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Short Communication: Tidal swamp rice cultivars of South Kalimantan Province, Indonesia: A case study of diversity and local culture

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Abstract. *Mursyidin DH, Nazari YA, Daryono BS.2017. Tidal swamp rice cultivars of South Kalimantan Province, Indonesia: A case study of diversity and local culture.Biodiversitas 18: 427-432.*Traditional rice (*Oryza sativa* L.) cultivars may become an indispensable part of the local culture and traditions of rice-growing people across Asia over many generations. The existence of this germplasm in the tidal swamp area of South Kalimantan Province, Indonesia has been observed morphologically and showed a close relationship with the local culture. A total of forty (40) traditional rice cultivars with different morphological characteristics have been found in this country, and still preserved sustainable by the local farmers along with their local culture and traditions. The tradition of 'wadai 41' may become a good example for this relationship. In this tradition, some traditional foods are made by the local people and use some of the local rice as basic ingredients. This information may be useful as guidance for conservation and rice breeding programs in the future.

Keywords: *Oryza sativa*, genetic diversity, traditional cultivar, local culture, tidal swamp area

INTRODUCTION

Tidal swamp area of South Kalimantan Province, Indonesia is a habitation of various plant species, including traditional rice cultivars (Khairullah et al. 1998). Hundreds of this germplasm found in this region and some of them show important traits for future breeding (Wijaya et al. 2007). In general, traditional rice cultivar contained several important genes related to acidity tolerance, salinity, and metals contamination (Ogunbayo et al. 2007). Further, this germplasm is shaped for a long time by the interplay between farmer selection and adapted to the local conditions (Sanghera et al. 2013). Hence, its becomes an indispensable part of the local culture and traditions of rice-growing people across Asia over many generations (Thomson et al. 2009). However, most of this germplasm are not well-characterized and now being replaced (disappeared) by the adoption of high yielding varieties (HYVs) (Iskandar and Ellen 1999). Thus, various efforts to preserve, maintain, characterize, and improve this germplasm are important to be undertaken.

An intensive study concerning the impact of farmer practices on preservation, exchange, and continuing development of traditional rice cultivars will be the most important task to hold the rice breeding programs in the future (Ogunbayo et al. 2007). Similarly, a detailed study of the genetic diversity of this germplasm, particularly on a local scale is a significant means to hold the rice breeding programs as well (Thomson et al. 2009). Nevertheless, the complex interaction between rice diversity and human cultivation practices, including local culture and tradition are not being revealed. Thus, this study focused on explored and assessed the interaction between the rice diversity to the local culture or customs at a tidal swamp area of South Kalimantan Province, Indonesia. Consequently, the complex interaction between that diversity and their local cultures would be better understood.

In this study, we are interested in discussing several issues related to the complex interaction between rice diversity and their local cultures. Those issues are (i) How long rice germplasm in this region cultivated by the local people?; (ii) How these cultivars reflected the ethnic history, cultural preferences, and production practices by the local farmers?; (iii) Which specific characters of cultivars selectively maintained and valued by the local cultures?; How do farmers decide to cultivate this germplasm every year? Thus, our objectives studies were: (i) collected traditional rice cultivars from a tidal swamp area of South Kalimantan Province, Indonesia; (ii) gathered information from farmers concerning the meanings of the name, origin, and special use of cultivars related to the local culture and tradition; and (iii) characterized this germplasm based on morphological method.

MATERIALS AND METHODS

This study initiated by collecting samples from a tidal swamp rice-growing area in three regions of South Kalimantan Province, Indonesia, i.e. Barito Kuala, Banjar,

and Tanah Laut districts (Figure 1). Samples collection was conducted from March-April 2013 by random sampling method (Thomson et al. 2009). The trip started with down the road along the beach in two locations, Kurau and Bumi Makmur Sub-districts on the Tanah Laut District then continued to Aluh Aluh and Gambut Sub-districts on the Banjar District. Sample collection was conducted finally in Anjir Muara and Marabahan, two Sub-districts of Barito Kuala District (Figure 1, Table 1). The GPS coordinates recorded for each region sampling.

