

DAVIS EXPEDITION FUND

REPORT ON EXPEDITION / PROJECT

Expedition/Project Title:	Expedition to collect epiphytic Solanaceae (tribe Solandreae) in the Andean/Amazonian slopes of the North, Central and South of Peru
Travel Dates:	3rd February to 7th April 2017
Location:	Peru (Amazonas, Cajamarca, Cusco, Huanuco, Pasco, San Martin)
Group Members:	Andrés Orejuela
Aims:	The work aimed to increase collections of poorly represented species of the Peruvian Solandreae in the herbaria, to collect seeds, fresh leaves in silica gel, to make field observations, and and to take live photographs.

Outcome (not less than 300 words):-

Expedition to collect epiphytic Solanaceae (tribe Solandreae) in the Andean/Amazonian slopes of the North, Central and South of Peru

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A field expedition, supported by the Davis Expedition Fund, was completed in the Andean and Amazon slopes of Peru between February and April 2017. A total of 250 specimens were collected, of which 24 represent 12 epiphytic species of the tribe Solandreae, including four new species. The fieldwork was divided into two trips. The first trip was to the north of Peru, specifically, to Cajamarca, Amazonas, San Martín and Huánuco departments. The second trip targeted Central and South of Peru (Cusco, Pasco). Four herbaria were also visited (CUZ, HOXA, MOL, USM), where 266 specimens of Solandreae were studied and two new species were found.

Introduction

Epiphytes comprise c. 9 % of the world's vascular flora and represent one of the most species-rich life forms in some humid tropical forests. Epiphytes carry out numerous functions in these forests such as the regulation of the water and nutrient cycles, they provide habitat and food for animals, and act as global indicators for climate change due to their specific habitat preference. Growing on other plants, epiphytes have evolved to grow in low input environments, frequently limited by biotic and abiotic factors. Epiphytic species across different families show various adaptations to deal with these environmental pressures. However, details of the evolution of these adaptations and how and when epiphytes evolved through time remain poorly understood.

This study aims to explore the evolution of epiphytic life form in the family Solanaceae. This family includes several species of poorly known Neotropical epiphytes mainly placed in the tribe Solandreae. Epiphytes in Solanaceae are comparatively poorly studied group, probably due to their hardly accessible habitat. This research will be achieved by (1) building of a robust, species-level molecular phylogeny of the entire family Solanaceae, with a focus on epiphytic members; (2) reconstructing character evolution using the molecular phylogeny and a set of morphological, functional, and climatic traits across Solanaceae; and (3) by analysing trait correlation in the context of life form evolution in Solanaceae between the studied traits and any observed mutations and rearrangements in the plastid genome.

Expedition Aims

The proposed expedition aimed to increase collections of poorly represented species of the Peruvian Solandreae in the herbaria, to collect seeds, fresh leaves in silica gel, to make field observations, and to take live photographs. The specimens, photographs and field observations will be used to assess variability in characters within a species and as a basis for trait evolution studies. The seeds will be used to grow the plants in the greenhouse and measure anatomical and ecophysiological traits across the study group and for cytological studies. Fresh leaves will be preserved in silica gel for DNA extractions, with the objective to build a species-level phylogeny for the tribe use NextGen nuclear and chloroplast gene data obtained through targeted enrichment.

Study Site

Peru with 1,285,216 km² is the 20th largest country in the world and third largest country in South America, after Brazil and Argentina. Peru as other countries in South America has a complex topography with an intricate

mosaic of mountains and valleys due to the age and orogeny of the Andes (Hoorn et al. 2010). Thus, Peru is a centre of diversity and endemism for plants. Brako and Zarucchi (1993) listed 17,143 species of flowering plants and gymnosperms known to occur in Peru with c. 31% endemism. Around 9% of all vascular flora of Peru or 1,484 species have been registered growing as epiphytes (Brako and Zaruchi, 1993).

Many of the epiphytic species of Solandreae distributed in Peru are restricted to the tropical montane cloud forest, named “bosque de ceja” or “selva alta”, that occurs mainly on the eastern slopes of the Andes. The expedition was focused in visiting the departments with previous records of Solandreae and large areas of the montane cloud forest. The expedition was divided into two trips. The first trip to north of Peru, specifically in Cajamarca, Amazonas, San Martin and Huánuco departments. The second trip comprised the areas to the south and central of Peru in the department of Cusco and Pasco (Fig. 1).



Figure 1. Collection trips to the cloud forest of Peru. Left: a trip to the north of Peru, specifically, to Cajamarca, Amazonas, San Martín and Huánuco departments. Right: a trip to the South and Central of Peru.

Participants

- Andrés Orejuela, RBGE (PhD student, Solanaceae systematics)
- Marco Cueva, Universidad San Marcos (MSc student, Peruvian Solanaceae specialist)

- Jhoana Castillo, Universidad Nacional de Colombia (MSc student, Field assistant and photographer)
- Mario Sanchez, Universidad Nacional de San Antonio Abad del Cusco (Undergraduate biology student, Field assistant)

Itinerary

TRIP	DATE	ACTIVITY
TRIP 1 (North Peru)	1 February 2017	Arrival to San Ignacio, Cajamarca (Peru) from Bogotá (Colombia)
	2 February 2017	Meeting with the field assistants
	3-11 February 2017	Collections around Cajamarca and Amazonas Departments (San Ignacio, Bagua Grande, Bagua Chica, Aramango and Imacita)
	12 February 2017	Collections around zona amortiguación Bosque de Protección Alto Mayo
	13-19 February 2017	Collections San Martin department (Moyobamba, Tarapoto, Tocache)
	20-22 February 2017	Collections around Huanuco Department (Tingo Maria, road to Aguaytia)
	22 February 2017	Resting day in Tingo Maria
	23-24 February 2017	Travel to Lima
TRIP 2 (Central and South Peru)	24 February-7 March	Visit collaborators in Universidad San Marcos and Herbarium USM. Visit to the herbarium MOL at Universidad Agraria La Molina.
	8-9 March	Travel to Cusco
	10-14 March	Visit to herbarium CUZ and collaborators in Universidad Nacional de San Antonio Abad del Cusco
	15-22 March 2017	Collections around Urubamba and La Convención provinces (Quillabamba, Santa Teresa, Santuario Historico Macchu Pichu)
	23-25 March 2017	Travel from Cusco to Oxapampa
	26 March-1 April 2017	Collections around Oxapampa (Including Parque Nacional Yanachaga-Chemillen)
	02 April	Travel from Oxapampa to Lima
	2-6 April	Sample processing and curation at Herbarium San Marcos (USM)
	7 April	Travel to Bogotá

