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原著論文

Collaborative Exploration of *Sorghum*, *Zea*, *Saccharum* and Their Relative Wild Genetic Resources in Laos, January, 2011

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Summary

The National Institute of Agrobiological Sciences (NIAS), Japan and the Rice and Cash Crop Research Center (RCCRC), National Agriculture and Forestry Research Institute (NAFRI), Lao People's Democratic Republic (Lao PDR) have collaborated since 2006 to survey plant genetic resources under the Memorandum of Agreement (MOA). The fourth collaborative mission to explore and collect genetic resources in Laos was conducted on *Sorghum*, *Zea*, *Saccharum* and their relative wild species on 18th-30th January in 2011. The main objectives of this study were to conserve genetic resources of Millets such as *Sorghum*, *Maize*, *Saccharum*, *Erianthus*, and *Miscanthus*. Along with these species, *Setaria italica*, *Eleusine coracana*, and *Sclerostachya fusca* were also our objectives. During the survey, Vientiane, Luang Namtha, Phongsaly, Luang Prabang and Phonsavan were explored.

A total of 2 of *Sorghum bicolor*, 1 of *Setaria italica*, 1 of *Eleusine coracana*, 10 of *Zea mays*, 6 of cultivar *Saccharum* species, 17 of *S. spontaneum*, 33 of *Erianthus procerus*, 6 of *E. arundinaceus*, 11 of *E. longesetosus*, 8 of *Miscanthus floridulus*, 4 of *Sclerostachya fusca* and, 1 of (cf) *Rhynchosia* spp. were investigated and collected. Then, total 100 genetic resource samples were investigated and collected from the explored regions.

The collections are planned to grow to record their growth behaviors, response to environmental conditions or diseases in the experimental field of NAFRI in Lao PDR in order to share and preserve these genetic resources in both countries.

Introduction

The National Institute of Agrobiological Sciences (NIAS), Japan and the Rice and Cash Crop Research Center (RCCRC), National Agriculture and Forestry Research Institute (NAFRI), Lao People's Democratic Republic (Lao PDR) have collaborated since 2006 to survey plant genetic resources under the Memorandum of Agreement (MOA). This report describes the first survey trip to investigate and collect Millets and *Erianthus* genetic resources in Laos.

Today, bio-ethanol is considered to be the most important renewable fuel to replace the fossil source. However, there is concerning about increase of the bio-ethanol production may result increased food prices due to the large amount of arable land required for conventional crops grown for human consumption and feeds. Millets such as *Sorghum* are thought to be the best genetic resources for this purposes, however, the possible accession in Laos is very limited, so that, survey of Millets in Laos is challenging but required. On the other hand, sugarcane is also hopeful for this purpose in tropical region. Therefore, to increase the sugarcane productivity will be the most important key to reduce the concerns. And, to increase the productivity of sugarcane can be achieved through introduction of new strains into the conventional sugarcanes to improve resistance of diseases, drought and low temperature condition. Although wild relatives of sugarcane, such as *Erianthus*, *Miscanthus* and *Sclerostachya* are abundantly distributed in Laos, their traits have not been still properly evaluated. Therefore, it is expected to be found high genetic variation of sugarcane in this country.

One aspect of this report is to summarize the preliminary field survey on wild sugarcane relatives including *Saccharum spontaneum*, *Erianthus* spp., *Miscanthus floridulus*, and *Sclerostachya fusca* in the regions of Vientiane, Luang Namtha, Phongsaly, Luang Prabang and Phonsavan.

Survey Methods

The itinerary of the survey is shown in Table 1. The survey routes and collection sites are shown in Fig. 1 and Table 1. The survey was conducted according to the planed regions as follows: Vientiane (Zone I), Luang Namtha (Zone II), Phongsaly and Oudomxai (Zone III), Luang Prabang (Zone IV) and Phonsavan (Zone V). A rental car was used to all field survey. Landscape of survey sites, information of investigated and collected sample traits, such as plant height, basal stem diameter, length of panicle or flower were recorded. Sample collections were conducted, and their pictures were taken as much as possible. The taxonomic concept of *Erianthus* Secrt. Ripidium proposed in Tagane *et al*. (in press), was accepted in the present study.

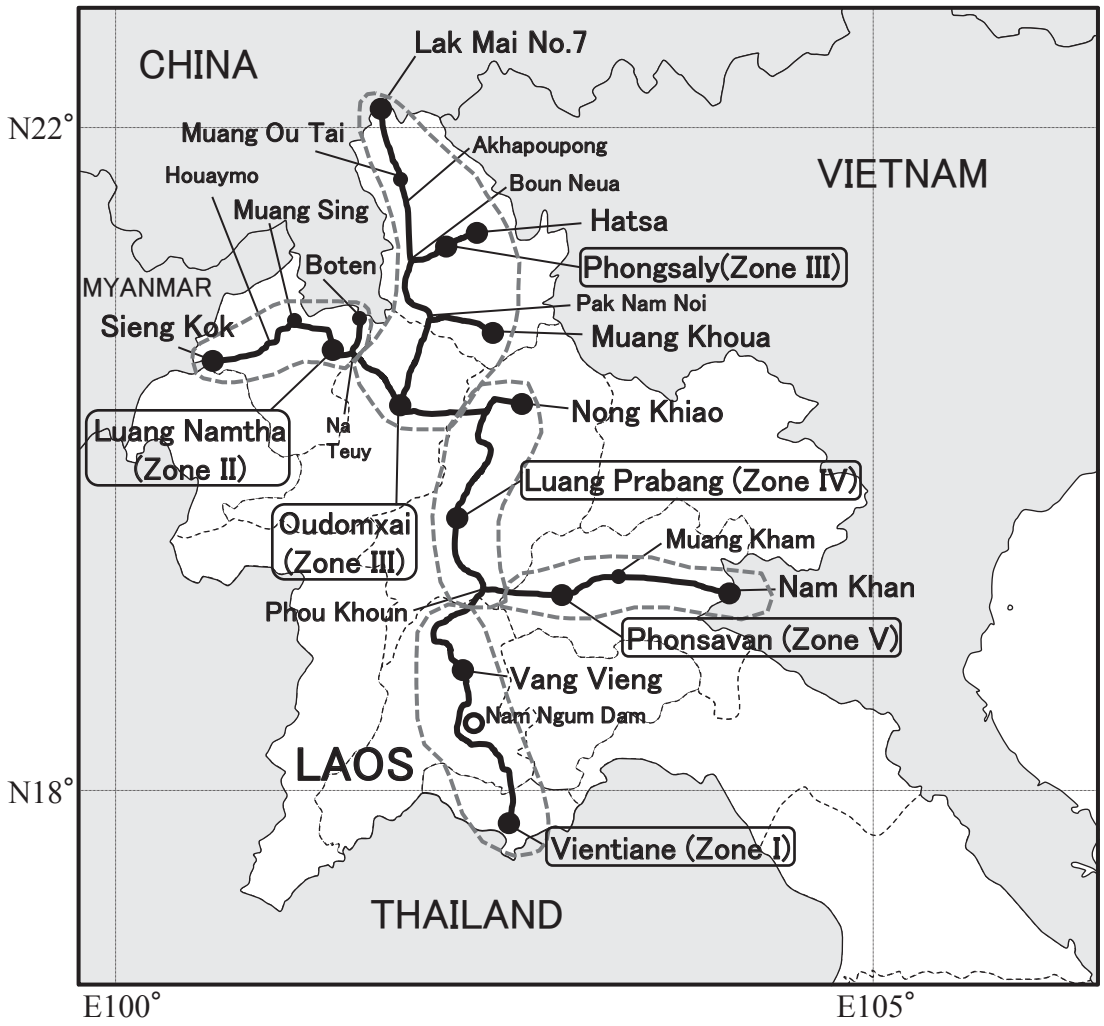

Fig. 1. Survey routes and major sites in Lao PDR

Results

1. Vientiane and surrounding area (Zone I)

(18th-19th January, 2011)

On 16th January, survey mission arrived in Vientiane and divided into two groups in order to use the occasion effectively. The group 1, with the Lao project participants visited the Rice and Cash Crop Research Center (RCCRC) on 17th and 18th, and the Vientiane JICA office on 18th to collect information and visited the Ministry of agriculture and Forestry (MAF) on 19th. And, group 1 started to carry out survey and collection in Zone I in the Vientiane region from 18th. As shown in Table 2, E. arundinaceus (L1) was found on the Mekong river bank near the Wattay International Airport and E. procerus (L2) was growing wild along the route to the RCCRC, outside of Vientiane (see Photos 1 and 2). On the other hand, the group 2 which rented a car from 18th to travel from Vientiane to Luang Namtha (ZoneII) in the northern Laos. The car route distance was about 700 km (Fig. 1). Then, both groups joined at Airport of Luang Namtha.

