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Species Diversity and Community Structure of Fruit Trees in *Pumonean* at Siberut, Mentawai Islands, Indonesia

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Abstract

The observation was conducted to investigate the species diversity and composition structure of indigenous fruit trees on pumonean (growing fields resembling forests) belonging to the local community of Mentawai. Data were collected from the Village Matotonan of District of South Siberut and the Village Bojakan of District of North Siberut using the quadrat method, which were randomly selected and inventory the fruit tree species within are plots. All trees with diameter at breast height (1.2m) of ≥ 8cm were identified. The contribution of families (relative abundance) and the Importance Value Index of the fruit tree species were calculated using standar formula The results show that in *pumonean* were found 14 families, 18 genera and 24 tree species. The high relative abundance of family is found in Euphorbiaceae, Bombacaceae and Meliaceae, which is 12.50%. In general the status of the 15 species of fruit trees are indigenous trees and only three exotic species. Based on Importance Value Index that *D. zibethinus* (22.43%) and *D. curtmatus* (20.41%) are the dominant species and saved in *pumonean*. Considering the high species diversity of indigenous fruit trees on *pumonean*, it is necessary to immediately conserve its programmed effort.

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Introduction

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Abstract

The observation was conducted to investigate the species diversity and composition structure of indigenous fruit trees on pumonean (growing fields resembling forests) belonging to the local community of Mentawai. Data were collected from the Village Matotonan of District of South Siberut and the Village Bojakan of District of North Siberut using the quadrant method, which were randomly selected and inventory the fruit tree species within are plots. All trees with diameter at breast height (1.2m) of ≥8cm were identified. The contribution of families (relative abundance) and the Importance Value Index of the fruit tree species were calculated using standar formula.The results show that in *pumonean* were found 14 families, 18 genera and 24 tree species. The high relative abundance of family is found in Euphorbiaceae, Bombacaceae and Meliacene, which is 12.50%. In general the status of the 15 species of fruit trees are indigenous trees and only three exotic species. Based on Importance Value Index that *D. zibethinus* (22.43%) and *D. carinatus* (20.41%) are the dominant species and saved in *pumonean*. Considering the high species diversity of indigenous fruit trees on *pumonean*, it is necessary to immediately conserve its programmed effort.

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Introduction

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Utilization of forests by Siberut indigenous peoples is very limited except for certain production interests (Schefold, 1997, Persoon, 2001). Similar to other indigenous agroforestry systems in the world, every *uma* (a large family of indigenous Mentawaians) uses forests based on the principle of unifying the economic and ecological interests known in the Mentawai language of *tinungglu* (newly opened fields) and *pumonean* (growing fields resembling forests). Tinungglu/ pumonean is a traditional method of forest management into a planting area that has commercial value by maintaining the function and characteristics of the forest. In *pumonean* there are staple food crops, forest fruits, vegetable crops, medicinal plants, plant sources of firewood, and trees for building materials and traditional boat.

In the last decade in line with community development programs, Mentawai people have started to move from wild forests to production forests with monoculture crops that are considered more economically valuable (Persoon, 2001). The program will have an impact on the loss of biodiversity of indigenous fruit trees in *pumonean*. For the purpose of developing and conserving indigenous fruit trees of Siberut, a study on species diversity and community structure has been conducted.

Materials and methods

Study area

The observation was conducted in the Village Matotonan of District of South Siberut (01°33'13,7"S, 099°01'14.4"E, 44-60m asl) and the Village Bojakan of District of North Siberut (01°14'44,44"S; 098°52'56,3"E; 22-136m asl), Regency of Mentawai Islands, Province of West Sumatera, Indonesia (Fig. 1).

