FULL PAPER

A Ranked Inventory of Commercially-important Mollusks of Panay, West Central Philippines as a Guide to Prioritize Research

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ABSTRACT

A first-ever effort to rank commercially-important mollusk species of Panay Island was conducted based on an extensive survey between March and April 2018. Ranking was based on the following criteria, namely: commercial value (40%), catch rates (20%), sources of threats (type of gear, processing plants, and number of fishers) (20%), frequency in the markets and source sites (10%), and literature available (10%), modified to a certain extent. A total of 90 mollusk species categorized into bivalves (49), gastropods (32), and cephalopods (9) were ranked. The comb pen shell *Atrina pectinata* (Pinnidae), Indian squid *Uroteuthis duvaucelii* (Loliginidae), and the scallop *Mimachlamys sanguinea* (formerly *Chlamys senatoria*) (Pectinidae) formed the top three species in the list strongly attributed to their high commercial value and thus catch rates. Squids, in general, are caught by trawls, whereas most of the other species are harvested primarily by gleaning and diving. The study highlights the high diversity of the malaco-fauna of Panay, as well as the multi-gear character of tropical fisheries. This ranked inventory can be used in prioritizing research on mollusks, by identifying target species for more in-depth studies useful for establishing their present status.

Keywords: bivalves, cephalopods, gastropods, mollusks, Panay Island, ranked inventory

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1. INTRODUCTION

Phylum Mollusca, the second-largest phylum of animals after the arthropods, is represented by many commercially-important species, primarily belonging to Class Gastropoda, Bivalvia, and Cephalopoda. The Philippine Statistics Authority (PSA) reported for 15 years (2002-2017) a total municipal squid production of 672T metric tons (MT) for the entire Philippines with a corresponding value of approximately PHP 48.5M (PSA 2018). Western Visayas supposedly contributes to this considerably, where production (89.9T MT) and value (PHP 7M) correspond to 13.4% and 14.4% of the total for the entire Philippines, respectively. Based on initial data, however, the values of Western Visayas are gross underestimates (del Norte-Campos et al. in prep.). These statistics also simply lump species together so that the real picture of the commercial importance (amount harvested) of individual species is not accounted for. This generalized picture makes prioritization of research for commercially-important marine mollusks more difficult. An earlier study to mitigate this problem was conducted for the invertebrates in Panay (del Norte-Campos et al. 2000). A set of criteria was used to rank species importance based on their commercial value, catch rate, threats, frequency in markets, and information available. Albeit acknowledged to be incomplete, the study came up with 50 species, 34 (68%) of which are mollusks. Based on this and subsequent studies, mollusks, among other invertebrates, are harvested in Panay using trawls (del Norte-Campos et al. 2003) and by diving (Declarador and del Norte-Campos, 2004). Gleaning, which until recently, remained to be a largely undocumented method of collection, also proves to be a reliably consistent and easily accessible source of income (del Norte-Campos et al. 2003; del Norte-Campos et al. 2005) for coastal populations, especially women. Following to a great extent, the methods of del Norte-Campos et al. (2000), an inventory of the commercially-important mollusks of Panay Island was conducted with the similar aim.
of ranking the species to serve as a guide in selecting target species for in-depth studies. These studies include population and reproductive biology, as well as fishery monitoring, which altogether are important in establishing the status of the resource.

2. MATERIALS AND METHOD

The survey was conducted between March and April 2018 in all four provinces of Panay Island (Fig. 1). The number of sampling sites (towns/cities) by province surveyed were as follows: Iloilo (6), Capiz (6), Aklan (3), and Antique (2), with each sampling site having their respective source sites, i.e., barangays (see Table 1). The different sites were visited, and interviews with fishers were conducted using a survey form (Table 2). Assistance in initial identification and selection of target sites for the interview was provided by local municipal agricultural officers (MAOs), faculty members of local fisheries schools and state colleges, as well as barangay captains. Printed images of known species were shown to interviewees to help validate species identity. Type specimens of unknown species were identified in the laboratory using literature such as FAO (1998 a & b) and Laureta (2008), while the rest were sent to the National Museum for Nature and Science (NMNS), Tokyo, for verification of taxonomic identification.

Figure 1. Map showing location of sampled areas during a mollusk inventory survey in the four provinces (Iloilo, Capiz, Aklan, Antique) of Panay Island. The numbers enclosed in parentheses indicate no. of barangay (s) surveyed in each town/municipality.
Table 1. Sampling and source sites in Panay Island where inventory of commercially-important mollusk species was conducted, March-April 2018.

| Province | Sampling Sites (Town and Cities) | Source Sites (Barangays) |
|----------|---------------------------------|--------------------------|
| ILOILO 6 | Barotac Nuevo (1)               | Tinurian                 |
|          | Banate (4)                      | Alacaygan                |
|          | Concepcion (2)                  | Poblacion                |
|          | Ajuy (1)                        | Loong                     |
|          | San Dionisio (1)                | Mangarocoro              |
|          | Carles/ Estancia (2)            | Siempreviva              |
|          |                                 | Isla Gigante Norte       |
|          |                                 | Isla Gigantes Sur        |
|          | Talokgangan                      | San Salvador             |
| AKLAN 3  | Batan (7)                       | Tabon                    |
|          |                                 | Camanci                  |
|          |                                 | Palay                    |
|          |                                 | Bay-ang                  |
|          | Tangalan (1)                    | Ipil                     |
|          | Nabas (1)                       | Poblacion                |
|          |                                 | Mapag-ong                |
|          |                                 | Dumatad                  |
| ANTIQUE 2| Tibiao (2)                      | Natividad                |
|          | Culasi (4)                      | Malabor                  |
|          |                                 | Maralison Is.            |
|          | Culasi                          | Lipata                   |
|          |                                 | Naba                     |
|          |                                 | Centro Norte             |
| CAPIZ 6  | Roxas (4)                       | Libas                    |
|          |                                 | Punta Cogon              |
|          |                                 | Talon                    |
|          |                                 | Cagay                    |
|          |                                 | Guibongan, Lonoy         |
|          |                                 | Culasi, Lonoy            |
|          |                                 | Agtatacay Norte          |
|          | Sapian (3)                      | Ivisan (1)               |
|          |                                 | Agustin Navarra          |
|          |                                 | Pilar (2)                |
|          |                                 | Poblacion                |
|          |                                 | Binaobawan               |
|          |                                 | Pontevedra (2)           |
|          |                                 | Lantangan                |
|          |                                 | Hiponia                  |
|          |                                 | Panay (1)                |
|          |                                 | Buntod                   |
Table 2. Survey form used during the interviews with fishers/gleaners in the various fishing villages in the four provinces of Panay Island, March-April 2018 (adopted from del Norte-Campos et al. 2000).

