Assessment of Fishery Resources from Ayeyarwady River, Magway Segment, Magway Region, Myanmar

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Abstract

The present study deals with the assessment of fishery resources of Ayeyarwady River Magway Segment from December 2019 to August 2020.The specimen was collected twice a month during the study period. A total of 40 fish species belonging to 18 families of eight orders were recorded. The production of fish was high in March (27.09%), April (24.73%) and February (22.75%) and the lowest in June (3.25%) based on the total catch weight, respectively. *Aspidoparia morar, Tenualosa ilisha,* and *Salmostoma sardinella* were the most productive fish species at the study site. Among them, the species *A. morar, S. sardinella* and *P. ranga* were the highest encountered during the study period.

Key words: Assessment, Fishery Resources, Magway Segment, Production, Catch weight

Introduction

Fish is the world's largest wild food harvest and provides a vital source of protein and fetch sustainable income for many families in the developing countries (Pereira, 2002). Fishery is an important sector for the socio-economic development of Myanmar (Khin Maung Soe, 2008). Myanmar has a diverse and favorable range of agro-ecological zones with varying climatic conditions, land quality and stability for agricultural activities. This has enabled the country to be largely self- sufficient in basic food commodities, with surplus production of rice, pulses and fish in most years (FAO, 2011)

Myanmar has impressive freshwater capture fisheries. The important river basins in Myanmar consist of the Ayeyarwady (2150km long), Chindwin (844 km; a tributary of the main Ayeyarwady) and Sittaung Rivers (563km plus the large Thalwin River (2400km) to the east: Tennasserim and Mekong basins including two important natural lakes: Inle and Indowgi.

The Ayeyarwady Basin is the most important source of inland fisheries for the country. The overall number of fish species recorded in the Ayeyawady Basin is 388, of which 311 are present in the Myanmar part. The others are being found in India and China. Among the 388fish species, 193 (50%) are endemic to the basin and 100 (26%) of the endemic are presently known only from Myanamr; two have been assessed in IUCN Red lists as Critically endangered, six as Endangered, 20 as vulnerable, 20 as near Threatened, 131 as least Concern and 75 as Data Deficient (Baran. *et al.*, 2017). At least 134 species have not yet been assessed (Kottelat, 2017).

Freshwater fisheries resources are probably among the most resilient harvestable nature resource, habitat, timing and variability of river flow maintenance. It means waters in which fishing rights are granted under a lease by the Department of fisheries, subject to stipulation relating to the area, species fishing implement, period and fishing methods etc.

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Freshwater fisheries legislation in Myanmar enacts a general species wide closed season from May to July identified spawning migration routes and mapped breeding areas, with adult fish reaching hundreds of kilometers upstream. Myanmar fish production is composed of about 863, 00 metric tons or 30% of inland capture fish, 1,062,000 metric tons or 37% of marine capture fish, and 942, 000 marine capture fish, and 942, 000 metric tons or 33% of aquaculture fish (Baran *et al*., 2017).

Although fishing represents a large socio-economic role, in the food security and cultural heritage of thousands of reverie families. Ayeyarwady River Segment, Magway Environs is an important natural shelter for many aquatic flora and fauna which is less studied. This fact drives to conduct the present work with the objectives

- to identify the recorded species of fish
- to assess the productivity of fish species caught from the study area

Materials and Methods

Study site

Ayeyarwady River Segment of Magway Township, Magway Region was chosen as the study site. It is located at Latitude 20°09'33.82"N and Longitude 94°56'20.57"E (Fig 1).

Study period

The study period lasted from December 2019 to August2020.

Specimen and data collection

The specimens were collected twice a month from fishermen of the study site. The specimens were photographed at the fresh state. The external morphology and color of each fish species were noted down and preserved in 5 to 10 percent formalin solution according to the size of specimens. Local names as informed by the fishermen were also recorded. Body weight (kg), catch number and catch weight (kg) of each fish species were recorded.

Identification of fish species

Identification of specimens was done follow after Talwar and Jhingran 1991, and Jayaram 2013.