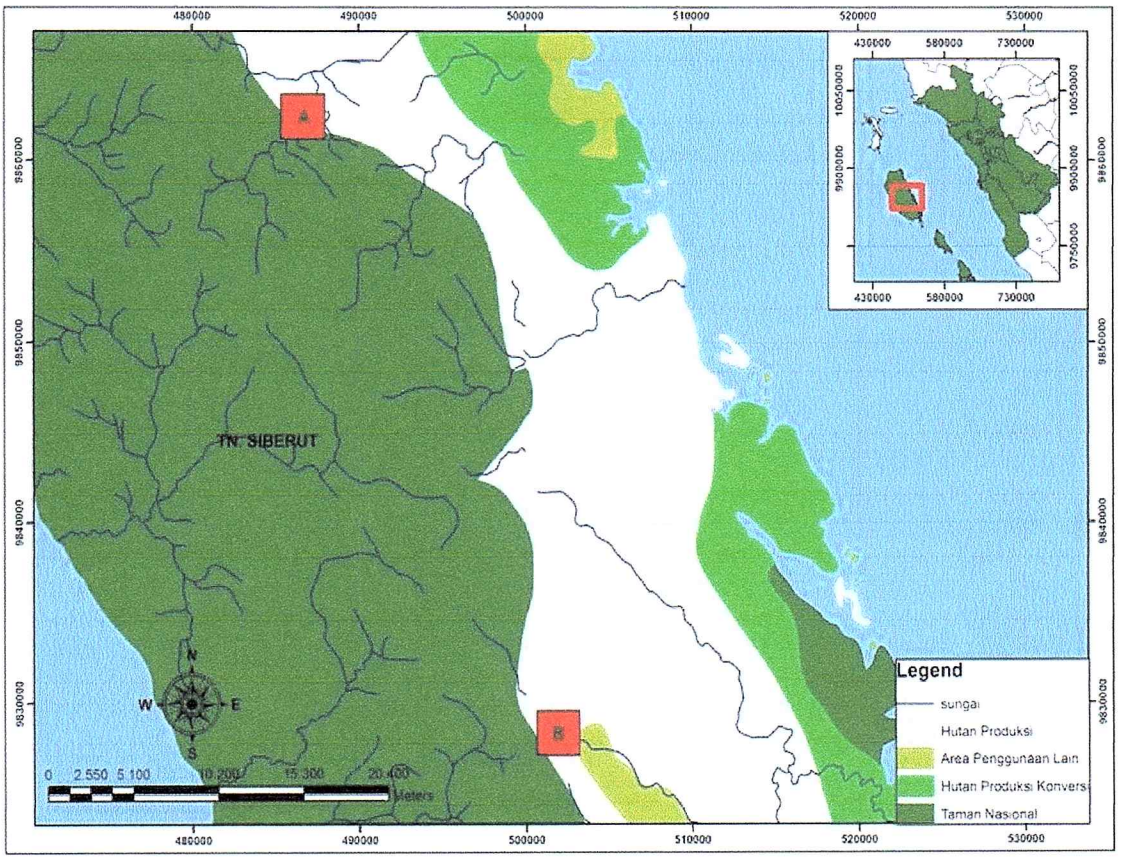

Fig. 1: Map of research location in District of Siberut, Regency of Mentawai Islands.

The Village Matotonanis a buffer zone in the southern region of TNS conservation area, which has a distance of about 25 km from the capital district Muaro Siberut. The Village Bojakan is also a buffer zone of Siberut National Park in the north with a distance of about 20 km from the capital district Sikabaluan. At each location were selected four *pumonean* for the study of the species diversity and community structure of fruit trees.

Trees sampling

Vegetation analysis of fruit trees and other trees was selected four productive *pumoneans*. The diversity of fruit tree species was calculated using 25 quadrant of 20m x 20m which were randomly selected, and for the sapling stage was inventoried at two quadrant angles of 5m x 5m. In each quadrant is calculated stem diameter at breast height (1.2m) of ≥8cm by using tap meter. Plant specimens were collected and identified in the *ANDA* Herbarium of Andalas University. Identification of the plant used relevant literature, such as Flora Malesiana (Hou, 1974; Adema *et al*., 1994; Mabberley *et al*., 1995; Berg and Corner, 2005; de Wilde, 2014), Tree Flora of Malaya (Whitemore, 1972; Ng, 1978), The collection and Illustration of Tropical Plant (Corner and Watanabe, 1969).

Secondary data collection on indigenous knowledge on fruit trees was obtained through direct interviews with informants. *Uma* who has *pumonean* were selected a key informants to know the local name, status, life form, and use or benefit of trees. The status of fruit trees are grouped into indigenous and exotic plants, and the life forms of indigenous trees are further subdivided into domestication by the *uma* or native that is allowed to continue growing when forest land is converted to *timunggh*.