In each Sub-district, seed samples were collected directly from the rice field when farmers have harvested fresh seeds and identified each cultivar based on its appearance. Those samples also collected from farmers from bags of stored grain (old seeds). At the same time, farmers have interviewed to gather information about the origins, the name, and the special uses of those cultivars, for example for mixed foodstuff and occasions to use rice products, etc. All of the collected data were arranged and analyzed by the following procedure of Tun et al. (2006). The characteristics of each rice cultivars identified by using grain shape, including length, width and their grain ratio. Those samples then classified as *Indica*, *Japonica*, or *Javanica* rice (Zhang et al. 2011). Variation of endosperm type was also characterized based on the rice descriptors of IRRI (Tran et al. 2012).

RESULTS AND DISCUSSION

Results

A total of 40 traditional rice cultivars collected from a tidal swamp area of South Kalimantan Province, Indonesia (Figure 2). Those cultivars have a unique name, origins and morphological characteristics, as presented in Table 2. In general, this germplasm grouped into five main clusters, namely Siam, Unus, Pandak, Adil, and Bayar (Figure 3.A). The cultivars group of Siam and Unus were the dominants compared to others with the percentage of 55% and 21%, respectively.

Table 1. Coordinate sampling locations where traditional rice cultivars were collected, including six Sub-districts of three districts in a tidal swamp area of South Kalimantan Province, Indonesia.

Districts	Sub-districts	Longitude	Latitude
Barito Kuala	Marabahan	03º 04’ 29.4” S	114º 37’ 20.5 E
	Ajir Muara	03º 11 40.0” S	114º 30’ 53.9 E
Banjar	Aluh-Aluh	03º 27’ 21.5” S	114º 31’ 20.5 E
	Gambut	03º 26’ 40.7” S	114º 35’ 06.2 E
Tanah Laut	Kurau	03º 37’ 19.8” S	114º 37’ 22.5 E
	Bumi Makmur	03º 30’ 46.0” S	114º 37’ 43.4 E