| Species | Local or Common Name | Landing Or Trading Site | Gears Used | Estimated Catch Rate (kg hr⁻¹) | Marketed Part & Form |
|---------|----------------------|-------------------------|------------|-------------------------------|----------------------|
|         |                      |                         |            | 5 Yrs ago | 2 Yrs ago | present | Season | Market Or Uses | Price (PHP kg⁻¹) |
|         |                      |                         |            | A         | B         | C        | D        | E            | F         |

LEGEND: A = whole organism, B = meat only, C = shell only, D = adductor, E = meat w/o adductor, F = fresh, Z = frozen
The data were analyzed using a set of criteria (Table 3) adopted and slightly modified from del Norte-Campos et al. (2000). The criteria are meant to highlight species with high commercial value and thus catch rates. Thus, species which score high in this scheme are those: a) with the highest commercial value, especially export value; b) which are processed with a processing plant, and thus high value added; c) which are fished more (i.e., high fishing intensity: high catch rates and more fishers); d) caught using destructive gear; and e) studied less (in terms of number of published literature). In this study, the last criterion was modified by giving a higher rank to species that have received less attention (i.e., relatively undocumented). This conforms more to use the resulting ranked inventory as a basis for selecting target species for more detailed studies, i.e., less studied, more attention needed.

Commercial Value (CV), assigned a total weight of 40%, was assessed using actual prices (in PHP) recorded during the interviews. This was further broken down to Local Commercial Value, LCV (15%), and Export Commercial Value, ECV (25%). Estimated Catch Rate, CR (standardized to kg hr-1) (20%), which served as the proxy for Estimated Volume of Catch, was encoded using averaged fishery monitoring data recorded during the 1st to 2nd quarters of the year (January-June). Sources of Threats (20%) were

Table 3. Criteria used in ranking mollusk species inventoried in Panay Island in March-April 2018 (adopted/modified from del Norte-Campos et al. 2000).

| CRITERIA                            | SCORE ASSIGNED | % WEIGHT (100%) |
|-------------------------------------|----------------|-----------------|
| 1. Commercial value (CV)            |                | 40              |
| Local value (LCV)                   | 15             |                 |
| Export value (ECV)                  | 25             |                 |
| 2. Estimated Volume of Catch (Est'd CPUE) (CR) | actual value weighted (kg hr-1 fished) | 20 |
| 3. Threats                          |                | 20              |
| a) presence /absence of processing plants, (PP) | presence = 1 absence = 0 | 8 |
| b) # of traders (modified to # of gleaners and fishers) (G/F) | | |
| >150                                | 3              |                 |
| 100-150                             | 2              |                 |
| <100                                | 1              |                 |
| c) destructiveness of gears (G)     |                | 6               |
| trawl                               | 6              |                 |
| Set gill net                        | 5.5            |                 |
| Encircling net                      | 5.5            |                 |
| Gleaning w/ trowel                  | 5.5            |                 |
| Spear                               | 4              |                 |
| Jigger                              | 3              |                 |
| Bamboo pots/traps, lift net         | 2              |                 |
| 4. Frequency in the public market (FPM) | 5             |                 |
| in the source sites (FSS)           | 5              |                 |
| 5. Info Availability (in PH) (# published studies) (IA) | | |
| >10                                 | 1              |                 |
| 5-10                                | 2              |                 |
| 0-5                                 | 3              |                 |
| TOTAL                               |                | 100%            |
further broken down into: 1) presence of processing plants, PP (8%); 2) number of traders, herein modified to number of gleaners/fishers, G/F (6%); and 3) destructiveness of gear, G (6%). Species with processing plants were assigned a value of 1 while those without were assigned a value of 0. The number of fishers was further ranked in descending order with a decreasing number of fishers, i.e., >150 fishers (=3), 100-150 (=2), and <100 (=1). Frequency (10%) was evaluated by assigning the number of days in a week that the species are usually observed in the markets (FPM, 5%) and source sites (FSS, 5%). The degree of destructiveness of gear (G) was ranked with the highest value of 6 assigned to trawl, deemed as the most destructive gear, down to a value of 2 for passive gears such as traps and lift nets. Lastly, the criterion Information Availability, IA, based on the number of published studies in the Philippines, as mentioned above, deviated totally from del Norte-Campos et al. (2000), i.e., species which had been studied least (0 to 5 studies) were given a higher score (6), highlighting the need for more attention on these lesser-known/documented species. Marketing of collected shells are in most areas conducted on the same day, and this is true in both cases where there are designated buyers, or when the fishers themselves have to sell in local markets.

For each criterion, the mean of individual entries for each species for all areas was computed. These means were divided by the total value of entries for that criterion and weighted by multiplying each with the corresponding percentage value assigned for the said criterion. Individual weighted scores for each species for each criterion were summed to get the final score. The species were then ranked from highest to lowest based on their final scores. To make the procedure for computation clearer, Table 4 illustrates the computation for all species. From here, we can see the input values used for each criterion, the sum of inputs across all species with input values for the specific criterion, and the respective % weight for each criterion. Weighted score for each species is then computed as follows:

\[ \text{Weighted score} = \left( \frac{\text{actual input value}}{\text{total value}} \right) \times \% \text{ weight} \]

Thus, for example, the local commercial value (LCV) used for the comb shell *Atrina pectinata* was PHP 105.00 kg\(^{-1}\), which was divided by the total LCV for all species recorded during the survey (PHP 5,427.1) = 0.019 x % weight for LCV 15% = 0.003. The same was done for all criteria, and the sum of all weighted scores taken (0.176), which is the final score for this species.

