699	-73.81622							
PURN5488	Fungi	Black fruiting bodies		<i>Puccinia cynodontis</i>	Ecuador	1975	Poaceae	-0.167606	-78.45071							
PURN5821	Fungi	Black fruiting bodies		<i>Puccinia thaliae</i>	Brazil	1901	Cannaceae	-22.512305	-48.916169							
PURN5918	Fungi	Black fruiting bodies		<i>Puccinia arachidis</i>	Uruguay	1936	Fabaceae	-30.987242	-55.577291							
PURN5925	Fungi	Black fruiting bodies		<i>Puccinia arachidis</i>	Argentina	1980	Fabaceae	-24.785893	-65.441477							
PURN6111	Fungi	Black fruiting bodies		<i>Puccinia hydrocotyles</i>	Ecuador	1975	Araliaceae	-1.252369	-78.622781							
PURN6156	Fungi	Black fruiting bodies		<i>Puccinia mitrata</i>	Mexico	1899	Lamiaceae	19.716667	-101.183333							
PURN6288	Fungi	Black fruiting bodies		<i>Puccinia abrupta</i>	Uruguay	1930	Asteraceae	-34.87	-56.22							
PURN6744	Fungi	Black fruiting bodies		<i>Melampsora yezoensis</i>	Taiwan	2012	Salicaceae	25.019619	121.536564							
PURN6855	Fungi	Black fruiting bodies		<i>Prosopodium appendiculatum</i>	Brazil	1998	Bignoniaceae	-24.16	-48.27							
PURN6916	Fungi	Black fruiting bodies		<i>Uredo lueheae</i>	Brazil	1995	Malvaceae	-21.966667	-47.816667							
PURN7542	Fungi	Black fruiting bodies		<i>Puccinia sp.</i>	Peru	1962	Asteraceae	-5.637309	-78.531198							
PURN7734	Fungi	Black fruiting bodies		<i>Puccinia neorotundata</i>	Colombia	1945	Asteraceae	3.442371	-73.310196							
PURN7884	Fungi	Black fruiting bodies		<i>Puccinia thaliae</i>	Brazil	1998	Cannaceae	-24.09	-48.21							
PURN8267	Fungi	Black fruiting bodies		<i>Puccinia hydrocotyles</i>	Colombia	1989	Araliaceae	6.25184	-75.569084							

Table 2.2 (Continued)

PUR Catalog Number	Natural enemy	Natural enemy Symptoms and Remarks	Natural Enemy Scientific Name	Host Rust Species	Country	Collection Year	Host Plant Family	Latitude	Longitude	ITS rDNA	LSU rDNA	TEF-1	RPB2	CO1 mtDNA (primers: LCO1490/HCO2198)	CO1 mtDNA (primers: UEA5/UEA6)	16S mtDNA
PURN8496	Fungi	Black fruiting bodies		<i>Puccinia arachidis</i>	Paraguay	1977	Fabaceae	-25.25	-57							
PURN8498	Fungi	Black fruiting bodies		<i>Puccinia arachidis</i>	Paraguay	1959	Fabaceae	-26.176526	-56.436737							
PURN8678	Fungi	Black fruiting bodies		<i>Uropyxis rickiana</i>	Argentina	1992	Bignoniaceae	-26.824144	-65.2226							
PURN8681	Fungi	Black fruiting bodies		<i>Uropyxis rickiana</i>	Argentina	1997	Bignoniaceae	-25.796929	-64.970939							
PURN9457	Fungi	Black fruiting bodies		<i>Puccinia sp.</i>	Ecuador	1920	Cyperaceae	-0.19457	-78.49301							
PURN9517	Fungi	Black fruiting bodies		<i>Puccinia sp.</i>	Colombia	1975	Cyperaceae	4.495866	-74.134521							
<b>PURF833</b>	Fungi and Larvae	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora aecidioides</i>	Argentina	1923	Salicaceae	-34.921454	-57.954533	*	*	*				
<b>PURN4127</b>	Fungi and Larvae	Black fruiting bodies	<i>Sphaerellopsis sp.</i>	<i>Melampsora ferrinii</i>	Brazil	1988	Salicaceae	-21.966667	-47.816667	*						
<b>PURN15342</b>	Fungi and Larvae	Black fruiting bodies	<i>Sph. paraphysata/ Mycodiplosis</i>	<i>Uromyces hedysari-paniculati</i>	Guyana	2013	NA	6.816	-58.1618		*	*		*	*	*
<b>PURN15343</b>	Fungi and Larvae	Black fruiting bodies	<i>Sph. paraphysata/ Mycodiplosis</i>	<i>Puccinia commelinae</i>	Guyana	2013	NA	6.816	-58.1618	*					*	*
<b>PURN16743</b>	Fungi and Larvae	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Puccinia sp.</i>	Venezuela	2016	Iridaceae	8.78092727	-71.4005428	*	*	*				
PURN22990	Fungi and Larvae	Black fruiting bodies	<i>Sph. paraphysata</i>	<i>Melampsora sp.</i>	China	2011	Salicaceae	25.64431956	100.1699856	*						*
<b>PURN2544</b>	Fungi and Larvae	Black fruiting bodies	<i>Sph. macroconidialis/ Mycodiplosis</i>	<i>Uromyces iresines</i>	Ecuador	1975	Amaranthaceae	-0.167606	-78.45071	*		*		*		*
<b>PUR66593</b>	Fungi and Larvae	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Phakopsora apoda</i>	Ecuador	1975	Poaceae	-1.252369	-78.622781	*						
<b>PURF1211</b>	Fungi and Larvae	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Phakopsora compressa</i>	Bolivia	1920	Poaceae	-17.055929	-65.565918	*						
<b>PURF1212</b>	Fungi and Larvae	Black fruiting bodies	<i>Sph. macroconidialis</i>	<i>Phakopsora compressa</i>	Bolivia	1920	Poaceae	-15.76667	-68.63333	*						
<b>PURF4300</b>	Fungi and Larvae	Black fruiting bodies	<i>Sph. filum</i>	<i>Puccinia graminis</i>	Ecuador	1920	Poaceae	-1.252369	-78.622781	*						*
PURN12557-1	Fungi and Larvae	Black fruiting bodies	<i>Mycodiplosis sp.</i>	<i>Melampsora warburgii aff.</i>	Russia	2014	Salicaceae	43.6857556	132.1640833						*	*
PURN12557-2	Fungi and Larvae	Black fruiting bodies	<i>Mycodiplosis sp.</i>	<i>Melampsora warburgii aff.</i>	Russia	2014	Salicaceae	43.6857556	132.1640833	*						*
PURF8737	Fungi and Larvae	Purple Mycelium. Macro and microphotographs provided only due to scarce material	<i>Helicobasidium sp.</i>	<i>Cionothrix praelonga</i>	Ecuador	1924	Asteraceae	-1.708836	-79.043114							
PURN4612	Fungi and Larvae	Purple Mycelium. Macro and microphotographs provided	<i>Helicobasidium sp.</i>	<i>Baeodromus sp.</i>	Peru	1924	Asteraceae	-10.046111	-76.621389							
PURF11373	Fungi and Larvae	Black fruiting bodies		<i>Puccinia polysora</i>	Trinidad	1944	Poaceae	10.5	-61.25							
PURF1209	Fungi and Larvae	Black fruiting bodies		<i>Phakopsora compressa</i>	Bolivia	1920	Poaceae	-17.055929	-65.565918							
PURF1335/PUR68235	Fungi and Larvae	Black fruiting bodies		<i>Tranzschelia discolor</i>	Ecuador	1918	Rosaceae	-1.252369	-78.622781							
PURF14940	Fungi and Larvae	Black fruiting bodies		<i>Puccinia substriata</i>	Trinidad	1953	Poaceae	10.5	-61.25							