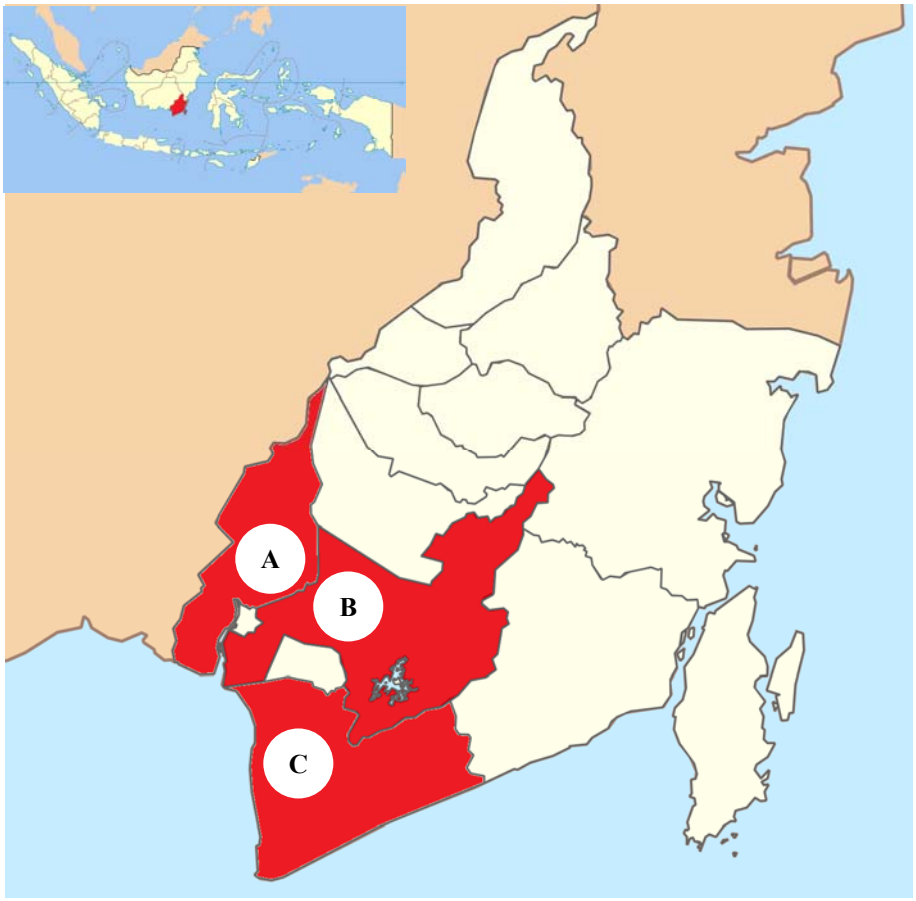

Figure 1. Sampling locations where traditional rice cultivars were collected, including six Sub-districts of three districts in a tidal swamp area of South Kalimantan Province, Indonesia. A. Barito Kuala, B. Banjar, C. Tanah Laut

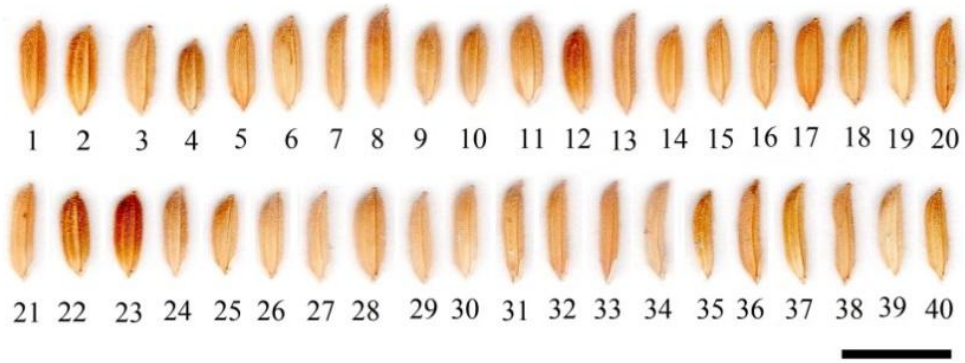

Figure 2. Grain features of forty (40) traditional rice cultivars collected from the tidal swamp area of South Kalimantan Province, Indonesia (Bar = 1 cm). Name of each cultivar are indicated in Table 2.

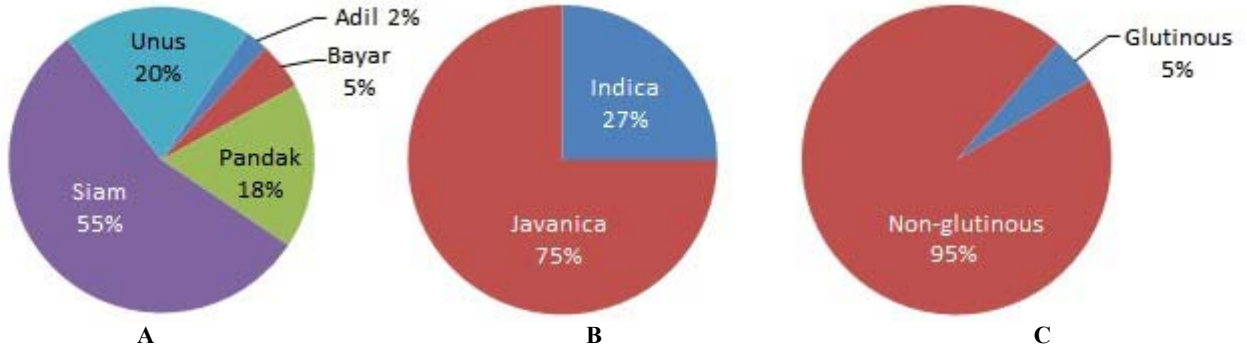

Figure 3. The percentage of cultivars group (A), sub-species (B), and endosperm type (C) of the traditional rice cultivars collected from the tidal swamp area of South Kalimantan Province, Indonesia