Table 1. Schedule for the epiphytic Solanaceae expedition in 2017

Methods

Epiphytic Solanaceae (tribe Solandreae) specimens were collected from February to April 2017. The expedition was divided into two trips (see study site). A pole pruner was used to collect samples from epiphytes. Geographical coordinates were taken for all collections with a GPS navigation device. Some herbarium specimens were preserved in the field using a portable dryer method, but others were preserved in 70% alcohol and subsequently dried after returning from the field. All collected specimens were deposited in the national herbarium of Peru in Lima

(USM). Collection permit for the field work, including a permit for genetic work, was obtained before field work (SERFOR 096-2017, SERNANP 024-2017), and we are now in the process of applying for an export permit with the Royal Botanic Garden of Edinburgh. Additionally, fragments of fresh leaves were collected in silica for each specimen for DNA extraction. Seeds were collected for the Solanaceae species with mature fruits. Finally, live photographs were taken in the field from almost all specimens collected using a DSLR camera Pentax KS-2.

Preliminary Results

A total of 250 specimens were collected, 219 collections belong to Solanaceae, 20 to Begoniaceae, two to Berberidaceae and six to other families (Appendix 1). In Solanaceae were collected 22 genera, *Solanum*, was the genus more collected with 141 specimens, followed for *Cestrum* and *Lycianthes*, each with 20 specimens (Fig. 2).

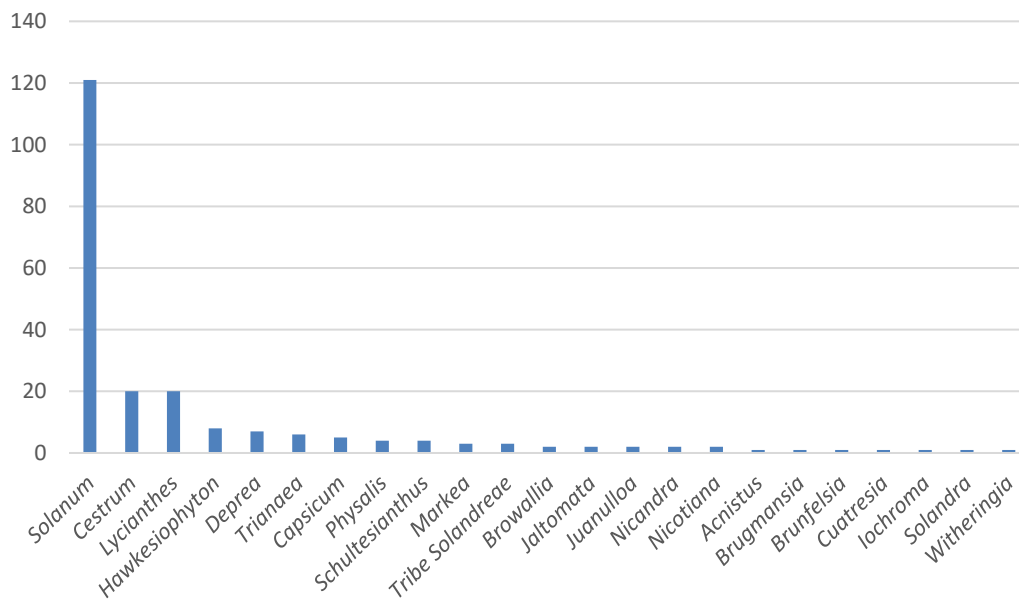


Figure 2. The proportion of specimens collected in each genus of Solanaceae during the expedition to Peru.

In relation to the collections of epiphytic Solanaceae, 24 specimens were collected, representing twelve species of the tribe Solandreae. Specifically, were collected eight specimens of *Hawkesiophyton* belong to four species, six *Trianaea* specimens belong to two species, four specimens of *Schultesianthus* belong to two species, three specimens of *Markea* that belong to two species, three sterile specimens of three unidentified species in the tribe Solandreae, two specimens of *Juanulloa* that belong to one species and one specimen of *Solandra*. The collections include four species of epiphytic species of Solanaceae new to science and a new record for the country (Fig. 3), and we plan to describe the new

species as part of the PhD project in the online taxonomic journal PhytoKeys (<http://phytokeys.pensoft.net/>). The species collected were:

- *Hawkesiophyton ulei* (Dammer) Hunz.
- *Hawkesiophyton* sp. nov. 1
- *Hawkesiophyton* sp. nov. 2
- *Hawkesiophyton* sp. nov. 3
- *Juanulloa parasitica* Ruiz & Pav.
- *Markea plowmanii* Hunz. (new record for Peru)
- *Markea vasquezii* E. Rodr.
- *Schultesianthus leucanthus* (Donn.Sm.) Hunz.
- *Schultesianthus dudleyi* Bernardello & Hunz.
- *Trianaea speciosa* (Drake) Soler.
- *Trianaea* sp. nov.
- *Solandra longiflora* Tussac
- Three unidentified species in vegetative state



Figure 3. New species of the tribe Solandreae discovered during the expedition to Peru. A. New species of *Trianaea*, B., C., D., Three new species of *Hawkesiophyton*. (Photos: A. by Alexander Damian, B. by Rodolfo Vásquez, C. and D. by Jhoana Castillo)

Additionally, fragments of fresh leaves were collected in silica for each specimen. Seeds were collected for 55 Solanaceae species. Finally, c. 10,000 photographs were taken in the field from almost all specimens collected.