Data analysis

In accordance with the number of individuals caught in each fish species, the abundance of fish species was evaluated. Fish species abundance was evaluated based on the percentage composition of individual catch number of the species. The percentage composition of species was 10% or more (dominant), 1 - 9% designated as (permanent), between 0.5 - 0.9 % (present) and below 0.5% (rare) species, respectively. With respect to total catch weight of fish, productivity of fish species was also assessed.

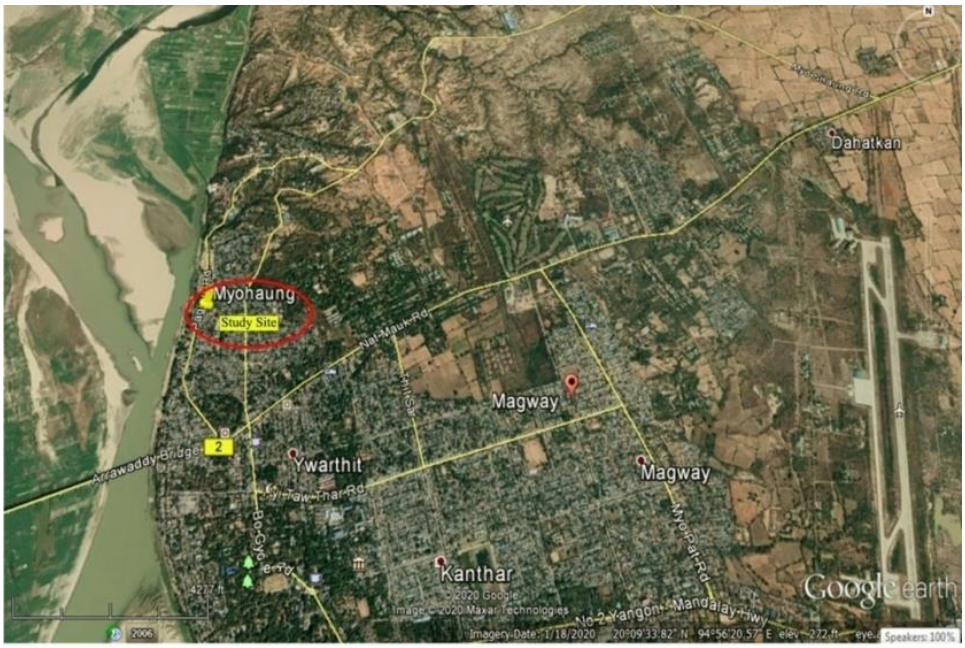


Fig .1 Map of the study area (Source: Google Earth, 2019)

Results

Composition of fish species in the study site

A total of 40 fish species belonging to 35 genera, families 18 and eight orders was recorded from Ayeyarwady River Segment of Magway Township during the study period (Table .1).

Productivity of fish species caught from the study site

A total of 602.326 kg of 40 fish species was observed to catch during eight months study period from the study site. Monthly productivity of fish and production of fish species were varied. According to the monthly variation of fish productivity, a total of 602.326 kg of fish was caught during the study period. Fish production in March (163.221 kg, 27.09%) was the highest which was followed by April (148.956 kg, 24.73%) and February (137.082 kg, 22.75%). That was the lowest in June (19.595 kg, 3.25%).

As the productivity of specific fish species, *A. morar* (143.026 kg, 23.75%) was the largest followed by *T. ilisha* (60.346 kg, 10.02%) and *S. sardinella* (47.05 kg, 7.81%) but those of *X.cancila* (0.016 kg, 0.00 %) followed by*T. cutcutia* (0.02 kg, 0.00 %) were the smallest in the catch (Table 2).

