

# DAVIS EXPEDITION FUND

## REPORT ON EXPEDITION / PROJECT

**Expedition/Project Title:** Fieldwork in Colombia for the project “The biogeographic and floral evolution of Gesneriaceae (Lamiales)”

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**Travel Dates:** 8 December 2013 – 11 February 2014

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**Location:** Colombia (Cundinamarca, Santander, Quindío)

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**Group Members:** Javier A. Luna

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**Aims:** To increase the taxon sampling of *Besleria* and other Gesneriaceae in Colombia.

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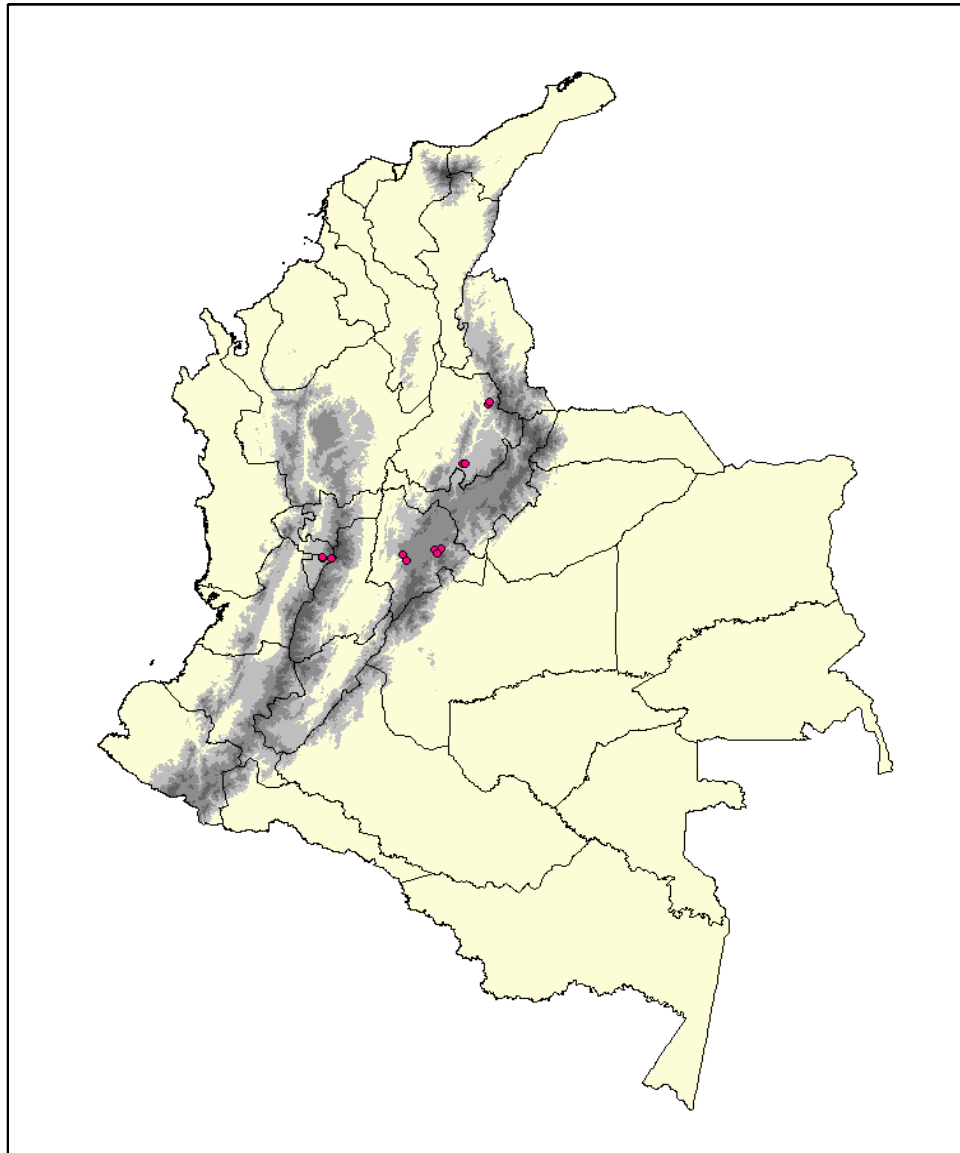
### Outcome:

We collected in cloud forests in altitudes ranging from 1621 m to 3160 m in the Central and East Andes cordilleras. In total 11 different localities were visited (Fig.1). Most of the collections were done along secondary roads of low traffic and with relatively well preserved cloud forests. This is the case for the road from Bucaramanga to Tona where we collected eight specimens. However more than 15 species were seen in less than 3 kilometers but not collected as they did not have fruit or flower. In contrast we did not find any Gesneriaceae in places with medium to high disturbance even along rivers with remaining gallery forests (3 localities: Oiba, Caqueza and El Centro).

