DAVIS EXPEDITION FUND

REPORT ON EXPEDITION / PROJECT

Expedition/Project Title:	Collecting *Cyrtandra* (Gesneriaceae) in Sumatra, Indonesia
Travel Dates:	10 Jan – 15 Feb 2016
Location:	Sumatra, Indonesia
Group Members:	Hannah Atkins, Sadie Barber, Mark Hughes, Peter Wilkie and Helen Yeats
Aims:	Collecting of *Cyrtandra* (Gesneriaceae) and other RBGE priority plant groups from the forests of Sumatra.

Outcome (not less than 300 words):-

Davis Expedition Fund – January 2016

Collecting *Cyrtandra*(Gesneriaceae) in Sumatra, Indonesia

Background and Scientific rationale

Cyrtandra

Cyrtandra is the largest genus in the Gesneriaceae with c. 800 species (Atkins et al., 2013). It is distributed throughout SE Asia and across the islands of the Pacific to Hawaii. Its high species numbers, tendency to restricted endemism and widespread distribution make it an excellent model genus for biogeographic and ecological studies. Its sheer size and lack of effective infrageneric structure, however, also make it challenging taxonomically. Basic taxonomic work is required throughout its distribution but primarily in its centres of diversity in SE Asia, on islands such as Borneo and Sumatra. In Sumatra there are approximately 50 known species of *Cyrtandra* (Skogg & Boggan, 2007), although this is certainly an underestimation due to the low collection density over much of the island.

Recent RBGE trips to the Indonesian island of Sumatra (in 2008 and 2011) have brought back a number of *Cyrtandra* novelties and underlined the need for further collecting. No systematic review of *Cyrtandra* on the island has been undertaken since C.B. Clarke's monograph of the genus in 1883 (Clarke, 1883) and no overall flora for the island exists (Frodin, 2001). This field trip had the aim of contributing valuable collections and data towards a scientific monograph of the *Cyrtandra* of Sumatra covering phylogeny, biogeography and systematics that will be a significant contribution to our knowledge of the genus in the region and will complement ongoing taxonomic work on the genus in Sulawesi and Borneo and phylogenetic work across its full distribution (eg Atkins et al., 2001; Atkins & Cronk, 2001; Atkins, 2004; Bone & Atkins, 2013; Bramley & Cronk, 2003; Clark et al., 2008; 2013).

Sumatra

The Indonesian island of Sumatra lies in the west of the Malesian region on the Sunda shelf. It has a wide range of vegetation types and due to its mountainous topography and equatorial position the high species diversity of its forests compares to that of Borneo and New Guinea (Whitten, 2000). These forests are under unprecedented levels of threat from development (Margono et al., 2012).

One of the largest remaining areas of untouched rainforest in Sumatra is in the **Barisan Mountain range** in the west of the island and this is where the fieldwork was focused during this trip. Eight localities in West Sumatra and Lampung were visited (see Table 1):

Table 1: Itinerary

10 Jan 2016	Arr. Jakarta
11-25 Jan 2016	Obtaining permits for fieldwork and working in the herbarium
26 Jan 2016	Flight to Padang.
27 Jan 2016	Kayutanam, Pariaman, West Sumatra
28 Jan 2016	Limau Manis, Padang, West Sumatra
29 Jan 2016	Near Air Manjoer at Lembah Anai, Tanah Datar, West Sumatra
30 Jan 2016	Simaroso Village and Jorong Gasung, Agam, West Sumatra
31 Jan 2016	Ngalau Tinggi, Halaban, West Sumatra
1 Feb 2016	Kaya Aro, Solok, West Sumatra
2 Feb 2016	Internal flight to Bandar Lampung, Lampung Province
3-7 Feb 2016	Gunung Tanggamus and Lembah Pelangi waterfall, Lampung
8 Feb 2016	Pesawaran, Lampung
9 Feb 2016	Return flight to Bogor
10-15 Feb 2016	Processing of specimens and obtaining export permits and phytosanitary certificate.
15 Feb 2016	Return flight to UK