PURF2388	Fungi and Larvae	Black fruiting bodies		<i>Uromyces epicampis</i>	Bolivia	1920	Poaceae	-15.76667	-68.63333							
PURF2563	Fungi and Larvae	Black fruiting bodies		<i>Uromyces commelinae</i>	Argentina	1906	Commelinaceae	-34.575987	-58.425245							
PURF3486	Fungi and Larvae	Black fruiting bodies		<i>Uromyces asclepiadis</i>	Peru	1914	Apocynaceae	-12.05	-77.05							
PURF3803	Fungi and Larvae	Black fruiting bodies		<i>Puccinia brachypoi var. poaememoralis</i>	Chile	1919	Poaceae	-36.81297	-73.04846							
PURF7401	Fungi and Larvae	Black fruiting bodies		<i>Puccinia porphyretica</i>	Bolivia	1920	Lamiaceae	-15.76667	-68.63333							

Table 2.2 (Continued)

PUR Catalog Number	Natural enemy	Natural enemy Symptoms and Remarks	Natural Enemy Scientific Name	Host Rust Species	Country	Collection Year	Host Plant Family	Latitude	Longitude	ITS rDNA	LSU rDNA	TEF-1	RPB2	CO1 mtDNA (primers: LCO1490/ HCO2198)	CO1 mtDNA (primers: UEA5/UEA6)	16S mtDNA
PURN10907	Fungi and Larvae	Black fruiting bodies		<i>Puccinia graminis</i>	Australia	1970	Poaceae	-35.714819	147.621593							
PURN2546	Fungi and Larvae	Black fruiting bodies		<i>Uromyces clarus</i>	Bolivia	1920	Amaranthaceae	-16.5	-68.15							
PURN4036	Fungi and Larvae	Black fruiting bodies		<i>Uredinopsis pteridis</i>	Brazil	1976	Dennstaedtiaceae	-28.93333	-49.48333							
PURN6215	Fungi and Larvae	Black fruiting bodies		<i>Puccinia illatabilis</i>	Peru	1924	Asteraceae	-10.046111	-76.621389							
PURN15011	Larva		<i>Mycodiplosis sp.</i>	<i>Austropuccinia psidii</i>	Venezuela	2016	Myrtaceae	8.595241	-71.143404						*	
PURN15014	Larva		<i>Mycodiplosis sp.</i>	<i>Austropuccinia psidii</i>	Venezuela	2016	Myrtaceae	8.595241	-71.143404	*	*			*	*	*
PURN15015-3	Larva		<i>Mycodiplosis sp.</i>	<i>Austropuccinia psidii</i>	Venezuela	2016	Myrtaceae	8.595241	-71.143404	*	*			*	*	*
PURN7676-1	Larva		<i>Mycodiplosis sp.</i>	<i>Austropuccinia psidii</i>	Brazil	1998	Myrtaceae	-22.512305	-48.916169						*	
PURN23059/PAZ03	Larva		<i>Mycodiplosis sp.</i>	<i>Austropuccinia sp.</i>	USA	2018	Myrtaceae	18.3014	-65.7842008						*	
BOG03 †	Larva		<i>Mycodiplosis sp.</i>	<i>Coleosporium solidaginis</i>	USA	2018	Asteraceae	40.454389	-86.938880						*	*
BOG08 †	Larva		<i>Mycodiplosis sp.</i>	<i>Coleosporium solidaginis</i>	USA	2018	Asteraceae	40.454389	-86.938880	*					*	*
BOG09 †	Larva		<i>Mycodiplosis sp.</i>	<i>Coleosporium solidaginis</i>	USA	2018	Asteraceae	40.454389	-86.938880	*	*			*	*	*
BOG12 †	Larva		<i>Mycodiplosis sp.</i>	<i>Coleosporium solidaginis</i>	USA	2018	Asteraceae	40.454389	-86.938880	*	*			*	*	*
BOG16 †	Larva		<i>Mycodiplosis sp.</i>	<i>Coleosporium solidaginis</i>	USA	2018	Asteraceae	40.454389	-86.938880		*			*	*	*
BOG17 †	Larva		<i>Mycodiplosis sp.</i>	<i>Coleosporium solidaginis</i>	USA	2018	Asteraceae	40.454389	-86.938880					*	*	*
BOG21 †	Larva		<i>Mycodiplosis sp.</i>	<i>Coleosporium solidaginis</i>	USA	2018	Asteraceae	40.454389	-86.938880					*	*	*
ML320	Larva		<i>Mycodiplosis sp.</i>	<i>Cerotelium sabiceae</i>	Guyana	2003	Rubiaceae	4.720860	-59.2146377					*	*	*
PURN16391	Larva		<i>Mycodiplosis sp.</i>	<i>Chaconia ingae</i>	Peru	2016	Fabaceae	-12.239679	-76.9473907	*	*			*	*	*
PURN16395	Larva		<i>Mycodiplosis sp.</i>	<i>Coleosporium plumeriae</i>	Peru	2016	Apocynaceae	-8.5333333	-74.75					*	*	
PURN16396	Larva		<i>Mycodiplosis sp.</i>	<i>Coleosporium plumeriae</i>	Peru	2016	Apocynaceae	-3.78511933	-73.3162772		*				*	*
PURN9648	Larva		<i>Mycodiplosis sp.</i>	<i>Coleosporium plumeriae</i>	Brazil	1999	Apocynaceae	-24.18	-46.59					*	*	*
BOG02 †	Larva		<i>Mycodiplosis sp.</i>	<i>Coleosporium solidaginis</i>	USA	2018	Asteraceae	40.4543889	-86.938879	*	*					
larvawheat2 †	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia sp.</i>	USA	2021	Poaceae	40.4683681	-86.99012968	*	*			*	*	*
lafayette5 †	Larva		<i>Mycodiplosis sp.</i>	<i>Coleosporium solidaginis</i>	USA	2018	Asteraceae	40.454389	-86.938880	*	*			*	*	*
PAGZ 1(3) †	Larva		<i>Mycodiplosis sp.</i>	<i>Coleosporium solidaginis</i>	USA	2017	Asteraceae	40.454389	-86.938880					*	*	*
MCA7983-2	Larva		<i>Mycodiplosis sp.</i>	<i>Coleosporium sp.</i>	USA	2018	Asteraceae	38.7854478	-77.1747091	*				*	*	*
MCA7983-3	Larva		<i>Mycodiplosis sp.</i>	<i>Coleosporium sp.</i>	USA	2018	Asteraceae	38.7854478	-77.1747091					*	*	
PAGZ 1(4) †	Larva		<i>Mycodiplosis sp.</i>	<i>Coleosporium solidaginis</i>	USA	2017	Asteraceae	40.454389	-86.938880	*				*	*	
West-lafayette8 †	Larva		<i>Mycodiplosis sp.</i>	<i>Coleosporium solidaginis</i>	USA	2018	Asteraceae	40.454389	-86.938880	*	*			*	*	*
MCA7983-1	Larva		<i>Mycodiplosis sp.</i>	<i>Coleosporium sp.</i>	USA	2018	Asteraceae	38.7854478	-77.1747091					*	*	*
PURN23057	Larva		<i>Mycodiplosis sp.</i>	<i>Coleosporium sp.</i>	USA	2018	Asteraceae	18.30149404	-65.7842008					*	*	
PURN22411/MCA3888	Larva		<i>Mycodiplosis sp.</i>	<i>Gymnoconia sp.</i>	USA	2010	Rosaceae	30.6413858	-92.0254634					*	*	*
B1 PV5923 †	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Hawaii, Kona	2022	Rubiaceae	19.49671	-155.90315					*		
B2 PV5924 †	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Hawaii, Kona	2022	Rubiaceae	19.49671	-155.90315					*		
B3 PV5925 †	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Hawaii, Kona	2022	Rubiaceae	19.49671	-155.90315					*		
p.malva jorge.peru2 †	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia pelargonii-zonalis</i>	Peru	2019	Geraniaceae	-7.1661772	-78.501317		*					*
B4 PV5926 †	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Hawaii, Kona	2022	Rubiaceae	19.49671	-155.90315					*		