Community structure analysis

Specific richness, number of genera and number of family were calculated. The contribution of families (relative abundance) was also calculated according to formula (Curtis and MacIntosch, 1950):

$$\text{Relative abundance (RA)} = \frac{\text{No. of species of the family}}{\text{Total no. of species}} \cdot 100$$

The Importance Value Index describes the community structure of the fruit tree species in *pumonean* and is calculated according to Mueller-Dumbois and Ellenberg (1974), with the following formula:

$$IVI = (RF + RD + RDo)/3$$

Where, IVI is Importance Value Index; RF is relative frequency; RD is relative density; and RDo is relative dominance.

$$\text{RF is relative frequency of species} = \frac{AF}{TF} \times 100$$

Where, AF is absolute frequency of species; and TF is sum of absolute frequencies of all species.

$$\text{RD is relative density of species} = \frac{AF}{TF} \times 100$$

Where, AD is absolute density of species (per ha); and TD is total density of all species (per ha).

$$\text{RDo is relative dominance of species} = \frac{ADo}{TDo} \times 100$$

Where, ADo is absolute dominance (basal area) of species (per ha); and TDo is total dominance basal area) of all species (per ha).

Results

At *pumonean* in the Village Matotonan and Bojakan were found 14 families, 18 genus and 24 tree species, where 15 species of them are fruit trees and other trees for building materials, medicine, ritual and fire wood (Tables 1 and 2). In general, the status of the 15 species of fruit trees are indigenous trees in Siberut and only three exotic species. *Artocarpus integer*, *Duriocarinatus*, *D.malaccensis*, *Lansium domesticum*, and one species of *Mangifera* were informed as indigenous fruit trees from cultivation, while two species of three genera (*Baccaurea*,*Nephelium*, and *Lansium*) and one species of *Garcinia* grow natively. In *pumonean* also has been planted with the exotic fruit trees, namely *D. zibethinus*, *G. mangostana* and *G. gnemon*. Besides fruit trees, eight other tree species were found native plants and they are used for building materials, medicines and firewood.

The high relative abundance of family is found in Euphorbiaceae, Bombacaceae and Meliaceae with RA 12.50%. The high relative abundance of family in *pumonean* is found inEuphorbiaceae, Bombacaceae and Meliaceae, which is 12.50% (Table 2).

Table 1. List of fruit trees and other trees in two *Pumoneans* at Siberut, Mentawai Islands, Indonesia.

No	Species	Family	Vernacular names	Common names	Location	Status and life form	Use/Benefit
Fruit trees							
1	*Artocarpus integer* (Thumb.) Merr.	Moraceae	Peigu	Cempedak	M, B	I, C	Food
2	*Baccaurea* sp1	Euphorbiaceae	Elak Mata	Kapundung	M	I, N	Food
3	*Baccaurea* sp2	Euphorbiaceae	Sileu	Kapundung	M, B	I, N	Food
4	*Duriocarinatus* Mast.	Bombacaceae	Toktuk	Wild Durian	M, B	I, C	Food
5	*Durioma laccensis* Planch.	Bombacaceae	Kinoso	Wild Durian	M	I, C	Food
6	*Duriozibethinus* L.	Bombacaceae	Doriat	Durian	M, B	I, C	Food; ritual
7	*Garcini amangostana* L.	Guttiferae	LakopakSareu	Mangosteen	M	E, C	Food; ritual
8	*Garcinia* sp.	Guttiferae	Lakopaksimalogat	Wild mangosteen	M	I, N	Food
9	*Lansium domesticum* Corr.	Meliaceae	Seccet	Langsat	M	E, C	Food
10	*Lansium* sp1	Meliaceae	Siamung	Langsat	M	I, N	Food
11	*Lansium* sp2	Meliaceae	Telu Toru Gokgok	Langsat	M	I, N	Food
12	*Mangifera* sp.	Anacardiaceae	Abangan	Wild mango	M	I, C	Food
13	*Nephelium cuspidatum* Blume	Sapindaceae	Babaet	Wild rambutan	M	I, N	Food
14	*Nephelium* sp.	Sapindaceae	Bairabbilelelu	Wild rambutan	M	I, N	Food
15	*Gnetum gnemon* L.	Gnetaceae	Bake/Tojjet	Melinjo	M	E, C	Food
Other trees							
1	*Horsfieldia irya* (Gaertn.) Warb	Myristicaceae	Roat	Panarahan	B	I, N	Building materials
	Elaeocarpus obtusus Blume	Elaeocarpaceae	Buluksurak	Jenitri	B	I, N	Building materials
2	*Litsea*sp.	Lauraceae	Bausiokok	-	M	I, N	Building materials
3	*Ficus*sp.	Moraceae	Ebbet	-	M	I, N	Medicine
4	*Knemala urina* (Blume) Warb.	Myristicaeae	Ngalopatadekat	Panarahanhitam	B	I, N	Medicine
5	*Aralia* sp.	Araliaceae	Siangu/Uleat	-	B	I, N	Medicine
6	*Vitex pubescens*Vahl	Verbenacea	Kulip	Alaban	M/B	I, N	Fire wood
7	*Sterculia leavis*Wall.	Sterculiaceae	Lakek	Kelumpang	B	I, N	Fire wood
8	*Macaranga bancana* (Miq.) Mul.Arg.	Euphorbiacea	Spaulompat	Mahang	B	I, N	Fire wood