| *Atrina pectinata* | LCVt | ECV | CR | PP* | G/F | G | FPM | FPS | IA | sum |
|--------------------|------|-----|----|-----|-----|---|-----|-----|----|-----|
| input value        | 105.00 | 220.00 | 0.54 | 0.5 | 1 | 5.5 | 4 | 6 | 3 |
| sum of inputs      | 5,427.1 | 620.00 | 253.1 | 0.5 | 96.3 | 482.8 | 311.9 | 359.7 | 247.9 |
| % weight           | 15 | 25 | 20 | 8 | 6 | 6 | 5 | 5 | 10 | 100.0 |
| weighted score     | 0.003 | 0.09 | 0.0004 | 0.08 | 0.006 | 0.007 | 0.006 | 0.001 | 0.001 | 0.176 |

*input value for PP is the mean value for 2 sites*
3. RESULTS AND DISCUSSION

3.1 Species Occurrence

A total of 95 mollusk species were encountered in the survey, of which 90 species belonging to three classes: Bivalvia (49), Gastropoda (32), and Cephalopoda (9) were ranked (Table 5). Figure 2 shows the relative distribution of the three mollusk classes by province. It can be seen here that bivalves predominate in Iloilo and Capiz, while there are more gastropods in Antique and Aklan. Cephalopod's occurrence in Iloilo, Capiz, and Antique is comparable, whereas Aklan's cephalopod resources are poor. Twenty-seven of the 90 species recorded in this survey were also reported in the study conducted by del Norte-Campos et al. (2000), while 62 species are new in the inventory for mollusks of Panay. These differences are likely due to the broader area covered in the present study, as well as the likelihood of some species having been omitted in the past study as they have only gained more considerable attention in the recent years. For example, several scallops (Pectinidae) species, namely Mimachlamys sanguinea (formerly Chlamys senatoria), Bractechlamys vexillum, Decatopecten amiculum, Annachlamys striatula are now included in the list due to the addition of Isla Gigantes Norte and Sur (previously excluded) in the present areas surveyed. These four species also ranked 3rd to 6th place, which validates their commercial importance. A few species have gained more attention, such as the granular ark Tegillarca granosa (also known as Anadara granosa) over which a stronger interest has increased due to the possibility of foreign markets (Korea). As such, the already high harvest rates (1.68 kg hr\(^{-1}\)) in the Batan Bay area are exceeded by even higher catch rates (6.16 kg hr\(^{-1}\)) in Capiz.

![Figure 2. Distribution of mollusk classes by province in Panay Island.](image-url)
Table 5. Overall ranking of commercially-important mollusks of Panay Island weighted by criterion [LCV = local commercial value; ECV = export commercial value; CR = catch rate; threats (PP = processing plant, G/F = gleaners & fishers, G = gears); frequency (FPM = in public markets, FSS = in source sites); IA = information available].