K2 PV5890 †	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Hawaii, Kona	2022	Rubiaceae	19.66148	-155.96409					*		
K3 PV5891 †	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Hawaii, Kona	2022	Rubiaceae	19.66148	-155.96409					*		
M1midge PV5888 †	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Hawaii, Kona	2022	Rubiaceae	19.66148	-155.96409					*		
O1 PV5927 †	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Hawaii, Ka'u	2022	Rubiaceae	19.21376	-155.49016					*		
O2 PV5928 †	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Hawaii, Ka'u	2022	Rubiaceae	19.21376	-155.49016					*		
O3 HCO PV5929 25 †	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Hawaii, Ka'u	2022	Rubiaceae	19.21376	-155.49016					*		
O4 PV5930 †	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Hawaii, Ka'u	2022	Rubiaceae	19.21376	-155.49016					*		
O5 PV5931 †	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Hawaii, Ka'u	2022	Rubiaceae	19.21376	-155.49016					*		
P1 PV5917 †	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Hawaii, Hilo	2022	Rubiaceae	19.69784	-155.09371					*		
P2 PV5918 †	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Hawaii, Hilo	2022	Rubiaceae	19.69784	-155.09371					*		
P3 PV5919 †	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Hawaii, Hilo	2022	Rubiaceae	19.69784	-155.09371					*		
PURF11174B	Larva		<i>Mycodiplosis sp.</i>	<i>Uromyces blainvilleae</i>	Peru	1923	Asteraceae	-9.3125	-77.7628							*
P4 PV5920 †	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Hawaii, Hilo	2022	Rubiaceae	19.69784	-155.09371					*		
P5 PV5921 †	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Hawaii, Hilo	2022	Rubiaceae	19.69784	-155.09371					*		
P6 PV5922 †	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Hawaii, Hilo	2022	Rubiaceae	19.69784	-155.09371					*		
PURN11725-1	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	USA	2014	Rubiaceae	18.2624974	-66.6990109					*		

Table 2.2 (Continued)

PUR Catalog Number	Natural enemy	Natural enemy Symptoms and Remarks	Natural Enemy Scientific Name	Host Rust Species	Country	Collection Year	Host Plant Family	Latitude	Longitude	ITS rDNA	LSU rDNA	TEF-1	RPB2	CO1 mtDNA (primers: LCO1490/HCO2198)	CO1 mtDNA (primers: UEA5/UEA6)	16S mtDNA
PURN15328/ PURF3514	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Bolivia	2016	Rubiaceae	15.56055	-67.321666					*	*	
PURN22448-4	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Peru	2016	Rubiaceae	-5.698456232	-78.7759563					*		*
PURF7260-2	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia leonotidicola</i>	Trinidad	1921	Lamiaceae	10.5	-61.25							*
PURN22449	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Peru	2016	Rubiaceae	NA	NA							*
PURN22450-1	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Peru	2016	Rubiaceae	-4.85849709	-80.6854085		*			*	*	*
PURN22537-1	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Panama	2016	Rubiaceae	8.77757613	-82.4522273					*		
PURN22625-2	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Panama	2016	Rubiaceae	8.944118753	-82.14593001					*		
W1 PV5892 †	larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Hawaii, Kona	2022	Rubiaceae	19.45573	-155.89391					*		
PURN11116-2	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia sorghi</i>	USA	2014	Poaceae	40.42809	-86.92251	*	*			*	*	*
PURN11116-3	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia sorghi</i>	USA	2014	Poaceae	40.42809	-86.92251	*	*			*	*	*
W2 PV5893 †	larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Hawaii, Kona	2022	Rubiaceae	19.45573	-155.89391					*		
W3 PV5894 †	larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Hawaii, Kona	2022	Rubiaceae	19.45573	-155.89391					*		
PURN11585	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora epiphylla</i>	Japan	2012	Salicaceae	36.652567	138.116938							*
PURN11705-2	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora occidentalis</i>	Canada	2013	Salicaceae	52.01661990	-116.639874	*	*			*	*	*
PURN16055-2	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora epitea</i> complex	USA	2009	Salicaceae	46.77784761	-121.5498808							*
PURN11725-3	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	USA	2014	Rubiaceae	18.26249747	-66.6990109						*	
PURN11725-4	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	USA	2014	Rubiaceae	18.26249747	-66.6990109					*		
Italy-1L †	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora gelmii</i>	Italy	2018	Salicaceae	46.52192136	11.30268466	*	*				*	*
PURN12029-4	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora sp.</i>	Russia	2014	Salicaceae	43.69890605	132.1621138							*
PURN12037-1	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora humboldtiana</i>	USA	2014	Salicaceae	29.72556	-84.98333	*	*			*	*	*
PURN12037-2	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora humboldtiana</i>	USA	2014	Salicaceae	29.72556	-84.98333					*	*	*
PURN12037-3	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora humboldtiana</i>	USA	2014	Salicaceae	29.72556	-84.98333	*	*					*
PURN12880-1	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora humboldtiana</i>	USA	2013	Salicaceae	55.624447	-114.93973	*	*			*		*
PURN12880-2	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora humboldtiana</i>	USA	2013	Salicaceae	55.624447	-114.93973	*	*					*
PURN12880-3	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora humboldtiana</i>	USA	2013	Salicaceae	55.624447	-114.93973							*
PURN15051	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora humboldtiana</i>	Canada	2015	Salicaceae	49.666667	-125.833333	*	*					*