Notes: location at Matotonan (M) and Bojakan (B); the tree status is indigenous (I) or exotic (CE); and the tree life form is native (N) or cultivated (C).

The high relative abundance of family in *pumonean* is found in Euphorbiaceae, Bombacaceae and Meliaceae with RA 12.50% (Table 2).

The Euphorbiaceae has two genera and three species (*Baccaurea*sp1, *Baccaurea* sp2, and *Macaranga bancana*). Bombacaceae has one genera and three species (*D. carinatus*, *D.malaccensis* and *D. zibethinus*), and Meliaceae has one genera and three species (*Lansium domesticum*, *Lansium* sp1 and *Lansium* sp2.). Moraceae, Guttiferae, Sapindaceae and Myristicaceae have two species, and other families have one species.

Table 2. Richness and relative abundance of family in *Pumonean*

No.	Family	Number of genera	Number of species	Relative abundance (%)
1	Moraceae	2	2	8.33
2	Euphorbiaceae	2	3	12.50
3	Bombacaceae	1	3	12.50
4	Guttiferae	1	2	8.33
5	Meliaceae	1	3	12.50
6	Anacardiaceae	1	1	4.17
7	Sapindaceae	1	2	8.33
8	Gnetaceae	1	1	4.17
9	Myristicaceae	2	2	8.33
10	Elaeocarpaceae	1	1	4.17
11	Lauraceae	1	1	4.17
12	Araliaceae	1	1	4.17
13	Verbenacea	1	1	4.17
14	Stereuliaceae	1	1	4.17
Total number		**18**	**24**	**100**

In *pumonean* of the Village Matotonan found 14 fruit tree species at tree stage (Table 3). The highest relative density was obtained at *D. zibethinus* which was 23.53%, followed by *D. carinatus*, *N. cuspidatum* and *A. integer* respectively 15.69%, 15.69% and 13.73%. The highest relative frequency obtained in *D. zibethinus* is 20.00%, followed by *D. carinatus*, *N. cuspidatum* and *A. integer* respectively 17.14%, 11.43% and 11.43%. However, the highest relative dominance was obtained in *D. carinatus* of 28.41%, followed by *D. zibethinus* and *A. integer* respectively 23.77% and 18.30%. The highest Importance Value Index obtained in*D. zibethinus* is 22.43%, followed by *D. carinatus*, *N. cuspidatum*, and *A. integer* respectively 20.41%, 14.48% and 11.20%. While Importance Value Index of 10 other fruit trees ranged from 1.66% to 6.11%.

