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Diversity of Edible Mollusc (Gastropoda and Bivalvia) at Selected Divison of Sarawak, Malaysia

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***Abstract*- Diversity of edible mollusc was studied at eight divisions of Sarawak from August 2010 to May 2011. At each division, diversity and number of species were collected from road site selling out lets and local wet markets. Total number of mollusc was comprised of 29 species namely *Solen regularies, S. lamarckii, Pharella acutidens, Anadara granosa, Pholas orientalis, Gluconome virens, Circe scripta, Anodonta woodina, Paphia undulata, Amusium pleuronectes, Meretrix meretrix, M. lyrata, Polymesoda bengalensis, P. erosa* and *P. expansa* for bivalve and *Cerithidea rizophorarum, C. obtusa, Telescopium telescopium, Clithon retropictus, Nerita articulate, N. chamaeleon, N. albicilla, Ellobium aurisjuda, Trochus radiates, Planaxis sulcatus, Monodonta labio, Turbo crasus, Thais aculate* and *Melo melo* for gastropod. The species number of bivalve was recorded highest (15 species) in mollusc group from Sarawak. Mollusc diversity was found highest (14 species) in Bintulu and lowest (1 species) in the division of Sarikei. From this study, there is a wide chance of research to further explore both on the possibility of commercial value and ecosystem conservation.**

***Keywords*- edible mollusc; biodiversity; bivalve; gastropod; Sarawak.**

I. INTRODUCTION

Mollusc provides an important source of protein for human besides fish. It can be found in many parts of the world such as marine, brackish, fresh and terrestrial areas. In Southeast Asia, about 1211 species of bivalves was reported, and it is the highest diversity for bivalves compared to 29 regions around the world [1]. It is believed that seasonal pattern in the Southeast Asia such as monsoonal rainfall provide nutrients enriched environment for these filter feeder organisms which eventually help to increase the number of mollusc diversity in this area [2].

Generally, mollusc from marine habitat received more attention because of their aesthetic and gastronomic appeals [3]. Marine gastropod and bivalve consists various species that use for many purposes besides their nutritional source. Bivalve from the Indian marine have been reported potential to use as antiviral drugs [4]. Certain country exploits gastropod and bivalve for food and decoration. In Malaysia, some of marine bivalve such as *Anadara granosa* is being cultured for commercialization. In Sarawak mangrove forest covered 173,792 ha of the land which is suitable for mollusc habitat [5].

Studies on mollusc were conducted in stream, thermal spring, canal, river, small pond, river bank forest, littoral vegetation on water basin bank, short grass vegetation, tall grass vegetation, agriculture land, bush vegetation, broad leaf xeric forest, forest, park forest and house yard elsewhere [6]. However, the studies on gastropod and bivalve in Malaysia are few. Studies on accumulation and depuration of heavy metal using *Nerita lineate* and *Faunusa ater* was conducted by Kanakaraju and Arfiziah [7] and Yap et al. [8], respectively. Furthermore, sexual polymorphism in a population of *Strambus canarium* at Merambung shoal was done by Zaidi et al. [9]. The studies by Chan [10] recorded the new genus *Rhachis* in Peninsular Malaysia. The population of freshwater molluscs in Crocker Range Park, Sabah was reported by Supian and Ikhwanuddin [11]. Another study by Hanafi et al. [12] observed the distribution of pen shell at seagrass bed of Sungai Pulai, Johor. Despite their importance, there is few distribution record of mollusc in tropical region and little is known of the edible mollusc in Sarawak, Malaysia. To assist fill this space in our knowledge, the present paper investigate the diversity of edible mollusc (gastropoda and bivalvia) in selected divisions of Sarawak, Malaysia.

II. MATERIALS AND METHODS

Samples were collected from local wet market, selling out lets at road side and fishermen stock covering eight divisions named Kuching, Sarikei, Mukah, Sibu, Bintulu, Miri, Limbang and Lawas, Sarawak (Fig. 1). All collected samples

were preserved in ice box and transfer to the laboratory for further study. The collected samples were identified and observed following the procedure described by Poutiers [13] and Morton [14].