Methodology

Herbarium specimens were collected in duplicates of at least 4, with the top set left in Herbarium Bogoriense (BO) in Java. A set will be distributed to the herbarium in Padang (ANDA) and one to Edinburgh (E) with additional material being sent to taxonomic specialists. Specimens were collected and pressed in newspaper dried for at least 24 hours at base camps, with further drying at Herbarium Bogoriense. GPS co-ordinates, photographs and silica dried material were taken of all plants collected. Living material, either cuttings or seeds, were taken for all of the *Cyrtandra* collections with duplicates collected for Kebun Raya Bogor.

We were working with our colleagues from the Indonesian Institute of Sciences with which the RBGE has recently signed a new 5 year MOU which promotes and facilitates 'cooperation in conserving plant biodiversity in Indonesia'. Our main counterparts on the trip were Abdulrokhman Kartonegoro (Gesneriaceae) and Deden Girmansayah (Begonia).

Plants Collected

It was a successful trip with 100 collections made of which 23 were *Cyrtandra* (Fig. 1). Appendix 1 provides a list of all of the collections made on the trip. It has not been possible to match all of the *Cyrtandra* collected with known species and it is expected that the collections contain some new species which will be published as part of the revision of the genus on the island.

Figure 1: Three of the *Cyrtandra* collections made on the trip. Photo: S. Barber

Acknowledgements

This fieldtrip was made possible with the generous support of the Davis Fund and the RBGE travel fund. Assistance in the field and, with obtaining all of the necessary permits and paperwork, was expertly provided by staff at the Indonesian Institute of Sciences, especially our counterparts, Abdulrokham Kartonegoro, Deden Girmansayah, Marlina Ardiyani and Prima Wahyu Kusuma.

References

Atkins, H.J., Bramley, G.L.C. & Clark, J.R. 2013. Current knowledge and future directions in the taxonomy of *Cyrtandra* (Gesneriaceae), with a new estimate of species number. *Selbyana* 31(2): 157—165

Atkins, H, Preston, J & Cronk, Q.C.B. 2001. A molecular test of Huxley's Line: *Cyrtandra* (Gesneriaceae) in Borneo and the Philippines. *Biological Journal of the Linnaean Society* 72: 143-159

Atkins, H & Cronk, Q.C.B. 2001. The genus *Cyrtandra* (Gesneriaceae) in Palawan, Philippines. *Edinburgh Journal of Botany* 58:(3): 443-458

Atkins, H.J. 2004. The *Gesneriaceae* of Sulawesi II: Seven new species of *Cyrtandra. Edinburgh Journal of Botany* 60(3): 305—321

Bone, R. & Atkins, H. 2013. Four new species of Cyrtandra (Gesneriaceae) from the Latimojong Mountains, South Sulawesi. *Edinburgh Journal of Botany* 70(3): 455-468
Bramley, G.L.C. & Cronk, Q.C.B. 2003. The *Cyrtandra* (Gesneriaceae) species of Mount Kerinci, Sumatra. *Harvard Pap. Bot*. 7(2): 407—421

Clark, J.R., Ree, R.H., Alfaro, M.E., King, M.G., Wagner, W.L. & Roalson, E.H. 2008. A comparative study in ancestral range reconstruction methods: retracing the uncertain histories of insular lineages. *Syst. Biol.* 57(5): 693—707

Clark, J.R., Atkins, H.J., Bramley, G.L.C., Jolles, D., Roalson, E.H. & Wagner, W.L. 2013. Towards a phylogenetically-informed taxonomic revision of *Cyrtandra* (Gesneriaceae) in the Solomon Islands. *Selbyana* 31(2):

Clarke, C.B. 1883. Cyrtandreae. Pp 1—303. In: de Candolle, A & C, Monographie Phanerogamarum, Vol. 5. G.Masson: Paris, France.