| RANK | SPECIES                        | Common Names (FAO, 1998) | LCV  | ECV  | CR   | PP   | G/F  | G    | FPM  | FSS  | IA   | sum  |
|------|--------------------------------|--------------------------|------|------|------|------|------|------|------|------|------|------|
| 1    | Atrina pectinata               | Comb pen shell           | 0.0029 | 0.0887 | 0.0004 | 0.0006 | 0.0007 | 0.0006 | 0.0006 | 0.001 | 0.001 | 0.1760 |
| 2    | Uroteuthis duvaucelii          | Indian squid             | 0.0063 | 0.1613 | 0.0013 | 0    | 0.0007 | 0.0005 | 0.0009 | 0.001 | 0.001 | 0.1729 |
| 3    | Mimachlamys sanguinea          | Senatorial scallop       | 0.0035 | 0     | 0.0253 | 0    | 0.0006 | 0.0007 | 0.0010 | 0.001 | 0.001 | 0.0331 |
| 4    | Brachteclamys                  | Distant scallop          | 0.0032 | 0     | 0.0227 | 0    | 0.0006 | 0.0007 | 0.0010 | 0.001 | 0.001 | 0.0302 |
| 5    | Decatopecten amiculum          | Cloak scallop            | 0.0030 | 0     | 0.0217 | 0    | 0.0006 | 0.0007 | 0.0010 | 0.001 | 0.001 | 0.0291 |
| 6    | Annachlamys striatula          | Macassar scallop         | 0.0030 | 0     | 0.0217 | 0    | 0.0006 | 0.0007 | 0.0002 | 0.001 | 0.001 | 0.0276 |
| 7    | Conomurex lubuanus             | Strawberry conch         | 0.0009 | 0     | 0.0118 | 0    | 0.0006 | 0.0007 | 0.0004 | 0.0004 | 0.001 | 0.0160 |
| 8    | Spondylus butleri              | Butler's thorny oyster   | 0.0030 | 0     | 0.0058 | 0    | 0.0012 | 0.0007 | 0.0011 | 0.001 | 0.001 | 0.0141 |
| 9    | Pholas orientalis              | Oriental angel wing      | 0.0083 | 0     | 0.0017 | 0    | 0.0006 | 0.0007 | 0.0010 | 0.001 | 0.0004 | 0.0135 |
| 10   | Nautilus pompilius             | Chambered nautilus       | 0.0099 | 0     | 0.0009 | 0    | 0.0006 | 0.0003 | 0.0006 | 0.001 | 0.0004 | 0.0134 |
| 11   | Spondylus squamosus            | Ducal thorny oyster      | 0.0030 | 0     | 0.0048 | 0    | 0.0012 | 0.0007 | 0.0011 | 0.001 | 0.001 | 0.0131 |
| 12   | Telescopium telescopium        | telescope snail          | 0.0005 | 0     | 0.0080 | 0    | 0.0007 | 0.0007 | 0.0008 | 0.001 | 0.001 | 0.0125 |
| 13   | Uroteuthis edulis              | swordtip squid           | 0.0062 | 0     | 0.0007 | 0    | 0.0006 | 0.0006 | 0.0010 | 0.001 | 0.001 | 0.0112 |
| 14   | Spondylus barbatus             | bearded thorny oyster    | 0.0030 | 0     | 0.0028 | 0    | 0.0012 | 0.0007 | 0.0011 | 0.001 | 0.001 | 0.0111 |
| 15   | Sepioteuthis lessoniana        | bigfin reef squid        | 0.0056 | 0     | 0.0004 | 0    | 0.0007 | 0.0006 | 0.0008 | 0.001 | 0.001 | 0.0100 |
| 16   | Melo broderipii                | crowned bailer           | 0.0014 | 0     | 0.0051 | 0    | 0.0006 | 0.0007 | 0.0005 | 0.0005 | 0.001 | 0.0099 |
| 17   | Amusium pleuronectes           | Asian moon scallop       | 0.0061 | 0     | 0.0003 | 0    | 0.0006 | 0.0007 | 0.0003 | 0.0003 | 0.001 | 0.0096 |
| 18   | Sepia latimanus                | broadclub cuttlefish     | 0.0055 | 0     | 0.0001 | 0    | 0.0006 | 0.0005 | 0.0008 | 0.001 | 0.001 | 0.0094 |
| 19   | Placuna placenta               | windowpane oyster        | 0.0010 | 0     | 0.0054 | 0    | 0.0006 | 0.0007 | 0.0003 | 0.0003 | 0.001 | 0.0090 |
| 20   | Sepia recurvirostra            | curvespine cuttlefish    | 0.0045 | 0     | 0.0010 | 0    | 0.0006 | 0.0005 | 0.0006 | 0.001 | 0.001 | 0.0090 |
| 21   | Spondylus versicolor           | golden thorny oyster     | 0.0030 | 0     | 0.0010 | 0    | 0.0012 | 0.0007 | 0.0008 | 0.001 | 0.001 | 0.0087 |
| 22   | Anadara antiquata              | antique ark              | 0.0007 | 0     | 0.0034 | 0    | 0.0006 | 0.0007 | 0.0010 | 0.001 | 0.001 | 0.0086 |
| RANK | SPECIES | Common Names (FAO, 1998) | LCV | ECV | CR | PP | G/F | G | FPM | FSS | IA | sum  |
|------|---------|--------------------------|-----|-----|----|----|-----|----|-----|-----|----|------|
| 23   | Tegillarca granosa | granular ark | 0.0011 | 0 | 0.0032 | 0 | 0.0007 | 0.0007 | 0.0008 | 0.001 | 0.01 | 0.0083 |
| 24   | Sthenoteuthis oualaniensis | purpleback flying squid | 0.0029 | 0 | 0.0011 | 0 | 0.0006 | 0.0004 | 0.0010 | 0.001 | 0.001 | 0.0080 |
| 25   | Octopus cyanea | day octopus | 0.0029 | 0 | 0.0011 | 0 | 0.0006 | 0.0006 | 0.0007 | 0.001 | 0.001 | 0.0076 |
| 26   | Saccostrea cucullata | hooded oyster | 0.0002 | 0 | 0.0031 | 0 | 0.0006 | 0.0007 | 0.0009 | 0.001 | 0.001 | 0.0076 |
| 27   | Geloina expansa | broad geloina | 0.0009 | 0 | 0.0026 | 0 | 0.0007 | 0.0007 | 0.0006 | 0.001 | 0.001 | 0.0073 |
| 28   | Laevistrombus turturrella | dog conch | 0.0017 | 0 | 0.0012 | 0 | 0.0006 | 0.0007 | 0.0010 | 0.001 | 0.001 | 0.0072 |
| 29   | Scapharca inaequivalvis | inequivalve ark | 0.0008 | 0 | 0.0022 | 0 | 0.0006 | 0.0007 | 0.0008 | 0.001 | 0.001 | 0.0070 |
| 30   | Trochus radiatus | radiate top shell | 0.0017 | 0 | 0.0012 | 0 | 0.0006 | 0.0007 | 0.0008 | 0.001 | 0.001 | 0.0069 |
| 31   | Octopus nocturnus | Philippine night octopus | 0.0019 | 0 | 0.0004 | 0 | 0.0006 | 0.0005 | 0.0011 | 0.001 | 0.001 | 0.0068 |
| 32   | Azorinus abbreviatus | small short razor | 0.0015 | 0 | 0.0012 | 0 | 0.0007 | 0.0007 | 0.0005 | 0.001 | 0.001 | 0.0065 |
| 33   | Nerita planospira | flatspired nerite | 0.0015 | 0 | 0.0008 | 0 | 0.0006 | 0.0007 | 0.0008 | 0.001 | 0.001 | 0.0064 |
| 34   | Malleus malleus | black hammery oyster | 0.0019 | 0 | 0.0001 | 0 | 0.0006 | 0.0007 | 0.0010 | 0.001 | 0.001 | 0.0063 |
| 35   | Marcia hiantina | hiant venus | 0.0011 | 0 | 0.0012 | 0 | 0.0007 | 0.0007 | 0.0008 | 0.001 | 0.001 | 0.0063 |
| 36   | Modiolus modulaides | yellowbanded horse mussel | 0.0008 | 0 | 0.0017 | 0 | 0.0006 | 0.0007 | 0.0009 | 0.001 | 0.001 | 0.0063 |
| 37   | Meretrix lyrata | lyrate hard clam | 0.0002 | 0 | 0.0014 | 0 | 0.0006 | 0.0007 | 0.0011 | 0.001 | 0.001 | 0.0062 |
| 38   | Austriella corrugata | corrugate lucine | 0.0015 | 0 | 0.0007 | 0 | 0.0006 | 0.0007 | 0.0008 | 0.001 | 0.001 | 0.0062 |
| 39   | Glaefarium pectinatum | tumid venus | 0.0006 | 0 | 0.0018 | 0 | 0.0007 | 0.0007 | 0.0006 | 0.001 | 0.001 | 0.0062 |
| 40   | Crassostrea echinata | spiny rock oyster | 0.0017 | 0 | 0.0010 | 0 | 0.0006 | 0.0007 | 0.0002 | 0.001 | 0.001 | 0.0061 |
| 41   | Glauconome virens | greenish glauconomya | 0.0015 | 0 | 0.0015 | 0 | 0.0008 | 0.0007 | 0.0002 | 0.002 | 0.001 | 0.0061 |
| 42   | Conus figulinus | fig cone | 0.0008 | 0 | 0.0012 | 0 | 0.0006 | 0.0007 | 0.0006 | 0.001 | 0.001 | 0.0060 |
| 43   | Trisidos semitorta | half-propellor ark | 0.0008 | 0 | 0.0011 | 0 | 0.0006 | 0.0007 | 0.0005 | 0.001 | 0.001 | 0.0059 |
| 44   | Lambis lambis | common spider conch | 0.0017 | 0 | 0.0007 | 0 | 0.0006 | 0.0007 | 0.0005 | 0.000 | 0.001 | 0.0058 |
| 45   | Meretrix meretrix | Asiatic hard clam | 0.0013 | 0 | 0.0007 | 0 | 0.0006 | 0.0007 | 0.0006 | 0.001 | 0.001 | 0.0057 |
| 46   | Oliva oliva | common olive | 0.0007 | 0 | 0.0012 | 0 | 0.0006 | 0.0007 | 0.0005 | 0.001 | 0.001 | 0.0056 |
| 47   | Haliotis glabra | glistening abalone | 0.0017 | 0 | 0.0011 | 0 | 0.0006 | 0.0007 | 0.0006 | 0.001 | 0.001 | 0.0044 |
| 48   | Isognomon ephippium | saddle tree oyster | 0.0010 | 0 | 0.0014 | 0 | 0.0006 | 0.0007 | 0.0002 | 0.0003 | 0.001 | 0.0054 |
| 49   | Barbata virescens | blood clam | 0.0010 | 0 | 0.0010 | 0 | 0.0006 | 0.0007 | 0.0004 | 0.0003 | 0.001 | 0.0052 |
| Rank | Species Name                      | Common Names (FAO, 1998)                  | LC | ECV | CR  | PP  | G/F | G   | FPM | FSS | IA | sum |
|------|----------------------------------|------------------------------------------|----|-----|-----|-----|-----|-----|-----|-----|----|-----|
| 50   | Canarium urceus                  | little pitcher conch                     | 0  | 0.0005 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0007 | 0 | 0.0005 | 0 | 0.0001 | 0 | 0.0002 |
