

Distribution of Decapods in the Selected Mangrove Sites in Sta. Maria, Davao Occidental

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ABSTRACT

Aims: To identify the species of decapods and their edibility, determine the population density, abundance, dominance, and diversity indices of decapods found in the selected mangrove sites, and measure the physicochemical parameters of the area.

Place and Duration of Study: Barangay Tanglad, Mamacao, and Basiawan of the Municipality of Sta. Maria, Davao Occidental. April 25-29, 2022.

Methodology: A transect-plot method was used in sampling and the samples were handpicked or captured using tongs, scooped using the locally used net, dug from their burrows, and collected from wooden hides. The samples were put in a container with seawater and ice, then cleaned, photographed, and identified. The samples were presented to the fisherfolks and locals to identify local names and their edibility. The pH, temperature, and salinity of the seawater were recorded on site. The decapods' taxonomic classification was identified. The population density, abundance, dominance, and diversity indices were computed.

Results: There were 13 species of decapods found in the three sampling sites, namely: Triangular fiddler crab (*A. triangularis*), Nymph snapping shrimp (*A. euphrosyne*), Mud crab (*B. vinosus*), Forceps crab (*E. dentatus*), Brown land crab (*C. carnifex*), Hermit crab (*C. rugosus*), Indian prawn (*F. indicus*), Giant freshwater prawn (*M. rosenbergii*), Alamihi crab (*M. thukuhar*), Mudflat crab (*P. pictum*), Flat porcelain crab (*P. cinctipes*), Mangrove swimming crab (*T. crenata*), and Compressed fiddler crab (*T. coarctata*). A total of 633 individuals were gathered from the three sampling sites. 279 individuals were collected in Barangay Tanglad, 189 individuals in Barangay Mamacao, and 165 individuals in Barangay Basiawan. Triangular fiddler crab (*A. triangularis*), Hermit crab (*C. rugosus*), Indian prawn (*F. indicus*), Alamihi crab (*M. thukuhar*), Mudflat Crab (*P. pictum*), and Compressed fiddler crab (*T. coarctata*) were observed to be present among the three sites. In the three sampling sites, Mudflat crab (*P. pictum*) showed to have the highest population density of 199 ind./2,700 m², highest index of the dominance of 0.291, and a relative abundance of 31.44%. Mudflat crab (*P. pictum*), Triangular fiddler crab (*A. triangularis*), and Compressed fiddler crab (*T. coarctata*) were the most dominant species in the area.

Conclusion: Barangay Tanglad was found to be the most diverse site, it also had the highest index of evenness. Barangay Mamacao and Basiawan had the highest similarity index. There was no significant difference in the number of decapod species between the sampling sites. The physicochemical parameters are within the optimum level which could be a favorable condition for the abundance of the decapods.

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Keywords: distribution, decapods, mangroves, Davao Occidental

15 **1. INTRODUCTION**

16

17 Mangroves are woody trees or shrubs that grow in dense thickets or forests along tidal
18 estuaries, in salt marshes, and on muddy coasts and that characteristically have prop roots
19 and respiratory or knee roots. Mangroves are extremely important to the coastal ecosystems
20 it inhabits as it serves as a buffer between marine and terrestrial communities and protects
21 shorelines from damaging waves, winds, and floods. Mangroves are also the most suitable
22 feeding, breeding, and nursing grounds for the decapods (Pawar, 2014).

23

24 Decapoda is the most diverse order of the class Malacostraca in marine and freshwater
25 ecosystems with more than 15,000 species of crustaceans that include shrimp, lobsters,
26 crayfish, hermit crab, and crabs. Decapods are useful and appropriate models for many years
27 of biological research and are also important to many economies as highly valued edible
28 shellfish. A high abundance of food and shelter and low predation pressure forms an ideal
29 habitat for a variety of animal species during part or all their life cycles (Nagelkerken et al.,
30 2008). Thus, healthy mangrove forests are key to a healthy marine ecology.