A total of 37 herbarium collections were made, each with an associated silica dried sample for DNA extraction (Appendix 1). Duplicates have been deposited at Edinburgh herbarium (E) and the herbarium of the Universidad de los Andes (ANDES). Collections represent 12 different genera of Gesneriaceae and at least 2

specimens do not seem to fit any species description already defined.

As to identify most of the species it is necessary to have fruit, flower and root and this was rarely the case; specimens are being identify with the help of neotropical Gesneriaceae experts and silica dried samples are being extracted to compare with our existing sequence dataset. Few neotropical genera have been described after phylogenetic analysis as there are very few morphological characters to differentiate them (Clark, 2009).



**Figure 1.** Map of Colombia showing the collection localities (red circles).



**Figure 2.** Cloud forest landscapes. From top left corner Salento (Quindío), Oiba (Santander), San Jose de Suita (Santander), Junín (Cundinamarca) and San Antonio del Tequendama (Cundinamarca).

### **Introduction:**

Gesneriaceae comprises between 150 and 160 genera and more than 3200 species that are mainly distributed in the tropics and subtropics (Möller et al., 2009; Perret et al., 2013). Gesneriaceae are an ecologically important component of biomes that occupy these regions, but the mechanisms responsible for the generation of this diverse group are unclear. Molecular phylogenetic studies support division of the family into two clades, the subfamilies Gesnerioideae and Didymocarpoideae; the first restricted to the New World with the exception of the tribe Coronanthereae that has a disjunct distribution between South America and Australasia; and the second spread in Africa, Eurasia and Australasia (Weber, 2004; Möller et al., 2009; Perret et al., 2013).

Considering the current extent of our knowledge Gesneriaceae are one of the most interesting plant groups to study radiation and floral diversification processes. Tribes in the subfamily Gesnerioideae (neotropical gesneriads) fulfill all the criteria necessary to be considered cases of adaptive radiations (*sensu* Schluter, 2000). Gesneriads are particularly diverse in Colombia where several genera diversify in the

Tumbes-Chocó-Magdalena and Tropical Andes hotspots of biodiversity. However plant collections from Colombia have been scarce due to the country's 40 years internal conflict.

### Methods:

We collected in the eastern and central ridge of the Andes in Cundinamarca, Santander and Quindío due to there being a number of recorded collections made in these areas and the fact that they have the perfect climatic conditions to host *Besleria* and other Gesnerids. These departments have cloud forests isolated by valleys and canyons with elevations between 1000 and 3500m. These forests are relatively close to Bogotá (Colombia capital city), making them easily accessible by car. Easy access in different localities along principal and back roads and different forests and altitudes, ensured a good species sampling. The main areas of sampling were around the National Parks of Chingaza, Sumapaz, out of secondary Roads on the roads from Bogotá to Fomeque, Bogotá to Caqueza, Bogotá to La Mesa, Bojacá to San Antonio del Tequendama, Bucaramanga to Tona and outside the towns of Suita, Oiba and Salento.



**Figure 11.** Some of the plants collected. (A) *Columnea* sp., (B) *Kohleria* sp., (C) *Glossoloma* sp. and (D) *Columnea* sp.

For each specimen we collected herbarium material and silica dried leaf material for DNA extraction. Additionally photographic records of floral morphology and GPS data will be kept. Herbarium collections were dried in the Herbarium of the Museum of Natural History ANDES of the Universidad de los Andes (Bogotá, Colombia). Collections of herbarium material are being deposited in the Royal Botanic Garden Edinburgh (E). Duplicates will be deposited in the Museum of Natural History ANDES. Field assistance and logistical support were carried out by the co-ordinator of the Herbarium of the Universidad de los Andes.

## Final Budget

Description	GBP (£)
National parks entry fee	25.67
Road tolls	43.07
Petrol	116.67
Materials	42.17
Internal buses and flights	174.97
Food	369.96
Local guide	50.00
Accommodation	193.76
Car rental	510.00
International banking	35.12
Air ticket	938.24
Total:	2499.62

## Funding

Davis Expedition Trust	£2351
RBGE	£121.27
Self-funding	£1.69

## Acknowledgements

I am very grateful with the Davis Expedition Trust and the RBGE for the funding received and the Herbarium of the Universidad de los Andes and its team for all the logistical support. I sincerely want to thank all the friends that help me in the field, with logistical support and with advice: Diego, James N., Adolfo, Iván, James R. and Eugenio. I am also grateful with Cons and her family for hosting me in Bucaramanga and with Juli for being such a fun driver.