Table 1. Systematic position of fish species recorded from the study area

Order	Family		Scientific Name	Common Name	Local Name
Osteoglossiformes	Notopteridae	1	*Notopterusnotopterus*	Grey feather back	Nga-phe
Anguilliformes	Ophichthidae	2	*Pisodonophisboro*	Rice-paddyeel	Nga-te
Clupeiformes	Clupeidae	3	*Gudusiavariegata*	Burmese river shad	Nga-la-bi
		4	*Tenualosailisha*	Hilsa	Nga-ta-lauk
Cypriniformes	Cyprinidae	5	*Gonoproktopteruscurmuca*	Curmuca barb	Nga-ta-Zee
		6	*Labeoboga*	Boga-labeo	Nga-lu
		7	*Osteobramabelangeri*	Manipur osteobrama	Nga-phant-waing
		8	*Osteobramacunma*	Cunmaosteobrama	Nga-lay-daung
		9	*Puntiuschola*	Swab barb	Nga-khone-ma-myi-ni
		10	*Puntiussarana*	Olive barb	Nga-khone-ma-gyi
		11	*Salmostomasardinella*	Sardinellarazorbelly minnow	Yin-baung-zar-khar-shay
		12	*Amblypharyngodonmola*	Molacarpiet	Nga-phyu-thay
		13	*Aspidopariamorar*	Aspidoparia	Yin-baung-zar-khar-waing
		14	*Raiamasguttatus*	Burmese trout	Nga-la-war
	Cobitidae	15	*Acantopsischoirorhynchos*	Bananafish	Nga-the-la-chay-dox
		16	*Lepidocephalusguntea*	Guntea loach	Nga-the-la-dox
		17	*Botiahistrionica*	Burmese loach	Nga-wet-ma
Siluriformes	Bagridae	18	*Aorichthyesaor*	Long whiskered catfish	Nga-gyaung
		19	*Mystuscavasius*	Gangeticmystus	Nga-zin-yaing-phyu
		20	*Mystuspulcher*	Pulchermystus	Nga-zin-yaing-kyet-chay

Table 1. (Continued)

Order	Family		Scientific Name	Common Name	Local Name
		21	*Rita rita*	Rita	Nga-htay
	Siluridae	22	*Ompokbimaculatus*	Indian butter-catfish	Nga-nu-than
		23	*Wallago attu*	Boal	Nga-butt
	Schilbeidae	24	*Clupisomagarua*	Bastargarua	Nga-kyi-tauk
		25	*Clupisomaprateri*	Batchwavacha	Nga-oak-ohar
		26	*Eutropiichthyesvacha*	Batchwavacha	Nga-myin-kun-mar
		27	*Siloniasilondia*	Silondia catfish	Nga-myin-yin
	Sisoridae	28	*Bagariusyarrellii*	Goonch	Nga-maung-ma
		29	*Gagatacenia*	Indian gagata	Nga-nan-kyaung-nat
		30	*Gagatagagata*	Gangetic gagta	Nga-nan-kyaung-war
	Arridae	31	*Hemipimelodusjatius*	River catfish	Nga-yaung
Beloniformes	Belonidae	32	*Xenentodoncancila*	Fresh water garfish	Nga-phaung-yoe
Perciformes	Ambassidae	33	*Pseudambassisranga*	Indian glassy fish	Nga-zin-zat
	Sciaenidae	34	*Otolithoidespama*	Pama	Nga-poke-thin
	Cichlidae	35	*Oreoschromis*sp.	Tilapia	Salapia
	Gobiidae	37	*Glossogobiusgiuris*	Tank goby	Ka-tha-boe
Muligiformes	Mugilidae	36	*Rhilomugilcorsula*	Corsula mullet	Nga-zin-lone
Mastacembeliformes	Mastacembelidae	38	*Macrognathuszebrinus*	Zig zag spiny eel	Nga-mway-doh-kyan-sit
		39	*Mastacembelusarmatus*	Tire-track-spinyeen	Nga-mway-nagar
Tetradontiformes	Tetradontidae	40	*Tetraodon cutcutia*	Ocellated pufferfish	Nga-si-pu

Table 2. Monthly productivity of fish in respective species caught from study area during the study period