| 51   | Nerita albicilla                 | opalescent nerite                        | 0  | 0.0007 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0007 | 0 | 0.0004 | 0 | 0.0001 | 0 | 0.0002 |
| 52   | Achatina fulica                 | globose ark                               | 0  | 0.0008 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0007 | 0 | 0.0005 | 0 | 0.0001 | 0 | 0.0002 |
| 53   | Potamocorbula fasciata          | basket clam                               | 0  | 0.0004 | 0 | 0.0020 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0001 | 0 | 0.0001 | 0 | 0.0002 |
| 54   | Gari ogata                      | courtesan sunset clam                     | 0  | 0.0007 | 0 | 0.0011 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0003 |
| 55   | Anadara globosa                 | globose ark                               | 0  | 0.0004 | 0 | 0.0014 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0003 |
| 56   | Potamocorbula fasciata          | basket clam                               | 0  | 0.0004 | 0 | 0.0049 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| 57   | New Zealand rock oyster         | bicolor pen shell                         | 0  | 0.0006 | 0 | 0.0004 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| 58   | Anadara globosa                 | globose ark                               | 0  | 0.0006 | 0 | 0.0004 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| 59   | Anodonta philippiana            | chalky buttercupine                       | 0  | 0.0007 | 0 | 0.0004 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| 60   | Potamocorbula fasciata          | basket clam                               | 0  | 0.0004 | 0 | 0.0014 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| 61   | Gari ogata                      | courtesan sunset clam                     | 0  | 0.0007 | 0 | 0.0011 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| 62   | Anadara globosa                 | globose ark                               | 0  | 0.0004 | 0 | 0.0014 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| 63   | Potamocorbula fasciata          | basket clam                               | 0  | 0.0004 | 0 | 0.0014 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| 64   | Anadara globosa                 | globose ark                               | 0  | 0.0004 | 0 | 0.0014 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| 65   | Potamocorbula fasciata          | basket clam                               | 0  | 0.0004 | 0 | 0.0014 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| 66   | New Zealand rock oyster         | bicolor pen shell                         | 0  | 0.0006 | 0 | 0.0004 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| 67   | Anadara globosa                 | globose ark                               | 0  | 0.0004 | 0 | 0.0014 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| 68   | Potamocorbula fasciata          | basket clam                               | 0  | 0.0004 | 0 | 0.0014 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| 69   | Anadara globosa                 | globose ark                               | 0  | 0.0004 | 0 | 0.0014 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| 70   | Potamocorbula fasciata          | basket clam                               | 0  | 0.0004 | 0 | 0.0014 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| 71   | Anadara globosa                 | globose ark                               | 0  | 0.0004 | 0 | 0.0014 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| 72   | Potamocorbula fasciata          | basket clam                               | 0  | 0.0004 | 0 | 0.0014 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| 73   | Anadara globosa                 | globose ark                               | 0  | 0.0004 | 0 | 0.0014 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| 74   | Potamocorbula fasciata          | basket clam                               | 0  | 0.0004 | 0 | 0.0014 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| 75   | Anadara globosa                 | globose ark                               | 0  | 0.0004 | 0 | 0.0014 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| 76   | Potamocorbula fasciata          | basket clam                               | 0  | 0.0004 | 0 | 0.0014 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| 77   | Anadara globosa                 | globose ark                               | 0  | 0.0004 | 0 | 0.0014 | 0 | 0.0006 | 0 | 0.0007 | 0 | 0.0006 | 0 | 0.0001 | 0 | 0.0004 |
| RANK | SPECIES                | Common Names (FAO, 1998) | LCV  | ECV  | CR   | PP   | G/F  | G    | FPM  | FSS  | IA   | sum  |
|------|-------------------------|--------------------------|------|------|------|------|------|------|------|------|------|-----|
| 78   | Conus pulicarius        | Pacific deer cowrie      | 0.0008 | 0    | 0.0004 | 0    | 0.0006 | 0.0007 | 0.0002 | 0.0001 | 0.001 | 0.0040 |
| 79   | Lyncina vitellus        | flea-bitten cone         | 0.0008 | 0    | 0.0004 | 0    | 0.0006 | 0.0007 | 0.0002 | 0.0001 | 0.001 | 0.0040 |
| 80   | Tellina scobinata       | rasp telline             | 0.0007 | 0    | 0.00002 | 0    | 0.0006 | 0.0007 | 0.0003 | 0.0003 | 0.001 | 0.0038 |
| 81   | Clypeomorus bifasciata  | morus cerith             | 0.0007 | 0    | 0.00001 | 0    | 0.0006 | 0.0007 | 0.0003 | 0.0003 | 0.001 | 0.0038 |
| 82   | Umbonium vestiarium     | common button top        | 0.0007 | 0    | 0.00001 | 0    | 0.0006 | 0.0007 | 0.0003 | 0.0003 | 0.001 | 0.0038 |
| 83   | Lambis millepeda        | milleped spider conch    | 0.0006 | 0    | 0.00002 | 0    | 0.0006 | 0.0007 | 0    | 0.001 | 0.001 | 0.0038 |
| 84   | Tectus pyramid          | pyramid top              | 0.0008 | 0    | 0.0004 | 0    | 0.0006 | 0.0007 | 0    | 0    | 0.001 | 0.0037 |
| 85   | Terebralia sulcata      | sulcate swamp cerith     | 0.0006 | 0    | 0.0005 | 0    | 0.0006 | 0.0007 | 0    | 0.0001 | 0.001 | 0.0037 |
| 86   | Mancinella alouina      | Mancinella rock-shell    | 0.0006 | 0    | 0.0006 | 0    | 0.0006 | 0.0007 | 0.0003 | 0.0004 | 0.0004 | 0.0036 |
| 87   | Lunella cinerea         | smooth moon turban       | 0.0006 | 0    | 0.0004 | 0    | 0.0006 | 0.0007 | 0.0005 | 0.0004 | 0.0004 | 0.0036 |
| 88   | Distorsio anus          | common distorsia         | 0.0007 | 0    | 0.00001 | 0    | 0.0006 | 0.0007 | 0.0002 | 0.0001 | 0.001 | 0.0035 |
| 89   | Meropesta nicobarica    | Nicobar mactra           | 0.0008 | 0    | 0.0003 | 0    | 0.0006 | 0.0007 | 0.0002 | 0.0003 | 0.0004 | 0.0032 |
| 90   | Pinctada imbricata      | Atlantic pearl-oyster    | 0.0007 | 0    | 0.00002 | 0    | 0.0006 | 0.0007 | 0.0002 | 0.0001 | 0.0004 | 0.0027 |
The cephalopods, comprised of nine species, figure prominently in the list and confirm their reported commercial importance in Philippine fisheries. The list now includes oceanic species, such as the purpleback flying squid *Sthenoteuthis oualanensis* which is caught in deeper waters (9.1-18.3 m) in Antique by lighted jiggers, spear, and hook and line. While the flying squid has been previously reported to occur in the northwestern Philippines (Siriraksophon et al. 2000; Basir 2000), as well as in Ayungon and Bindoy, Negros Oriental (Campos et al. 2016), it has never been recorded in Panay waters. The once-named *Uroteuthis bartschi* by del Norte-Campos et al. (2000), is now verified actually to be the swordtip squid *Uroteuthis edulis*. The confusion was likely caused by the similar elongate body shape of both species. The list also includes the day octopus *Octopus cyanea*, as well as *O. nocturnus*, which is only encountered in Antique (Table 6).