During the expedition four herbaria in Peru were also visited (MOL and USM in Lima, CUZ in Cusco and HOXA in Oxapampa). A total of 266

specimens from the tribe Solandreae were studied, and where possible, all specimens in these institutions were determined. A total of 166 specimens belonging to *Hawkesiophyton*, 43 to *Schultesianthus*, 41 to *Juanulloa*, 27 to *Markea*, 24 to *Trianaea*, 16 to *Solandra*, and one to *Rahowardiana* and *Ectozoma* were studied during the trip. Amongst the material studied, other two new species were found, one belonging to *Trianaea* and another possibly to *Rahowardiana* (Fig. 4). All collections examined were photographed and the collection information of every collection is now in the process of being entered into a spreadsheet to be imported into the Solanaceae database in Brahm's.

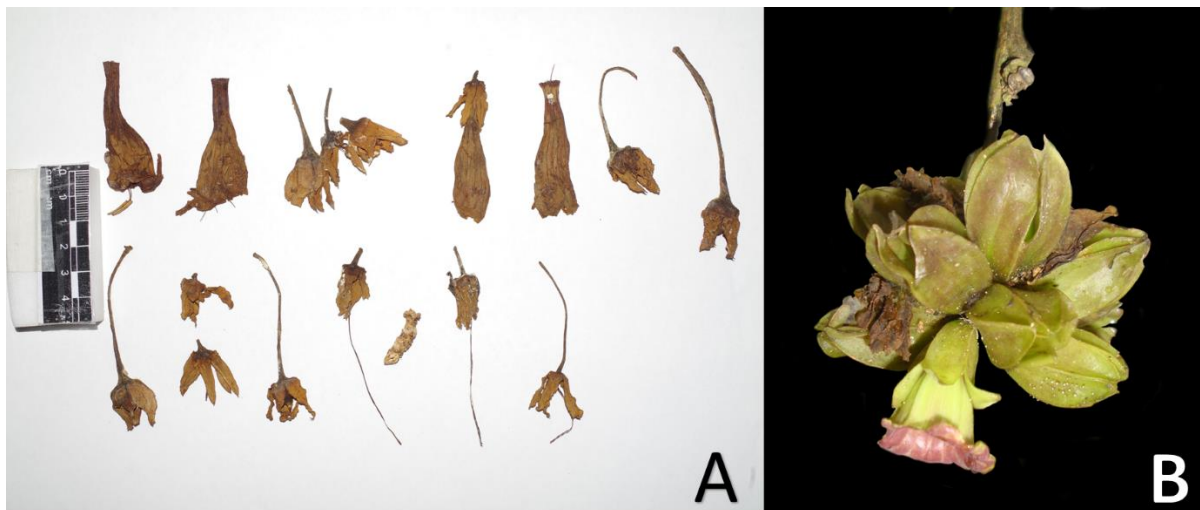


Figure 4. New species of the tribe Solandreae at the visited herbaria. A. *Trianaea* sp. nov. from herbarium CUZ. B. New species of *Rahowardiana* (Photo B by L. Valenzuela, collector of the specimen studied)

Acknowledgements

This field trip was made possible by the generous support of the Davis Fund. Assistance in the field and in obtaining all the necessary permits and paperwork was provided by staff at the Museo de Historia Natural of the Universidad Mayor de San Marcos, especially to Marco Cueva and Asunción Cano. We thank Marco Cueva (USM), Jhoana Castillo (UNAL) and Mario Sanchez (UNSAAC) for their field assistance; Asunción Cano (USM), Mercedes Flores (MOL), Isau Huamantupa, Washington Galeano and Percy Nuñez (CUZ), and Luis Valenzuela (HOXA) for their support during my herbaria visits; and Tiina Särkinen for academic support and for giving me a lot of useful information about her previous experiences in Peru.

References

Brako, L. and Zarucchi, J. (1993). Catálogo de las Angiospermas y Gimnospermas del Perú. *Monogr. Syst. Bot. Missouri Bot. Garden* 45: 1-1286.

Hoorn, C., Wesselingh, F.P., Ter Steege, H., Bermudez, M.A., Mora, A., Sevink, J., et al. (2010). Amazonia through time: Andean uplift, climate change, landscape evolution, and biodiversity. *Science* 330: 927–931.