PURN15011-1	Larva		<i>Mycodiplosis sp.</i>	<i>Austropuccinia psidii</i>	Venezuela	2016	Myrtaceae	8.595.241	-71.143.404					*	*	*
PURN15011-2	Larva		<i>Mycodiplosis sp.</i>	<i>Austropuccinia psidii</i>	Venezuela	2016	Myrtaceae	8.595.241	-71.143.404							*
PURN5750-1	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora larici-populina</i>	Germany	2004	Salicaceae	52.922691	10.305664							*
PURN11700	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora medusae</i>	Canada	2013	Salicaceae	52.02080292	-116.643769	*						*
PURN11705-1	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora occidentalis</i>	Canada	2013	Salicaceae	52.01661990	-116.639874	*	*			*	*	*
MT3-merie	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora sp.</i>	USA	2011	Salicaceae	64.83822649	-147.716387					*	*	*
PURN12029-1	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora sp.</i>	Russia	2014	Salicaceae	43.69890605	132.1621138	*	*					*
PURN15091-3	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora sp.</i>	Japan	2012	Salicaceae	36.11055	140.1008167	*	*					*
PURN15091-2	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora sp.</i>	Japan	2012	Salicaceae	36.11055	140.1008167							*
PURN15118-1	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora sp.</i>	Japan	2012	Salicaceae	36.516667	138.316667	*	*				*	*
PURN15118-2	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora sp.</i>	Japan	2012	Salicaceae	36.516667	138.316667						*	*
PURN15118-3	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora sp.</i>	Japan	2012	Salicaceae	36.516667	138.316667	*					*	*
PURN16030	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora sp.</i>	USA	2004	Salicaceae	46.794733155	-121.879689							*
PURN16119-1	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora sp.</i>	Germany	2004	Salicaceae	50.988340	11.31156509		*				*	*
PURN15331b	Larva		<i>Mycodiplosis sp.</i>	<i>Olvea tectonae</i>	Bolivia	2016	Bignoniaceae	15.560555	-67.3216666					*	*	*
PURN22739	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora sp.</i>	Canada	2006	Salicaceae	48.1042604	-70.82480208							*
PURN22989	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora sp.</i>	China	2001	Salicaceae	NA	NA							*
PURN15118	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora tremulae</i>	Japan	2012	Salicaceae	36.516667	138.316667						*	
PURN16055-3	Larva		<i>Mycodiplosis sp.</i>	<i>Melampsora epitea</i> complex	USA	2009	Salicaceae	46.77784761	-121.5498808							*
PURN16373	Larva		<i>Mycodiplosis sp.</i>	<i>Mikronegeria alba</i>	Chile	2017	Nothofagaceae	-40.565536	-73.0896474	*					*	*
PUR68963	Larva		<i>Mycodiplosis sp.</i>	NA	NA	NA	NA	NA	NA							*
PUR87962	Larva		<i>Mycodiplosis sp.</i>	<i>Olvea sp.</i>	Brazil	1984	Lamiaceae	-21.966667	-47.816667							*
PURN15331	Larva		<i>Mycodiplosis sp.</i>	<i>Olvea tectonae</i>	Bolivia	2016	Bignoniaceae	15.5605556	-67.321666					*	*	
PURF8883	Larva		<i>Mycodiplosis sp.</i>	<i>Phakopsora cherimoliae</i>	Ecuador	1890	Annonaceae	-2.754284	-79.739918							*
PUR44594	Larva		<i>Mycodiplosis sp.</i>	<i>Phakopsora nishidana</i>	Dominican Republic	1930	Moraceae	19.39352	-70.52598							*
PURN16381	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia pelargonii-zonalis</i>	Peru	2016	Geraniaceae	-5.8327778	-77.916752							*
PURN11116-1	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia sorghi</i>	USA	2014	Poaceae	40.42809	-86.92251	*	*			*	*	*
PURN16378	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia arundinariae</i>	Peru	2016	Poaceae	-6.49671244	-75.5136290	*	*			*	*	*
PURN16	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia caeomatiformis</i>	Ecuador	1975	Asteraceae	-167.606	-7.845.071						*	*
PURF6270	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia distenta</i>	Bolivia	1920	Geraniaceae	-15.76667	-68.63333						*	

Table 2.2 (Continued)

PUR Catalog Number	Natural enemy	Natural enemy Symptoms and Remarks	Natural Enemy Scientific Name	Host Rust Species	Country	Collection Year	Host Plant Family	Latitude	Longitude	ITS rDNA	LSU rDNA	TEF-1	RPB2	COI mtDNA (primers: LCO1490/HCO2198)	COI mtDNA (primers: UEA5/UEA6)	16S mtDNA
PURF7260-1	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia leontidicola</i>	Trinidad	1921	Lamiaceae	10.5	-61.25							*
PURN22537-2	Larva		<i>Mycodiplosis sp.</i>	<i>Hemileia vastatrix</i>	Panama	2016	Rubiaceae	8.77757613	-82.4522273							*
PURF5972	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia mogiphanis</i>	Ecuador	1918	Amaranthaceae	-1.252369	-78.622781							*
PURN5852	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia mogiphanis</i>	Ecuador	1975	Amaranthaceae	-0.935206	-78.615545							*
PURN15018	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia oxalidis</i>	Venezuela	2016	Oxalidaceae	8.595241	-71.143404	*	*				*	*
p.malva jorge.peru1 †	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia pelargonii-zonalis</i>	Peru	2019	Geraniaceae	-7.1661772	-78.501317		*					*
PURN23083-1	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia pelargonii-zonalis</i>	Peru	2019	Geraniaceae	-7.16617722	-78.50131719						*	
larvacomb1 †	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia polysora</i>	USA	2021	Poaceae	38.749289	-87.4845080	*	*			*	*	*
PURN23084/CJP1 †	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia sorghi</i>	Peru	2019	Poaceae	7.192099	78.505365						*	*
larvawheat1 †	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia sp.</i>	USA	2021	Poaceae	40.4683681	-86.99012968	*	*			*	*	*