Frodin, D. 2001. Guide to standard floras of the world. Cambridge: CUP.

Margono, B.A. et al. 2012. Mapping and monitoring deforestation and forest degradation in Sumatra (Indonesia) using Landsat time series data sets from 1990 to 2010. *Environmental Research Letters* 7(3): 1—16

Skog, L.E. & J.K. Boggan. 2007. World Checklist of Gesneriaceae. Washington, DC: Dept. of Botany, Smithsonian Institution. http://botany.si.edu/Gesneriaceae/Checklist

Whitten, A.J. et al. 2000. The ecology of Sumatra. Yogyakarta: Gadjah Mada University Press.

Appendix 1: Provisional names of all plants collected on the trip.

SUBOE 1	*Cyrtandra rubrifolia*
2	*Cyrtandra pendula*
3	*Curcuma sumatrana*
4	*Begonia atricha*
5	*Cytrandra*
6	*Cyrtandra pendula*
7	*Sapotaceae*
8	*Epithema*
9	*Cytrandra*
10	*Cytrandra*
11	*Begonia atricha*
12	*Cytrandra*
13	*Cyrtandra dispar*
14	*Begonia aberrans*
15	*Didyssandra sp*
16	*Cyrtandra cf. picta*
17	*Didyssandra sp*
18	*Cyrtandra sp*
19	*Cyrtandra sp*
20	*Cyrtandra cf. sandei*
21	*Begonia aberrans*
22	*Begonia stictopoda*
23	*Begonia aberrans*
24	*Stauranthera caerula*
25	*Cyrtandra cf. peltata*
26	*Liebigia*
27	*Begonia longifolia*
28	*Cyrtandra pendula*
29	*Cytrandra cf sandei*
30	*Rynchoglossum obliquum*
31	*Begonia stictopoda*
32	*Epithema*
33	*Begonia cf trichopoda*
34	*Epithema*
35	*Begonia cf trichopoda*
36	*Liebigia*
37	*Liebigia*
38	*Commelina*
39	*Globba*
40	*Vittaria*
41	*Cyrtandra*
42	*Arthromeris*

43	*Cytrandra pendula*
44	*Rynchoglossum obliquum*
45	*Impatiens*
46	*Epithema*
47	*Stauranthera caerula*
48	*Amorphophallus titanum*
49	*Begonia inversa*
50	*Streptocarpus sumatranus*
51	*Amorphophallus titanum*
52	*Epithema saxatile*
53	*Pyrrosia*
54	*Paraboea rufescens*
55	*Elaphoglossum*
56	*Begonia atricha*
57	*Liebigia*
58	*Monophylla*
59	*Selaginella*
60	*Begonia aff. areolata*
61	*Balanophora*
62	*Aeschynanthus lutea*
63	*Cyrtandra*
64	*Aglaonema*
65	*Scindapsus*
66	*fern*
67	*Leucostegia*
68	*Begonia kemumuensis*
69	*Loxonia cf. hirsuta*
70	*Cyrtandra*
71	*Macrolenes subulata*
72	*Cyrtandra*
73	*Liebigia*
74	*Begonia isoptera*
75	*Liebigia*
76	*Balanophora*
77	*Acanthaceae*
78	*Cyrtandra picta*
79	*Begonia scottii*
80	*Begonia scottii*
81	*Begonia areolata*
82	*Medinilla alpestris*
83	*Weinmannia sp.*
84	*Vaccinium lucidum*
85	*Litsea sp.*
86	*Agalmyla sp.*

87	*Polypodiaceae*
88	*Blechnum*
89	*Dipteris conjugata*
90	*Elaphoglossum*
91	*Rhododendron*
92	*fern*
93	*Cyrtandra*
94	*Aeschynanthus*
95	*Begonia isoptera*
96	*Cyrtandra*
97	*Begonia aff. trichopoda*
98	*Impatiens*
99	*Stauranthera*
100	*Amomum uliginosum*