Appendix 1: Collections

Number	Family	Genus	Species	Province	District	
AOR2694	SOLANACEAE	<i>Solanum</i>	sect. Brevantherum	Cajamarca	Provincia de San Ignacio. Distrito de San Ignacio.	
AOR2695	SOLANACEAE	<i>Physalis</i>		Cajamarca	Provincia de San Ignacio. Distrito de San Ignacio.	
AOR2696	SOLANACEAE	<i>Solanum</i>	sect. Basarthrum	Cajamarca	Provincia de San Ignacio. Distrito de San Ignacio.	
AOR2697	SOLANACEAE	<i>Acnistus</i>	arborescens	Cajamarca	Provincia de San Ignacio. Distrito de San Ignacio.	
AOR2698	SOLANACEAE	<i>Cestrum</i>		Cajamarca	Provincia de San Ignacio. Distrito de San Ignacio.	
AOR2699	SOLANACEAE	<i>Solanum</i>	americanum	Cajamarca	Distrito de San Ignacio.	
AOR2700	SOLANACEAE	<i>Solanum</i>	sect. Acantophora	Cajamarca	Distrito de San Ignacio.	
AOR2701	SOLANACEAE	<i>Solanum</i>	sect. Basarthrum	Amazonas	Provincia de Utcubamba. Distrito de Bagua Grande.	
AOR2702	SOLANACEAE	<i>Solanum</i>	sect. Geminata	Amazonas	Provincia de Utcubamba. Distrito de Bagua Grande.	
AOR2703	SOLANACEAE	<i>Solanum</i>	sect. Basarthrum	Amazonas	Provincia de Utcubamba. Distrito de Bagua Grande.	
AOR2704	SOLANACEAE	<i>Solanum</i>	sect. Solanum	Amazonas	Provincia de Utcubamba. Distrito de Bagua Grande.	
AOR2705	SOLANACEAE	<i>Nicandra</i>	physalodes	Amazonas	Provincia de Utcubamba. Distrito de Bagua Grande.	
AOR2706	SOLANACEAE	<i>Solanum</i>	sect. Geminata	Amazonas	Provincia de Utcubamba. Distrito de Bagua Grande.	
AOR2707	SOLANACEAE	<i>Solanum</i>	americanum	Amazonas	Provincia de Utcubamba. Distrito de Bagua Grande.	
AOR2708	BEGONIACEAE	<i>Begonia</i>	foliosa	Amazonas	Provincia de Utcubamba. Distrito de Bagua Grande.	
AOR2709	SOLANACEAE	<i>Lycianthes</i>		Amazonas	Provincia de Utcubamba. Distrito de Bagua Grande.	
AOR2710	SOLANACEAE	<i>Lycianthes</i>		Amazonas	Provincia de Utcubamba. Distrito de Bagua Grande.	
AOR2711	SOLANACEAE	<i>Jaltomata</i>	sinuosa	Amazonas	Provincia de Utcubamba. Distrito de Bagua Grande.	
AOR2712	SOLANACEAE	<i>Capsicum</i>		Amazonas	Provincia de Utcubamba. Distrito de Bagua Grande.	
AOR2713	SOLANACEAE	<i>Solanum</i>	longifilamentum	Amazonas	Provincia de Utcubamba. Distrito de Bagua Grande.	
AOR2714	SOLANACEAE	<i>Solanum</i>	longifilamentum	Amazonas	Provincia de Utcubamba. Distrito de Bagua Grande.	
AOR2715	SOLANACEAE	<i>Cestrum</i>		Amazonas	Provincia de Utcubamba. Distrito de Bagua Grande.	
AOR2716	ACANTHACEAE	<i>Justicia</i>		Amazonas	Provincia de Utcubamba. Distrito de Bagua Grande.	
AOR2717	SOLANACEAE	<i>Lycianthes</i>	brachyloba	Amazonas	Provincia de Utcubamba. Distrito de Bagua Grande.	
a	AOR2717	SOLANACEAE	<i>Solanum</i>	hutchisonii	Amazonas	Provincia de Bagua. Distrito de Bagua Chica.
b	AOR2718	SOLANACEAE	<i>Solanum</i>	sect. Geminata	Amazonas	Provincia de Bagua. Distrito de Aramango.
AOR2719	SOLANACEAE	<i>Physalis</i>		Amazonas	Provincia de Bagua. Distrito de Aramango.	
AOR2720	SOLANACEAE	<i>Solanum</i>	sect. Basarthrum	Amazonas	Provincia de Bagua. Distrito de Aramango.	
AOR2721	SOLANACEAE	<i>Solanum</i>	mite	Amazonas	Provincia de Bagua. Distrito de Aramango.	
AOR2722	SOLANACEAE	<i>Solanum</i>	sect. Geminata	Amazonas	Provincia de Bagua. Distrito de Aramango.	
AOR2723	BEGONIACEAE	<i>Begonia</i>	fischeri	Amazonas	Provincia de Bagua. Distrito de Aramango.	
AOR2724	SOLANACEAE	<i>Cestrum</i>		Amazonas	Provincia de Bagua. Distrito de Aramango.	
AOR2725	SOLANACEAE	<i>Solanum</i>	sect. Brevantherum	Amazonas	Provincia de Bagua. Distrito de Aramango.	
AOR2726	SOLANACEAE	<i>Deprea</i>		Amazonas	Provincia de Bagua. Distrito de Aramango.	
AOR2727	SOLANACEAE	<i>Solanum</i>	occultum	Amazonas	Provincia de Bagua. Distrito de Aramango.	
AOR2728	SOLANACEAE	<i>Schultesianthus</i>	leucanthus	Amazonas	Provincia de Bagua. Distrito de Aramango.	