PURN23084-2/CJP2 †	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia sorghi</i>	Peru	2019	Poaceae	7.19209899	78.50536499		*			*		
PURF6438	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia triumfettae</i>	Ecuador	1924	Malvaceae	-2.218369	-80.228825						*	
PURN23060	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia tubulosa</i>	USA	2018	Solanaceae	18.30149404	-65.7842008					*	*	
PURF8146	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia unicolor</i>	Bolivia	1920	Asteraceae	-17.118938	-65.950439							*
PURN7676-2	Larva		<i>Mycodiplosis sp.</i>	<i>Austropuccinia psidii</i>	Brazil	1998	Myrtaceae	-22.512305	-48.916169						*	
PURN7676-3	Larva		<i>Mycodiplosis sp.</i>	<i>Austropuccinia psidii</i>	Brazil	1998	Myrtaceae	-22.512305	-48.916169							*
PURF8323	Larva		<i>Mycodiplosis sp.</i>	<i>Puccinia verbesinae-dentatae</i>	Ecuador	1920	Asteraceae	-2.900545	-79.004527							*
PURF9848	Larva		<i>Mycodiplosis sp.</i>	<i>Uromyces cestri</i>	Bolivia	1941	Solanaceae	-17.118938	-65.950439						*	*
PURF11174	Larva		<i>Mycodiplosis sp.</i>	<i>Uromyces blainvillae</i>	Peru	1923	Asteraceae	-9.3125	-77.762778							*
PURF3638-2	Larva		<i>Mycodiplosis sp.</i>	<i>Uromyces colombianus</i>	Trinidad	1913	Asteraceae	10.5	-61.25							*
PURF2926	Larva		<i>Mycodiplosis sp.</i>	<i>Uromyces hedysari-paniculati</i>	Trinidad	1921	Fabaceae	10.5	-61.25							*
MCA4170	Larva			<i>Puccinia obliquoseptata</i>	Guyana	2010	Poaceae	4.70772327	-59.21444432							
MCA4196a	Larva			<i>Coleosporium ipomoeae</i>	USA	2010	Convolvulaceae	30.9598115	-90.295109							
MCA4196b	Larva			<i>Coleosporium ipomoeae</i>	USA	2010	Convolvulaceae	30.959811	-90.2951096							
MCA4228	Larva			<i>Puccinia modiolae</i>	USA	2011	Malvaceae	30.4508705	-91.11074452							
MCA4228-1	Larva			<i>Puccinia modiolae</i>	USA	2011	Malvaceae	30.45087059	-91.11074452							
ML143	Larva			<i>Puccinia kuehnii</i>	Ecuador	2011	Poaceae	-2.3136512	-79.4474193							
PAGZ-1 †	Larva			<i>Coleosporium solidaginis</i>	USA	2017	Asteraceae	40.454389	-86.938880					*		
PAGZ-3L †	Larva			<i>Coleosporium solidaginis</i>	USA	2017	Asteraceae	40.454389	-86.938880							
PAGZ-4 †	Larva			<i>Coleosporium solidaginis</i>	USA	2017	Asteraceae	40.454389	-86.938880							
PUR52270	Larva			<i>Uromyces brasiliensis</i>	Trinidad	1951	Convolvulaceae	10.688447	-61.754619							
PUR62238	Larva			<i>Puccinia melampodii</i>	Trinidad	1923	Asteraceae	10.5	-61.25							
PUR66739	Larva			<i>Phakopsora nishidana</i>	USA	1974	Moraceae	30.450746	-91.154551							
PUR66796	Larva			<i>Crossopora uleana</i>	Ecuador	1924	Solanaceae	-2.218369	-80.228825							
PUR66834	Larva			<i>Kuehneola sp.</i>	Ecuador	1975	Rosaceae	-2.900545	-79.004527							
PUR7784	Larva			<i>Phragmidium fusiforme</i>	USA	1914	Rosaceae	57.053168	-135.35107							
PUR86966	Larva			<i>Olvea sp.</i>	Brazil	1983	Lamiaceae	-21.966667	-47.816667							
PUR87091	Larva			<i>Olvea sp.</i>	Brazil	1983	Lamiaceae	-19.118652	-54.596288							
PUR87181	Larva			<i>Olvea sp.</i>	Brazil	1983	Lamiaceae	-21.966667	-47.816667							
PUR87208	Larva			<i>Melampsora euphorbiae</i>	Brazil	1983	Euphorbiaceae	-21.229178	-44.980742							
PUR87230	Larva			<i>Coleosporium vernoniae</i>	Brazil	1983	Asteraceae	-18.975688	-44.483961							
PUR87298	Larva			<i>Melampsora euphorbiae</i>	Brazil	1983	Euphorbiaceae	-21.966667	-47.816667							
PUR87302	Larva			<i>Coleosporium vernoniae</i>	Brazil	1983	Asteraceae	-21.966667	-47.816667							
PUR87657	Larva			<i>Melampsora euphorbiae</i>	Brazil	1983	Euphorbiaceae	-18.975688	-44.483961							
PUR87679	Larva			<i>Chaconia ingae</i>	Brazil	1983	Fabaceae	-21.922924	-46.395979							
PUR87718	Larva			<i>Melampsora euphorbiae</i>	Brazil	1983	Euphorbiaceae	-21.966667	-47.816667							
PUR87823	Larva			<i>Coleosporium vernoniae</i>	Brazil	1984	Asteraceae	-21.966667	-47.816667							
PUR87838	Larva			<i>Olvea sp.</i>	Brazil	1984	Lamiaceae	-21.966667	-47.816667							
PUR87905	Larva			<i>Coleosporium vernoniae</i>	Brazil	1984	Asteraceae	-21.966667	-47.816667							
PUR87982	Larva			<i>Coleosporium vernoniae</i>	Brazil	1984	Asteraceae	-22.512305	-48.916169							
PUR88988	Larva			<i>Olvea sp.</i>	Brazil	1979	Lamiaceae	-21.966667	-47.816667							
PUR89175	Larva			<i>Olvea capituliformis</i>	Brazil	1975	Euphorbiaceae	-21.966667	-47.816667							
PUR89660	Larva			<i>Phakopsora meibomia</i>	Colombia	1982	Fabaceae	3.5	-73							
PURF10658	Larva			<i>Phakopsora nishidana</i>	Colombia	1941	Moraceae	6.25184	-75.563591							
PURF10664	Larva			<i>Phakopsora cherimoliae</i>	Colombia	1941	Annonaceae	6.25184	-75.563591							
PURF10670	Larva			<i>Chrysocylus mikaniae</i>	Venezuela	1939	Asteraceae	10.492004	-67.609711							
PURF10907	Larva			<i>Prosopidium singeri</i>	Argentina	1942	Bignoniaceae	-34.921454	-57.954533							
PURF11164	Larva			<i>Gerwasia holwayi</i>	Peru	1922	Rosaceae	-9.835933	-76.495945							

Table 2.2 (Continued)

PUR Catalog Number	Natural enemy	Natural enemy Symptoms and Remarks	Natural Enemy Scientific Name	Host Rust Species	Country	Collection Year	Host Plant Family	Latitude	Longitude	ITS rDNA	LSU rDNA	TEF-1	RPB2	CO1 mtDNA (primers: LCO1490/HCO2198)	CO1 mtDNA (primers: UEA5/UEA6)	16S mtDNA
PURF11211	Larva			<i>Puccinia roseana</i>	Peru	1923	Asparagaceae	-11.846081	-76.386809							
PURF1153	Larva			<i>Phakopsora tecta</i>	Argentina	1906	Commelinaceae	-34.6	-58.45							
PURF11712	Larva			<i>Uromyces bonariensis</i>	Argentina	1949	Amaranthaceae	-27.566675	-56.914669							
PURF11728	Larva			<i>Uromyces asclepiadis</i>	Colombia	1944	Apocynaceae	6.7672	-73.197461							