Table 1. Itinerary of the survey in northern Lao PDR, 2011

day	M/DD*		Exploring activities	Moving km	Stay town
1	1/16	Sun	Depart Japan and arrive in Lao PDR		Vientiane (Zone I)
2	1/17	Mon	Visit RCCRC		Vientiane (Zone I)
3	1/18	Tue	Visit RCCRC and JICA		Vientiane (Zone I)
4	1/19	Wed	Visit Ministry of Agriculture and Forestry, and go to Luang Namtha.		Luang Namtha (Zone II)
5	1/20	Thu	Luang Namtha←→Sieng Kok (1way=130.8km)	260	Luang Namtha (Zone II)
6	1/21	Fri	Luang Namtha→(East)→Oudomxai (109.8km)	110	Oudomxai (Zone III)
7	1/22	Sat	Oudomxai→(North)→Phongsaly (216km)	216	Phongsaly (Zone III)
8	1/23	Sun	Phongsaly to Boun Neua with China border (188.9km)	370	Boun Neua (Zone III)
9	1/24	Mon	Phongsaly→(South)→Oudomxai (109.8km)	110	Oudomxai (Zone III)
10	1/25	Tue	Oudomxai→Luang Prabang (187.2km)	187	Luang Prabang (Zone IV)
11	1/26	Wed	Rest and collection checking at Luang Prabang	0	Luang Prabang (Zone IV)
12	1/27	Thu	Luang Prabang→(East)→Phonsavan (232.9km)	233	Phonsavan (Zone V)
13	1/28	Fri	Phonsavan←(East)→Nam Khan (129.8km)	130	Phonsavan (Zone V)
14	1/29	Sat	Phonsavan→(South West)→Vang Vieng(217.7km)	218	Vang Vieng (Zone I)
15	1/30	Sun	Vang Vieng→(South)→Vientiane (155.8km)	156	Vientiane (Zone I)
16	1/31	Mon	Collection checking and transplanting		Vientiane (Zone I)
17	2/1	Tue	Collection checking and depart to Japan via Bang Kok (BKK)		
18	2/2	Wed	Arrive in Japan		

*M/DD for month/day.

Table 2. Results of survey in Lao PDR, 16th-30th, January, 2011

No.	Genus	Species	Accessions	Notes
1	*Sorghum*	*bicolor*	2	Cultivar
2	*Setaria*	*italica*	1	Cultivar
3	*Eleusine*	*coracana*	1	Cultivar
4	*Zea*	*mays*	10	Cultivar
5	*Saccharum*	*officinarum*	6	Sugarcane cultivar
6	*Saccharum*	*spontaneum*	17	Wild
7-1	*Erianthus*	*procerus*	33	Wild
7-2	*Erianthus*	*arundinaceus*	6	Wild
7-3	*Erianthus*	*longesetosus*	11	Wild
8	*Miscanthus*	*floridulus*	8	Wild
9	*Sclerostachya*	*fusca*	4	Wild
10	cf. *Rhynchosia*	spp.	1	Wild
	Total		100	

2. Luang Namtha and surrounding areas (Zone II)

(19th - 21st January, 2011)

Survey mission stayed overnights on 19th and 20th in Luang Namtha which is the center of Zone II. The survey on this zone was started from 19th to 21st from Luang Namtha. One cultivar, 'Vadilla', of *S. officinarum* (L3) was found in a market of this town. Then, the mission moved by car from Luang Namtha to Sieng Kok situated on the Mekong river border with Myanmar in the region known as the Golden Triangle of Indochina on 20th January. The recorded distance between Luang Namtha and Sieng Kok was about 131 km. The survey was started from Sieng Kok back towards Luang Namtha. On the way, 3 of *S. officinarum* (L11 to L13) and 3 of *S. spontaneum* (L5, L7 and L15), 4 of *E. procerus* (L4, L6, L9 and L14), 2 of *E. longesetosus* (L8 and L10) and 1 of *M. floridulus* (L16) were found.

The cane of 'Vadilla' (L3) found in Luang Namtha market, showed dark purple color. This plant is used as ornamental plant at the occasion of important ceremonies and seemed to be able to use as a medical plant. Other three *S. officinarum* varieties of L11to L13 were found at Houaymo village on the way back to Muang Sing from Sieng Kok which is a mid-point between Luang Namtha and Sieng Kok. The pictures of these plants are shown in Photos 3, 4 , 9 and 10 for *S. officinarum*.

The *S. spontaneum* (L5, L7 and L15) were found on the way between Sieng Kok and Muang Long (Photo 5). Four *E. procerus* (L4, L6, L9 and L14) were found on the way between Muang Long (Photo 6, 8, ,11, 14 and 15).

The local name of *Erianthus procerus* (L4) is "Oi Lau" with "Oi" meaning sugarcane and "Lau", the local name for the *Erianthus*. The local name for wild sugarcane is "Oi Nu" meaning "rat sugarcane". The "Oi Lau" is for the flower cotton. This name of "Oi", the cane sugar is well known to the people in the region because in the region bordering with Vietnam North is called "Na Noi Oi Nu" meaning "the land of wild sugarcane". It is a historical spot because the Lao people believe that their legendary king reached into Laos at there (Berval 1959). The two collections of *E. procerus* (L22 and L24), 5 of *Zea mays* (L17 ~ L21) and *E. longesetosus* (L23) were obtained on the way from Luang Namtha - Na Teuy - Boten in the north. Boten is a gateway to Yunnan, China.

The 2 *E. longesetosus* of L8 and L10 (Photo 7 and 17) were found on the way between Sieng Kok to Muang Sing while L23 was found along the route from Luang Namtha to Na Teuy which is a turning point towards Boten and Oudomxai.

The M. floridulus (L16, Photo 12) was found on the way between Muang Sing and Luang Namtha, the center of Zone II while 5 *Zea mays* from L17 to L21 (Photo 13) were found in the suburbs of Luang Namtha city. It seemed that Luang Namtha and Muang Sing are the main producing districts of the sugarcane brought to the Chinese sugar factories in Muang La, Yunnan, China.

On the way from Luang Namtha to Oudomxai, *E. procerus* (L25) and *E. longesetosu* (L26) and *M. floridulus* (L27, Photo 16) were found.

The sugarcane grown in these districts in Laos are seemed to include the thin type of cane (Simmonds, 1976) which meets to the sugar production procedure in Chinese factories in Yunnan. Therefore, the old type of canes may be discarded away as less-economic genetic

resources and they will be missing in the future if we do not preserve them.

3. Phongsaly and surrounding areas (Zone III)

(22nd-25th January, 2011)

We tripped from Oudomxai via Pak Nam Noi where is a mid-point from Oudomxai to Phongsaly in the north. The distance from Oudomxai to Phongsaly was 216 km. On the way at Pak Nam Noi, we turned left to Boun Neua. We arrived at this town where is a turning point to Phongsaly and Hatsa to the northeast, then we went up to this town. We arrived in Hatsa. After investigation and collection of two samples (L37 and L38), we moved to back to Phongsaly. We moved to Akhapoupong via Boun Neua. After finding of L39, L40 and L41, we moved to Muang Ou Tai where we got samples of L42 and L43. After that we moved to Lak Mai No.7 where is a gateway into Yunnan, China. We obtained on a sample (L44). The picture of these accessions are Photo 19 for *E. arundinaceus* and Photo 20 for *E. procerus*.

