

# FINAL REPORT

## ERIOCAULACEAE IN SOUTHERN LAO PDR

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## Eriocaulaceae in southern Lao PDR

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### Introduction

The Eriocaulaceae is a family of perennial or annual herbs with usually grass-like leaves. The family comprises 10 genera with around 1,300 species and is found mainly in tropical and subtropical regions, with most of its species occurring in South America and Africa. The family still needs much intensive investigation because information on it is based on a few, very incomplete studies (Dahlgren *et al.*, 1985). *Eriocaulon* L. contains 400 species almost all of which occur in tropical and subtropical areas of the world (Stützel, 1998). *Eriocaulon* is the only genus of the family present in Asia, (Phillips, 1997; Stützel, 1998).

The flora of Laos is very poorly known: there are very few taxonomic botanists present in the country and the national herbarium is both very small and poorly resourced. Most accounts of the flora of the country are very old, incomplete and out-of-date: the Eriocaulaceae are no exception. The species diversity of Eriocaulaceae in Laos, was first discussed 100 years ago in the Flora of Indochina by Lecomte (1912), who recorded 27 species, only three of which were found in Laos; namely *Eriocaulon alatum* Lecomte, *E. nautiliforme* Lecomte and *E. ubonense* Lecomte. Later, Zhang (1999) reported a further 2 species from Laos, *E. bassasense* Moldenke and *E. laosense* Moldenke.

Eriocaulaceae of Thailand has been revised and found that there were 45 taxa and 35 species present (Prajaksood, 2006): with 15 taxa including 8 species being new to science (Prajaksood *et al.*, 2012). Unfortunately the Eriocaulaceae of Laos has never been revised and it is clear based on Eriocaulaceae in Thailand that many species new to science will occur there. Preliminary scoping work began in Vientiane Capital, Lao PDR and 10 species were reported, and 5 of them were new records from Laos (Meesawat and Souladeth, 2012, Table 1). On this basis, we are sure that there are many more than 10 species found in Laos.

Unfortunately, the family has a little economic value, which is a prerequisite for local grant funding. Only two uses are known - firstly, the rigid scapes along with their attached inflorescences are often dyed and sold as ornamental everlastings (Heywood, 2007) and *Eriocaulon cinereum* R.Br. is used for its antiphlogistic and ophthalmic properties (Hooper, 1929; Keys, 1976). The project formed the core of a Taxonomic Revision of Eriocaulaceae in Laos and was a co-operative project between National University of Laos, Lao PDR and Khon Kaen University, Thailand.

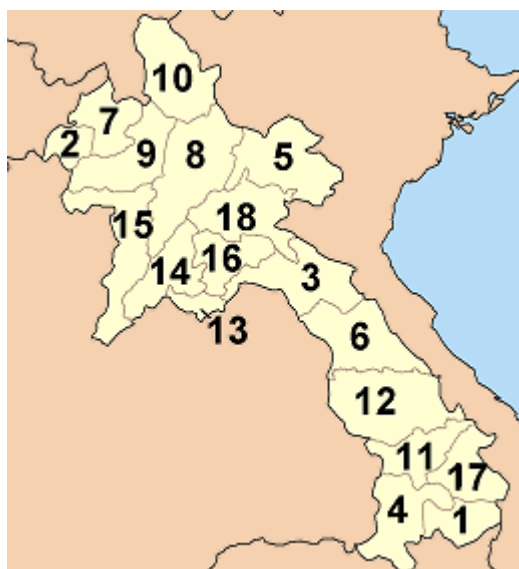
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## Materials and methods

The field-study was undertaken on 21 - 26 October 2013 throughout 4 provinces of southern Lao PDR, including : Champasak, Khammouan, Savannakhet and Salavan (Figure 1; number 4, 6, 11 and 12). The collections of material, identification and collections of material for subsequent DNA analysis were made. Specimens were kept in the National Herbarium of Lao PDR (NUoL) as well as Herbarium, Royal Botanic Garden Edinburgh, U.K. (E) and Khon Kaen University Herbarium (KKU).



**Figure 1** Eighteen Provinces in Laos

1. Attapu (Attapeu)
  2. Bokeo
  3. Bolikhamxai (Bolikhamsai)
  4. Champasak (Champasack)
  5. Houaphan (Houaphanh)
  6. Khammouan (Khammuane)
  7. Loung Namtha
  8. Louangphabang (Luang Prabang)
  9. Oudomxai (Oudomxay)
  10. Phongsali (Phongsaly)
  11. Salavan (Saravan)
  12. Savannakhet
  13. Vientiane Prefecture and Vientiane Capital (municipality)
  14. Vientiane Province
  15. Sainyabuli (Xaignabouli, Saiyabouly)
  16. Xaisomboun (special administrative zone, dissolved in 2006)
  17. Sekong (Xekong)
  18. Xiangkhoang (Xieng Khouang)
- ([http://en.wikipedia.org/wiki/Provinces\\_of\\_Laos](http://en.wikipedia.org/wiki/Provinces_of_Laos))