31

32 Little is known about the population biology and distribution of marine decapods in the
33 province. Hence, this study was conducted to establish data on the distribution of decapods
34 in the mangrove sites of Sta. Maria, Davao Occidental, and the results were shared to provide
35 awareness to the local community on marine decapod species.

36

37 **2.1 Objectives of the Study**

38 The primary concern of this study was to determine the distribution of decapods in the selected
39 mangrove areas in the Municipality of Sta. Maria, Davao Occidental. It aimed to answer the
40 following objectives:

41

- 42 1. Identify the species of decapods found in the mangrove selected sites.
- 43 2. Identify the edible and non-edible species of decapods in the mangrove selected sites.
- 44 3. Determine the population density and most abundant species of decapods in the
45 mangrove selected sites.
- 46 4. Determine the diversity indices of decapod species found in the mangrove selected
47 sites.
- 48 5. Measure the level of the Physico-chemical parameters in terms of temperature, pH,
49 depth, and salinity in the mangrove selected sites.

49

50 **2.2 Scope and Limitation of the Study**

51 The study was focused on the distribution of decapods in mangroves forests specifically in the
52 municipality of Sta. Maria Davao Occidental covering the three selected sites: Barangay
53 Tanglad, Barangay Basiawan, and Barangay Mamacao. The actual sampling was conducted
54 at low tide during the daytime. It aims to identify the varied species of decapods, determine
55 the abundance and dominant species, calculate density diversity, and determine the edible
56 and non-edible decapod species. The collection of decapods was done using hand nets and
57 other locally used gears. The Physico-chemical parameters such as temperature, salinity, pH,
58 and depth were monitored during sampling. The samples that were collected were preserved
59 in a large container with ice. The identification of local names and edibility of species was done
60 through discussion with the locals in the area. Photographed samples were used for taxonomic
61 classification and description. One-shot sampling was employed in the study.

62

63 **2. MATERIAL AND METHODS**

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64 **2.1 Research Locale**

65 The municipality of Sta. Maria is a 2nd class municipality in the province of Davao
66 Occidental, Philippines. It is located on Mindanao Island, about 40 kilometers northwest

67 of province capital municipality of Malita, and about 1-23 kilometers south-south-east of
 68 Philippine's main capital Manila. It has a total area of 175 km², having coordinates of
 69 6°33'N 125°28'E According to the 2020 census, Sta. Maria has a population of 57, 526
 70 people. The municipality of Sta. Maria is composed of 24 Barangays. The study was
 71 conducted in the three selected mangrove sites: Barangay Tanglad, Barangay Mamacao,
 72 and Barangay Basiawan. Barangay Tanglad is located at the coordinates of 6° 36'
 73 41.2164"N 125° 26' 0.6324"E; Barangay Mamacao is at 6° 35' 41.0496"N 125° 26'
 74 53.4696"E; and Barangay Basiawan is at 6° 31' 35.2308"N 125° 31' 10.4052"E.



75 **Fig. 1.** Map showing the three study sites: (a) Barangay Tanglad, (b) Barangay Mamacao,
 76 (c) Barangay Basiawan via Google Maps
 77

78 2.2 Sampling Design and Technique

79 The transect plot method was used in the study. Three sampling sites were established
 in the 80 study area, in each site, three transect lines with a length of 50 meters were
 laid out 81 perpendicular to the shore, at 20 meters from each other. In every line, a 10x10
 m plot for the 82 sampling for decapods was set up with an interval of 10 meters for every
 plot (See Figure 1). 83 The collection of samples was done inside the plots. In ecology, plot
 sampling is a method of 84 abundance estimation in ecology in which plots are selected and
 sampled from within a survey 85 region. General plot sampling is a helpful strategy
 (Borchers et. al. 2002).