PURF11857	Larva			<i>Crossopora mateleae</i>	Grenada	1946	Apocynaceae	12.114055	-61.672638							
PURF11864	Larva			<i>Puccinia oahuensis</i>	Trinidad	1947	Poaceae	10.5	-61.25							
PURF1221	Larva			<i>Phakopsora pavida</i>	Trinidad	1921	Euphorbiaceae	10.5	-61.25							
PURF14688	Larva			<i>Endophyllum decoloratum</i>	Trinidad	1952	Asteraceae	10.5	-61.25							
PURF14925	Larva			<i>Uromyces commelinae</i>	Trinidad	1953	Commelinaceae	10.5	-61.25							
PURF14926	Larva			<i>Uromyces commelinae</i>	Trinidad	1953	Commelinaceae	10.5	-61.25							
PURF15160	Larva			<i>Uromyces dolichosporus</i>	Bolivia	1920	Heliotropiaceae	-16.397025	-67.651947							
PURF15276	Larva			<i>Uromyces renovatus</i>	Argentina	1951	Fabaceae	-34.921454	-57.954533							
PURF15277	Larva			<i>Uromyces hedysari-paniculati</i>	Argentina	1952	Fabaceae	-34.623432	-58.386353							
PURF15575	Larva			<i>Uromyces columbianus</i>	Colombia	1953	Asteraceae	6.25184	-75.569084							
PURF16284	Larva			<i>Alveolaria cordiae</i>	Peru	1958	Cordiaceae	-13.239075	-71.905029							
PURF1661	Larva			<i>Gerwasia variabilis</i>	Venezuela	1913	Rosaceae	10.488011	-66.879193							
PURF1663	Larva			<i>Gerwasia clara</i>	Ecuador	1918	Rosaceae	-4.005579	-79.202235							
PURF1668	Larva			<i>Gerwasia cundinamarcensis</i>	Ecuador	1918	Rosaceae	1.183333	-78.8							
PURF1671	Larva			<i>Gerwasia quitensis</i>	Bolivia	1920	Rosaceae	-16.5	-68.15							
PURF16867	Larva			<i>Chrysocelis lupini</i>	Ecuador	1962	Fabaceae	-0.19457	-78.49301							
PURF17323	Larva			<i>Mikronegeria fagi</i>	Chile	1965	Nothofagaceae	-41.870699	-73.81622							
PURF18138	Larva			<i>Phakopsora zeae</i>	Peru	1957	Poaceae	-14.338681	-71.766731							
PURF18645	Larva			<i>Chaconia ingae</i>	Colombia	1975	Fabaceae	4.495866	-74.134521							
PURF18654	Larva			<i>Chrysocelis lupini</i>	Ecuador	1975	Fabaceae	-0.167606	-78.45071							
PURF18869	Larva			<i>Coleosporium veroniae</i>	Brazil	1979	Asteraceae	-22.512305	-48.916169							
PURF19001	Larva			<i>Olivea capituliformis</i>	Brazil	1979	Euphorbiaceae	-20.756822	-42.876638							
PURF19466	Larva			<i>Mikronegeria fagi</i>	Chile	1970	Nothofagaceae	-41.870699	-73.8162							
PURF19576	Larva			<i>Coleosporium tussilaginis</i>	Chile	1925	Asteraceae	-41.870699	-73.81622							
PURF1962	Larva			<i>Prospodium tuberculatum</i>	Bolivia	1920	Verbenaceae	-16.139956	-67.724731							
PURF2063	Larva			<i>Ravenelia echinata</i>	Bolivia	1920	Fabaceae	-15.76667	-68.63333							
PURF2267	Larva			<i>Sorataea amicae</i>	Bolivia	1920	Fabaceae	-15.731265	-64.529297							
PURF2357	Larva			<i>Uromyces eragrostidis</i>	Bolivia	1920	Poaceae	-17.118938	-65.950439							
PURF2359	Larva			<i>Uromyces eragrostidis</i>	Bolivia	1920	Poaceae	-15.76667	-68.63333							
PURF2919	Larva			<i>Uromyces hedysari-paniculati</i>	Bolivia	1920	Fabaceae	-17.055929	-65.565918							
PURF2923	Larva			<i>Uromyces hedysari-paniculati</i>	Bolivia	1920	Fabaceae	-16.139956	-67.724731							
PURF2924	Larva			<i>Uromyces hedysari-paniculati</i>	Ecuador	1920	Fabaceae	-1.670984	-78.647124							
PURF2978	Larva			<i>Uromyces viciae-fabae</i>	Bolivia	1920	Fabaceae	-16.49667	-68.13							
PURF3007	Larva			<i>Uromyces viciae-fabae</i>	Ecuador	1920	Fabaceae	-1.252369	-78.622781							
PURF3156	Larva			<i>Uromyces trifolii-repentis</i>	Bolivia	1920	Fabaceae	-17.118938	-65.950439							
PURF3283	Larva			<i>Uromyces neurocarpi</i>	Ecuador	1924	Fabaceae	-2.218369	-80.228825							
PURF3335	Larva			<i>Uromyces euphorbiae</i>	Ecuador	1924	Euphorbiaceae	-2.218369	-80.228825							
PURF3353	Larva			<i>Uromyces euphorbiae</i>	Peru	1920	Euphorbiaceae	-5.533333	-74.633333							
PURF3362	Larva			<i>Uromyces euphorbiae</i>	Ecuador	1920	Euphorbiaceae	-1.670984	-78.647124							
PURF3364	Larva			<i>Uromyces euphorbiae</i>	Peru	1929	Euphorbiaceae	-12	-76.834706							
PURF3484	Larva			<i>Uromyces asclepiadis</i>	Trinidad	1921	Apocynaceae	10.5	-61.25							
PURF3497	Larva			<i>Uromyces brasiliensis</i>	Ecuador	1920	Convolvulaceae	-2.20584	-79.90795							
PURF3521	Larva			<i>Uromyces cestri</i>	Bolivia	1920	Solanaceae	-17.055929	-65.565918							
PURF3525	Larva			<i>Uromyces cestri</i>	Chile	1920	Solanaceae	-34.24832	-70.55543							
PURF3530	Larva			<i>Uromyces cestri</i>	Ecuador	1920	Solanaceae	-0.19457	-78.49301							
PURF3539	Larva			<i>Uromyces cestri</i>	Peru	1925	Solanaceae	-14.102022	-71.429431							
PURF3568	Larva			<i>Uromyces emmeorrhize</i>	Bolivia	1920	Rubiaceae	-16.5	-68.15							
PURF3640	Larva			<i>Uromyces columbianus</i>	Trinidad	1921	Asteraceae	10.5	-61.25							
PURF3649	Larva			<i>Uromyces bidenticola</i>	Peru	1924	Asteraceae	-10.046111	-76.621389							
PURF3655	Larva			<i>Uromyces bidenticola</i>	Trinidad	1921	Asteraceae	10.5	-61.25							
PURF3682	Larva			<i>Uromyces bidentis</i>	Venezuela	1913	Asteraceae	10.488011	-66.879193							



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PUR Catalog Number	Natural enemy	Natural enemy Symptoms and Remarks	Natural Enemy Scientific Name	Host Rust Species	Country	Collection Year	Host Plant Family	Latitude	Longitude	ITS rDNA	LSU rDNA	TEF-1	RPB2	CO1 mtDNA (primers: LCO1490/HCO2198)	CO1 mtDNA (primers: UEAE5/UEAE6)	16S mtDNA
PURF3857	Larva			<i>Puccinia poanin</i>	Bolivia	1920	Poaceae	-17.055929	-65.565918							
PURF4107	Larva			<i>Puccinia recondita</i>	Chile	1919	Poaceae	-35.758046	-71.407898							
PURF4826	Larva			<i>Puccinia macra</i>	Bolivia	1920	Poaceae	-16.397025	-67.651947							
PURF4842	Larva			<i>Puccinia substriata</i>	Peru	1920	Poaceae	-9.049722	-77.774444							