AOR2729	SOLANACEAE	<i>Trianaea</i>		Amazonas	Provincia de Bagua. Distrito de Aramango.
AOR2730	SOLANACEAE	<i>Cestrum</i>		Amazonas	Provincia de Bagua. Distrito de Aramango.
AOR2731	SOLANACEAE	<i>Schultesianthus</i>	leucanthus	Amazonas	Provincia de Bagua. Distrito de Aramango.
AOR2732	SOLANACEAE	<i>Brugmansia</i>		Amazonas	Provincia de Bagua. Distrito de Aramango.
AOR2733	SOLANACEAE	<i>Solanum</i>	sect. Nemorense	Amazonas	Provincia de Bagua. Distrito de Aramango.
AOR2734	BEGONIACEAE	<i>Begonia</i>	parviflora	Amazonas	Provincia de Bagua. Distrito de Aramango.
AOR2735	CAMPANULACEAE	<i>Burmeistera</i>		Amazonas	Provincia de Bagua. Distrito de Aramango.
AOR2736	CAMPANULACEAE	<i>Centropogon</i>		Amazonas	Provincia de Bagua. Distrito de Aramango.
AOR2737	SOLANACEAE	<i>Browallia</i>		Amazonas	Provincia de Bagua. Distrito de Aramango.
AOR2738	SOLANACEAE	<i>Solanum</i>		Amazonas	Provincia de Bagua. Distrito de Aramango.
AOR2739	SOLANACEAE	<i>Cuatresia</i>		Amazonas	Provincia de Bagua. Distrito de Aramango.
AOR2740	SOLANACEAE	<i>Trianaea</i>		Amazonas	Provincia de Bagua. Distrito de Aramango.
AOR2741	SOLANACEAE	<i>Solanum</i>	sect. Crinitum	Amazonas	Provincia de Bagua. Distrito de Aramango.
AOR2742	SOLANACEAE	<i>Solanum</i>	anceps	Amazonas	Provincia de Bagua. Distrito Imaza.
AOR2743	SOLANACEAE	<i>Deprea</i>	maculatifolia	Amazonas	Provincia de Bagua. Distrito Imaza.
AOR2744	SOLANACEAE	<i>Lycianthes</i>		Amazonas	Provincia de Bagua. Distrito Imaza.
AOR2745	SOLANACEAE	<i>Solanum</i>	malleti	Amazonas	Provincia de Bagua. Distrito Imaza.
AOR2746	BEGONIACEAE	<i>Begonia</i>	maynensis	Amazonas	Provincia de Bagua. Distrito Imaza.
AOR2747	SOLANACEAE	<i>Deprea</i>		Amazonas	Provincia de Bagua. Distrito Imaza.
AOR2748	SOLANACEAE	<i>Cestrum</i>		Amazonas	Provincia de Bagua. Distrito Imaza.
AOR2749	SOLANACEAE	<i>Witheringia</i>		Amazonas	Provincia de Bagua. Distrito Imaza.
AOR2750	SOLANACEAE	<i>Solanum</i>		Amazonas	Provincia de Bagua. Distrito Imaza.
AOR2751	SOLANACEAE	<i>Markea</i>	vasquezii	Amazonas	Provincia de Bagua. Distrito Imaza.
AOR2752	SOLANACEAE	<i>Markea</i>	vasquezii	Amazonas	Provincia de Bagua. Distrito Imaza.
AOR2753	SOLANACEAE	<i>Solanum</i>		Amazonas	Límites entre los departamentos de Amazonas y San Martín
AOR2754	SOLANACEAE	<i>Solanum</i>	americanum	Amazonas	Límites entre los departamentos de Amazonas y San Martín
AOR2755	SOLANACEAE	<i>Solanum</i>	juglandifolium	Amazonas	Límites entre los departamentos de Amazonas y San Martín
AOR2756	SOLANACEAE	<i>Solanum</i>	pendulum	Amazonas	Límites entre los departamentos de Amazonas y San Martín
AOR2757	SOLANACEAE	<i>Solanum</i>	longifilamentum	Amazonas	Límites entre los departamentos de Amazonas y San Martín
AOR2758	BEGONIACEAE	<i>Begonia</i>	sect. Cyathcnemis	Amazonas	Límites entre los departamentos de Amazonas y San Martín
AOR2759	SOLANACEAE	<i>Solanum</i>	sect. Solanum	Amazonas	Límites entre los departamentos de Amazonas y San Martín
AOR2760	SOLANACEAE	<i>Deprea</i>	auccana	Amazonas	Límites entre los departamentos de Amazonas y San Martín
AOR2761	SOLANACEAE	<i>Deprea</i>	niewa	Amazonas	Límites entre los departamentos de Amazonas y San Martín

AOR2762	SOLANACEAE	<i>Deprea</i>	<i>auccana</i>	Amazonas	Límites entre los departamentos de Amazonas y San Martín
AOR2763	SOLANACEAE	<i>Trianaea</i>		Amazonas	Límites entre los departamentos de Amazonas y San Martín
AOR2764	SOLANACEAE	<i>Solanum</i>	<i>ternatum</i>	Amazonas	Límites entre los departamentos de Amazonas y San Martín
AOR2765	SOLANACEAE	<i>Solanum</i>		Amazonas	Límites entre los departamentos de Amazonas y San Martín
AOR2766	SOLANACEAE	<i>Deprea</i>		Amazonas	Límites entre los departamentos de Amazonas y San Martín
AOR2767	SOLANACEAE	<i>Solanum</i>	sect. <i>Geminata</i>	Amazonas	Límites entre los departamentos de Amazonas y San Martín
AOR2768	SOLANACEAE	<i>Cestrum</i>		Amazonas	Límites entre los departamentos de Amazonas y San Martín
AOR2769	SOLANACEAE	<i>Capsicum</i>		Amazonas	Límites entre los departamentos de Amazonas y San Martín
AOR2770	CAMPANULACEAE	<i>Centropogon</i>		Amazonas	Límites entre los departamentos de Amazonas y San Martín
AOR2771	SOLANACEAE	<i>Solanum</i>	<i>mite</i>	San Martín	Provincia de Moyobamba.
AOR2772	SOLANACEAE	<i>Lycianthes</i>		San Martín	Provincia de Moyobamba.
AOR2773	SOLANACEAE	<i>Solanum</i>	sect. <i>Pteroidea</i>	San Martín	Provincia de Moyobamba.
AOR2774	SOLANACEAE	<i>Cestrum</i>		San Martín	Provincia de Moyobamba.
AOR2775	SOLANACEAE	<i>Solanum</i>	sect. <i>Pteroidea</i>	San Martín	Provincia de Moyobamba.
AOR2776	SOLANACEAE	<i>Cestrum</i>		San Martín	Provincia de Moyobamba.
AOR2777	SOLANACEAE	<i>Solanum</i>	<i>anceps</i>	San Martín	Provincia de Moyobamba.
AOR2778	SOLANACEAE	<i>Cestrum</i>		San Martín	Provincia de Moyobamba, distrito Jepelacio.
AOR2779	SOLANACEAE	<i>Solanum</i>	<i>nemorense</i>	San Martín	Provincia de Moyobamba, distrito Jepelacio.
AOR2780	CAMPANULACEAE	<i>Centropogon</i>		San Martín	Provincia de Moyobamba, distrito Jepelacio.
AOR2781	GESNERIACEAE	<i>Drymonia</i>		San Martín	Provincia de Moyobamba, distrito Jepelacio.
AOR2782	SOLANACEAE	<i>Trianaea</i>	<i>speciosa</i>	San Martín	Provincia de Moyobamba, distrito Jepelacio.
AOR2783	BEGONIACEAE	<i>Begonia</i>	<i>albomaculata</i>	San Martín	Provincia de Moyobamba, distrito Jepelacio.
AOR2784	SOLANACEAE	<i>Trianaea</i>	<i>speciosa</i>	San Martín	Provincia de Moyobamba, distrito Jepelacio.
AOR2785	SOLANACEAE	<i>Solanum</i>	<i>calidum</i>	San Martín	Provincia de San Martín, distrito de Tarapoto.
AOR2786	SOLANACEAE	<i>Cestrum</i>		San Martín	Provincia de San Martín, distrito de Tarapoto.
AOR2787	BEGONIACEAE	<i>Begonia</i>	<i>semiovata</i>	San Martín	Provincia de San Martín, distrito de Tarapoto.
AOR2788	SOLANACEAE	<i>Solanum</i>	sect. <i>Pteroidea</i>	San Martín	Provincia de San Martín, distrito de Tarapoto.
AOR2789	SOLANACEAE	<i>Solanum</i>	sect. <i>Geminata</i>	San Martín	Provincia de San Martín, distrito de Tarapoto.
AOR2790	SOLANACEAE	<i>Solanum</i>	sect. <i>Pteroidea</i>	San Martín	Provincia de San Martín, distrito de Tarapoto.
AOR2791	SOLANACEAE	<i>Solanum</i>	<i>nudum</i>	San Martín	Provincia de San Martín, distrito de Tarapoto.
AOR2792	SOLANACEAE	<i>Solanum</i>	sect. <i>Geminata</i>	San Martín	Provincia de San Martín, distrito de Tarapoto.
AOR2793	SOLANACEAE	<i>Hawkesiophyton</i>	<i>ulei</i>	San Martín	Provincia de San Martín, distrito de Tarapoto.
AOR2794	SOLANACEAE	<i>Solanum</i>	<i>sessile</i>	San Martín	Provincia de San Martín, distrito de Tarapoto.
AOR2795	BEGONIACEAE	<i>Begonia</i>	sp.	San Martín	Provincia de San Martín, distrito de Tarapoto.
AOR2796	SOLANACEAE	<i>Cestrum</i>		San Martín	Provincia de San Martín, distrito de Tarapoto.