The landscape is formed with high mountain pikes. Crops, mainly upland rice are carried by horses through mountainous path.

We departed from Phongsaly straightly to Muang Khoua in the east towards a region, Na Noi Oi Nu bordering with Vietnam North.

On the way from Oudomxai to Hat-En where is the mid-point to Pak Nam Noi *E. longesetosus* and *S. spontaneum* were found (Photo 18). Pak Nam Noi is the border point between Zone II and Zone III of the Phongsaly province.

On the way, *E. arundinaceus* (L31 and L47), *M. floridulus* (L32, L40 and L49), *E. procerus* (L33 with Photo 20, L34, L38, L42, L44 and L46), *E. longesetosus* (L36 with Photo 21 and L50), and *S. spontaneum* (L35, L37, L43 with Photos 22 and 23, L45 and L48) were found. According to the villagers in the region, they use the inflorescence of *Erianthus* as sponges for cushions and mattress. About 2,000 inflorescences were harvested and stored at his house. It seemed that the goods are produced for family use, but not for marketing. Many of the farmers in this county are living on self-consumption. Local people said that the dried florescence of *Erianthus* was also used for the same purpose instead of cotton or kapok in other district of Lao, but very little is known about the *Erianthus* cotton. *Erianthus* is C4 plant of higher biomass productivity. Other related picture is Photo 24 for *E. arundinaceus* in this survey zone.

4. Luang Prabang and surrounding areas (Zone IV)

(25th- 27th January, 2011)

The mission started the survey in zone IV where is a mountainous region, named Phou Khoun bordering with zone III. In the region, *Sorghum. bicolor* (L65 with Photo 33), *Setaria italica* (L66 with Photo 34), *Eleusine coracana* (L67 with Photo 35), *Zea mays* (L55, Photos 26 and 32, L60 with Photo 30, L62 to L64), *S. officinarum* (L61 with Photo 31), *S. spontaneum* (L51 with Photo 25 and L57 with Photo 29), *E. procerus* (L54, L56 with Photo 28, L58, L59, L68 and L71 with Photo 36), *E. arundinaceus* (L52) and *M. floridulus* (L69) were found. Photo 27 is about interview to the local people.

5. Phonsavan and surrounding areas (Zone V)

(27th-29th January, 2011)

We then moved to Zone V. One way distance between Luang Prabang and Phonsavan was about 232 km, and 218 km from there to the next city, Vang Vieng.

In the zone V, *S. bicolor* (L80 with Photo 37), *S. officinarum* (L81), *S. spontaneum* (L73, L74 and L79), *E. procerus* (L72, L75, L77, L86 and L87), *E. arundinaceus* (L82 and L83), *E. longesetosus* (L85) and *M. floridulus* (L78) were found.

S. bicolor (L80), *S. officinarum* (L81), and *E. arundinaceus* (L82 and L83) were found along the route No. 7 from Muang Kham towards Nam Khan.

S. spontaneum (L73, L74 and L79) were found along the route No. 7 from Phou Khoun towards Nam Khan.

E. procerus (L72, L75 and L77) were found along the route No. 7 from Phou Khoun to Muang Kham, and L86 was found along the route No. 7 from Muang Kham towards Nam Khan. L87 was found along the route No. 7 from Phou Khoun towards the Vang Vieng (Zone I).

E. longesetosus (L85) was found at few kilometers to the border with Vietnam. *M. floridulus* (L78) was found along the route No. 7 from Phonsavan to Muang Kham.

6. Vientiane North and surrounding areas (Zone I)

(29th- 30th January, 2011)

The mission moved from Phonsavan to Phou Khoun and from there towards Vang Vieng on 29th, to get into the northern part of the zone I. The surveyed distance from Vang Vieng to Vientiane was about 156 km. The survey was going on up to 30th January. *S. spontaneum* (L89, L91 and L98), *E. procerus* (L88, L90, L93, L94 and L99 with Photo 40), *Sclerostachva fusa* (L95 with Photo 39 and L100) and (cf) *Rhynchosia* spp (L92 with Photo 38) were found.

Two *S. spontaneum* (L89 and L91) and Three *E. procerus* (L88, L90 and L94) were found along the route No. 13 from Phou Khoun towards Vientiane.

Discussions

The centre of origin of the sugarcane (*Saccharum*) is thought to be New Guinea (Simmonds, 1976). It is considered to be transmitted from the South via Indochina into the southern part of China (Simmonds, 1976). Therefore, it seemed that there is also a great number of wild sugarcane relatives such as *Erianthus* in Laos.

The major investigation and collections in this survey were:

1. *Sorghum bicolor* (Total collection was 2 accessions: L65, L80) (Photos 33 and 37).

Two collections of a cultivar of *S. bicolor* (L65 and L80) were collected from a farmer's market and garden in Luang Prabang region. There was no any information from the farmer who is a mountainous ethnic tribe, when the local staff asked to him by questioning about the presence of any other sorghum cultivar. The failure of the questionnaire might be due to linguistic problem. The Lao name of sorghum might be different in the regions or ethnic groups. Therefore, the picture of panicle is essential to seek minor millets in ethnic region.

2. *Staria italica* (L66).

S. Italica (Photo 34) was found in the Luang Prabang region (Zone IV). The panicle of it was conical shape and the panicle length was 40cm. It was provided with S. bicolor and *E. coracana*.

3. *Eleusine coracana* (L67).

E. coracana (Photo 35) was found in the Luang Prabang region (Zone IV) with *S. bicolor* and *S. italica*. The length of strait panicle was 15 cm.

4. *Zea mays* (Total collection was 10 accessions: L17, L18, L19, L20, L21, L55, L60, L62, L63 and L64).

Five accessions (L17 ~ L21) of *Z. mays* were found in the Luang Namtha region (Zone II). The other collections (L55, L60, L62, L63 and L64) are from the Luang Prabang region (Zone IV). There was one sample (L55) of dent corn in them. It is generally used for animals, mainly pig, but it is not certain whether it is also used for human foods. Another species showed grains of different colors, black and white on small size panicles. They look old landraces. (Photos 13, 26, 30 and 32).

5. *Saccharum officinarum* and *Saccharum* spp. (Total collection was 6 accessions: L3, L11, L12, L13, L61 and L81).

'Vadilla', a black type of cultivar *Saccharum officinarum* were found at the market in Luang Namtha (L11~13, Photos 3 and 4). It is not for sugar production, but used as an ornamental and a medical plant. According to Okada and Mitsuhashi (2002), the cane is boiled to extract sugar and other substances to use as healthy drink, containing vitamins B1, B2 and B6 along with many other functional substances. Same species of them, L61 was found in Luang Prabang (Zone IV) and L81 in Xieng Khouang (Zone V) (Photos 9, 10 and 31).

6. *Erianthus* species (Total collection was 50 accessions: L1, L2, L4, L6, L8~ L10, L14, L22~ L26, L28, L29, L31, L33, L34, L36, L38~ L40, L42, L44, L46, L47, L50, L52~ L54, L56, L58, L59, L68, L70~ L72, L75~ L77, L82, L83, L85~ L88, L90, L93, L94, and L99) (Table 3). As shown in Table 3, 66% of the 50 *Erianthus* accessions were the E. procerus and *E. arundinaceus* and *E. longesetosus* were 12% and 22%, respectively.

The wild species of *Erianthus* are of rare genus and are therefore important for conservation and study of genetic resources. They were classified as one group differently from *Saccharum*, *Miscanthus* and *Sclerostachya*. Most of them found along the survey routes were wild. However, we found the *Erianthus* was grown and the inflorescence of it was harvested at the slope near the cultivation field of rice and mustard. The inflorescence was needed to make a sponge for cushion and mattress.

6-1. *E. procerus* (Total collection was 33 accessions: L2, L4, L6, L9, L14, L22, L24, L25, L28, L33, L34, L38, L39, L42, L44, L46, L53, L54, L56, L58, L59, L68, L71, L72, L75, L77, L86, L87, L88, L90, L93, L94 and L99).