86

87 2.3 Data Gathering Procedure

88 The samples of decapod species in the selected mangrove areas were gathered in
 the 89 daytime during low tide. Gears, such as the locally used dip net (Echeverría-Sáenz
 et al., 90 2003), tongs, and bolo were used to capture decapods. The decapods that
 were easy to 91 collect were handpicked or aided by tongs. On the other hand, dip nets
 were used to scoop 92 small decapods, especially in the narrow spaces of the root systems
 of mangroves. Bolo or 93 garden shovel (Negromonte et al., 2012) was used to dig into the
 burrows of the burrowing

94 crabs and to check those under the rocks. The decapods living within the wood in
95 decomposition (fallen logs) were collected by breaking the log and catching them. All the
96 collected samples were stored in a container with a small amount of seawater and ice to
97 preserve them for later identification.

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99 **2.4 Identification of Samples**

100 The collected samples were cleaned carefully and photographed on a white background. The
101 photographed samples were used for taxonomic classification and description using the Field
102 Guide for the Edible Crustacea of the Philippines (Motoh, 1980), Marine Decapod Crustacea
103 of Southern Australia: A Guide to Identification (Poore, 2004), Key to Families of Brachyura
104 (Poore, 2004), Keys to Superfamilies and Families of Caridea (Poore, 2004), Simple Key to
105 Common Shallow-Water Caridean Families (Poore, 2004), Dichotomous key for the Mangrove
106 Crab Genus *Scylla* (Abeledo and Ablan, 2018) and verified on the WoRMS internet database.
107 Furthermore, the invisible samples were subjected for validation by expert. And the local
108 names were determined through an interview with the locals.

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110 **2.5 Edibility of Samples**

111 The samples' edibility was identified using Field Guide for the Edible Crustacea of the
112 Philippines (Motoh, 1980). The locals and fisherfolks were presented with the actual decapods
113 samples and they were interviewed to help identify and create list of edible and non-edible
114 decapods.

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116 **3. RESULTS AND DISCUSSION**

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118 **3.1. Decapod Species Composition**

119 The assessment of decapod species in the mangrove forest of Barangay Tanglad, Barangay
120 Mamacao, and Barangay Basiawan of Sta. Maria, Davao Occidental was conducted on April
121 25 to 29, 2022.

122

123 The study revealed that there were 13 species of decapods recorded and identified in
124 Barangay Tanglad, these species include: Nymph snapping shrimp (*Alpheus euphrosyne*),
125 Triangular fiddler crab (*Austruca triangularis*), Mud crab (*Baptozius vinosus*), Brown land crab
126 (*Cardisoma carnifex*), Hermit crab (*Coenobita rugosus*), Forceps crab (*Epixanthus dentatus*),
127 Indian prawn (*Fenneropenaeus indicus*), Giant freshwater prawn (*Macrobrachium*
128 *rosenbergii*), Alamihi crab (*Metopograpsus thukuhar*), Mudflat crab (*Parasesarma pictum*),
129 Flat porcelain crab (*Petrolisthes cinctipes*), Mangrove swimming crab (*Thalamita crenata*), and
130 Compressed fiddler crab (*Tubuca coarctata*).

131

132 In Barangay Mamacao, eight species were recorded, namely: Triangular fiddler crab (*Austruca*
133 *triangularis*), Hermit crab (*Coenobita rugosus*), Forceps crab (*Epixanthus dentatus*), Indian
134 prawn (*Fenneropenaeus indicus*), Giant freshwater prawn (*Macrobrachium rosenbergii*),
135 Alamihi crab (*Metopograpsus thukuhar*), Mudflat crab (*Parasesarma pictum*), and
136 Compressed fiddler crab (*Tubuca coarctata*).

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138 In Barangay Basiawan, seven species were found and identified, these are: Triangular fiddler
139 crab (*Austruca triangularis*), Brown land crab (*Cardisoma carnifex*), Hermit crab (*Coenobita*
140 *rugosus*), Indian prawn (*Fenneropenaeus indicus*), Alamihi crab (*Metopograpsus thukuhar*),
141 Mudflat crab (*Parasesarma pictum*), and Compressed fiddler crab (*Tubuca coarctata*).