PURF4966	Larva			<i>Puccinia abnormis</i>	Bolivia	1920	Poaceae	-17.118938	-65.950439							
PURF5968	Larva			<i>Puccinia mogiphanis</i>	Bolivia	1920	Amaranthaceae	-17.055929	-65.565918							
PURF598	Larva			<i>Coleosporium ipomoeae</i>	Ecuador	1918	Convolvulaceae	-4.005579	-79.202235							
PURF603	Larva			<i>Coleosporium ipomoeae</i>	Trinidad	1913	Convolvulaceae	10.5	-61.25							
PURF608	Larva			<i>Coleosporium ipomoeae</i>	Peru	1920	Convolvulaceae	-5.533333	-74.633333							
PURF6288	Larva			<i>Puccinia oxalidis</i>	Argentina	1919	Oxalidaceae	-34.921454	-57.954533							
PURF6507	Larva			<i>Puccinia sherardiana</i>	Bolivia	1920	Malvaceae	-15.76667	-68.63333							
PURF69289-1	Larva			NA	NA	NA	NA	NA	NA							
PURF7138-2	Larva			<i>Puccinia crassipes</i>	Argentina	1971	Convolvulaceae	-34.585032	-58.420095							
PURF7194	Larva			<i>Puccinia menthae</i>	Bolivia	1920	Lamiaceae	-17.118938	-65.950439							
PURF7262	Larva			<i>Puccinia leontidicola</i>	Trinidad	1913	Lamiaceae	10.5	-61.25							
PURF7286	Larva			<i>Puccinia hyptidis-mutabilis</i>	Venezuela	1913	Lamiaceae	10.488011	-66.879193							
PURF7307	Larva			<i>Puccinia persciti</i>	Bolivia	1920	Lamiaceae	-16.5	-68.15							
PURF7400	Larva			<i>Puccinia porphyretica</i>	Bolivia	1920	Lamiaceae	-17.118938	-65.950439							
PURF7409	Larva			<i>Puccinia conturbata</i>	Ecuador	1920	Lamiaceae	-2.900545	-79.004527							
PURF756	Larva			<i>Coleosporium tussilaginis</i>	NA	1914	Asteraceae	13.128501	-61.231812							
PURF803	Larva			<i>Coleosporium tussilaginis</i>	Bolivia	1920	Asteraceae	-17.118938	-65.950439							
PURF8259	Larva			<i>Puccinia ocellifera</i>	Bolivia	1920	Asteraceae	-17.118938	-65.950439							
PURF8260	Larva			<i>Puccinia ocellifera</i>	Bolivia	1920	Asteraceae	-15.76667	-68.63333							
PURF827	Larva			<i>Melampsora medusae</i>	Brazil	1935	Salicaceae	-18.975688	-44.483961							
PURF8293	Larva			<i>Puccinia boliviana</i>	Bolivia	1920	Asteraceae	-16.397025	-67.651947							
PURF8309	Larva			<i>Puccinia cnici-oleracei</i>	Venezuela	1913	Asteraceae	10.488011	-66.879193							
PURF8314	Larva			<i>Puccinia irregularis</i>	Bolivia	1920	Asteraceae	-15.76667	-68.63333							
PURF8350	Larva			<i>Puccinia subaquila</i>	Ecuador	1920	Asteraceae	-1.670984	-78.647124							
PURF8665	Larva			<i>Endophyllum decoloratum</i>	Trinidad	1921	Asteraceae	10.5	-61.25							
PURF8667	Larva			<i>Endophyllum decoloratum</i>	Colombia	1910	Asteraceae	6.25184	-75.563591							
PURF8677-2	Larva			<i>Puccinosira pallidula</i>	Bolivia	1920	Malvaceae	-16.397025	-67.651947							
PURF8725	Larva			<i>Cionothrix praelonga</i>	Colombia	1910	Asteraceae	6.25184	-75.563591							
PURF8730	Larva			<i>Cionothrix praelonga</i>	Bolivia	1920	Asteraceae	-16.5	-68.15							
PURF8736	Larva			<i>Cionothrix praelonga</i>	Ecuador	1924	Asteraceae	-1.708836	-79.043114							
PURF8739	Larva			<i>Cionothrix praelonga</i>	Ecuador	1891	Asteraceae	-0.559399	-77.683838							
PURF8745	Larva			<i>Alveolaria cordiae</i>	Bolivia	1920	Cordiaceae	-16.5	-68.15							
PURF8747	Larva			<i>Alveolaria cordiae</i>	Bolivia	1920	Cordiaceae	-16.5	-68.15							
PURF8748	Larva			<i>Alveolaria cordiae</i>	Ecuador	1924	Cordiaceae	-1.591918	-78.222168							
PURF8751	Larva			<i>Alveolaria cordiae</i>	Bolivia	1920	Cordiaceae	-16.5	-68.15							
PURF8752	Larva			<i>Alveolaria cordiae</i>	Bolivia	1920	Cordiaceae	-16.5	-68.15							
PURF9007	Larva			<i>Puccinia hyptidis-mutabilis</i>	Bolivia	1920	Lamiaceae	-15.76667	-68.63333							
PURF9015	Larva			<i>Phragmidella minuta</i>	Trinidad	1921	Bignoniaceae	10.5	-61.25							
PURF9795	Larva			<i>Puccinia dolosa</i>	Venezuela	1937	Poaceae	10.337996	-65.973698							
PURF9796	Larva			<i>Puccinia levis</i>	Venezuela	1939	Poaceae	10.205241	-68.18187							
PURF9801	Larva			<i>Puccinia substriata</i>	Venezuela	1940	Poaceae	10.500139	-66.893838							
PURN10078	Larva			<i>Chrysocylus mikaniae</i>	Ecuador	1975	Asteraceae	-0.935206	-78.615545							
PURN10280	Larva			<i>Olvea capituliformis</i>	Brazil	1998	Euphorbiaceae	-21.966667	-47.816667							
PURN11116	Larva			<i>Puccinia sorghi</i>	USA	2014	Poaceae	40.4280899	-86.922510							
PURN11562	Larva			<i>Chrysocelis lupini</i>	Peru	2014	Fabaceae	-7.133333	-78.483333							
PURN11725-2	Larva			<i>Hemileia vastatrix</i>	USA	2014	Rubiaceae	18.2624974	-66.6990109							
PURN12881	Larva			<i>Melampsora occidentalis</i>	Canada	2013	Salicaceae	55.624447	-114.93973							
PURN14	Larva			<i>Arthuria colombiana</i>	Venezuela	1972	Euphorbiaceae	10.174444	-63.498889							
PURN15	Larva			<i>Puccinia caeomariiformis</i>	Ecuador	1975	Asteraceae	-0.167606	-78.45071							
PURN15013	Larva			<i>Austropuccinia psidii</i>	Venezuela	2016	Myrtaceae	8.595241	-71.143404							
PURN15015-1	Larva			<i>Puccinia psidii</i>	Venezuela	2016	Myrtaceae	8.595.241	-71.143.404							
PURN15016	Larva			<i>Phakopsora tecta</i>	Venezuela	2016	Commelinaceae	8.595241	-71.143404							
PURN15017	Larva			<i>Puccinia oxalidis</i>	Venezuela	2016	Oxalidaceae	8.595241	-71.143404							
PURN15019	Larva			<i>Puccinia oxalidis</i>	Venezuela	2016	Oxalidaceae	8.595241	-71.143404							
PURN15091	Larva			<i>Melampsora tremulae</i>	Japan	2012	Salicaceae	36.11055	140.1008167							

Table 2.2 (Continued)

PUR Catalog Number	Natural enemy	Natural enemy Symptoms and Remarks	Natural Enemy Scientific Name	Host Rust Species	Country	Collection Year	Host Plant Family	Latitude	Longitude	ITS rDNA	LSU rDNA	TEF-1	RPB2	CO1 mtDNA (primers: LCO1490/HCO2198)	CO1 mtDNA (primers: UEA5/UEA6)	16S mtDNA
PURN15328	Larva			<i>Hemileia vastatrix</i>	Bolivia	2016	Rubiaceae	15.56055555	-67.321666							