AOR2797	SOLANACEAE	<i>Solanum</i>	sessile	San Martín	Provincia de San Martín, distrito de Tarapoto.
AOR2798	SOLANACEAE	<i>Solanum</i>	sessile	San Martín	Provincia de San Martín, distrito de Tarapoto.
AOR2799	BEGONIACEAE	<i>Begonia</i>	albomaculata	San Martín	Provincia de San Martín, distrito de Tarapoto.
AOR2800	SOLANACEAE	<i>Markea</i>	plowmanii	San Martín	Provincia de San Martín, distrito de Tarapoto.
AOR2801	SOLANACEAE	<i>Solanum</i>	Sect. nemorense	San Martín	Provincia de San Martín, distrito de Tarapoto.
AOR2802	SOLANACEAE	<i>Hawkesiophyton</i>		San Martín	Provincia de Tocache, distrito de Tocache.
AOR2803	SOLANACEAE	<i>Hawkesiophyton</i>		San Martín	Provincia de Tocache, distrito de Tocache.
AOR2804	SOLANACEAE	<i>Hawkesiophyton</i>		San Martín	Provincia de Tocache, distrito de Tocache.
AOR2805	SOLANACEAE	<i>Solanum</i>	mite	San Martín	Provincia de Tocache, distrito de Tocache.
AOR2806	SOLANACEAE	<i>Solanum</i>	anceps	San Martín	Provincia de Tocache, distrito de Tocache.
AOR2807	SOLANACEAE	<i>Solanum</i>	lepidotum	San Martín	Provincia de Tocache, distrito de Tocache.
AOR2808	SOLANACEAE	<i>Lycianthes</i>	coffeifolia	San Martín	Provincia de Tocache, distrito de Tocache.
AOR2809	SOLANACEAE	<i>Lycianthes</i>	coffeifolia	San Martín	Provincia de Tocache, distrito de Tocache.
AOR2810	SOLANACEAE	<i>Solanum</i>	thelopodium	San Martín	Provincia de Tocache, distrito de Tocache.
AOR2811	SOLANACEAE	<i>Cestrum</i>		San Martín	Provincia de Tocache, distrito de Tocache.
AOR2812	SOLANACEAE	<i>Cestrum</i>		San Martín	Provincia de Tocache, distrito de Tocache.
AOR2813	SOLANACEAE	<i>Solanum</i>	sect. Geminata	San Martín	Provincia de Tocache, distrito de Tocache.
AOR2814	SOLANACEAE	<i>Physalis</i>		San Martín	Provincia de Tocache, distrito de Tocache.
AOR2815	SOLANACEAE	<i>Solanum</i>	morellifolium	San Martín	Provincia de Tocache, distrito de Tocache.
AOR2816	SOLANACEAE	<i>Juanulloa</i>	parasitica	San Martín	Provincia de Tocache, distrito de Shunte.
AOR2817	SOLANACEAE	<i>Solanum</i>	suaveolens	San Martín	Provincia de Tocache, distrito de Shunte.
AOR2818	SOLANACEAE	<i>Physalis</i>		San Martín	Provincia de Tocache, distrito de Shunte.
AOR2819	SOLANACEAE	<i>Solanum</i>	americanum	San Martín	Provincia de Tocache, distrito de Shunte.
AOR2820	SOLANACEAE	<i>Solanum</i>	sisymbriifolium	San Martín	Provincia de Tocache, distrito de Shunte.
AOR2821	SOLANACEAE	<i>Solanum</i>	sessile	San Martín	Provincia de Tocache, distrito de Shunte.
AOR2822	SOLANACEAE	<i>Juanulloa</i>	parasitica	San Martín	Provincia de Tocache, distrito de Shunte.
AOR2823	SOLANACEAE	<i>Solanum</i>	sect. Geminata	Huanuco	Provincia Leoncio Prado, distrito Hermilio Valdizan.
AOR2824	SOLANACEAE	<i>Solanum</i>	sect. Dulcamara	Huanuco	Provincia Leoncio Prado, distrito Hermilio Valdizan.
AOR2825	SOLANACEAE	<i>Solanum</i>	anceps	Huanuco	Provincia Leoncio Prado, distrito Hermilio Valdizan.
AOR2826	SOLANACEAE	<i>Lycianthes</i>		Huanuco	Provincia Leoncio Prado, distrito Hermilio Valdizan.
AOR2827	SOLANACEAE	<i>Hawkesiophyton</i>		Huanuco	Provincia Leoncio Prado, distrito Hermilio Valdizan.
AOR2828	SOLANACEAE	<i>Solanum</i>	sect. Torva	Huanuco	Provincia Leoncio Prado, distrito Hermilio Valdizan.
AOR2829	SOLANACEAE	<i>Cestrum</i>		Huanuco	Provincia Leoncio Prado, distrito Hermilio Valdizan.
AOR2848	SOLANACEAE	<i>Lycianthes</i>		Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2849	SOLANACEAE	<i>Browallia</i>		Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2850	SOLANACEAE	<i>Jaltomata</i>		Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"