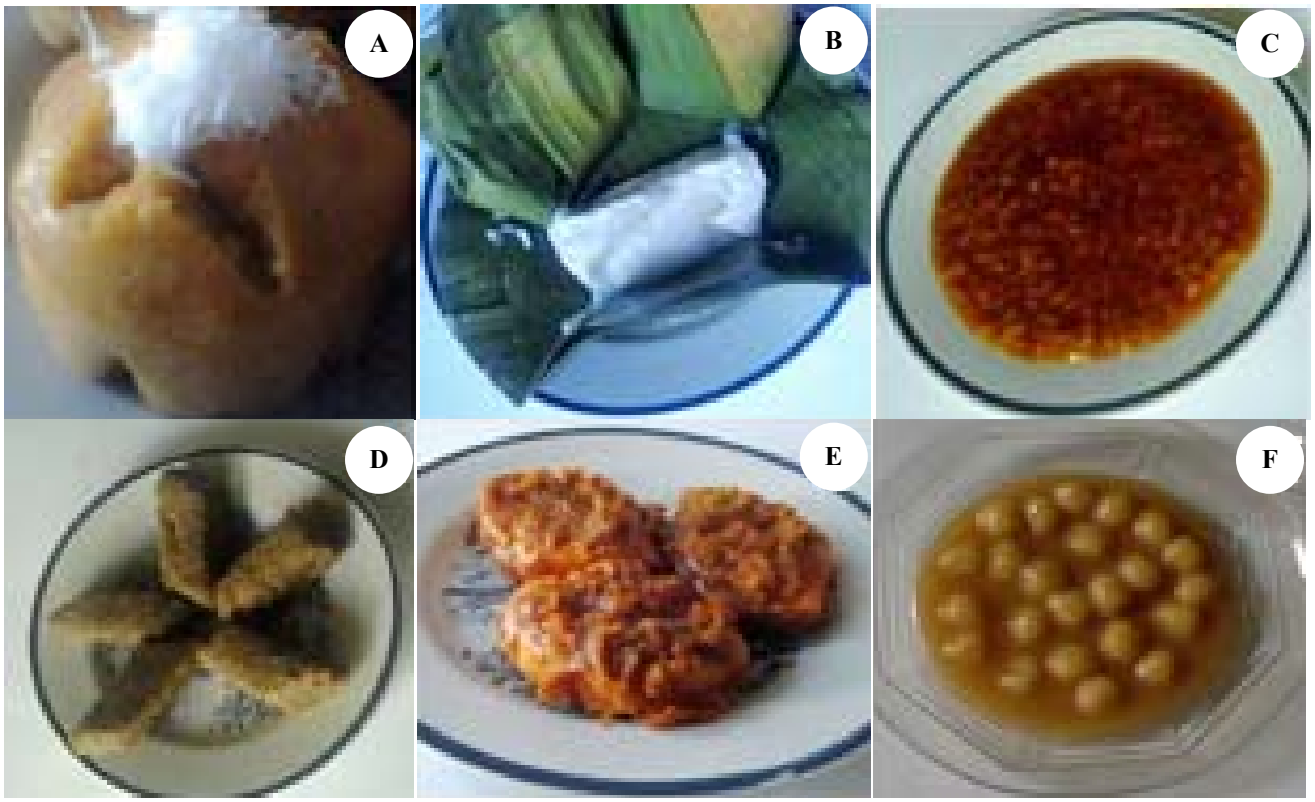

Figure 4. Six traditional food (cakes) examples made by the local people of South Kalimantan Province, Indonesia. A. Apam Habang, B. Babungku, C. Bubur Habang, D. Cingkaruk Putih, E. Gagatas Habang, F. Hintalu Karuang (Syarifuddin 2016)

Table 2. Traditional rice cultivars collected from a tidal swamp area of South Kalimantan Province, Indonesia in March-April 2013, and its morphological characteristics