PURN15333	Larva			<i>Puccinia melampodii</i>	Guyana	2016	NA	6.50837739	-58.261896							
PURN15341	Larva			<i>Uromyces hedysari-paniculati</i>	Guyana	2014	Fabaceae	6.8299944	-58.118505							
PURN15496	Larva			<i>Uromyces euphorbiae</i>	Guyana	2003	Euphorbiaceae	6.52294886	-58.256072							
PURN15509	Larva			<i>Coleosporium veroniae</i>	Guyana	2003	Asteraceae	5.30931852	-58.9825091							
PURN16034	Larva			<i>Melampsora sp.</i>	USA	2004	Salicaceae	46.80525555	-121.8479326							
PURN16119-2	Larva			<i>Melampsora sp.</i>	Germany	2004	Salicaceae	50.9883408	11.31156509							
PURN16376	Larva			<i>Puccinia oahuensis</i>	Peru	2016	Poaceae	-6.48790409	-76.3747583							
PURN16568	Larva			<i>Coleosporium ipomoeae</i>	USA	2010	Convolvulaceae	30.9598115	-90.29510965							
PURN16569	Larva			<i>Melampsora sp.</i>	Switzerland	2010	Salicaceae	47.1351243	9.205544645							
PURN22416	Larva			<i>Cerotelium sabiceae</i>	Guyana	2013	Rubiaceae	4.720860	-59.214637							
PURN22445-1	Larva			<i>Hemileia vastatrix</i>	Peru	2016	Rubiaceae	-5.27294774	-78.7759563							
PURN22445-2	Larva			<i>Hemileia vastatrix</i>	Peru	2016	Rubiaceae	-5.27294774	-78.7759563							
PURN22448-1	Larva			<i>Hemileia vastatrix</i>	Peru	2016	Rubiaceae	-5.698456232	-78.7759563							
PURN22625-1	Larva			<i>Hemileia vastatrix</i>	Panama	2016	Rubiaceae	8.881418852	-82.59953271							
PURN23056	Larva			<i>Coleosporium solidaginis</i>	USA	2017	Asteraceae	40.45438899	-86.93887999							
PURN23063	Larva			<i>Uromyces sp.</i>	USA	2018	Asteraceae	18.30149	-65.7842008							
PURN23069	Larva			<i>Angiopsora paspalicola</i>	USA	2018	Poaceae	18.301	-65.7842008							
PURN23083-2	Larva			<i>Puccinia pelargonii-zonalis</i>	Peru	2019	Geraniaceae	-7.16617722	-78.50131719							
PURN24	Larva			<i>Puccinia pelargonii-zonalis</i>	Ecuador	1975	Geraniaceae	-0.194568	-78.493005							
PURN2545	Larva			<i>Uromyces iresines</i>	Ecuador	1937	Amaranthaceae	-0.167606	-78.45072							
PURN2810	Larva			<i>Puccinia sp.</i>	Ecuador	1975	Amaranthaceae	-0.935206	-78.615545							
PURN2826	Larva			<i>Puccinia oxalidis</i>	Colombia	1986	Oxalidaceae	6.25184	-75.563591							
PURN3064	Larva			<i>Coleosporium ipomoeae</i>	Brazil	1977	Convolvulaceae	-22.398698	-48.864444							
PURN3065	Larva			<i>Coleosporium ipomoeae</i>	Brazil	1977	Convolvulaceae	-22.398698	-48.864444							
PURN3099	Larva			<i>Chaconia ingae</i>	Brazil	1982	Fabaceae	-3.11333	-60.02528							
PURN3255	Larva			<i>Coleosporium ipomoeae</i>	Brazil	1976	Convolvulaceae	-21.966667	-47.816667							
PURN3267	Larva			<i>Olvea sp.</i>	Brazil	1990	Lamiaceae	-21.966667	-47.816667							
PURN3359	Larva			<i>Puccinia sp.</i>	Peru	1924	Asteraceae	-11.417007	-75.686686							
PURN3784	Larva			<i>Gerwasia variabilis</i>	Ecuador	1975	Rosaceae	-0.083333	-78.5							
PURN3787	Larva			<i>Gerwasia variabilis</i>	Venezuela	1972	Rosaceae	10.500139	-66.893838							
PURN3788	Larva			<i>Gerwasia tenella</i>	Ecuador	1975	Rosaceae	-1.670984	-78.647124							
PURN3789	Larva			<i>Gerwasia quitensis</i>	Ecuador	1975	Rosaceae	-0.167606	-78.45071							
PURN3844	Larva			<i>Gerwasia sp.</i>	Peru	1924	Rosaceae	-11.233333	-75.483333							
PURN3856	Larva			<i>Gerwasia mayorii</i>	Venezuela	1973	Rosaceae	8.533018	-71.24585							
PURN3898	Larva			<i>Puccinosira pallidula</i>	Ecuador	1924	Malvaceae	-2.218369	-80.228825							
PURN3905	Larva			<i>Trichopsora tournefortiae</i>	Ecuador	1975	Heliotropiaceae	-0.467137	-78.7475							
PURN3906	Larva			<i>Trichopsora tournefortiae</i>	Ecuador	1975	Heliotropiaceae	-0.167606	-78.45071							
PURN3907	Larva			<i>Trichopsora tournefortiae</i>	Ecuador	1975	Heliotropiaceae	-1.670984	-78.647124							
PURN3908	Larva			<i>Trichopsora tournefortiae</i>	Ecuador	1975	Heliotropiaceae	-0.935206	-78.615545							
PURN3909	Larva			<i>Trichopsora tournefortiae</i>	Ecuador	1975	Heliotropiaceae	-0.167606	-78.45071							
PURN3955	Larva			<i>Coleosporium veroniae</i>	Ecuador	1924	Asteraceae	-2.218369	-80.228825							
PURN4039	Larva			<i>Melampsora sp.</i>	Brazil	1988	Euphorbiaceae	-21.966667	-47.816667							
PURN4040	Larva			<i>Melampsora sp.</i>	Brazil	1988	Euphorbiaceae	-16.246089	-50.198506							
PURN4041	Larva			<i>Melampsora sp.</i>	Brazil	1988	Euphorbiaceae	-21.326889	-46.365393							
PURN4078	Larva			<i>Melampsora sp.</i>	Brazil	1980	Euphorbiaceae	-21.966667	-47.816667							
PURN4091	Larva			<i>Melampsora sp.</i>	Brazil	1981	Euphorbiaceae	-16.246089	-50.198506							
PURN4092	Larva			<i>Melampsora sp.</i>	Brazil	1986	Euphorbiaceae	-21.24243	-44.99785							
PURN4094	Larva			<i>Uredinopsis pteridis</i>	Brazil	1976	Dennstaedtiaceae	-22.73398	-45.57844							
PURN5969	Larva			<i>Puccinia pelargonii-zonalis</i>	Venezuela	1972	Geraniaceae	10.174444	-63.498889							
PURN5992	Larva			<i>Puccinia inrecta</i>	Paraguay	1908	Malpighiaceae	-26.176526	-56.436737							
PURN6254	Larva			<i>Puccinia caeomariiformis</i>	Ecuador	1924	Asteraceae	-2.20584	-79.90795							
PURN6395	Larva			<i>Coleosporium russilaginis</i>	Argentina	1997	Asteraceae	-28.469574	-65.785239							
PURN6503	Larva			<i>Coleosporium plumeriae</i>	Colombia	1986	Apocynaceae	6.25184	-75.563591							
PURN7676	Larva			<i>Puccinia psidii</i>	Brazil	1998	Myrtaceae	-22.512305	-48.9161689							
PURN8262	Larva			<i>Uromyces neocarpi</i>	Colombia	1975	Fabaceae	4.12554542	-73.620157							
PURN93955/PURN3955	Larva			<i>Coleosporium veroniae</i>	Ecuador	1924	Asteraceae	-2.218369	-80.228825							
PURN9649	Larva			<i>Coleosporium plumeriae</i>	Brazil	1990	Apocynaceae	-4	-39							