In *pumonean* of the Village Bojakan, four fruit tree species were found at tree stage (Table 4). The highest relative density was obtained in *D. zibethinus*, 44.44%, followed by *D. carinatus*, *A. integer* and *Baccaurea*sp2 respectively 33.33%, 11.11% and 11.11%. The highest relative frequency was obtained at *D. zibethinus*, 40.00%, followed by *D. carinatus*, *A. integer* and *Baccaurea*sp2, each of which was 20%. The highest relative dominance was obtained in *D. zibethinus*, 61.81%, followed by *Baccaurea*sp2 and *A. integer* respectively 24.61% and 11.36%. The highest Importance Value Index was obtained from *D. zibethinus*, which was 28.15%, followed by *D. carinatus*, *A. integer* and *Baccaurea* sp2 respectively 17.78%, 10.37% and 10.37%.

The sapling stage on *pumonean* of the Village Matotonan known that the highest relative density, relative frequency, relative dominance and Importance Value Index are *Lansium*sp1, respectively 33.33%, 33.33%, 36.63% and 34.43%, while the other four tree species have relatively low value (Table 3). In *pumonean*of the Village Bojakan, it is known that the highest relative density, relative frequency, relative dominance and importance index value are *Baccaurea*sp2, 60.00%, 50.00%, 65.34% and 58.45%, respectively, while *D. zibethinus* respectively 40.00%, 50.00%, 34.66% and 41.55% (Table 4).

Table 3. The community structure of fruit trees on *Pumonean* in the Village Matotonan.

No.	Species	D	RD (%)	F	RF (%)	Do	RDo (%)	IVI(%)
Tree stage								
1	*D. zibethinus*	0.0037	23.53	0.8750	20.00	7.8088	23.77	22.43
2	*D. carinatus*	0.0025	15.69	0.7500	17.14	9.3334	28.41	20.41
3	*D. malaccensis*	0.0006	3.92	0.2500	5.71	2.8594	8.70	6.11
4	*N. cuspidatum*	0.0025	15.69	0.5000	11.43	2.1305	6.48	11.20
5	*Nephelium* sp.	0.0003	1.96	0.1250	2.86	1.2020	3.66	2.83
6	*A. integer*	0.0022	13.73	0.5000	11.43	6.0117	18.30	14.48
7	*L. domesticum*	0.0003	1.96	0.1250	2.86	0.1472	0.45	1.76
8	*Lansium*sp1	0.0003	1.96	0.1250	2.86	0.0516	0.16	1.66
9	*Lansium*sp2	0.0003	1.96	0.1250	2.86	0.0709	0.22	1.68
10	*Baccaurea* sp1.	0.0009	5.88	0.3750	8.57	0.8703	2.65	5.70
11	*Baccaurea*sp2	0.0006	3.92	0.2500	5.71	0.7040	2.14	3.93
12	*G. gnemon*	0.0003	1.67	0.1250	2.38	0.2388	0.71	4.76
13	*G. mangostana*	0.0009	5.88	0.1250	2.86	0.3609	1.10	3.28
14	*Garcinia* sp.	0.0003	1.96	0.1250	2.86	1.0686	3.25	2.69
Sapling stage								
1	*Artocarpus integer*	0.0050	16.67	0.1250	16.67	0.3179	19.13	17.49
2	*Lansium*sp1	0.0100	33.33	0.2500	33.33	0.6086	36.63	34.43
3	*Mangifera* sp.	0.0050	16.67	0.1250	16.67	0.3179	19.13	17.49
4	*D. malaccensis*	0.0050	16.67	0.1250	16.67	0.1658	9.98	14.44
5	*D. zibethinus*	0.0050	16.67	0.1250	16.67	0.2512	15.12	16.15

Table 4. The community structure of fruit trees on *Pumonean* in the Village Bojakan.