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143 The taxonomic classification of decapods found in the three sampling sites including their
144 common and local names (See Table 1). The IUCN red list is included in the table to know the
145 current conservation status of each species collected from the study area. Of all 13 species,

146 12 were not yet assessed and Giant freshwater prawn (*M. rosenbergii*) was evaluated as least
 147 concern.
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Table 1. Taxonomic classification of decapods in the study sites

FAMILY	SCIENTIFIC NAME	ENGLISH NAME	LOCAL NAME	IUCN Red List
Alpheidae	<i>Alpheus euphrosyne</i>	Nymph snapping shrimp	Takla	NE
Ocypodidae	<i>Austruca triangularis</i>	Triangular fiddler crab	Kumpihig/ Kapay-Langit	NE
Oziidae	<i>Baptozius vinosus</i>	Mud crab	Suga-Suga	NE
Gecarcinidae	<i>Cardisoma carnifex</i>	Brown land crab	Kagang	NE
Coenobitidae	<i>Coenobita rugosus</i>	Hermit crab	Umang	NE
Oziidae	<i>Epixanthus dentatus</i>	Forceps crab	Suga-Suga	NE
Penaeidae	<i>Fenneropenaeus indicus</i>	Indian prawn	Pasayan	NE
Palaemonidae	<i>Macrobrachium rosenbergii</i>	Giant freshwater prawn	Ulang	LC
Grapsidae	<i>Metopograpsus thukuhar</i>	Alamihi crab	Karas-Karas	NE
Sesarmidae	<i>Parasesarma pictum</i>	Mudflat crab	Asan	NE
Porcellanidae	<i>Petrolisthes cinctipes</i>	Flat porcelain crab	Kasway	NE
Portunidae	<i>Thalamita crenata</i>	Mangrove swimming crab	Kasag	NE
Ocypodidae	<i>Tubuca coarctata</i>	Compressed fiddler crab	Kumpihig/ Kapay-Langit	NE

150 IUCN Red List Legend: **LC** – Least Concern **NE** – Not Evaluated

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152 **3.2 Edibility of Decapods**

153 Identification of edible and non-edible species of decapods in three sampling sites was
 154 assessed through an interview with the locals and fisherfolks. The result of the interview
 155 revealed that 11 species of decapod species were edible, these are: Nymph snapping shrimp
 156 (*A. euphrosyne*), Triangular fiddler crab (*A. triangularis*), Mud crab (*B. vinosus*), Brown land
 157 crab (*C. carnifex*), Hermit crab (*C. rugosus*), Forceps crab (*E. dentatus*), Indian prawn (*F.*
 158 *indicus*), Giant freshwater prawn (*M. rosenbergii*), Mudflat crab (*P. pictum*), Mangrove
 159 swimming crab (*T. crenata*), and Compressed fiddler crab (*T. coarctata*). Most of the locals do
 160 not consume Triangular fiddler crab (*A. triangularis*), Hermit crab (*C. rugosus*) and
 161 Compressed fiddler crab (*T. coarctata*), but there were fisherfolks who preferred eating these
 162 three species. Furthermore, only the Flat porcelain crab (*P. cinctipes*) and Alamihi crab (*M.*
 163 *thukuhar*) were inedible.

164

165 **3.3 Distribution of Decapods**

166 Of the identified 13 species of decapods in Sta. Maria, Davao Occidental, all the 13 species
 167 were recorded in Barangay Tanglad, eight species in Barangay Mamacao, and seven in
 168 Barangay Basiawan. The species of Triangular fiddler crab (*A. triangularis*), Hermit crab (*C.*
 169 *rugosus*), Alamihi crab (*M. thukuhar*), Mudflat crab (*P. pictum*), and Compressed fiddler crab
 170 (*T. coarctata*) were found to be present among all three sites. The distribution of other
 171 decapods were presented in Table 2.