No.	Species	Weight (kg) of fish								Total	%
		Jan	Feb	Mar	Apr	May	June	Jul	Aug		
1	*N. notopterus*	-	0.057	1.176	-	-	-	-	0.947	2.18	0.36
2	*P. boro*	-	-	2.351	-	-	-	-	-	2.351	0.39
3	*G. variegate*	-	490	-	4.964	-	2.09	-	-	7.544	1.25
4	*T. ilisha*	2.903	9.634	25.34	20.901	1.568	-	-	-	60.346	10.02
5	*G. curmuca*	0.485	0.651	3.445	0.751	-	0.457	1.502	-	7.292	1.21
6	*L.boga*	-	-	4.311	3.005	-	0.392	-	-	7.707	1.28
7	*O. belangeri*	0.592	3.348	-	-	3.592	1.437	-	3.233	12.202	2.03
8	*O. cunma*	4.390	4.833	7.430	11.79	5.879	2.482	2.057	-	38.861	6.45
9	*P. chola*	-	0.485	-	-	3.07	0.098	0.098	-	3.751	0.62
10	*P. sarana*	-	-	1.764	0.751	1.078	1.012	-	-	4.605	0.76
11	*S.sardinella*	0.415	16.987	16.003	11.071	-	0.653	1.922	-	47.05	7.81
12	*A. mola*	9.508	1.465	-	17.897	9.144	-	-	-	38.014	6.31
13	*A. morar*	21.996	38.276	45.784	30.666	1.372	1.012	2.580	1.339	143.026	23.75
14	*R. guttatus*	-	2.450	9.716	0.751	-	-	2.449	2.874	18.24	3.03
15	*A. choirorhynchos*	-	2.006	-	-	-	-	-	-	2.006	0.33
16	*L. guntea*	-	0.651	-	-	-	-	-	-	0.651	0.11
17	*B. histrionic*	0.024	-	-	-	-	-	-	-	0.024	0.00
18	*A. aor*	-	1.764	3.527	0.751	1568	588	1600	-	9.798	1.63
19	*M. cavasius*	-	0.816	-	-	0.980	-	0.196	1.045	3.037	0.50
20	*M. pulcher*	-	-	1.176	-	2.547	-	-	0.980	4.703	0.78

Table. 2. (Continued)

No.	Species	Weight (kg) of fish								Total	%
		Jan	Feb	Mar	Apr	May	June	Jul	Aug		
21	*R. rita*	-	-	1.176	-	-	-	-	-	1.176	0.20
22	*O. bimaculatus*	-	2.449	-	0.425	-	0.294	-	-	3.168	0.53
23	*W. attu*	-	1.878	-	-	0.784	-	-	0.261	2.923	0.49
24	*C. garua*	-	1.764	-	-	-	-	-	0.653	2.417	0.40
25	*C. prateri*	-	9.781	-	-	-	0.294	2.384	2.351	14.81	2.46
26	*E.vacha*	-	3.266	10.385	8.034	3.952	2.580	2.123	0.980	31.32	5.20
27	*S. silonia*	0.004	-	-	-	-	2.155	-	-	2.16	0.36
28	*B. yarrellii*	-	1.551	-	-	-	-	-	-	1.551	0.26
29	*G. cenia*	1.037	19.429	11.561	7.511	0.980	1.698	1.372	-	43.588	7.24
30	*G.gagata*	1.037	5.369	3.462	7.446	-	0.196	-	-	17.510	2.91
31	*H.jatius*	-	-	-	3.005	-	-	-	-	3.005	0.50
32	*X. cancila*	0.016	-	-	-	-	-	-	-	0.016	0.00
33	*P. ranga*	1.729	5.946	9.406	7.087	5.164	1.372	0.849	4.213	35.766	5.94
34	*O.pama*	-	0.024	1.176	4.964	-	-	-	-	6.164	1.02
35	*Oreoschromis*sp	0.242	-	-	-	0.653	0.425	-	-	1.32	0.22
36	*R. corsula*	0.830	1.712	4.033	0.588	-	-	0.914	1.012	9.09	1.51
37	*G. giuris*	0.439	-	-	0.588	1.764	0.359	0.261	0.849	4.26	0.71
38	*M. zebrinus*	-	-	-	6.009	1.633	-	-	-	7.642	1.27
39	*M. armatus*	0.053	-	-	-	-	-	0.980	-	1.033	0.17
40	*T. cutcutia*	0.020	-	-	-	-	-	-	-	0.02	0.00
	Total	45.722	137.082	163.221	148.956	45.726	19.595	21.288	20.737	602.326	100
	%	7.59	22.75	27.09	24.73	7.59	3.25	3.53	3.44	100	