This species was found in the most widely and abundantly in where part of northern Laos,

Table 3. Content of the *Erianthus* collection species

Zones	Zone I	Zone II	Zone III	Zone IV	Zone V
Center city	Vientiane	Luang Namtha	Phongsaly and Oudomxai	Luang Prabang	Phonsavan
E. procerus	L2, L88, L90, L93, L94, L99	L4, L6, L9, L14, L22, L24	L33, L34, L38, L39, L42, L44, L46	L53, L54, L56, L58, L59, L68, L71, L87	L25, L28, L72, L75, L77, L86
E. arundinaceus	L1		L31		L47, L52, L82, L83
E. longesetosus		L8, L10, L23	L36, L40	L70	L26, L29, L50, L76, L85

except some part. The habitat is mainly dry land, mountain area and hill slopes (Photo 2).

6-2. *E. arundinaceus* (Total collection was 6 accessions: L1, L31, L47, L52, L82 and L83) (Photo 24).

This species was found only in the wet enveirnment such as streambed and riverbank, and didn't grew in the dry land.

6-3. *E. longesetosus* (Total collection was 11 accessions: L8, L10, L23, L26, L29, L36, L40, L50, L70, L76 and L85) (Photo 7).

This species was normally found in the disturbed slope along the road, in the mountainous area. We couldn't see this species around Vientiane area (Zone I).

7. *Saccharum spontaneum* (Total collection was 17 accessions: L5, L7, L15, L30, L35, L37, L43, L45, L48, L51, L57, L73, L74, L79, L89, L91 and L98) (Photo 18).

This species was usually found in wet area such as riverbed and dike of paddy field. They are planned to grow in the same field for *Erianthus* in RCCRC with similar growing method and management as *Erianthus*.

8. *Miscanthus floridulus* (Total collection was 8 accessions: L16, L27, L32, L41, L49, L69, L78 and L84) (Photo 16).

They were found at high elevation area (400m~) in Laos. We never found this species in Zone I.

9. *Sclerostachya fusca* (Total collection was 4 accessions: L95, L96, L97 and L100) (Photo 39).

They were found sporadically in the swamp or flooding area around Vientiane, Zone I.. The flowering season has already finished in January and thought to be July -October.

10. (cf.) *Rhynchosia* spp (L92).

This sample was found in Zone I of the Vientiane province. It is a wild type. Sample seeds and

flowers as herbarium were collected (Photo 38).

Acknowledgements

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和文摘要

本報告は，独立行政法人農業生物資源研究所ジーンバンクとラオス農林省（MAF）・国立農林研究所（NAFRI）傘下の稲・換金作物研究センター（RCCRC）の間で 2006 年に締結した共同研究協定（MOA）に基づいて行われた 2010 年度ジーンバンク事業のラオス人民民主共和国における植物遺伝資源調査報告である．調査は第四回の共同調査活動として 2011 年 1 月 18 日～ 1 月 30 日に，ビエンチャン地区，ルアンナムタ地区，ポンサリ地区，ルアンパバン地区およびポンサヴァン地区の 5 つの地区で実施された．

今回の調査の主な目的は雑穀とエリアンサスの現地調査であったが，ほかにトウモロコシ，サトウキビ，ススキ及びその近縁種も対象とした．合計 100 点について生息地での調査を行ったほか，種子及び栄養体の茎，株も採取した．これらのうち種子は十分乾燥させた後，5℃の RCCRC 種子庫で保存した．また，エリアンサスは共同研究機関である RCCRC の圃場で保存する計画である．

Table 4. A passport data of collected materials.

No.	JP No.	Coll. No.	Coll. Date (Jan)	Species name	Status*1)	Local name	Sample*2)	Locality (Province, Village)	Latitude	Longitude	Altitude (m)	Condition*3)	Collection	Remarks
L1	243682	2011 Lao001	18	*Erianthus arundinacerus*	1	-	In	Vientiane	N17-58-124	E102-33-50.5	166	2-2-1-1-3	Vegetative	Plant length including flower (panicle) : 2 m
L2	243683	2011 Lao002	18	*Erianthus procerus*	1	-	In	Vientiane, Phailom	N18-4-49.1	E102-24-11.2	173	3-1-1-4-1	Vegetative	Plant length including flower (panicle) : 3.5 m Basal stem diameter : 15 mm
L3	243684	2011 Lao003	19	*Saccharum officinarum*	4	Vadilla	In	Luang Namtha, Agricultural Market	N20-59-51.7	E102-24-22.9	544	3-1-2-N-3	Vegetative	Plant length including flower (panicle) : 2 m Basal stem diameter : 340 mm
L4	243685	2011 Lao004	20	*Erianthus procerus*	1	Oi Lau	In	Luang Namtha, Xiengkok, Mai	N20-53-56.5	E100-38-33.1	426	5-2-2-2-3	Both	Plant length including flower (panicle) : 5.3 m Basal stem diameter : 17 mm
L5	243686	2011 Lao005	20	*Saccharum spontaneum*	1	-	In	Luang Namtha, Xiengkok, Mai	N20-53-56.5	E100-38-33.1	430	5-2-2-2-3	Vegetative	Plant length including flower (panicle) : 0.84 m
L6	243687	2011 Lao006	20	*Erianthus procerus*	1	Oi Lau	In	Luang Namtha, Samphan Mai	N20-55-50.5	E100-44-26.2	552	5-2-2-3-3	Both	Plant length including flower (panicle) : 6.45 m Basal stem diameter : 17 mm Flower (panicle) length : 1.05 m
L7	243688	2011 Lao007	20	*Saccharum spontaneum*	1	-	In	Luang Namtha, Tao Home	N20-56-31.4	E100-45-45.9	513	5-1-1-1-3	Both	Plant length including flower (panicle) : 1.83 m Basal stem diameter : 7 mm Flower (panicle) length : 0.53 m
L8	243689	2011 Lao008	20	*Erianthus longesetosus*	1	-	In	Luang Namtha, Houa Khoa	N20-58-2.8	E100-50-47.5	523	5-2-3-4-3	Both	Plant length including flower (panicle) : 3.7 m Basal stem diameter : 8 mm Flower (panicle) length : 0.7 m
L9	243690	2011 Lao009	20	*Erianthus procerus*	1	-	In	Luang Namtha, Chak Ham Ping	N20-59-17.5	E100-53-43.3	552	5-1-2-3-2	Both	Plant length including flower (panicle) : 7.5 m Basal stem diameter : 17 mm Flower (panicle) length : 1.0 m
L10	243691	2011 Lao010	20	*Erianthus longesetosus*	1	-	In	Luang Namtha, Chak Ham Ping	N20-59-17.5	E100-53-43.4	552	5-1-2-3-2	Vegetative	Plant length including flower (panicle) : 4.7 m Basal stem diameter : 12 mm Flower (panicle) length : 0 m
L11	243692	2011 Lao011	20	*Saccharum officinarum*	4	-	In	Luang Namtha, Houaymo	N21-0-58.1	E100-56-43.9	579	5-1-1-2-2	Vegetative	Basal stem diameter : 27 mm
L12	243693	2011 Lao012	20	*Saccharum officinarum*	4	-	In	Luang Namtha, Houaymo	N21-0-58.1	E100-56-43.9	579	5-1-1-2-2	Vegetative	Basal stem diameter : 19 mm
L13	243694	2011 Lao013	20	*Saccharum officinarum*	4	-	In	Luang Namtha, Houaymo	N21-0-58.1	E100-56-43.9	579	5-1-1-2-2	Seed	
L14	243695	2011 Lao014	20	*Erianthus procerus*	1	-	In	Luang Namtha, Muang Long	N21-8-34.6	E101-11-4.2	705	5-2-2-2-3	Both	Plant length including flower (panicle) : 3.9 m Basal stem diameter : 18 mm Flower (panicle) length : 0.7 m
L15	243696	2011 Lao015	20	*Saccharum spontaneum*	1	-	In	Luang Namtha, Muang Long	N21-8-34.6	E101-11-4.2	705	5-1-2-2-3	Vegetative	Plant length including flower (panicle) : 1.9 m Basal stem diameter : 8 mm
L16	243697	2011 Lao016	20	*Miscanthus. floridulus*	1	-	In	Luang Namtha, Muang Long	N21-8-34.6	E101-11-4.2	705	5-1-2-3-2	Both	Plant length including flower (panicle) : 4.9 m Basal stem diameter : 9 mm Flower (panicle) length : 1.0 m
L17	243698	2011 Lao017	20	*Zea mays*	4	Sa Loi	In	Luang Namtha, Night Market	N21-0-10.7	E101-24-35.1	566	3-1-1-2-3	Seed	Plant length including flower (panicle) : 1.0 - 2.0 m Basal stem diameter : 15 mm
L18	243699	2011 Lao018	21	*Zea mays*	4	-	In	Luang Namtha, Thong Chai	N21-59-59.7	E101-24-50.7	560			Plant length including flower (panicle) : 1.0 - 2.0 m Basal stem diameter : 15 mm

Table 4 (Continued).