| No. | Species                          | Iloilo | Capiz | Aklan | Antique | Fishing Gears/Methods                      |
|-----|---------------------------------|--------|-------|-------|---------|-------------------------------------------|
| 1   | *Amusium pleuronectes*           | x      | x     |       |         | Trawl                                     |
| 2   | *Anadara antiquata*              |        | x     |       |         | gleaning                                  |
| 3   | *Anadara globosa*                |        | x     |       |         | diving                                    |
| 4   | *Angaria delphinus*              | x      | x     | x     | x       | gleaning                                  |
| 5   | *Anachlamys striatula*           | x      |       |       |         | diving                                    |
| 6   | *Anodontia philippiana*          |        | x     |       |         | gleaning                                  |
| 7   | *Antigona magnifica*             | x      |       |       |         | gleaning                                  |
| 8   | *Arrina pectinata*               | x      |       |       |         | diving                                    |
| 9   | *Austriella corrugata*           |        | x     |       |         | gleaning                                  |
| 10  | *Azorinus abbreviatus*           | x      | x     | x     |         | gleaning                                  |
| 11  | *Barbatia amygdalumostum*        | x      |       |       |         | gleaning                                  |
| 12  | *Barbatia fusca*                 | x      |       |       |         | gleaning                                  |
| 13  | *Barbatia virescens*             | x      | x     |       |         | gleaning                                  |
| 14  | *Bractechlamys*                  | x      | x     |       |         | diving                                    |
| 15  | *Canarium urceus*                | x      | x     |       |         | gleaning                                  |
| 16  | *Clypeomorus bifasciata*         | x      |       |       |         | gleaning                                  |
| 17  | *Conomurex luhuanus*             | x      | x     |       |         | gleaning                                  |
| 18  | *Conus characteristicus*         |        | x     |       |         | Diving, gleaning                          |
| 19  | *Conus ebraeus*                  | x      |       |       |         | diving                                    |
| 20  | *Conus figulinus*                |         | x     |       |         | gleaning                                  |
| 21  | *Conus pulicarius*               |         | x     |       |         | gleaning                                  |
| 22  | *Crassostrea echinata*           | x      | x     | x     |         | gleaning                                  |
| 23  | *Crassostrea glomerata*          |         | x     |       |         | gleaning                                  |
| 24  | *Cypraea tigris*                 | x      | x     |       |         | gleaning                                  |
| 25  | *Decatopecten amiculum*          | x      |       |       |         | diving                                    |
| 26  | *Distorsio anus*                 |         |       | x     |         | Diving, gleaning                          |
| 27  | *Donax cuneatus*                 |         | x     |       |         | gleaning                                  |
| 28  | *Euprotomus auriadiumae*         |         | x     |       |         | gleaning                                  |
| 29  | *Gastrarium pectinatum*          | x      | x     | x     |         | gleaning                                  |
| 30  | *Gari elongata*                  |         | x     |       |         | gleaning                                  |
| No. | Species                              | Iloilo | Capiz | Aklan | Antique | Fishing Gears/Methods |
|-----|-------------------------------------|--------|-------|-------|---------|----------------------|
| 31  | Gari togata                         | x      |       |       |         | gleaning             |
| 32  | Gari virescens                      | x      |       |       |         | gleaning             |
| 33  | Geloina expansa                     | x      | x     |       | x       | gleaning             |
| 34  | Glaucome virens                     | x      |       |       |         | gleaning             |
| 35  | Halioitis asinina                   | x      |       | x     |         | gleaning             |
| 36  | Isognomon ephippium                 | x      | x     |       | x       | gleaning             |
| 37  | Marcia hiantina                     | x      | x     | x     |         | gleaning             |
| 38  | Laevistrobus turturella             | x      |       | x     |         | gleaning             |
| 39  | Lambis lambis                      | x      |       |       |         | gleaning             |
| 40  | Lambis millepeda                    |       | x     |       |         | gleaning             |
| 41  | Lunella cinerea                     | x      |       |       |         | gleaning             |
| 42  | Lycolina vitellus                   | x      |       |       |         | gleaning             |
| 43  | Malleus malleus                     | x      | x     |       |         | Diving, gleaning     |
| 44  | Mancinella alouina                  | x      |       |       |         | gleaning             |
| 45  | Melo broderipii                     | x      | x     |       |         | Diving, gleaning     |
| 46  | Meretrix lyrata                     | x      |       |       |         | gleaning             |
| 47  | Meretrix meretrix                   | x      | x     |       |         | gleaning             |
| 48  | Meropista nicobarica                | x      |       |       |         | gleaning             |
| 49  | Mimachlamys sanguinea               | x      |       |       |         | diving               |
| 50  | Modiolus moduloides                 | x      | x     |       |         | gleaning             |
| 51  | Monodonta canalifera                | x      | x     |       |         | gleaning             |
| 52  | Nautilus pompilius                  | x      |       | x     | x       | Baited traps         |
| 53  | Nerita albicilla                    | x      | x     |       |         | gleaning             |
| 54  | Nerita exuvia                       | x      |       |       |         | gleaning             |
| 55  | Nerita planospira                   | x      |       |       |         | gleaning             |
| 56  | Nerita polita                       | x      | x     |       |         | Diving, gleaning     |
| 57  | Nerita undata                       | x      |       |       |         | gleaning             |
| 58  | Neverita didyma*                    | x      |       |       |         | gleaning             |
| 59  | Octopus cyanea                      | x      | x     | x     | x       | Spear, trawl         |
| 60  | Octopus nocturnus                   | x      |       |       |         | Spear               |
| 61  | Oliva oliva                         | x      |       |       |         | gleaning             |
| 62  | Paphia undulata                     | x      |       |       |         | Diving               |
| 63  | Pharella acutidens                  | x      |       |       |         | gleaning             |
| 64  | Pholas orientalis                   | x      |       |       |         | Diving               |
| 65  | Pinctada imbricata                  | x      |       |       |         | gleaning             |
| 66  | Pinna bicolor                       | x      |       |       |         | gleaning             |
| 67  | Placuna ephippium                   | x      | x     |       |         | gleaning             |
| 68  | Placuna placenta                    | x      | x     | x     |         | gleaning             |
| 69  | Potamocorbula fasciata              | x      |       |       |         | gleaning             |
| 70  | Rochia nilotica*                    | x      | x     | x     |         | gleaning             |
| 71  | Saccostrea cucullata                | x      | x     |       |         | gleaning             |
## Species Importance: Commercial Value and Catch Rates