No.	Jenis/Nama Lokal	Den	RD (%)	Freq	RF (%)	Dmn	RD (%)	IVI(%)
Tree stage								
1	*D. zibethinus*	0.0040	44.44	0.2	40.00	11.9951	61.81	28.15
2	*D. carinatus*	0.0030	33.33	0.1	20.00	0.4299	2.22	17.78
3	*A. integer*	0.0010	11.11	0.1	20.00	2.2051	11.36	10.37
4	*Baccaurea*sp2	0.0010	11.11	0.1	20.00	4.7759	24.61	10.37
Sapling stage								
1	*Baccaurea*sp2	0.0120	60.00	0.2	50.00	0.1332	65.34	58.45
2	*D. zibethinus*	0.0080	40.00	0.2	50.00	0.0706	34.66	41.55

Discussion

The relative abundance of family in *pumonean* is found in Euphorbiaceae, Bombacaceae and Meliaceae. Euphorbiaceae has two genera and three species, each Bombacaceae and Meliaceae has one genera and three species. Other families (Moraceae, Guttiferae, Sapindaceae and Myristicaceae) have two species of fruit trees (Table 2). Hadi *et al.* (2009) has recorded that Siberut primary forest was dominated by Euphorbiaceae, Myrtaceae, Lauraceae and Moraceae.

All indigenous fruit trees in *pumonean* have grown from cultivation or native when before or after forest conversion into fields. Nopiansyah *et al.* (2016) has reported 21 indigenous fruit tree species and seven exotic species in Siberut villages and primary forests. The high species diversity of fruit trees in *pumonean*, as well as Gari (1999) stated in *llacta* (village) and *purina* (areas for subsidiary residence that have isolated house and field) of indigenous peoples of Pastaza in Western Amazonia. In lands of *llacta* and *purina*, indigenous people cultivate more than 50 plant species for food

security and other uses. Stygeret *al.* (1999) has reported that most of the indigenous fruit trees are collected from the humid primary forest region of Eastern Madagascar, and for a few species has been domesticated in agricultural fields. Coomes and Ban (2004) have stated that cultivated plant species diversity in traditional agriculture of forest peasant community (Nuevo Triounfo, Northeastern Peru) is related strongly to specific garden characteristics, household socio-economic features, and access to planting materials.

In *pumonean* also has been planted with the exotic fruit trees, namely *G. mangostana, L. domesticum* and *G. gnemon* (Table 2). Besides these three species, according to Nopiansyah et al. (2016) has also found *A. heterophyllus, N. lappaceum, Citrus spp., Annona muricata* and *A. comusus* as exotic fruit trees in the villages.From one aspect that the exotic fruit trees will add diversity, but its presence will have an impact on reducing the diversity of indigenous fruit trees. Local community will select the exotic fruit trees gradually because it has a higher economic value. According to Fukushima *et al.* (2010), local people recognized indigenous fruit trees with marketability or food value as priority species. Awodoyin et al. (2015) have informed that the most of introduced fruit species of American and Asian origin rather than the indigenous species of tropical Africa were grown and established in orchards and plantations.

Based on relative density, relative frequency, relative dominance and Importance Value Index that *D. zibethinus, D. carinatus* and *N. cuspidatum* are the dominant species in *pumonean* (Table 3 and Table 4). The main uses of the fruit trees are for seasonal food (Table 1). According to Agea et al. (2007), the most importance criteria used in selecting fruit trees for on-farm cultivation was the contribution made to household food supply. The fruit trees are also a favorite plant in Indonesia, as reported by Astiani and Ripin (2016) that *D.zibethtinus* was a dominant species on mixed fruit garden at Sanggau District in West Kalimantan. Another reason, according to *Uma* information that planting *doriat* (*D. zibethinus*) and *tokuk* (*D. carinatus*) is a mandatory activity for the youth because these tree are used as a dowry to marry a girl (Table 1). In addition, their belief that the tree is a dwelling place for the spirits of the deceased family.

The tree level in *pumonean* of the Village Matotonan found that indigenous fruit trees diversity was higher (14 species) than in the Village Bojakan (four species) (Table 3 and Table 4). The community structure of the fruit trees in *pumonean* shows the low regeneration because at the sapling level there were only five species found in the Village Matotonan and two species in Bojakan.The low diversity of species and regeneration in *pumonean* in Bojakan may be related to disturbance to adjacent forest habitat due to "Forest Concession Rights" activities during previous two decade. According to Omoroet *al.* (2010), species diversity correlates with disturbance of a forest area, and the low generation islikely due to the absence of seed banks since some of the plantations.