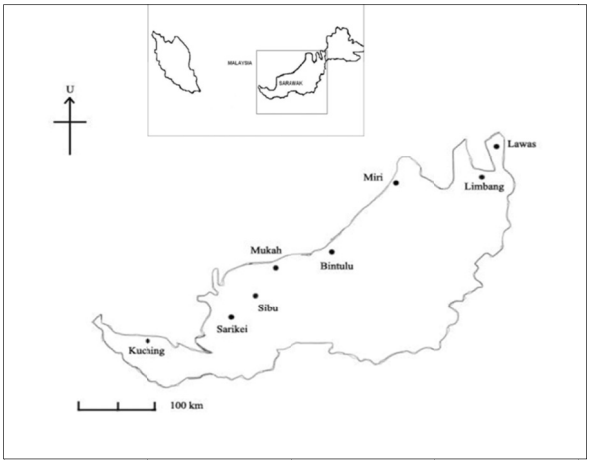


Fig. 1 Eight divisions for sampling collection

III. Results and Discussion

A total of 29 species of edible molluscs from 16 family, 15 bivalves and 14 gastropods were recorded from eight divisions of Sarawak (Tables 1 and 2). Compared to estuarine and mangrove molluscs, the data presented on edible mollusc from eight divisions of Sarawak is that the diversity is low. Probably, this could not be mostly correct when it is considered for whole edible and non edible mollusc diversity in Sarawak coastal region. Printrakoon et al. [15], Frith et al. [16] and Brandt [17] recorded 47, 43 and 56 species of mangrove, coastal and estuarine mollusc in Thailand, respectively. Macintosh et al. [18] found 34 species of molluscs in the Ranong biosphere reserve in Thailand. Jiang and Li [19] recorded 52 species in the Jiulong river estuary, China. However, none of the above study was specific for edible mollusc rather than taxonomic, diversity and distribution study in some specified coastal wet lands in the tropics. The study on the diversity of edible mollusc in this region is less although Somchai [20] reported that gastropod was the major class of mollusc which has high market value in Phuket Island, Thailand.

TABLE I
SPECIES CHECKLIST OF GASTROPODA AT EIGHT DIVISIONS OF SARAWAK

Division	Family	Species
Kuching	Potamididae	*Cerithidea rizophorarum*
		Cerithidea obtusa
	Melampide	*Ellobium aurisjudae*
Sarikei	-	-
Sibu	Potamididae	*Cerithidea rizophorarum*
		Cerithidea obtusa
	Neritidae	*Clithon retropictus*
Mukah	Potamididae	*Cerithidea rizophorarum*
		Cerithidea obtusa
	Neritidae	*Nerita articulata*
Bintulu	Neritidae	*Nerita chamaeleon*
		Nerita albicilla
	Trochidae	*Trochus radiates*
		Monodonta labio
	Planaxidae	*Planaxis sulcatus*
	Turbinidae	*Turbo crasus*
	Muricidae	*Thais aculeata*
	Volutidae	*Melo melo*
Miri	-	-
Limbang	Potamididae	*Cerithidea rizophorarum*
Lawas	Potamididae	*Telescopium telescopium*

The marsh clam, *Polymesoda erosa* was found and distributed in six divisions namely Sibu, Mukah, Bintulu, Miri, Limbang and Lawas. This marsh clam at Indo-pacific area can be described under the subgenus *Geloina* [14] which is also distributed in the mangroves area of China [21], Australia [22] and Thailand [15]. The species *Polymesoda expansa* and *P. bengalensis* (Bivalvia) and *Cerithidea rizophorarum* (Gastropoda) were distributed at four divisions. Other gastropods and bivalves species was found at least one species in one division only (Tables 1 and 2).