## Bibliography

- Clark, J. L. 2009. Systematics of *Glossoloma* (Gesneriaceae). Systematic Botany Monographs 88.
- Möller, M., M. Pfosser, C. G. Jang, V. Mayer, A. Clark, M. L. Hollingsworth, M. H. Barfuss, et al. 2009. A preliminary phylogeny of the 'didymocarpoid Gesneriaceae' based on three molecular data sets: Incongruence with available tribal classifications. American Journal of Botany 96: 989-1010.
- Perret, M., A. Chautems, A. O. De Araujo, and N. Salamin. 2013. Temporal and spatial origin of Gesneriaceae in the New World inferred from plastid DNA sequences. Botanical Journal of the Linnean Society 171: 61-79.
- Weber, A. 2004. Gesneriaceae and Scrophulariaceae: Robert Brown and now. Telopea 10: 543–571.

## Appendix 1. Collections made in Colombia.

Coll No.	Collectors	Family	Genus	Species	Department	Municipality	Locality	Latitude	Longitude	Altitude (m)
JaL01	Javier A. Luna, Diego Cueva	Gesneriaceae	<i>Besleria</i>	<i>reticulata</i>	Cundinamarca	San Antonio del Tequendama	Parque Natural Chicaque	4.610	-74.308	2421.188
JaL02	Javier A. Luna, Diego Cueva	Gesneriaceae	<i>Glossoloma</i>	<i>cf. formosa</i>	Cundinamarca	San Antonio del Tequendama	Parque Natural Chicaque	4.610	-74.308	2408.450
JaL03	Javier A. Luna, Diego Cueva	Gesneriaceae	<i>Besleria</i>	<i>sp.</i>	Cundinamarca	San Antonio del Tequendama	Parque Natural Chicaque	4.610	-74.308	2370.238
JaL04	Javier A. Luna, Diego Cueva	Gesneriaceae	<i>Sinningia</i>	<i>sp.</i>	Cundinamarca	San Antonio del Tequendama	Parque Natural Chicaque	4.610	-74.308	2370.238
JaL05	Javier A. Luna, Adolfo Jara	Gesneriaceae	<i>Columnnea</i>	<i>cf. fuschihirta</i>	Santander	Suita	Near the Road to Santana	6.158	-73.448	1621.858
JaL06	Javier A. Luna, Adolfo Jara	Gesneriaceae			Santander	Suita	Near the Road to Santana	6.158	-73.448	1726.400
JaL07	Javier A. Luna, Adolfo Jara	Gesneriaceae	<i>Sinningia</i>	<i>sp.</i>	Santander	Suita	Near the Road to Santana	6.158	-73.448	1726.400
JaL09	Javier A. Luna, Adolfo Jara	Gesneriaceae			Santander	Suita	Near the Road to Santana	6.158	-73.448	1726.400
JaL10	Javier A. Luna, Adolfo Jara	Gesneriaceae	<i>Columnnea</i>	<i>sp.</i>	Santander	Suita	Near the Road to Santana	6.158	-73.448	1726.400
JaL11	Javier A. Luna, Adolfo Jara	Gesneriaceae	<i>Corytolectus</i>	<i>zamorensis</i>	Santander	Suita	Finca Marbella	6.158	-73.448	1726.400
JaL12	Javier A. Luna, Adolfo Jara	Gesneriaceae			Santander	Suita	Finca Marbella	6.158	-73.448	1726.400