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Table 2. Distribution of decapods in the study sites

SPECIES	BARANGAY		
	TANGLAD	MAMACAO	BASIAWAN
<i>A. euphrosyne</i>	✓	x	x
<i>A. triangularis</i>	✓	✓	✓
<i>B. vinosus</i>	✓	x	x
<i>C. carnifex</i>	✓	x	✓
<i>C. rugosus</i>	✓	✓	✓
<i>E. dentatus</i>	✓	✓	x
<i>F. indicus</i>	✓	✓	✓
<i>M. rosenbergii</i>	✓	✓	x
<i>M. thukuhar</i>	✓	✓	✓
<i>P. pictum</i>	✓	✓	✓
<i>P. cinctipes</i>	✓	x	x
<i>T. crenata</i>	✓	x	x
<i>T. coarctata</i>	✓	✓	✓

174 Legend: ✓ - denotes presence x - denotes absence

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176 **3.5 Population Density of Decapods**

177 The population density of the species of decapods in the sampling area is presented in Table
178 3. Population density is a measure of the number of organisms that make up a population in
179 a defined area (Arrington, 2018). A total of 633 individuals were found in the sampling area.
180 Mudflat crab (*P. pictum*) had the highest density of 199 ind./2,700 m², followed by Triangular
181 fiddler crab (*A. triangularis*) and Compressed fiddler crab (*T. coarctata*) which both have 91
182 ind./2,700 m², and the Nymph snapping shrimp obtained the lowest density, 1 ind./2,700 m².

183

184 **Table 3.** Population density (ind./m2) of decapods in the study sites

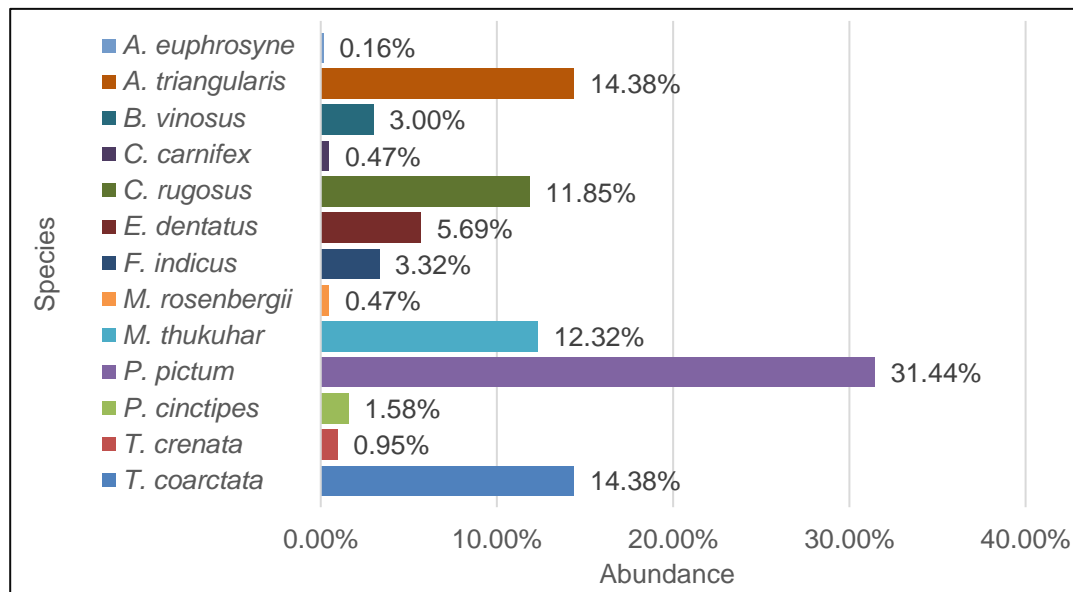
SPECIES	POP. DENSITY
<i>Alpheus euphrosyne</i>	1 ind./2,700 m ²
<i>Austruca triangularis</i>	91 ind./2,700 m ²
<i>Baptozius vinosus</i>	19 ind./2,700 m ²
<i>Cardisoma carnifex</i>	36 ind./2,700 m ²
<i>Coenobita rugosus</i>	3 ind./27,00 m ²
<i>Epixanthus dentatus</i>	75 ind./2,700 m ²
<i>Fenneropenaeus indicus</i>	21 ind./2,700 m ²
<i>Macrobrachium rosenbergii</i>	3 ind./2,700 m ²
<i>Metopograpsus thukuhar</i>	78 ind./2,700 m ²
<i>Parasesarma pictum</i>	199 ind./2,700 m ²
<i>Petrolisthes cinctipes</i>	10 ind./2,700 m ²
<i>Thalamita crenata</i>	6 ind./2,700 m ²
<i>Tubeuca coarctata</i>	91 ind./2,700 m ²