No.	JP No.	Coll. No.	Coll. Date (Jan)	Species name	Status*1)	Local name	Sample*2)	Locality (Province, Village)	Latitude	Longitude	Altitude (m)	Condition*3)	Collection	Remarks
L19	243700	2011 Lao019	21	*Zea mays*	4	-	In	Luang Namtha, Thong Chai Thai	N20-59-59.7	E101-24-50.7	560			Plant length including flower (panicle) : 1.0 - 2.0 m Basal stem diameter : 15 mm
L20	243701	2011 Lao020	21	*Zea mays*	4	-	In	Luang Namtha, Thong Chai Thai	N20-59-59.7	E101-24-50.7	560			Plant length including flower (panicle) : 1.0 - 2.0 m Basal stem diameter : 15 mm
L21	243702	2011 Lao021	21	*Zea mays*	4	-	In	Luang Namtha, Thong Chai Thai	N20-59-59.7	E101-24-50.7	560			Plant length including flower (panicle) : 1.0 - 2.0 m Basal stem diameter : 15 mm
L22	243703	2011 Lao022	21	*Erianthus porcerus*	1	-	In	Luang Namtha, KM 17	N20-59-59.1	E101-30-47.6	612	5-1-3-3-2	Both	Plant length including flower (panicle) : 4.7 m Basal stem diameter : 15 mm Flower (panicle) length : 1.0 m
L23	243704	2011 Lao023	21	*Erianthus longesetosus*	1	-	In	Luang Namtha, KM 17	N20-59-59.1	E101-30-47.6	612	5-2-4-4-2	Vegetative	Plant length including flower (panicle) : 1.7 m Basal stem diameter : 6 mm Flower (panicle) length : 0.3 m
L24	243705	2011 Lao024	21	*Erianthus procerus*	1	-	In	Luang Namtha, Boten	N21-9-11.3	E101-40-20.4	805	5-1-3-2-3	Both	Plant length including flower (panicle) : 5.9 m Basal stem diameter : 24 mm Flower (panicle) length : 0.9 m
L25	243706	2011 Lao025	21	*Erianthus procerus*	1	-	In	Oudomxai, Keo Cheb	N20-51-39.0	E101-48-13.8	831	5-1-2-2-3	Both	Plant length including flower (panicle) : 5.0 m Basal stem diameter : 19 mm Flower (panicle) length : 0.8 m
L26	243707	2011 Lao026	21	*Erianthus longesetosus*	1	-	In	Oudomxai, Keo Cheb	N20-51-39.0	E101-48-13.8	831	5-2-4-3-2	Vegetative	Plant length including flower (panicle) : 1.5 m Basal stem diameter : 7 mm Flower (panicle) length : 0.5 m
L27	243708	2011 Lao027	21	*Miscanthus. floridulus*	1	-	In	Oudomxai, Keo Cheb	N20-51-39.0	E101-48-13.8	831	5-2-4-3-2	Vegetative	Plant length including flower (panicle) : 0.2 m Basal stem diameter : 4 mm
L28	243709	2011 Lao028	22	*Erianthus procerus*	1	-	In	Oudomxai, Samakkhixay	N20-46-15.4	E102-3-31.9	661	5-1-2-2-3	Both	Plant length including flower (panicle) : 6.3 m Basal stem diameter : 25 mm Flower (panicle) length : 1.0 m
L29	243710	2011 Lao029	22	*Erianthus longesetosus*	1	-	In	Oudomxai, Samakkhixay	N20-46-15.4	E102-3-31.9	661	5-2-2-3-3	Vegetative	Plant length including flower (panicle) : 4.2 m Basal stem diameter : 19 mm Flower (panicle) length : 0.3 m
L30	243711	2011 Lao030	22	*Saccharum spontaneum*	1	-	In	Oudomxai, Hat En	N20-52-30.0	E102-9-3.3	439	5-2-2-1-3	Vegetative	Plant length including flower (panicle) : 3.6 m Basal stem diameter : 9 mm Flower (panicle) length : 0.8 m
L31	243712	2011 Lao031	22	*Erianthus arundinaceus*	1	-	In	Phongsaly	N21-10-28.8	E102-7-3.7	797	6-1-2-2-3	Both	Plant length including flower (panicle) : 5.9 m Basal stem diameter : 15 mm Flower (panicle) length : 1.0 m
L32	243713	2011 Lao032	22	*Miscanthus. floridulus*	1	-	In	Phongsaly	N21-10-32.8	E102-7-5.4	818	6-2-2-3-2	Seed	Plant length including flower (panicle) : 5.3 m Basal stem diameter : 13 mm Flower (panicle) length : 0.7 m
L33	243714	2011 Lao033	22	*Erianthus procerus*	1	-	In	Phongsaly	N21-16-23.8	E102-2-35.3	1138	6-1-3-3-2	Both	Plant length including flower (panicle) : 5.2 m Basal stem diameter : 20 mm Flower (panicle) length : 0.7 m

Table 4 (Continued).