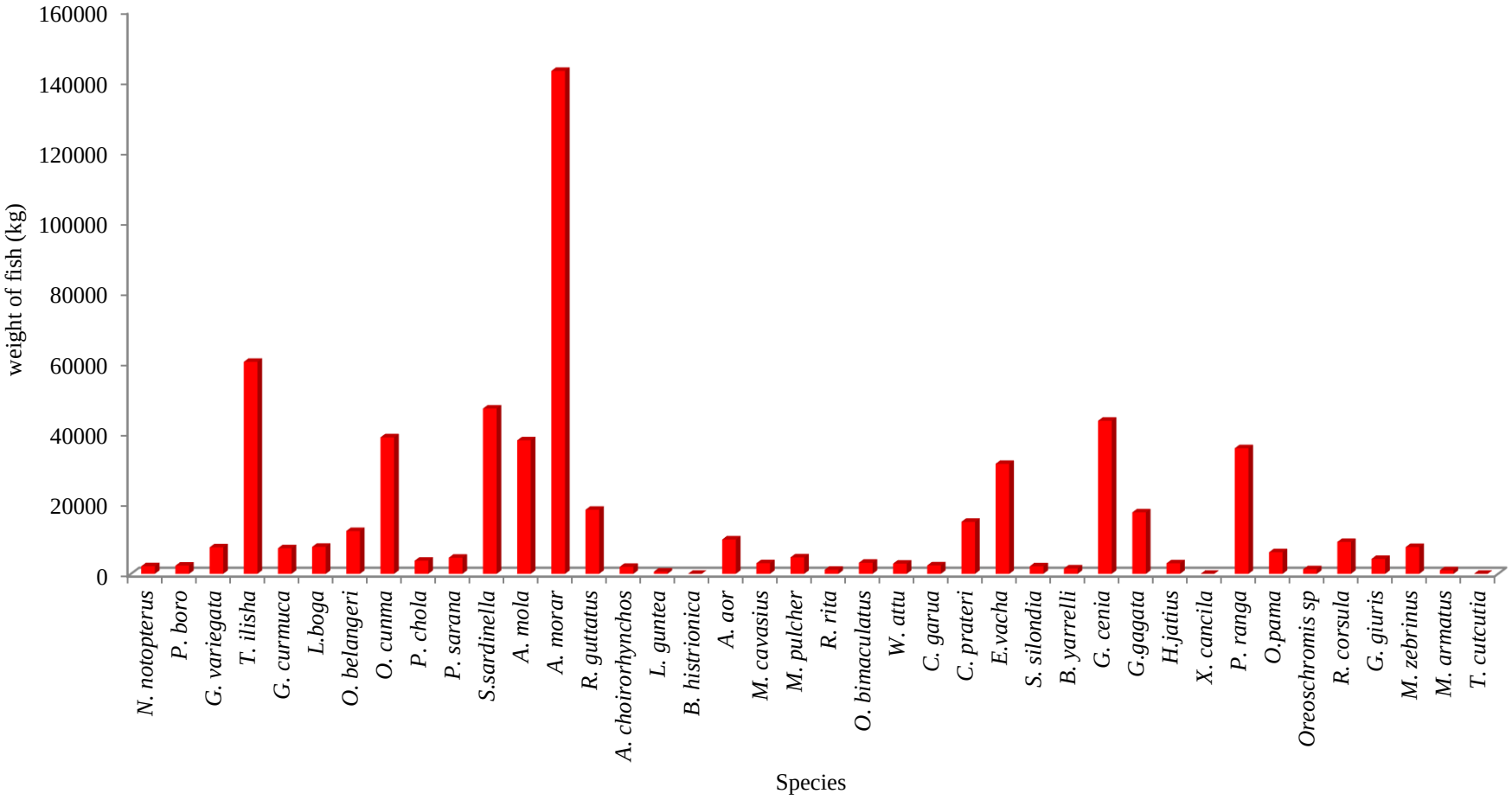
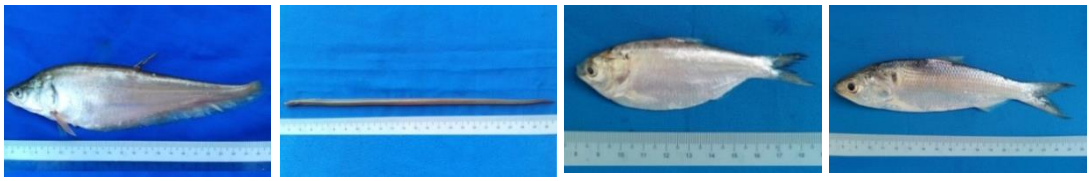