185

186 **3.6 Relative Abundance of Decapods**

187 The relative abundance of decapod species found in the study area is shown in Figure 2.
188 Relative species abundance is a component of biodiversity and is a measure of how common
189 or rare a species is relative to other species in a defined location or community (Hubbel, 2001).
190 Mudflat crab (*P. pictum*) had the highest relative abundance with 31.438%, followed by both
191 Triangular fiddler crab (*A. triangularis*) and Compressed fiddler crab (*T. coarctata*) with
192 14.376%, and Alamih crab (*M. thukuhar*) with 12.322%. Nymph snapping shrimp (*A.*
193 *euphrosyne*) had the lowest relative abundance with 0.158%.

194



195 **Fig. 2.** The relative abundance of decapods in the study sites

196

197 3.7 Species Diversity

198 The data gathered in the study area were computed and analyzed in terms of species diversity 199 using the Shannon-Weiner index and evenness index. The number of various species in each 200 area, as well as their relative abundance, is referred to as species diversity. It could be a 201 habitat, a biome, or the entire biosphere in question (Ha and Schleiger, 2021).

202

203 The species diversity of marine decapods found in the study area is presented in Figure 2. 204 Barangay Tanglad had a higher Shannon-Weiner index value of 2.978 followed by Barangay 205 Mamacao with 2.525, and Barangay Basiawan with 2.466. To interpret the index of diversity, 206 the higher the value of H , the higher the diversity of species in a particular community; the 207 lower the value of H , the lower the value of diversity (Zach, 2021). Therefore, Barangay 208 Tanglad had the highest diversity among the three sites for it had the highest Shannon-Weiner 209 index of 2.978.

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211 Barangay Tanglad had the highest value of evenness with 1.217, followed by Barangay 212 Mamacao with 1.109, and Barangay Basiawan with 1.112. The Shannon Equitability Index is 213 a way to measure the evenness of species in an area. The term evenness simply refers to 214 how similar the abundance of different species is in the community (Zach, 2021). An area in 215 which all the species have similar abundances will have a greater species evenness (Lára, 216 n.d.).

217 3.7 Index of Dominance

218 The index of the dominance of decapods gathered in the three sites was computed. If it has a 219 higher value, it indicates that a particular species occurrence is more dominating in number in 220 the population of decapods. Mudflat crab (*P. pictum*) had the highest index of dominance 221 among other species with a combined value of 0.218 from all sites.

222

223 3.8 Similarity Index

224 A similarity test of the three sites on the presence of mangrove decapods was computed to 225 determine how similar the sites were in terms of species present.

226

227 Barangay Mamacao versus Barangay Basiawan had the highest value of 66.667% due to the
 228 presence of six common species, namely: Triangular fiddler crab (*A. triangularis*), Hermit crab
 229 (*C. rugosus*), Indian prawn (*F. indicus*), Alamihi crab (*M. thukuhar*), Mudflat crab (*P. pictum*),
 230 and Compressed fiddler crab (*T. coarctata*).