No.	JP No.	Coll. No.	Coll. Date (Jan)	Species name	Status*1)	Local name	Sample*2)	Locality (Province, Villege)	Latitude	Longitude	Altitude (m)	Condition*3)	Collection	Remarks
L34	243715	2011 Lao034	22	*Erianthus procerus*	1	-	In	Phongsaly	N21-26-48.3	E101-53-30.2	654	5-1-2-3-2	Both	Plant length including flower (panicle) : 5.2 m Basal stem diameter : 14 mm Flower (panicle) length : 1.2 m
L35	243716	2011 Lao035	22	*Saccharum spontaneum*	1	-	In	Phongsaly	N21-26-48.3	E101-53-30.2	654	5-2-2-3-2	Vegetative	Plant length including flower (panicle) : 2.6 m Basal stem diameter : 16 mm Flower (panicle) length : 0.8 m
L36	243717	2011 Lao036	22	*Erianthus longesetosus*	1	-	In	Phongsaly	N21-26-48.3	E101-53-30.2	654	5-1-2-2-3	Vegetative	Plant length including flower (panicle) : 1.4 m Basal stem diameter : 8 mm Flower (panicle) length : 0 m
L37	243718	2011 Lao037	22	*Saccharum spontaneum*	1	-	In	Phongsaly, Hatsa	N21-44-36.7	E102-11-49.1	426	2-1-2-1-2	Vegetative	Plant length including flower (panicle) : 2.4 m Basal stem diameter : 5 mm Flower (panicle) length : 0.4 m
L38	243719	2011 Lao038	22	*Erianthus procerus*	1	-	In	Phongsaly, Hatsa	N21-44-9.7	E102-11-28.4	631	4-1-3-3-1		Plant length including flower (panicle) : 8.1 m Basal stem diameter : 21 mm Flower (panicle) length : 1.8 m
L39	243720	2011 Lao039	23	*Erianthus procerus*	1	-	In	Phongsaly	N21-59-13.9	E101-53-7.9	724	5-2-3-3-1	Both	Plant length including flower (panicle) : 5.0 m Basal stem diameter : 13 mm Flower (panicle) length : 0.9 m
L40	243721	2011 Lao040	23	*Erianthus longesetosus*	1	-	In	Phongsaly	N21-59-13.9	E101-53-7.9	724	5-2-4-4-2	Both	Plant length including flower (panicle) : 5.0 m Basal stem diameter : 14 mm Flower (panicle) length : 0.4 m
L41	243722	2011 Lao041	23	*Miscanthus. floridulus*	1	-	In	Phongsaly	N21-59-13.9	E101-53-7.9	724	5-1-3-3-1	Both	Plant length including flower (panicle) : 2.5 m Basal stem diameter : 6 mm Flower (panicle) length : 0.5 m
L42	243723	2011 Lao042	23	*Erianthus procerus*	1	-	In	Phongsaly, Ou Tai	N22-5-42.3	E101-47-50.0	818	5-2-3-2-2	Both	Plant length including flower (panicle) : 5.9 m Basal stem diameter : 20 mm Flower (panicle) length : 0.9 m
L43	243724	2011 Lao043	23	*Saccharum spontaneum*	1	-	In	Phongsaly, Ou Tai	N22-7-7.5	E101-47-13.9	695	5-1-3-2-2	Vegetative	Plant length including flower (panicle) : 2.6 m Basal stem diameter : 5 mm Flower (panicle) length : 0.6 m
L44	243725	2011 Lao044	23	*Erianthus procerus*	1	-	In	Phongsaly, Dan Teuy	N22-26-18.9	E101-43-47.5	918	5-1-2-3-2	Both	Plant length including flower (panicle) : 3.9 m Basal stem diameter : 15 mm Flower (panicle) length : 0.5 m
L45	243726	2011 Lao045	24	*Saccharum spontaneum*	1	-	In	Phongsaly, Muang Khoua	N21-5-0.5	E102-30-17.2	343	2-2-2-1-3	Both	Plant length including flower (panicle) : 3.4 m Basal stem diameter : 8 mm Flower (panicle) length : 0.7 m
L46	243727	2011 Lao046	24	*Erianthus procerus*	1	-	In	Phong Saly, Cha Kout	N21-4-23.7	E102-22-33.0	388	5-1-3-2-3	Both	Plant length including flower (panicle) : 5.5 m Basal stem diameter : 15 mm Flower (panicle) length : 1.3 m
L47	243728	2011 Lao047	25	*Erianthus arundunaceus*	1	-	In	Oudomxai	N20-34-28.9	E102-8-1.5	824	2-1-2-3-2	Both	Plant length including flower (panicle) : 5.7 m Basal stem diameter : 16 mm Flower (panicle) length : 1.1 m
L48	243729	2011 Lao048	25	*Saccharum spontaneum*	1	-	In	Oudomxai	N20-34-28.9	E102-8-1.5	824	2-1-2-3-2	Both	Plant length including flower (panicle) : 3.1 m Basal stem diameter : 8 mm Flower (panicle) length : 0.5 m

Table 4 (Continued).

No.	JP No.	Coll. No.	Coll. Date (Jan)	Species name	Status[*1)]	Local name	Sample[*2)]	(Province, Villege)	Latitude	Longitude	Altitude (m)	Condition[*3)]	Collection	Remarks
L49	243730	2011 Lao049	25	*Miscanthus. floridulus*	1	-	In	Oudomxai	N20-34-28.9	E102-8-1.5	824	2-1-2-3-2	Both	Plant length including flower (panicle) : 2.8 m Basal stem diameter : 8 mm Flower (panicle) length : 1.0 m
L50	243731	2011 Lao050	25	*Erianthus longesetosus*	1	-	In	Oudomxai	N20-34-28.9	E102-8-1.5	824	2-1-2-3-2	Both	Plant length including flower (panicle) : 3.0 m Basal stem diameter : 9 mm Flower (panicle) length : 0.3 m
L51	243732	2011 Lao051	25	*Saccharum spontaneum*	1	-	In	Luang Prabang, Nong Khiao	N20-34-18.8	E102-36-54.7	340	2-1-1-1-3	Vegetative	Plant length including flower (panicle) : 2.9 m Basal stem diameter : 9 mm Flower (panicle) length : 0.2 m
L53	243734	2011 Lao053	25	*Erianthus procerus*	1	-	In	Luang Prabang	N20-32-14.9	E102-22-30.8	387	3-1-2-2-3	Both	Plant length including flower (panicle) : 7.2 m Basal stem diameter : 15 mm Flower (panicle) length : 1.0 m
L54	243735	2011 Lao054	25	*Erianthus procerus*	1	-	In	Luang Prabang	N20-32-14.9	E102-22-30.8	387	3-1-2-2-3	Both	Plant length including flower (panicle) : 6.8 m Basal stem diameter : 16 mm Flower (panicle) length : 1.0 m
L55	243736	2011 Lao055	25	*Zea mays*	4	-	In	Luang Prabang, Houana	N20-27-57.4	E102-20-16.4	407	5-1-2-N-2	Seed	Plant length including flower (panicle) : ~2.0 m
L56	243737	2011 Lao056	25	*Erianthus procerus*	1	-	In	Luang Prabang	N20-22-0.2	E102-23-10.1	352	5-1-3-2-3	Both	Plant length including flower (panicle) : 5.1 m Basal stem diameter : 18 mm Flower (panicle) length : 1.0 m
L57	243738	2011 Lao057	25	*Saccharum spontaneum*	1	-	In	Luang Prabang	N20-5-14.6	E102-15-50.6	290	2-1-4-1-2	Vegetative	Plant length including flower (panicle) : 2.6 m Basal stem diameter : 8 mm Flower (panicle) length : 0.6 m
L58	243739	2011 Lao058	25	*Erianthus procerus*	1	-	In	Luang Prabang	N20-5-13.1	E102-15-48.4	310	5-2-3-2-3	Both	Plant length including flower (panicle) : 4.1 m Basal stem diameter : 15 mm Flower (panicle) length : 0.5 m
L59	243740	2011 Lao059	27	*Erianthus procerus*	1	-	In	Luang Prabang	N19-44-37.6	E102-11-52.5	616	5-2-2-2-3	Both	Plant length including flower (panicle) : 6.5 m Basal stem diameter : 15 mm Flower (panicle) length : 1.0 m
L60	243741	2011 Lao060	27	*Zea mays*	4	-	In	Luang Prabang, Kiew Taloune (Hmong)	N19-34-50.6	E102-13-32.4	1332	5-2-2-2-3	Seed	
L61	243742	2011 Lao061	27	*Saccharum officinarum*	4	Gahchi	In	Luang Prabang, Kiew Taloune (Hmong)	N19-34-50.6	E102-13-32.4	1332	5-2-2-2-3	Vegetative	
L62	243743	2011 Lao062	27	*Zea mays*	4	Sali Khao	P	Luang Prabang, Kiew Taloune (Hmong)	N19-34-55.8	E102-13-44.7	1372	5-2-2-2-3	Seed	
L63	243744	2011 Lao063	27	*Zea mays*	4	Sali Luang	P	Luang Prabang, Kiew Taloune (Hmong)	N19-34-55.8	E102-13-44.7	1372	5-2-2-2-3	Seed	
L64	243745	2011 Lao064	27	*Zea mays*	4	Sali Dam	P	Luang Prabang, Kiew Taloune (Hmong)	N19-34-55.8	E102-13-44.7	1372	5-2-2-2-3	Seed	
L65	243746	2011 Lao065	27	*Sorghum bicolor*	4	Khao Fang / Kon Chuah	P	Luang Prabang, Kiew Taloune (Hmong)	N19-34-50.6	E102-13-32.4	1332	5-2-2-2-3	Seed	

Table 4 (Continued).