Name of cultivars	Sampling locations		Group of cultivars	Seed Morphological Characteristics			Endosperm type	Sub-species
	Sub-district	District		Grain Lenght (mm)	Grain Width (mm)	Ratio of Grain Lenght/Width		
1. Adil Ganal	Aluh Aluh	Banjar	Adil	8.35 ± 0.20	2.25 ± 0.09	3.71	Non-glutinous	Javanica
2. Banih Kuning	Aluh Aluh	Banjar	Pandak	8.17 ± 0.27	2.82 ± 0.46	2.90	Non-glutinous	Javanica
3. Banih Putih	Aluh Aluh	Banjar	Pandak	8.35 ± 0.17	2.37 ± 0.09	3.52	Non-glutinous	Javanica
4. Bayar Papuyu	Aluh Aluh	Banjar	Bayar	7.38 ± 0.39	2.47 ± 0.13	2.99	Non-glutinous	Javanica
5. Bayar Putih	Aluh Aluh	Banjar	Bayar	8.15 ± 0.31	2.31 ± 0.18	3.53	Non-glutinous	Javanica
6. Ganal Perak	Aluh Aluh	Banjar	Pandak	7.42 ± 0.02	2.39 ± 0.07	3.04	Non-glutinous	Javanica
7. Karang Dukuh	Anjir Muara	Barito Kuala	Siam	8.88 ± 0.38	1.38 ± 0.10	6.43	Non-glutinous	Indica
8. Lakatan Wangi	Aluh Aluh	Banjar	Pandak	9.23 ± 0.19	2.05 ± 0.04	4.50	Glutinous	Javanica
9. Pandak Kambang	Aluh Aluh	Banjar	Pandak	6.46 ± 0.18	2.25 ± 0.07	2.81	Non-glutinous	Javanica
10. Pandak Laut	Aluh Aluh	Banjar	Pandak	6.41 ± 0.07	2.39 ± 0.27	2.92	Non-glutinous	Javanica
11. Pandak Putih	Aluh Aluh	Banjar	Pandak	7.87 ± 0.42	2.49 ± 0.07	3.16	Non-glutinous	Javanica
12. Siam Adil	Aluh Aluh	Banjar	Siam	8.27 ± 0.27	2.19 ± 0.11	3.78	Non-glutinous	Javanica
13. Siam Adus	Aluh Aluh	Banjar	Siam	9.10 ± 0.20	1.99 ± 0.10	4.57	Non-glutinous	Javanica
14. Siam Arjuna	Aluh Aluh	Banjar	Siam	6.86 ± 0.17	1.68 ± 0.18	4.43	Non-glutinous	Indica
15. Siam Babirik	Aluh Aluh	Banjar	Siam	6.42 ± 0.05	2.13 ± 0.09	3.11	Non-glutinous	Javanica
	Kurau	Tanah Laut						
	Bumi Makmur	Tanah Laut						
16. Siam Gadis	Kurau	Tanah Laut	Siam	7.59 ± 0.05	2.13 ± 0.01	3.56	Non-glutinous	Javanica
17. Siam Halus	Aluh Aluh	Banjar	Siam	9.24 ± 0.21	2.11 ± 0.05	4.38	Non-glutinous	Javanica
18. Siam Khaidir	Aluh Aluh	Banjar	Siam	6.74 ± 0.33	2.27 ± 0.08	2.89	Non-glutinous	Javanica
19. Siam Lakatan	Aluh Aluh	Banjar	Siam	9.47 ± 0.07	1.51 ± 0.09	6.27	Glutinous	Javanica
	Bumi Makmur	Tanah Laut						
20. Siam Oon	Gambut	Banjar	Siam	6.99 ± 0.57	1.68 ± 0.18	4.49	Non-glutinous	Javanica
21. Siam Orok	Gambut	Banjar	Siam	9.23 ± 0.19	2.05 ± 0.04	4.50	Non-glutinous	Javanica
22. Siam Pandak	Aluh Aluh	Banjar	Siam	8.15 ± 0.31	2.31 ± 0.18	3.53	Non-glutinous	Javanica
	Kurau	Tanah Laut						
23. Siam Pandak Kambang	Kurau	Tanah Laut	Siam	8.18 ± 0.21	2.35 ± 0.10	3.48	Non-glutinous	Javanica
24. Siam Perak	Aluh Aluh	Banjar	Siam	6.88 ± 0.15	2.07 ± 0.17	3.13	Non-glutinous	Javanica
25. Siam Puntal	Kurau	Tanah Laut	Siam	7.69 ± 0.26	1.97 ± 0,10	3.90	Non-glutinous	Javanica
26. Siam Randah	Kurau	Tanah Laut	Siam	7.70 ± 0.25	1.98 ± 0.09	3.89	Non-glutinous	Javanica
27. Siam Rukut	Gambut	Banjar	Siam	7.20 ± 0.32	1.59 ± 0.18	4.53	Non-glutinous	Indica
	Kurau	Tanah Laut						
	Bumi Makmur	Tanah Laut						
	Marabahan	Barito Kuala						
28. Siam Saba	Aluh Aluh	Banjar	Siam	8.74 ± 0.09	1.83 ± 0.01	4.78	Non-glutinous	Javanica
	Kurau	Tanah Laut						
29. Siam Sebelas	Marabahan	Barito Kuala	Siam	6.56 ± 0.06	1.67 ± 0.10	3.93	Non-glutinous	Javanica
30. Siam Tanggung	Aluh Aluh	Banjar	Siam	7.26 ± 0.37	1.89 ± 0.30	3.45	Non-glutinous	Javanica
31. Siam Unus	Aluh Aluh	Banjar	Siam	8.26 ± 0.36	2.00 ± 0.09	4.00	Non-glutinous	Javanica
32. Siam Unyil	Gambut	Banjar	Siam	6.91 ± 0.27	1.87 ± 0.09	3.82	Non-glutinous	Indica
33. Unus Jambun	Gambut	Banjar	Unus	7.90 ± 0.20	2.24 ± 0.11	3.53	Non-glutinous	Indica
34. Unus Jambun Putih	Gambut	Banjar	Unus	7.55 ± 0.46	1.62 ± 0.09	4.50	Non-glutinous	Indica
35. Unus Kuning	Gambut	Banjar	Unus	6.74 ± 0.22	1.62 ± 0.11	3.97	Non-glutinous	Indica
36. Unus Mayang	Aluh Aluh	Banjar	Unus	8.30 ± 0.19	1.50 ± 0.03	5.53	Non-glutinous	Indica
	Gambut	Banjar						
	Kurau	Tanah Laut						
	Bumi Makmur	Tanah Laut						
37. Unus Mayang Kuning	Bumi Makmur	Tanah Laut	Unus	8.25 ± 0.14	1.75 ± 0.09	4.55	Non-glutinous	Indica
38. Unus Mutiara	Kurau	Tanah Laut	Unus	9.37 ± 0.28	1.65 ± 0.52	5.68	Non-glutinous	Indica
	Bumi Makmur	Tanah Laut						
39. Unus Putih	Kurau	Tanah Laut	Unus	8.91 ± 0.50	1.85 ± 0.09	4.82	Non-glutinous	Javanica
40. Unus Saba	Anjir Muara	Barito Kuala	Unus	9.61 ± 0.14	1.55 ± 0.09	6.20	Non-glutinous	Javanica