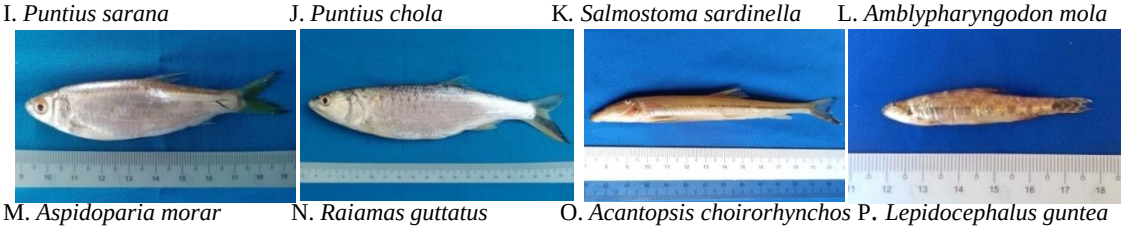
Fig.3. Total catch weight of fish species from the study site



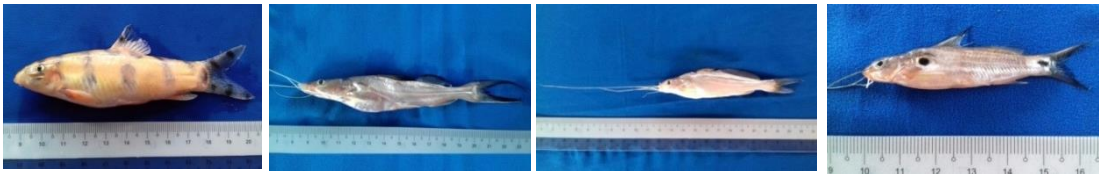
A. *Notopaterus notopterus* B. *Pisodonophis boro* C.*Gudusia variegata* D. *Tenualosa iliha*

E. *Gonoproktopterus curm* F. *Labeo boga* G.*Osteobrama belangeri* H. *Osteobrama cunma*

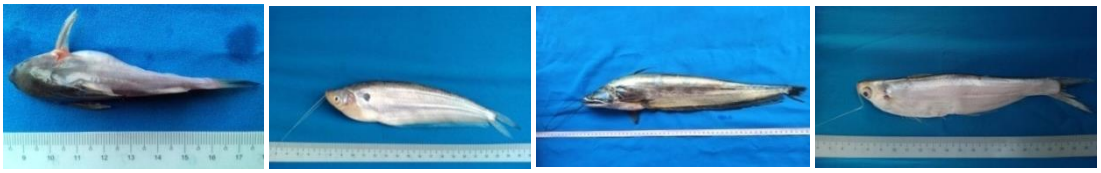
I. *Puntius sarana* J. *Puntius chola* K. *Salmostoma sardinella* L. *Amblypharyngodon mola*



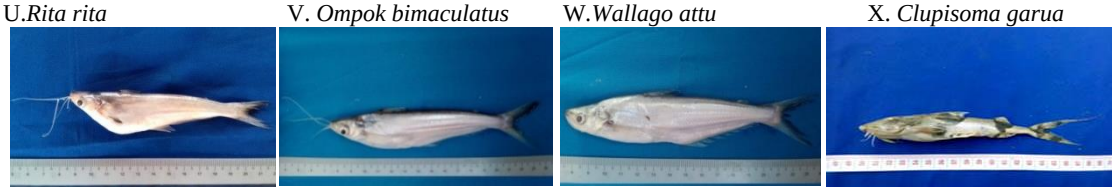
M. *Aspidoparia morar* N. *Raiamas guttatus* O. *Acantopsis choirorhynchos* P. *Lepidocephalus guntea*