JaL13	Javier A. Luna, Adolfo Jara	Gesneriaceae	<i>Columnea</i>	<i>purpurata</i>	Santander	Suita	Finca Marbella	6.158	-73.448	1726.400
JaL14	Javier A. Luna, Adolfo Jara	Gesneriaceae	<i>Besleria</i>	<i>fallax</i>	Santander	Suita	Finca La Meseta	6.164	-73.409	1925.392
JaL15	Javier A. Luna, Adolfo Jara	Gesneriaceae	<i>Columnea</i>	<i>sp.</i>	Santander	Suita	Finca La Meseta	6.164	-73.409	1925.392
JaL16	Javier A. Luna, Adolfo Jara	Gesneriaceae			Santander	Suita	Finca La Meseta	6.164	-73.411	1932.842
JaL17	Javier A. Luna, Adolfo Jara	Gesneriaceae	<i>Besleria</i>	<i>sp.</i>	Santander	Suita	Finca La Meseta	6.167	-73.412	1941.734
JaL18	Javier A. Luna, Adolfo Jara	Gesneriaceae	<i>Glossoloma</i>	<i>sp.</i>	Santander	Tona	Road to Tona	7.124	-73.059	1763.170
JaL19	Javier A. Luna, Adolfo Jara	Gesneriaceae	<i>Glossoloma</i>	<i>sp.</i>	Santander	Tona	Road to Tona	7.124	-73.059	1763.170
JaL20	Javier A. Luna, Adolfo Jara	Gesneriaceae	<i>Sinningia</i>	<i>sp.</i>	Santander	Tona	Road to Tona	7.124	-73.059	1763.170
JaL21	Javier A. Luna, Adolfo Jara	Gesneriaceae	<i>Besleria</i>	<i>sp.</i>	Santander	Tona	Finca el Carajo	7.146	-73.029	2141.687
JaL22	Javier A. Luna, Adolfo Jara	Gesneriaceae	<i>Kohleria</i>	<i>sp.</i>	Santander	Tona	Finca el Carajo	7.146	-73.029	2141.687
JaL23	Javier A. Luna, Adolfo Jara	Gesneriaceae	<i>Besleria</i>	<i>sp.</i>	Santander	Tona	Finca el Carajo	7.146	-73.029	2141.687
JaL24	Javier A. Luna, Adolfo Jara	Gesneriaceae	<i>Columnea</i>	<i>sp.</i>	Santander	Tona	Finca el Carajo	7.146	-73.029	2141.687
JaL25	Javier A. Luna, Adolfo Jara	Gesneriaceae	<i>Besleria</i>	<i>sp.</i>	Santander	Tona	Finca el Carajo	7.146	-73.029	2141.687



JaL26	Javier A. Luna	Gesneriaceae	<i>Drymonia</i>	sp.	Quindio	Salento	Next to the Road	4.646	-75.450	2857.000
JaL27	Javier A. Luna	Gesneriaceae	<i>Percea</i>	sp.	Quindio	Salento	Next to the Road	4.647	-75.582	1744.425
JaL28	Javier A. Luna	Gesneriaceae	<i>Kohleria</i>	sp.	Quindio	Salento	Next to the Road	4.658	-75.577	1960.720
JaL29	Javier A. Luna	Gesneriaceae	<i>Kohleria</i>	<i>warszewiczii</i>	Quindio	Salento	Next to the Road	4.658	-75.577	1960.720
JaL30	Javier A. Luna	Gesneriaceae	<i>Kohleria</i>	cf. <i>warszewiczii</i>	Quindio	Salento	Next to the Road	4.658	-75.577	1960.720
JaL31	Javier A. Luna, Eugenio Valderrama	Gesneriaceae	<i>Glossoloma</i>	sp.	Cundinamarca	Bojaca	Road Bojaca - Cachipay	4.706	-74.363	2504.000
JaL32	Javier A. Luna, Eugenio Valderrama	Gesneriaceae	<i>Corytopectus</i>	sp.	Cundinamarca	Bojaca	Road Bojaca - Cachipay	4.706	-74.363	2504.000
JaL33	Javier A. Luna, Eugenio Valderrama	Begoniaceae	<i>Begonia</i>	sp.	Cundinamarca	Bojaca	Road Bojaca - Cachipay	4.706	-74.363	2504.000
JaL34	Javier A. Luna, Eugenio Valderrama	Gesneriaceae	<i>Sinningia</i>	sp.	Cundinamarca	Bojaca	Road Bojaca - Cachipay	4.706	-74.363	2504.000
JaL35	Javier A. Luna, Adolfo Jara	Gesneriaceae	<i>Glossoloma</i>	sp.	Cundinamarca	Junin	Next to the Road	4.806	-73.783	2700.000
JaL36	Javier A. Luna, James Richardson, Adolfo Jara	Gesneriaceae			Cundinamarca	Fomeque	Next to the Road	4.785	-73.863	3160.000
JaL37	Javier A. Luna, James Richardson, Adolfo Jara	Gesneriaceae	<i>Allopectus</i>	sp.	Cundinamarca	Fomeque	Next to the Road	4.727	-73.837	3160.000