231
 232 Barangay Tanglad versus Barangay Mamacao had a similarity index value of 64.286% due to
 233 the presence of eight common species, namely: Triangular fiddler crab (*A. triangularis*), Hermit
 234 crab (*C. rugosus*), Forceps crab (*E. dentatus*), Indian prawn (*F. indicus*), Giant freshwater
 235 prawn (*M. rosenbergii*), Alamihi crab (*M. thukuhar*), Mudflat crab (*P. pictum*), and Compressed
 236 fiddler crab (*T. coarctata*).

237
 238 Barangay Tanglad versus Barangay Basiawan got the lowest value of 53.846% due to the
 239 presence of seven common species, namely: Triangular fiddler crab (*A. triangularis*), Brown
 240 land crab (*C. carnifex*), Hermit crab (*C. rugosus*), Indian prawn (*F. indicus*), Alamihi crab (*M.*
 241 *thukuhar*), Mudflat crab (*P. pictum*), and Compressed fiddler crab (*T. coarctata*).

242

243 3.9 Statistical Analysis

244 In Kruskal-Wallis Test, the result showed that there is no significant difference between the
 245 numbers of species of decapods since the computed value, 1.000 is higher than the tabular
 246 value of 0.05. The null hypothesis that stated, there is no significant difference in the number
 247 of decapods species between the sampling sites is accepted.

248

249 3.10 Physico-chemical Parameters

250 The prevailing physicochemical parameters in the three sampling sites such as temperature,
 251 pH and salinity, and depth were measured (See Table 4). The obtained temperature of the
 252 water in the study area during the daytime and low tide sampling was 27.87°C. In addition, the
 253 average salinity of the seawater in the study site was 28.97 ppt, the average pH of the water
 254 was 7.52, and the average depth of the water was 0.17 m.

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Table 4. Physico-chemical parameters in the study sites

PARAMETERS	BARANGAY TANGLAD	BARANGAY MAMACAO	BARANGAY BASIAWAN	MEAN
Temp. (°C)	27.43	27.24	28.95	27.87
Salinity (ppt)	29.23	28.58	29.1	28.97
Ph	7.37	7.5	7.7	7.52
Depth (m)	0.05	0.18	0.28	0.17

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258

259 4. SUMMARY, CONCLUSION, AND RECOMMENDATION

260

261 4.1 Summary

262

263 The primary aim of this study was to assess and determine the distribution of decapods in the
 264 selected mangrove areas in the Municipality of Sta. Maria, Davao Occidental and to find out
 265 the following: identify the species of decapods found in the study area; determine the edibility,
 266 population density, abundance, and diversity indices of decapods; and measure the
 267 physicochemical parameters in terms of temperature, salinity, pH, and depth in the selected
 268 mangrove sites.

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Based on the actual collection of specimens, there were 13 species of decapods found in the
 study area, namely: Nymph snapping shrimp (*Alpheus euphrosyne*), Triangular fiddler crab
 (*Austruca triangularis*), Mud crab (*Baptozius vinosus*), Brown land crab (*Cardisoma carnifex*),

271 Hermit crab (*Coenobita rugosus*), Forceps crab (*Epixanthus dentatus*), Indian prawn
272 (*Fenneropenaeus indicus*), Giant freshwater prawn (*Macrobrachium rosenbergii*), Alamihi
273 crab (*Metopograpsus thukuhar*), Mudflat crab (*Parasesarma pictum*), Flat porcelain crab
274 (*Petrolisthes cinctipes*), Mangrove swimming crab (*Thalamita crenata*), and Compressed
275 fiddler crab (*Tubuca coarctata*).