Table 2. Traditional food (cakes) which made by the local people of South Kalimantan Province, Indonesia from traditional rice cultivar, both glutinous and non-glutinous rice

Name of traditional foods	Key ingredient
Apam Habang	Non-glutinous rice
Apam Putih	Non-glutinous rice
Bubur Habang	Non-glutinous rice
Bubur Putih	Non-glutinous rice
Bubur Baayak	Non-glutinous rice
Babungku	Non-glutinous rice
Babalungan Hayam	Glutinousrice
Cingkaruk Habang	Glutinousrice
Cingkaruk Putih	Glutinousrice
Cincin	Non-glutinous rice
Cucur Habang	Non-glutinous rice
Cucur Putih	Non-glutinous rice
Cucur Kuning	Non-glutinous rice
Dodol Habang	Glutinousrice
Dodol Putih	Glutinousrice
Gagatas Habang	Glutinousrice
Gagatas Putih	Glutinousrice
Hintalu Karuang	Glutinousrice
Kakulih Habang	Glutinousrice
Kakulih Putih	Glutinousrice
Kalalapun	Glutinousrice
Lakatan Putih Bahinti	Glutinousrice
Lakatan Kuning Bahintalu	Glutinousrice
Lamang	Glutinousrice
Lupis	Glutinousrice
Nasi Kuning Banjar	Non-glutinous rice
Papudak Baras	Non-glutinous rice
Papari	Glutinousrice
Putu Mayang	Non-glutinous rice
Roti Baras Habang	Non-glutinous rice
Roti Baras Putih	Non-glutinous rice
Surabi	Non-glutinous rice
Tapai Baras	Glutinousrice
Wajik	Glutinousrice