Considering the high species diversity of indigenous fruit trees on *pumonean* in Siberut, it is necessary to immediately conserve its programmed efforts by involving local community, government of Mentawai Islands, and higher education institution. According to Siregar (2006), the genetic diversity of fruits in Kalimatan has been saved partly through indigenous agroforestry by indigenous people in the village agroecosystem. Wild relative or wild-growing semi domesticated species of tropical fruit trees also provide services to domesticated fruit trees. Integrating wild tropical fruit species into home gardens is another good practice for conservation of wild relative diversity (Hunter and Changtragoon, 2016). *Kandyan* home or forest gardens add value to the conservation of endemic and indigenous fruit crops by providing the option of a field gene bank because they have natural population in forest (Pushpakumaraet *al*., 2016). Salma *et al*., (2015) has implemented a conservation approach of fruit trees on diversity block, heritage block, and common block by involving local community in Malaysia.

Conclusion

At *pumonean* in the Village Matotonan and Bojakan were found 14 families, 18 genus and 24 tree species, where 15 species of them are fruit trees and other trees for building materials, medicine, ritual and fire wood. The status of the 15 species of fruit trees are indigenous trees in Siberut and only three exotic species. In the Village Matotonan, highest Importance Value Index of fruit tree species was obtained from *D. zibethinus*, which was 22.43%, followed by *D. carinatus, N. cuspidatum*, and *A. integer* respectively 20.41%, 14.48% and 11.20%. InBojakan, *D. zibethinus* and *D. carinatus* also have the high Importance Value Index respectively 28.15% and 17.78%, and then *A. integer* and *Baccaurea* sp2 are both 10.37%.

Conflict of interest statement

Authors declare that they have no conflict of interest.

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References

Adema, F., Leenhouts, P.W. and van Welzen, P.C., 1994. Flora Malesiana. Series I, Spermatophyta: flowering plants. Vol.11. Part 3: Sapindaceae. Rijksherbarium. pp.419-768.

Agea, J.G., Obua,J., Kaboggoza, J.R.S., Waiswa, D., 2007. Diversity of indigenous fruit trees in traditional cotton-millet farming system: the case ofAdwarisubcounty, Lira districst, Uganda. Afr. J. Ecol. 45(3), 39-43.

Astiani, D., Ripin. 2016. The role of community fruit garden (*tembawang*) on maintaining forest structure, biodiversity and standing biomass allocation: an alternative effort on reducing carbon emission. Biodivers. 17(1), 359-365.

Awodoyin, R.O., Olubode, O.S., Ogbu, J.U., Balogun, R.B., Nwawuisi, J.U., Orji, K.U., 2015. Indigenous fruit trees of Tropical Africa: Status, opportunity for development and biodiversity management. Agric. Sci. 6, 31-41.

Berg, C.C., Corner, E.J.H., 2005. Moraceae (*Ficus*). Flora Malesiana. Series I (Seed plants.) Volume 17/Part 2. National Herbarium of the Netherlands. Leiden.

Coomes, O. T., Ban, N., 2004. Cultivated plant species diversity in home gardens of Amazonian Peasant Village in Northeastern Peru. Econ. Bot. 58(3), 420-434.

Corner, E.J.H., Watanabe, K., 1969. Illustrated Guide to Tropical Plants. Hirokawa Publishing Company, Tokyo.

Curtis, J.T. ,MacIntosch, R.P., 1950. The interrelation of certain analytic and synthetic phytosociological characters. Ecology. 31, 434-455.

de Wilde, W., 2014. Flora Malesiana. Series I-Seed Plants. Vol. 14. Myristicaceae. Advanced Books. doi: 10.3897/ab.e1141.

Fukushima, T., Morimoto, Y., Maundu, P., Kahindi, B., Fonndo, J., 2010. Local preference of indigenous fruit tree in Coast Province, Kenya.Afr. J. Environ. Sci. Tech. 4(12), 472-885.

Gari, J.A., 1999. Biodiversity and indigenous agroecology in Amazonia: The indigenous peoples of Pastaza. Etnoecológica. 5(7), 21-37.

Hadi, S., Ziegler,T., Waltert, M., Hodges, J.K., 2009. Tree diversity and forest structure in northern Siberut, Mentawai Islands, Indonesia. Trop. Ecol. 50(2), 315-327.