TABLE II
SPECIES CHECKLIST OF BIVALVIA AT EIGHT DIVISION OF SARAWAK

Division	Family	Species
Kuching	Solenidae	*Solen regularies*
		Solen lamarckii
		Pharella acutidens
	Veneridae	*Meretrix. lyrata*
	Corbiculidae	*Polymesoda bengalensis*
	Myoida	*Pholas orientalis*
	Gluconomidae	*Gluconome virens*
	Pectinidae	*Amusium pleuronectes*
	Arcidae	*Anadara granosa*
Sarikei	Corbiculidae	*Polymesoda bengalensis*
Sibu	Corbiculidae	*Polymesoda erosa*
Mukah	Corbiculidae	*Polymesoda erosa*
	Veneridae	*Paphia undulata*
Bintulu	Corbiculidae	*Polymesoda bengalensis*
		Polymesoda erosa
		Polymesoda expansa
	Veneridae	*Circe scripta*
		Meretrix meretrix
	Pectinidae	*Amusium pleuronectes*
Miri	Corbiculidae	*Polymesoda bengalensis*
		Polymesoda erosa
		Polymesoda expansa
	Unionidae	*Anodonta woodina*
Limbang	Corbiculidae	*Polymesoda bengalensis*
		Polymesoda erosa
		Polymesoda expansa
Lawas	Corbiculidae	*Polymesoda erosa*
		Polymesoda expansa

The species number of bivalve was recorded higher (15 species; 52%) than gastropod (14 species; 48%) in Sarawak region (Fig. 2). Bivalve species was found higher in Kuching while gastropod was higher in Bintulu probably due to habitat differences. The overall mollusc diversity was found higher (14 species) in Bintulu and lower (1 species) in the division of Sarikei (Fig. 3). The higher mollusc species in Bintulu could be either habitat preference of mollusc i.e. rocky coastal area in Bintulu or over exploitation of natural resource by local fishermen due to rapid urbanization and

customer demand that may eventually increase the number of edible mollusc diversity in the present data. Therefore, further study is required to clarify this statement as well as to monitor and classify the diversity status of edible mollusc in this region prior to conservation.

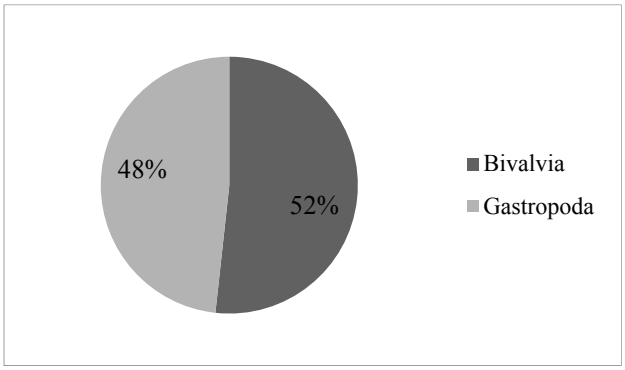
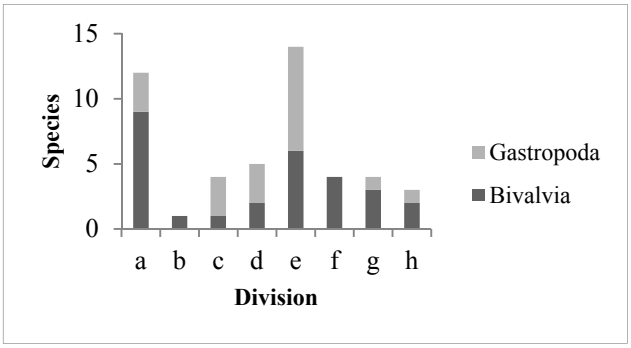


Fig. 2 Percentage of edible mollusc class at the eight selected divisions of Sarawak



Note: a; Kuching, b; Sarikei, c; Sibu; d; Mukah, e; Bintulu, f; Miri, g; Limbang, h; Lawas

Fig. 3 Species number for each of selected division at Sarawak

IV. Conclusion

The diversity of edible mollusc at eight divisions of Sarawak varies significantly. There was a considerable difference within the divisions studied. High species diversity was found in a certain division; it was due to the presence of higher number of different species. The present study revealed that all recorded mollusc are indigenous species of Sarawak those have greater commercial value and biodiversity importance. The total number and type of edible mollusc probably is influenced by habitat and geographical condition. Notwithstanding, only few divisions of Sarawak could probably have suitable habitat to support large number of edible mollusc diversity.

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