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277 Barangay Tanglad had 13 species of decapods and had a total of 279 individuals, Barangay
278 Mamacao had eight species with a total of 189 individuals, and Barangay Basiawan had seven
279 species with 165 individuals. There were six species of decapods commonly found in three
280 sampling sites, namely: Triangular fiddler crab (*A. triangularis*), Hermit crab (*C. rugosus*),
281 Indian prawn (*F. indicus*), Alamihi crab (*M. thukuhar*), Mudflat crab (*P. pictum*), and
282 Compressed fiddler crab (*T. coarctata*).

283

284 Data from the actual collection of specimens in the three sampling sites showed Mudflat crab
285 (*P. pictum*) to have the highest population density of 199 ind./2,700 m², relative abundance of
286 31.44%, and an index of dominance of 0.218. This was followed by Triangular fiddler crab (*A.*
287 *triangularis*) and Compressed fiddler crab (*T. coarctata*) which both have a density of 91
288 ind./2,700 m² and a relative abundance of 14.35%. On the other hand, Nymph snapping
289 shrimp (*Alpheus euphrosyne*) obtained lowest density of 1 ind./2,700 m² and a relative
290 abundance of 0.16%.

291

292 Barangay Tanglad had the highest Shannon-Weiner index of diversity with 2.978, followed by
293 Barangay Mamacao with 2.525, and Barangay Basiawan with 2.466. Barangay Mamacao had
294 the highest index of dominance with 0.2026 followed by Barangay Tanglad with 0.169, and
295 Barangay Mamacao with 0.127. Barangay Tanglad obtained the highest evenness of 1.217,
296 followed by Barangay Mamacao with 1.109, and Barangay Basiawan had the lowest evenness
297 with 1.112. For similarity, Barangay Mamacao versus Barangay Basiawan had the highest
298 value among the three sites with 66.667%, followed by Barangay Tanglad versus Barangay
299 Mamacao which had a value of 64.286% and lastly, Barangay Tanglad versus Barangay
300 Basiawan which had the lowest value of 53.846%.

301

302 The null hypothesis that states, there is no significant difference in the number of decapod
303 species between the sampling sites is accepted.

304

305 Physico-chemical parameters of the sampling sites were determined. The mean temperature
306 reading from the three sites was 27.8°C, the mean salinity of the water was 28.97 ppt, the pH
307 reading was 7.52, and the average depth during the sampling was 0.17 m.

308

309 4.2 Conclusions

310 The following conclusions were deduced from the study;

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- 312 1. A total of 13 species of decapods were found in the selected mangrove sites namely:
313 *Alpheus. euphrosyne*, *Austruca triangularis*, *Baptozius vinosus*, *Epixanthus dentatus*,
314 *Cardisoma carnifex*, *Coenobita rugosus*, *Fenneropenaeus indicus*, *Macrobrachium*
315 *rosenbergii*, *Metopograpsus thukuhar*, *Parasesarma pictum*, *Petrolisthes cinctipes*,
Thalamita crenata, and *Tubuca coarctata*.

316

- 317 2. Barangay Tanglad, Sta. Maria, Davao Occidental was found to have the most diverse
318 in terms of decapod species with 13 species identified;

318

- 319 3. Mudflat crab (*Parasesarma pictum*), Compressed fiddler crab (*Tubuca coarctata*),
320 and Triangular fiddler crab (*A. triangularis*) were revealed to be the most dominant
321 species found in the study area;

321

- 322 4. The Physico-chemical parameters of the three sampling sites are in tolerable range
for the survival of decapods species; and,

323 5. There was no significant difference in the number of decapod species between the
 324 sampling sites.
 325

326 **4.5 Recommendations**

327 The following recommendation was drawn based on the result of the study;

- 328 1. Further study shall be conducted about the decapods in the mangrove forests.
- 329 2. Study of species diversity of decapods shall be conducted at nighttime during high
 330 and low tide to know the occurrence of different species in the mangrove areas; and,
- 331 3. Further study considering the interrelationship of mangrove species and other
 332 associated fauna within Davao Occidental will be conducted.
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