AOR2851	SOLANACEAE	<i>Lycianthes</i>		Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2852	SOLANACEAE	<i>Solanum</i>		Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2853	SOLANACEAE	<i>Solanum</i>	sect. Torva	Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2854	SOLANACEAE	<i>Solanum</i>		Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2855	SOLANACEAE	<i>Lycianthes</i>		Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2856	BEGONIACEAE	<i>Begonia</i>	lophoptera	Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2857	SOLANACEAE	<i>Tribu Solandreae</i>		Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2858	SOLANACEAE	<i>Schultesianthus</i>	dudleyi	Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2859	BEGONIACEAE	<i>Begonia</i>	bracteosa	Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2860	SOLANACEAE	<i>Solanum</i>	urubambaense	Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2861	BEGONIACEAE	<i>Begonia</i>	lophoptera	Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2862	SOLANACEAE	<i>Solanum</i>	urubambaense	Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2863	SOLANACEAE	<i>Solanum</i>	longifilamentum	Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2864	SOLANACEAE	<i>Tribu Solandreae</i>		Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2865	BEGONIACEAE	<i>Begonia</i>	erythrocarpa	Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2866	SOLANACEAE	<i>Nicandra</i>	physalodes	Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2867	SOLANACEAE	<i>Lycianthes</i>		Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2868	SOLANACEAE	<i>Solanum</i>	sect. Solanum	Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2869	SOLANACEAE	<i>Solanum</i>	sect. Solanum	Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2870	SOLANACEAE	<i>Solanum</i>	pallidum	Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2871	SOLANACEAE	<i>Solanum</i>	sect. Petota	Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2872	SOLANACEAE	<i>Lycianthes</i>		Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2873	SOLANACEAE	<i>Solanum</i>	sect. Petota	Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2874	SOLANACEAE	<i>Solanum</i>	sect. Geminata	Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2875	SOLANACEAE	<i>Solanum</i>		Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"

AOR2876	SOLANACEAE	<i>Solanum</i>	sect. Geminata	Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2877	SOLANACEAE	<i>Solanum</i>	sect. Pterioidea	Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2878	SOLANACEAE	<i>Capsicum</i>		Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2879	SOLANACEAE	<i>Lycianthes</i>		Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2880	SOLANACEAE	<i>Solanum</i>	sect. Pterioidea	Cusco	Provincia La Convención, distrito Santa Ana "Quillabamba"
AOR2881	SOLANACEAE	<i>Solanum</i>	sect. Erythrotrichum	Cusco	Provincia La Convención, distrito Santa Teresa.
AOR2882	SOLANACEAE	<i>Solanum</i>	sessile	Cusco	Provincia La Convención, distrito Santa Teresa.
AOR2883	SOLANACEAE	<i>Capsicum</i>		Cusco	Provincia La Convención, distrito Santa Teresa.
AOR2884	BEGONIACEAE	<i>Begonia</i>	pleiopetala	Cusco	Provincia Urubamba, arriba de Machu Picchu pueblo, Aguas Calientes
AOR2885	BERBERIDACEAE	<i>Berberis</i>		Cusco	Provincia Urubamba, arriba del Santuario de Machu Picchu.
AOR2886	SOLANACEAE	<i>Solanum</i>	probolospermum	Cusco	Provincia Urubamba, arriba del Santuario de Machu Picchu.
AOR2887	BERBERIDACEAE	<i>Berberis</i>		Cusco	Provincia Urubamba, arriba del Santuario de Machu Picchu.
AOR2888	SOLANACEAE	<i>Capsicum</i>		Cusco	Provincia Urubamba
AOR2889	SOLANACEAE	<i>Solanum</i>	urubambaense	Cusco	Provincia Urubamba
AOR2890	SOLANACEAE	<i>Tribu Solandreae</i>		Cusco	Provincia Urubamba
AOR2891	SOLANACEAE	<i>Solanum</i>	sessile	Pasco	Provincia Oxapampa, distrito Chontabamba.
AOR2892	SOLANACEAE	<i>Cestrum</i>	longiflorum	Pasco	Provincia Oxapampa, distrito Chontabamba.
AOR2893	SOLANACEAE	<i>Solanum</i>	Brevantherum	Pasco	Provincia Oxapampa, distrito Chontabamba.
AOR2894	SOLANACEAE	<i>Solanum</i>	sect. Geminata	Pasco	Provincia Oxapampa, distrito Chontabamba.
AOR2895	SOLANACEAE	<i>Solanum</i>	Brevantherum	Pasco	Provincia Oxapampa, distrito Chontabamba.
AOR2896	SOLANACEAE	<i>Solanum</i>	americanum	Pasco	Provincia Oxapampa, distrito Chontabamba.
AOR2897	SOLANACEAE	<i>Schultesianthus</i>	dudleyi	Pasco	Provincia Oxapampa, distrito Chontabamba.
AOR2898	SOLANACEAE	<i>Solanum</i>	sect. Erythrotrichum	Pasco	Provincia Oxapampa, distrito Chontabamba.
AOR2899	SOLANACEAE	<i>Solanum</i>	sect. Torva	Pasco	Provincia Oxapampa, distrito Chontabamba.
AOR2900	SOLANACEAE	<i>Solanum</i>	sect. Torva	Pasco	Provincia Oxapampa, distrito Chontabamba.
AOR2901	SOLANACEAE	<i>Solanum</i>	sect. Torva	Pasco	Provincia de Oxapampa, entre los distritos de Huancabamba y Pozuzo.
AOR2902	SOLANACEAE	<i>Solanum</i>	sect. Brevantherum	Pasco	Provincia de Oxapampa, entre los distritos de Huancabamba y Pozuzo.
AOR2903	SOLANACEAE	<i>Solanum</i>	pseudoamericanum	Pasco	Provincia de Oxapampa, entre los distritos de Huancabamba y Pozuzo.
AOR2904	SOLANACEAE	<i>Nicotiana</i>		Pasco	Provincia de Oxapampa, entre los distritos de Huancabamba y Pozuzo.
AOR2905	SOLANACEAE	<i>Nicotiana</i>		Pasco	Provincia de Oxapampa, entre los distritos de Huancabamba y Pozuzo.
AOR2906	SOLANACEAE	<i>Cestrum</i>		Pasco	Provincia de Oxapampa.
AOR2907	SOLANACEAE	<i>Solanum</i>		Pasco	Provincia de Oxapampa.