Table 5 shows the list of species ranked ac-

| No. | Species                      | Iloilo | Capiz | Aklan | Antique | Fishing Gears/Methods            |
|-----|------------------------------|--------|-------|-------|---------|----------------------------------|
| 72  | Scapharca inequivalvis       | x      | x     | x     | x       | gleaning, diving                 |
| 73  | Scapharca pilula             |        | x     |       |         | gleaning                         |
| 74  | Scutarcopagia scobinata      |        | x     |       |         | gleaning                         |
| 75  | Sepia latimanus              | x      |       |       |         | Spear, hook & line, trawl        |
| 76  | Sepia recurvirostra          | x      | x     | x     | x       | Spear, trawl                     |
| 77  | Sepioteuthis lessoniana      |        | x     | x     | x       | Spear, traps, trawl              |
| 78  | Selena granis                | x      |       |       |         | gleaning                         |
| 79  | Spondylus barbatus           | x      |       |       |         | diving                           |
| 80  | Spondylus butleri            | x      |       |       |         | diving                           |
| 81  | Spondylus squamosus          | x      |       |       |         | diving                           |
| 82  | Spondylus versicolor         | x      |       |       |         | diving                           |
| 83  | Sthenoteuthis oualaniensis   | x      |       |       |         | jigger                           |
| 84  | Tectus pyramis               | x      | x     |       |         | gleaning                         |
| 85  | Tegillarca granosa           | x      | x     | x     |         | gleaning                         |
| 86  | Telescopium telescopium      | x      | x     | x     |         | gleaning                         |
| 87  | Terebralia sulcata           | x      |       |       |         | gleaning                         |
| 88  | Trisidos semitorta           | x      |       |       |         | gleaning                         |
| 89  | Trochus radiatus             | x      |       |       |         | gleaning                         |
| 90  | Turbo chrysostomus           | x      |       |       |         | gleaning                         |
| 91  | Turbo intercostalis*         | x      |       |       |         | gleaning                         |
| 92  | Umbonium vestiarum           | x      | x     |       |         | gleaning                         |
| 93  | Uroteuthis davaucelli        | x      | x     | x     |         | Trawl, motorized bag-net, traps  |
| 94  | Uroteuthis edulis            | x      | x     |       |         | Trawl, motorized bag-net, traps  |
| 95  | Vasticardium pectiniforme*   | x      |       |       |         | gleaning                         |

Some species formerly reported to be abundant have now suffered a decline. These include, for instance, the angelwing *Pholas orientalis*, which is now caught in much smaller quantities and on a very erratic basis. While biological data are available and intense restocking efforts (Marasigan and Laureta 2001; Laureta et al. 2014), it is apparent that the lack of parallel management efforts has caused its decline. The hammerhead oyster *Malleus malleus*, reported to be the number one species (mean monthly catch = 483 kg) in the diving fishery of Bancal bay, northern Panay (Declarador and del Norte-Campos 2004) only ranks 14th in the present survey. The same goes for the Asian moon scallop *Amusium pleuronectes*, which was once caught in huge quantities in the Visayan Sea (Gabriel-Llana 1983) and landed in Estancia, northeastern Panay. Currently, this scallop is now only landed in much lesser quantities in Concepcion, Iloilo and Roxas Capiz (del Norte-Campos et al. in prep.).

Aside from the occurrence of species by province, Table 6 also shows the gears/methods of fishing for each. Included herein is the glistening abalone *Haliotis glabra*, a species of abalone not previously reported in Panay. This species is regularly gleaned in Nabas, Aklan. Restocking efforts in various areas in the western Visayas by SEAFDEC (Buen-Ursua and Ludevese 2011; Lebata-Ramos et al. 2013) pertain to another abalone species, the Donkey’s ear abalone *Haliotis asinina*, reportedly introduced in Panay.