No.	JP No.	Coll. No.	Coll. Date (Jan)	Species name	Status[*1)]	Local name	Sample[*2)]	Locality (Province, Villege)	Latitude	Longitude	Altitude (m)	Condition[*3)]	Collection	Remarks
L66	243747	2011 Lao066	27	*Setaria Italica*	4	Chuda	P	Luang Prabang, Kiew Taloune (Hmong)	N19-34-50.6	E102-13-32.4	1332	5-2-2-2-3	Seed	Flower (panicle) length : 0.4 m
L67	243748	2011 Lao067	27	*Eleusine coracana*	4	Piang	In	Luang Prabang, Kiew Taloune (Hmong)	N19-34-50.6	E102-13-32.4	1332	5-2-2-2-3	Seed	Flower (panicle) length : 0.15 m
L68	243749	2011 Lao068	27	*Erianthus procerus*	4	-	In	Luang Prabang	N19-33-21.5	E102-14-51.2	1324	5-2-2-2-3	Both	Plant length including flower (panicle) : 5.0 m Basal stem diameter : 16 mm Flower (panicle) length : 0.7 m
L69	243750	2011 Lao069	27	*M. floridulus*	1	-	In	Luang Prabang	N19-33-21.5	E102-14-51.2	1324	5-2-2-2-3	Both	Plant length including flower (panicle) : 1.9 m Basal stem diameter : 7 mm Flower (panicle) length : 0.6 m
L70	243751	2011 Lao070	27	*Erianthus longesetosus*	1	-	In	Luang Prabang	N19-33-21.5	E102-14-51.2	1324	5-1-2-2-3	Both	Plant length including flower (panicle) : 4.5 m Basal stem diameter : 11 mm Flower (panicle) length : 0.5 m
L71	243752	2011 Lao071	27	*Erianthus procerus*	1	-	In	Luang Prabang, Phoukhoune	N19-26-15.0	E102-26-49.1	1299	5-2-2-2-3	Both	Plant length including flower (panicle) : 6.1 m Basal stem diameter : 30 mm Flower (panicle) length : 0.9 m
L72	243753	2011 Lao072	27	*Erianthus procerus*	1	-	In	Xieng Khouang, Namchat	N19-29-13.5	E102-43-17.7	789	2-1-3-2-2	Both	Plant length including flower (panicle) : 4.4 m Basal stem diameter : 13 mm Flower (panicle) length : 1.2 m
L73	243754	2011 Lao073	27	*Saccharum spontaneum*	1	-	In	Xieng Khouang, Namchat	N19-29-13.5	E102-43-17.7	789	2-1-3-2-2	Both	Plant length including flower (panicle) : 3.1 m Basal stem diameter : 8 mm Flower (panicle) length : 0.7 m
L74	243755	2011 Lao074	27	*Saccharum spontaneum*	1	-	In	Xieng Khouang	N19-31-18.3	E103-4-0.5	1020	2-2-4-1-2	Both	Plant length including flower (panicle) : 1.8 m Basal stem diameter : 5 mm Flower (panicle) length : 0.3 m
L75	243756	2011 Lao075	27	*Erianthus procerus*	1	-	In	Xieng Khouang	N19-31-18.3	E103-4-0.5	1020	2-2-4-4-2	Both	Plant length including flower (panicle) : 3.2 m Basal stem diameter : 12 mm Flower (panicle) length : 0.8 m
L76	243757	2011 Lao076	27	*Erianthus longesetosus*	1	-	In	Xieng Khouang	N19-31-20.1	E103-3-58.9	1029	5-2-4-4-3	Both	Plant length including flower (panicle) : 3.8 m Basal stem diameter : 11 mm Flower (panicle) length : 0.4 m
L77	243758	2011 Lao077	28	*Erianthus procerus*	1	-	In	Xieng Khouang	N19-36-24.1	E103-26-46.6	1037	6-2-2-2-3	Both	Plant length including flower (panicle) : 5.2 m Basal stem diameter : 12 mm Flower (panicle) length : 0.8 m
L78	243759	2011 Lao078	28	*Miscanthus. floridulus*	1	-	In	Xieng Khouang	N19-36-24.1	E103-26-46.6	1037	6-2-2-2-3		Plant length including flower (panicle) : 2.9 m Basal stem diameter : 9 mm Flower (panicle) length : 0.5 m
L79	243760	2011 Lao079	28	*Saccharum spontaneum*	1	-	In	Xieng Khouang	N19-35-24.1	E103-39-42.5	522	2-1-3-2-2	Both	Plant length including flower (panicle) : 2. 9m Basal stem diameter : 9 mm Flower (panicle) length : 0.5 m
L80	243761	2011 Lao080	28	*Sorghum bicolor*	4	Khao Fang / Kon Chuah	In	Xieng Khouang, Nam Kone Ngoua	N19-35-8.2	E103-44-32.8	839	5-2-3-2-3	Seed	Plant length including flower (panicle) : 2.5 m Flower (panicle) length : 0.5 m

Table 4 (Continued).

No.	JP No.	Coll. No.	Coll. Date (Jan)	Species name	Status[*1)]	Local name	Sample[*2)]	Locality (Province, Villege)	Latitude	Longitude	Altitude (m)	Condition[*3)]	Collection	Remarks
L81	243762	2011 Lao081	28	*Saccharum officinarum*	4	Oi Luang	In	Xieng Khouang, Nong Het	N19-29-45.9	E103-59-9.3	1406	5-2-3-2-3	Vegetative	
L82	243763	2011 Lao082	28	*Erianthus arundinacerus*	1	-	In	Xieng Khouang	N19-28-19.0	E104-5-2.1	1026	6-2-4-4-2	Vegetative	Plant length including flower (panicle) : 2.4 m Basal stem diameter : 24 mm
L83	243764	2011 Lao083	28	*Erianthus arundinacerus*	1	-	In	Xieng Khouang	N19-29-37.0	E104-1-21.0	1476	6-2-3-2-3	Both	Plant length including flower (panicle) : 5.0 m Basal stem diameter : 18 mm Flower (panicle) length : 0.8 m
L84	243765	2011 Lao084	28	*Miscanthus floridulus*	1	-	In	Xieng Khouang	N19-29-37.0	E104-1-21.0	1476	6-2-3-2-3	Vegetative	Plant length including flower (panicle) : 1.8 m Basal stem diameter : 6 mm Flower (panicle) length : 0.2 m
L85	243766	2011 Lao085	28	*Erianthus longesetosus*	1	-	In	Xieng Khouang	N19-29-37.0	E104-1-21.0	1476	6-2-4-4-3	Both	Plant length including flower (panicle) : 1.4 m Basal stem diameter : 6 mm Flower (panicle) length : 0.2 m
L86	243767	2011 Lao086	28	*Erianthus procerus*	1	-	In	Xieng Khouang	N19-30-3.3	E103-54-8.4	1298	5-2-3-3-3	Both	Plant length including flower (panicle) : 4.5 m Basal stem diameter : 10 mm Flower (panicle) length : 0.9 m
L87	243768	2011 Lao087	29	*Erianthus procerus*	1	-	In	Luang Prabang	N19-21-47.2	E102-25-24.7	961	5-1-4-4-3	Both	Plant length including flower (panicle) : 5.0 m Basal stem diameter : 18 mm Flower (panicle) length : 0.9m
L88	243769	2011 Lao088	29	*Erianthus procerus*	1	-	In	Vientiane	N19-14-46.7	E102-16-29.3	408	2-2-2-2-3	Both	Plant length including flower (panicle) : 7.3 m Basal stem diameter : 17 mm Flower (panicle) length : 2.0 m
L89	243770	2011 Lao089	29	*Saccharum spontaneum*	1	-	In	Vientiane	N19-14-46.7	E102-16-29.3	408	2-1-2-2-2	Vegetative	Plant length including flower (panicle) : 2.8 m Basal stem diameter : 8 mm Flower (panicle) length : 0.9 m
L90	243771	2011 Lao090	29	*Erianthus procerus*	1	-	In	Vientiane	N18-58-45.1	E102-26-55.2	249	2-1-3-2-3	Both	Plant length including flower (panicle) : 4.5 m Basal stem diameter : 13 mm Flower (panicle) length : 1.0 m
L91	243772	2011 Lao091	29	*Saccharum spontaneum*	1	-	In	Vientiane	N18-58-45.1	E102-26-55.2	249	2-1-3-1-3	Both	Plant length including flower (panicle) : 2.2m Basal stem diameter : 6mm Flower (panicle) length : 0.4m
L92	243773	2011 Lao092	29	*cf. Rhynchosia*	1	-	In	Vientiane	N18-58-45.1	E102-26-55.2	249	2-1-3-2-3	Seed	Herbarium sample
L93	243774	2011 Lao093	30	*Erianthus procerus*	1	-	In	Vientiane	N18-48-6.8	E102-38-32.6	425	4-2-3-2-3	Both	Plant length including flower (panicle) : 5.5m Basal stem diameter : 17mm Flower (panicle) length : 1.2m
L94	243775	2011 Lao094	30	*Erianthus procerus*	1	-	In	Vientiane	N18-34-3.1	E102-21-43.0	208	3-1-2-2-3	Both	Plant length including flower (panicle) : 6.0m Basal stem diameter : 16mm Flower (panicle) length : 1.0m

Table 4 (Continued).