Based on interviews with the local farmers, most of the traditional rice cultivars were preferred by the local people to create a different type of traditional foods. Some of those traditional foods given in Table 2 and Figure 4. From Table 2, the glutinous and non-glutinous rice has been used extensively in those traditional foods.

Discussion

A total of 40 traditional rice cultivars collected from a tidal swamp area of South Kalimantan Province, Indonesia (Figure 2, Table 1). Most of those cultivars show a unique characteristic of the grain shape (Figure 2), indicating the high genetic diversity of the rice cultivars. From Figure 2, some cultivars have a long-slender grain (shown typically by Siam Unus and Siam Unyil cultivars), a long-thick grain (demonstrated clearly by Lakatan Wangi and Siam Lakatan), and an intermediate form (owned particularly by Bayar Papuyu and two Pandak cultivars). According to Grubben and Partohardjono (1996), cultivars with long-slender grain can be classified into Indica sub-species, while cultivars with long-thick grain into Javanica sub-species. Thus, from the morphological characterization (Table 1, Figure 2b), this germplasm can be classified into Javanica and Indica sub-species, where Javanica is more dominant to Indica. However, the cultivars with an intermediate form may confuse in their classification. Consequently, further verification through DNA analysis is required to reveal the genetic identity of this form.

According to Khairullah et al. (2008), most of the traditional rice cultivars from the tidal swamp area of South Kalimantan Province, Indonesia contained a high concentration of iron (Fe) and zinc (Zn). The content of Fe ranging from 11-83 ppm, whereas Zn from 20-108 ppm. Compared to one improved rice cultivar (IR66), this germplasm has higher levels of both Fe and Zn content. For example, Siam Pandak cultivar showed the higher Fe content than IR66, i.e. 83 ppm and 36 ppm, respectively. The cultivar of Siam Panangah is also higher in Zn content (108 ppm) than IR66 (36 ppm Zn) (Khairullah et al. 2008). This information is very useful for breeders who will develop new rice cultivars with high levels of Fe and Zn.

From a historical perspective, a local people of South Kalimantan Province, Indonesia, which dominated by Banjar tribes (Banjarese) have been known the traditional rice cultivars for a long time ago. Since 1920, the Banjarese has known Bayar as one of the tidal swamp rice in South Kalimantan (Idak 1982). A local people of this region has also been known three other cultivars besides Bayar, namely Lemo, Siam, and Pandak (Khairullah et al. 1998). Following the results (Table 1), Siam and Pandak are both the largest cultivars found in a tidal swamp area South Kalimantan Province, Indonesia. Following the results (Table 1), Siam and Pandak are both the largest cultivars found in a tidal swamp area South Kalimantan Province, Indonesia. In this study, we could not find Lemo cultivar, as reported by Khairullah et al. (1998), but find Adil cultivar, a new one. This event becomes interesting to study because it may reflect genetic erosion on one side and the genetic extension on the other side.

Based on historical reviews as well, most of the traditional rice cultivars are essential materials for daily meals and other traditional foods of Banjarese. In the culture of Banjarese, there is a unique local tradition related to the existence of local rice cultivars, namely the tradition of ‘Wadai 41’. In Banjarese language, ‘Wadai’ is mean snack or cakes, while the number of ‘41’ may address to the number of food or cakes which made by the local people. In this tradition, some traditional foods are made by the local people and use some of the local rice as basic ingredients (see Table 2). Some historians claim that 'wadai 41' is an old tradition before Islamic religion come to this region and originated from Hindu’s ritualism. The local people believe that this tradition can repel the demons. The traditional food also symbolized the spiritual values in their daily life. For example, white foods symbolize a kindness, while red symbolized a braveness (Syarifuddin 2016). Thus, we can infer that the existence of rice diversity is close related to the local cultures of the region.