### 3.2. Species Importance: Commercial Value and Catch Rates

Table 5 shows the list of species ranked ac-
cording to the given set of criteria. The number 1 spe-
cies in the list, the comb pen shell *Atrina pectinata*,
ranked higher than the Indian squid, which has greater
local and export commercial value (see below). This is
primarily because the comb pen shell is the only moll-
lusk species with processing plants in the area (scored
in the criteria PP = processing plant) dedicated to ex-
tracting the species’ adductor muscles for export to
Taiwan. It is thus logically conceivable that a more tar-
geted, severely wasteful, level of harvesting (Burgos et
al. in prep.), is being conducted for this species given
that only its adductor muscle has a high commercial
value.

The number two species in the list, the Indian
squid *Uroteuthis duvaucelii* ranked high due to its local
and export commercial value (LCV = PHP 275 kg$^{-1}$
and ECV = 400.00 kg$^{-1}$) and high catch rates. Catch
rates for trawl during the summer months (March-
April) were comparable for the two areas in Pilar Bay
(1.97 kg hr$^{-1}$) and Concepcion Bay (3.7 kg hr$^{-1}$).
Higher catch rate values in the latter are due to fishing in the
fringes of the highly productive Visayan Sea. Lift nets,
on the other hand, despite using attractants (lights),
have lower catch rates (1.86 kg hr$^{-1}$) for *U. duvaucelii*,
as they operate more towards nearshore areas.

It is also noteworthy that 4 (*Mimachlamys
senatoria*, *Brechtelamys vexillum*, *Decatopecten amic-
ulum*, and *Annachlamys striatula*) out of the top 10
species are scallops (Pectinidae). Aside from the works
of Soliman and Dioneda (2004) and Morillo-Manalo
(2017) on *C. senatoria*, the other three scallop species
have been unstudied in the country. They are those occurr-
ing in more coralline substrates of the Gigantes
Islands where diving fisheries are conducted. The
more studied species the Asian moon scallop *Amusi-
um pleuronectes* (Gabral-Llana and Aprieto 1980; Ga-
bral-Llana 1983; del Norte 1988; del Norte et al. 1988;
Belda and del Norte 1988), on the other hand, occurs
in soft bottoms and is a trawl by-catch.

While ranking relatively low in the past
study, the Chambered nautilus *Nautilus pompilius* has
risen to become one of the top 10 species in the pres-
ent study, and this is attributed first to the change in its
use in the market. Whereas it was formerly harvested
only for its shell (del Norte-Campos 2005), its meat is
now likewise sold. In addition, change in the species’
fishing seasonality was observed, which factored in the
rankings, i.e., traps to catch the chambered nau-
tilus are now deployed even outside the rainy season,
unlike before.

Five species that were excluded in Table 5
(ranked) are included in Table 6 (not ranked). These
are the species which likewise occur in Panay Island
but have no direct commercial value as they are only
for fisher household consumption. From here, it ap-
ppears species are divided into two categories, i.e., those
caught by single fishing gears/methods (86%), and
those caught by a combination of gears (13%). For
the species caught by single gears/methods, gleaning
is the most important (79.8%) fishing method, fol-
lowed by diving (14.3%). Exploiting species using a
combination of methods, attest to fisher ingenuity and
resourcefulness.

### 3.3. Sources of Threats

Of the gears/methods used to catch mollusks in Panay, the trawl remains to be the most destructive
gear causing a considerable extent of damage to the
bottom (Stiles et al. 2010). *Uroteuthis duvaucelii*, the
number two ranked species (Table 5), also scores high
in this criterion as it is caught by trawl and landed pri-
marily in Iloilo and Capiz. At the same time, however,
the extent of damage caused by diving and gleaning in
terms of the upturning of the bottom substrate can-
not be underrated. The existence of processing plants
where shucked pen shell adductor muscles (*Atrina
pectinata*) are sold, causes grave threats, together with
the means of harvesting this species (digging up the
substrate to unearth pen shells). These processing
plants which purchase shucked adductor muscles of
pen shells for export to Taiwan represent an easily ac-
cessible source of income for the fishers, which then
will further encourage unabated harvesting at the ex-
pense of the stock.

### 3.4. Information Available

Ranking higher less-studied species high-
lighted those that need more attention, foremost of
which is the pen shell *Atrina pectinata*. While the
species has been studied in other areas, e.g., China (Qiu
et al. 2014), no known studies on the species exist in the
country. While squids have traditionally been includ-
ed in trawl survey lists (Hernando and Flores 1981),
there has been little effort to identify the species cor-
crrectly and even worse, just referring to all of them as
*Loligo* spp. (e.g., Armada et al. 1983). More specific
studies on squids have also been recently conducted,
such as that of the age and growth of the bigfin reef
squid *Sepioteuthis lessoniana* (Bagols 1990) and re-
productive biology of *Uroteuthis duvaucelii* (Tajolosa
2011), all species whose names have been updated in
FAO (1998b) from the original (Voss 1963). There is
also an obvious need for studies on *Octopus cyanea*, which is caught in all provinces of Panay (Table 6).

The newly-reported invasive species, the Charru mussel *Mytella charruana* (Vallejo et al. 2017) in Manila Bay, has fortunately not yet been observed in Panay waters.

**4. CONCLUSIONS AND RECOMMENDATIONS**

This inventory provides the only known list and importance ranking of the commercially-important mollusk species in Panay Island, albeit short-term and limited. Although the data do not fully integrate the effects of seasonality, the list is considered nonetheless realistic as ranking was based on recorded catch rates (fisher's records) rather than solely based on recall interviews. This ranked inventory does not only highlight the multi-species and multi-gear character typical of many tropical species but also emphasizes the importance of Panay as a center of mollusk biodiversity. There is no area in the Philippines now known for such a high malacofauna record. Although the list is acknowledged to be incomplete and remains to be updated, it provides a picture of species importance and serves as a guide on where future more in-depth malacological studies should be focused. Assessment studies on the heavily exploited species can be initiated based on this inventory. Further studies on the species' biology can be investigated, so guidelines may be formulated for their proper resource utilization and to avoid possible stock collapse.

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