L95	243776	2011 Lao095	30	*Sclerostachya fusca*	1	-	In	Vientiane	N18-23-7.9	E102-30-6.6	166	1-1-1-2-3	Vegetative	Plant length including flower (panicle) : 1.8m Basal stem diameter : 5mm Flower (panicle) length : 0.3m
L96	243777	2011 Lao096	30	*Sclerostachya fusca*	1	-	In	Vientiane	N18-23-7.9	E102-30-6.6	166	1-1-1-2-3	Both	Plant length including flower (panicle) : 1.8m Basal stem diameter : 5mm Flower (panicle) length : 0.3m
L97	243778	2011 Lao097	30	*Sclerostachya fusca*	1	-	In	Vientiane	N18-23-7.9	E102-30-6.6	166	1-1-1-2-3	Vegetative	Plant length including flower (panicle) : 1.2m Basal stem diameter : 5mm
L98	243779	2011 Lao098	30	*Saccharum spontaneum*	1	-	In	Vientiane	N18-25-41.8	E102-32-24.8	154	2-2-2-2-3	Both	Plant length including flower (panicle) : 3.2m Basal stem diameter : 9mm Flower (panicle) length : 0.6m
L99	243780	2011 Lao099	30	*Erianthus procerus*	1	-	In	Vientiane, Sapheu	N18-18-9.4	E102-40-18.1	165	3-2-2-2-3	Both	Plant length including flower (panicle) : 4.9m Basal stem diameter : 16mm Flower (panicle) length : 1.2m
L100	243781	2011 Lao100	30	*Sclerostachya fusca*	1	-	In	Vientiane, None Tae	N18-7-41.7	E102-41-46.6	162	3-1-2-2-3	Vegetative	Plant length including flower (panicle) : 2.9m Basal stem diameter : 11mm

*1) 1; Wild, 4; Landrace

*2) In; Individual, P; Population (seeds)

*3) Topography-Site-Stoniness-Soil texture-Drainage

Topography 1; swamp, 2; flood plain, 3; plain level, 4; undulation, 5; hilly, 6; mountainous, 7; other (specify)

Site 1; level, 2; slope, 3; summit, 4; depression

Stoniness 1; none, 2; low, 3; medium, 4; rocky

Soil texture 1; sand, 2; loam, 3; clay, 4; silt, 5; highly organic

Drainage 1; poor, 2; moderate, 3; good, 4; excessive

Photo 1 *E. procerus* in Zone I (3519/L2)

Photo 2. Panicle of *E. procerus* in Zone I (3523/L2)

Photo 3 . Cane of *S. officinarum* in the market in Zone II (3611/L3)

Photo 4. Cane section of *S. officinarum* in the market in Zone II (3614/L3)

Photo 5 . *S. spontaneum* in Zone II (3689/L5)

Photo 6. *E. procerus* in Zone II (3712/L6)

Photo 7. Panicle of *E. longesetosus* in Zone II (3734/L8)

Photo 8. Panicle of *E. procerus* in Zone II (3742/L9)

Photo 9. *S. officinarum* in Zone II (3751/L11-13)

Photo 10. Panicle of *S. officinarum* in Zone II (3753/L13)

Photo 11. *E. procerus* in Zone II (3760/L14)

Photo 12. Panicle of *M floridulus* in Zone II (3767/L16)

Photo 13. *Zea mays* found in a market in Zone II (3772/L17-21)

Photo 14. *E. procerus* in Zone II (3788/L22)

Photo 15. *E. procerus* in Zone II (3805/L24)

Photo 16. Young plant of *M. floridulus* in Zone II (3822/L27)

Photo 17. *E. longesetosus* in Zone II (3858/L29)

Photo 18. Stalk of *S. spontaneum* in Zone II (3869/L30)

Photo 19. *E. arundinaceus* in Zone III (3887/L31)

Photo 20. *E. procerus* survey in Zone III (3909/L33)

Photo 21. *E. longesetosus* in Zone III (3950/L36)

Photo 22. *S. spontaneum* in Zone III (3971/L37)

Photo 23. *S. spontaneum* in Zone III (4063/L43)

Photo 24. Panicle of *E. arundinaceus* in Zone III (4233/L47)

Photo 25. *S. spontaneum* in Zone IV (4267/L51)

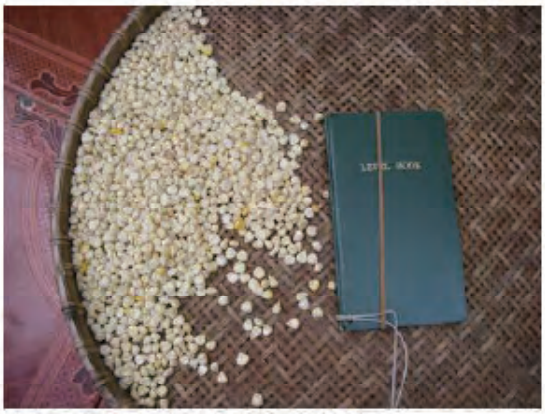

Photo 26. *Zea mays* in Zone IV (4291/L55)

Photo 27. Getting information from local people in Zone IV (4293/L55)

Photo 28. *E. procerus* in Zone IV (4296/L56)

Photo 29. *S. spontaneum* in Zone IV (4306/L57)

Photo 30. *Zea mays* in Zone IV (4397/L60)

Photo 31. Sections of *S. officinarum* in Zone IV (4400/L61)

Photo 32. *Zea mays* panicles in Zone IV (4401/L62-64)

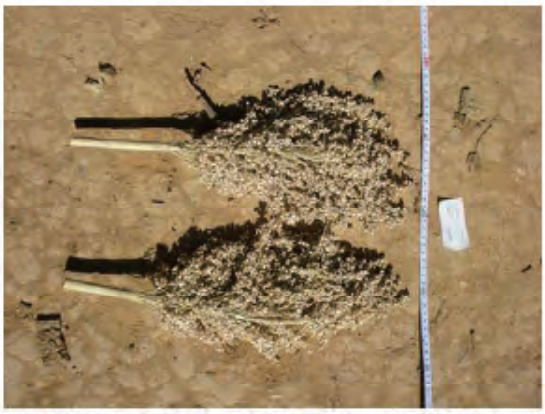

Photo 33. Panicles of *S. bicolor* in Zone IV (4411/L65)

Photo 34. Panicles of *Setaria italica* in Zone IV (4413/L66)

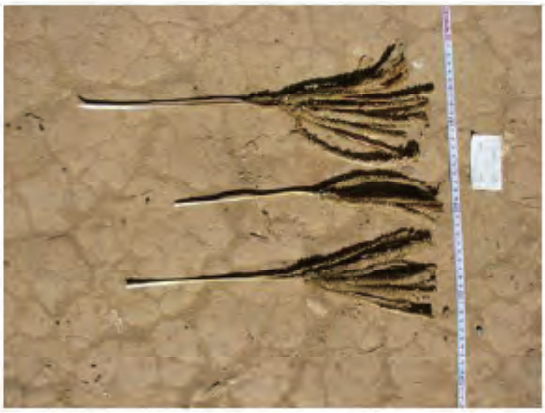

Photo 35. Panicles of *E. coracana* in Zone IV (4415/L67)

Photo 36. *E. procerus* in Zone IV (4449/L71)

Photo 37. Panicle of *S. bicolor* in Zone I (4527/L80)

Photo 38. Pods of cf. *Rhynchosia* in Zone I (4643/L92)

Photo 39. *Sclerostachya fusca* in Zone I (4672/L95)

Photo 40 . Hill of *E. procerus* in Zone I (4708/L99)