Hou, D., 1974. Anacardiaceae. Flora Malesiana-Series 1, Spermatophyta, 8(1), pp.395-548.

Hunter, D., Changtragoon, S., 2016. Good practices for conservation and sustainable uses of crop wild relatives of tropical fruit tree diversity. In: Tropical Fruit Diversity: Good Practices for In Situ and On-farm Conservation (Eds.: Sthapit, B., Lamers, H.A.H., Rao, V.R., Bailey, A.). Roudledge, New York. pp.83-95.

Mabberley, D.J., Pannell, C.M., Sing, A.M., 1995. Flora Malesiana: Series I. Spermatophyta Vol. 12, Part 1, 1995. Meliaceae. Rijksherbarium, Foundation Flora Malesiana.

Mueller-Dumbois, D., Ellenberg, H., 1974. Method of Vegetation Ecology. John Wiley and Sons, New York, NY, USA.

Ng, F.S.P., 1978. Tree Flora of Malaya. Vol. 3. Malayan Forest Records, 26.

Nopiansyah, F., Basuni, S., Purwanto, Y., Kosmaryandi, N., 2016. Forest resource utilization by the Siberut Community and its implications for the Siberut Island Biosphere Reserve Policy. J. Manaj. Hutan Trop. 22(2), 94-104.

Omoro, L.M.A., Pellikka, P.K.E., Rogers, P.C., 2010. Tree species diversity, richness and similarity between exotic and indigenous forests in the cloud forest of Eastern Arc Mountains, Taita Hills, Kenya. J. For. Res. 21(3), 255-264.

Persoon, G.A., 2001. The Management of Wild and Domesticated Forest Resources on Siberut, West Sumatra. Antropologi Indon. 64, 68-83.

Pushpakumara, D.K.N.G., Heenkenda, H.M.S., Marambe, B., Ranil, R.H.G., Punyawardena, B.V.R., Weerahewa, J., Silva, G.L.L.P., Hunter, D., Rizvi, J., 2016. *Kandyan* home gardens: A time-tested good practices from Sri Lanka for conserving tropical fruit tree diversity. In: Tropical Fruit Diversity: Good Practices for In Situ and On-farm Conservation (Eds.: Sthapit, B., Lamers,H.A.H., Rao, V.R., Bailey, A.). Roudledge, New York. pp.127-146.

Salma, I., Shariah, U., Pearlycia, B., Wong, W.W., Shukor, A., Norhayati, H., Noor Camellia, N.A., 2015. Community contribution towards conservation of fruit tree in Malaysia. Open Access Library J. 2, e1146. http://dx.doi.org/10.4236/oalib.1101146.

Schefold, R., 1997. The two faces of the forest: Visions of the wilderness on Siberut (Mentawai) in a comparative Southeast Asian prospective. Paper, Conference 'Tribal Communities in the Malay World: Historical, Cultural, and Social Prospectives'. Singapore, 24-27 March, 1997.

Siregar, M., 2006. Species diversity of local fruit trees in Kalimantan: Problems of conservation and its development. Biodivers. 7(1), 94-99.

Styger, E., Rakotoarimanana, J.E.M., Rabevohitra, R., Fernandes, E.C.M., 1999. Indigenous fruit trees of Madagascar: potential components of agroforestry system to improve human nutrition and restore biological diversity. Agrofor. Syst. 46, 289-310.

Verstappen, H.T., 1975. On palaeoclimates and landform development in Malaysia. In: Modern Quaternary Research in Southeast Asia (Eds.: Bartstra, G.J., Casparie, W. A.). Rotterdam: Balkema. pp.3-36.

Whitmore, T.C., 1972. Tree Flora of Malaya. Vol. 2. Malayan Forest Records. 26, pp.291-292

Whitten, A.J., 1982. A numerical analysis of tropical rain forest, using floristic and structural data, and its application to an analysis of gibbon ranging behaviour. J. Ecol. 70, 249-271.

WWF, 1980. Saving Siberut: A Conservation Master Plan. World Wide Fund for Nature Indonesian Program (Bogor, Indonesia).

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