In other parts of Indonesian country, typically in the western interior of Java Island, Iskandar and Allen (1999) studied intensively about the relationships between the

existence of traditional rice cultivar to the local culture of Baduy people. The results showed that the local tradition of Baduy people has a great contribution to the existence of this germplasm. Tunt et al. (2006) reported that traditional rice cultivar still conserved in Myanmar because of its diverse utilization of the local traditions. Rahman et al. (2006) and Umadevi et al. (2012) reported that traditional rice cultivar in India is maintained sustainably because of its potential benefits, such as medicinal and nutritional values. Thus, information related to this topics is important for breeders to make conclusions for conservation strategy and rice breeding program in the future.

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REFERENCES

Grubben GJH, Partohardjono S. 1996. Plant Resources of South-East Asia No. 10: Cereals. Prosea, Bogor.

Idak H. 1982. Development and history of rice fields in South Kalimantan. The Government of South Kalimantan Province, Indonesia, Banjarmasin. [Indonesian]

Iskandar J, Ellen R. 1999. In situ conservation of rice landraces among the Baduy of West Java. J Ethnobiol 19 (1): 97-125.

Khairullah I, Imberan M, Subowo S. 1998. Adaptability and acceptability of rice varieties on a tidal swamp area of South Kalimantan. Kalimantan Scientiae 47: 38-50. [Indonesian]

Khairullah I, William E, Nurtirtayani. 2008. Genetic potential of crops germplasm in swamps area. Indonesian Swampland Agriculture Reasearch Institute. [Indonesian]

Ogunbayo SA, Ojo DK, Popoola AR, Ariyo OJ, Sie M, Sanni KA, Nwilene FE, Somado EA, Guei RG, Tia DD, Oyelakin OO, Shittu A. 2007. Genetic comparison of landraces rice accessions by morphological and RAPDs techniques. Asian J Plant Scie 6 (4): 653-666.

Rahman R, Sharma MP, Sahai S.2006. Nutritional and meditional values of some indigenous rice varieties, Indian Journal of Traditional Knowledge 5(4): 454-458.

Sanghera GS, Kasyap SC, Parray GA. 2013. Genetic variation for grain yield and related traits in temperate red rice (*Oryza sativa* L.) ecotypes. Not Sci Biol 5 (iii): 400-406.

Syarifuddin R. 2016. Wadai 41, the tradition of Banjar people (Banjarese). http://kesultananbanjar.com [Indonesian]

Thomson MJ, Polato NR, Prasetiyono J, Trijatmiko KR, Silitonga TS, McCouch SR. 2009. Genetic diversity of isolated populations of Indonesian landraces of rice (*Oryza sativa* L.) collected in East Kalimantan on The Island of Borneo. Rice 2: 80-92.

Tran DS, Tran TTH, Nguyen TLH, Ha ML, Dinh BY, Kumamaru T, Satoh H. 2012. Variation on grain quality in Vietnamese rice cultivars collected from Central Vietnam. J Fac Agr Kyushu Univ 57 (2): 365–371.

Tun YT, Irie K, Sein T, Shirata K, Toyohara H, Kikuchi F, Fujiniaki H. 2006. Diverse utilization of Myanmar rice with varied amylose contents. Jpn J Trop Agr 50(1): 42-50.

Umadevi M, Pushpa R, Sampathkumar KP, Bhowmik D. 2012. Rice-traditional, medicinal plant in India, J Pharmacog Phytochem 1 (1): 6-12.

Wijaya, Bernard CH, Purnomo E, Hashidoko Y. 2007. Physico-chemical properties, sensory characteristics and glycemic index of tidal peat-swamp rice grown in South Kalimantan. ASEAN Food J 14 (1): 37-43.

Zhang P, Li J, Li X, Liu X, Zhao X, Lu Y. 2011. Population structure and genetic diversity in a rice core collection (*Oryza sativa* L.) investigated with SSR markers. PLoS ONE 6 (12). DOI: 10.1371/journal.pone.0027565.