AOR2908	SOLANACEAE	<i>Solanum</i>	sect. Pteroidea	Pasco	Provincia de Oxapampa.
AOR2909	SOLANACEAE	<i>Solanum</i>	sect. Torva	Pasco	Provincia de Oxapampa, entre los distritos de Huancabamba y Pozuzo.
AOR2910	SOLANACEAE	<i>Solanum</i>	sect. Brevantherum	Pasco	Provincia de Oxapampa, entre los distritos de Huancabamba y Pozuzo.
AOR2911	SOLANACEAE	<i>Solanum</i>	sect. Geminata	Pasco	Provincia de Oxapampa, entre los distritos de Huancabamba y Pozuzo.
AOR2912	SOLANACEAE	<i>Cestrum</i>		Pasco	Provincia de Oxapampa, entre los distritos de Huancabamba y Pozuzo.
AOR2913	SOLANACEAE	<i>Lycianthes</i>		Pasco	Provincia de Oxapampa, distrito del Pozuzo
AOR2914	BEGONIACEAE	<i>Begonia</i>	pleiopetala	Pasco	Provincia de Oxapampa, distrito del Pozuzo
AOR2915	SOLANACEAE	<i>Lycianthes</i>		Pasco	Provincia de Oxapampa, distrito del Pozuzo
AOR2916	SOLANACEAE	<i>Solanum</i>	sect. Petota	Pasco	Provincia de Oxapampa, distrito del Pozuzo
AOR2917	SOLANACEAE	<i>Solandra</i>		Pasco	Provincia de Oxapampa, distrito del Pozuzo
AOR2918	SOLANACEAE	<i>Solanum</i>	sect. Brevantherum	Pasco	Provincia de Oxapampa, distrito Oxapampa
AOR2919	SOLANACEAE	<i>Solanum</i>	sect. Torva	Pasco	Provincia de Oxapampa, distrito Oxapampa
AOR2920	SOLANACEAE	<i>Hawkesiophyton</i>		Pasco	Provincia de Oxapampa, distrito Oxapampa
AOR2921	BEGONIACEAE	<i>Begonia</i>	subciliata	Pasco	Provincia de Oxapampa, distrito Oxapampa
AOR2922	SOLANACEAE	<i>Lycianthes</i>		Pasco	Provincia de Oxapampa, distrito Oxapampa
AOR2923	SOLANACEAE	<i>Solanum</i>	sect. Erythrotichum	Pasco	Provincia de Oxapampa, distrito Oxapampa
AOR2924	SOLANACEAE	<i>Solanum</i>	sect. Brevantherum	Pasco	Provincia de Oxapampa, distrito Oxapampa
AOR2925	SOLANACEAE	<i>Trianaea</i>		Pasco	Provincia de Oxapampa, distrito Oxapampa
AOR2926	SOLANACEAE	<i>Lochroma</i>	amicorum	Pasco	Provincia de Oxapampa, distrito Oxapampa
AOR2927	SOLANACEAE	<i>Solanum</i>		Pasco	Provincia de Oxapampa, distrito Oxapampa
AOR2928	SOLANACEAE	<i>Solanum</i>	sect. Erythrotichum	Pasco	Provincia de Oxapampa, distrito Oxapampa
AOR2929	SOLANACEAE	<i>Solanum</i>	sect. Herpystichum	Pasco	Provincia de Oxapampa, distrito Oxapampa
AOR2930	SOLANACEAE	<i>Lycianthes</i>		Pasco	Provincia de Oxapampa, distrito Oxapampa
AOR2931	SOLANACEAE	<i>Cestrum</i>		Pasco	Provincia de Oxapampa, distrito Oxapampa
AOR2932	SOLANACEAE	<i>Solanum</i>	sessile	Pasco	Provincia de Oxapampa, distrito Oxapampa
AOR2933	BEGONIACEAE	<i>Begonia</i>	humilis	Pasco	Provincia de Oxapampa, distrito de Palcazú
AOR2934	SOLANACEAE	<i>Cestrum</i>		Pasco	Provincia de Oxapampa, distrito de Palcazú
AOR2935	SOLANACEAE	<i>Lycianthes</i>		Pasco	Provincia de Oxapampa, distrito de Palcazú
AOR2936	SOLANACEAE	<i>Solanum</i>	anceps	Pasco	Provincia de Oxapampa, distrito de Palcazú
AOR2937	SOLANACEAE	<i>Hawkesiophyton</i>		Pasco	Provincia de Oxapampa, distrito de Palcazú
AOR2938	SOLANACEAE	<i>Hawkesiophyton</i>		Pasco	Provincia de Oxapampa, distrito de Palcazú
AOR2939	SOLANACEAE	<i>Lycianthes</i>		Pasco	Provincia de Oxapampa, distrito de Palcazú
AOR2940	SOLANACEAE	<i>Solanum</i>	sect. Pteroidea	Pasco	Provincia de Oxapampa, distrito de Palcazú
AOR2941	BEGONIACEAE	<i>Begonia</i>	chemillenensis	Pasco	Provincia de Oxapampa, distrito de Palcazú