**Table 1** Eriocaulaceae from Vientiane Capital, Lao PDR  
(From Meesawat and Souladeth, 2012).

No.	Taxa	New Record
1	<i>Eriocaulon cinereum</i> R.Br.	
2	<i>E. echinulatum</i> Mart.	
3	<i>E. hamiltonianum</i> Mart.	✓
4	<i>E. laosense</i> Moldenke	
5	<i>E. nepalense</i> var. <i>luzulaefolium</i> Praj. & J.Parn.	✓
6	<i>E. phuphanoides</i> Praj. & J.Parn.	✓
7	<i>E. setaceum</i> L.	
8	<i>E. thailandicum</i> Moldenke	✓
9	<i>E. truncatum</i> Buch.-Ham. ex Mart.	
10	<i>E. zollingerianum</i> Körn.	✓

## Results

Eighteen taxa of Eriocaulaceae have been found from four provinces of southern Laos including 14 species and 3 varieties (Figure 2). Two of which have been proved to be new to science (Table 2). The most species diverse for *Eriocaulon* L. in the study areas is Salavan province.

**Table 2** The Species diversity in each province of southern Lao PDR (1 = Champasak, 2 = Khammouan, 3 = Savannakhet, 4 = Salavan, ✓ = present, and × = absent).

No.	Taxa	Province			
		1	2	3	4
1	<i>Eriocaulon cinereum</i> R.Br.	✓	×	×	✓
2	<i>E. echinulatum</i> Mart.	✓	✓	✓	✓
3	<i>E. hamiltonianum</i> Mart.	✓	✓	✓	✓
4	<i>E. infirmum</i> Steud.	×	×	✓	✓
5	<i>E. nautilifome</i> Lecomte	✓	×	×	✓
6	<i>E. nautiliformoides</i> Praj. & J.Parn.	×	×	×	✓
7	<i>E. nautiliformoides</i> var. <i>hexagynum</i> Praj. & J.Parn.	×	×	×	✓
8	<i>E. phuchongense</i> Praj. & J.Parn.	✓	×	×	×
9	<i>E. phuphanoides</i> Praj. & J.Parn.	×	×	✓	✓
10	<i>E. siamense</i> var. <i>hexagynum</i> Praj. & J.Parn.	✓	×	✓	×
11	<i>E. smitinandii</i> Moldenke	×	×	✓	✓
12	<i>E. thailandicum</i> Moldenke	×	×	✓	×
13	<i>E. truncatum</i> Buch.-Ham. ex Mart.	✓	×	✓	✓
14	<i>E. truncatum</i> var. <i>florensense</i> Z.X.Zhang	✓	×	✓	✓
15	<i>E. xeranthemum</i> Mart.	✓	×	×	×
16	<i>E. zollingerianum</i> Körn.	✓	✓	✓	✓
17	<i>E. sp. 1</i> (Souladeth et al. 311)	×	×	✓	×
18	<i>E. sp. 2</i> (Souladeth et al. 314)	×	✓	×	×
	<b>Total (taxa)</b>	<b>10</b>	<b>4</b>	<b>11</b>	<b>12</b>



(A) *Eriocaulon nautilifome* Lecomte



(B) *Eriocaulon smitinandii* Moldenke



(C) *Eriocaulon xeranthemum* Mart.



(D) *Eriocaulon zollingerianum* Körn.

**Figure 2** Some species of Eriocaulaceae found in southern Lao PDR

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## A BRIEF FINANCIAL REPORT

Receiving 28,600 Baht from IAPT on 09/04/2013

Field work in 2013	Cost	Total (Baht)	Balance (Baht)
Receiving from IAPT	-	28,600	28,600
Car rental in Lao PDR 21-26 October 2013 (include petrol)	6 days @5,000 Baht per day	30,000	-1,400

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(Assoc. Prof. Dr. Narumon Sangpradub)  
Head of Biology Department  
Faculty of Science, Khon Kaen University

Date: *30 October 2013*  
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*A. Prajaksod*  
.....  
(Asst. Prof. Dr. Amornrat Prajaksod)  
Awardee, Staff of Biology Department  
Faculty of Science, Khon Kaen University

Date: *30 October 2013*  
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Lao's People Democratic Republic  
Peace Independence Democracy Unity and Prosperity

TS Car Rental Services  
Thongkang Village, Sisatanak District,  
Vientian Capital Lao PDR.  
Tel: 020 22222005, 99999005

**RECEIPT**

No: 00210  
Date: 21-Oct-2013

ນາມ ມ :

ລດ No	ລາຍການ Decription	ຈຳນວນ Quantity	ລາຄາ U.Price	ຈຳນວນເງິນ Amount
1)	Car rental in Lao 21 to 26 Oct 2013 Minibus, Car No: 7748  21 - 26 Oct 2013, Vientiane Capital to Savannakhet - Pakse - Salavan and Come back to Vientiane Capital	6	5,000	30,000

**PAID**  
( 26 OCT 2013 )

Received by:

TOTAL

**THB 30,000**