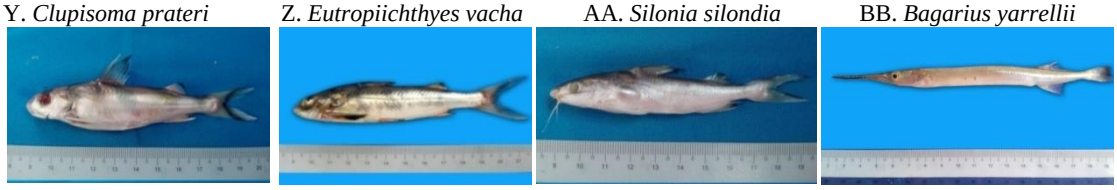
Q. *Botia histrionica* R. *Aorichthyes aor* S. *Mystus cavasius* T. *Mystus pulcher*



U.*Rita rita* V. *Ompok bimaculatus* W.*Wallago attu* X. *Clupisoma garua*

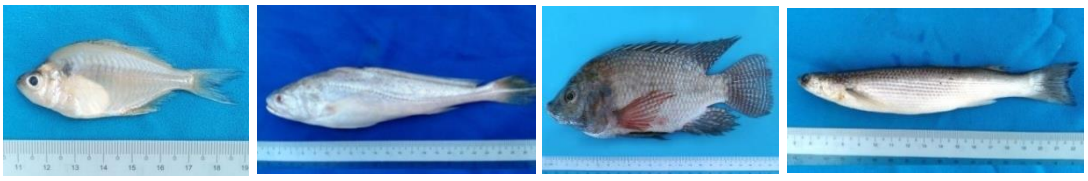


Y. *Clupisoma prateri* Z. *Eutropiichthyes vacha* AA. *Silonia silondia* BB. *Bagarius yarrellii*



CC. *Gagata cenia* DD. *Gagata gagata* EE. *Hemipimelodus jatius* FF.*Xenentodon cancila*

Plate .1 Recorded fish species from the study site



GG. *Pseudambassis ranga* HH. *Otolithoidespama* II. *Oreoschromis* sp. JJ. *Rhinomugil corsula*

KK. *Glossogobius giuris* LL. *Macrognathus zebrinus* MM.*Mastacembelus armatus* NN. *Tetraodon cutcutia*

Plate . 2 Recorded fish species from the study site (Continued)

Discussion

Ayeyarwady River flows from north to south through Myanmar and represented the Largest River and most important commercial waterway. The floodplain of the Ayeyarwady River is highly and play important role in the ecology of the river system. The floodplain fauna includes a diverse and productive fish community which provided an important food source for villages along the river.

Janko (2014) reported that the fishery production is overexploited due to inappropriate fishing practice the potential of fish was underdeveloped and the management rule and regulation at federal level and regional level to the control the devastation was poor.

Thandar Aung (2018) stated that the fish were predominantly caught from March to May in her study area. In the present study, the highest catch weight and catch numbers of species were observed in February, March and April, these different may be due to habitat variation and fishing activities.

Langton *et al.*, 1996 stated fish habitat is an essential ingredient in the productivity of fish, the source of harvests taken by fisheries. While substantial progress has been achieved in the management of fisheries to sustain yield, relatively little progress has been made in the development of habitat management regimes to sustain the necessary productivity.

In the present study, different number of individuals and species of fish were recorded during study period in the study area. A total weight of (602.326 kg) were collected in the study area. Among the study months the highest weight of (163.221 kg) in March and the lowest weight of (19.595kg) in June were collected. According to recorded data, the highest number of species (26) were observed in February, (21) species in April and the lowest number of species (13) in August. Thus, the number of fish species and weight of collected fish species were different in months of the study period. It may be due to different water level of the respective month and season.

Conclusion

On the base of the recorded data, *A. morar, S. Sardinella, P. ranga, T. ilisha* were the most economic important species in the study area. In the present study, among the recorded 40 fish species, 22 fish species were rare species. This river is a vital source of irrigation of river-bank agriculture and plentiful fish fauna provide daily food for communities along the length of river. So, there is a need to put awareness

in local people for the importance of conservation of fish fauna for the future generations.

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