Study of Ostracoda in Territorial Nusawere, Bay of Pangandaran, West Java (Heritage of Sediment Quarter)

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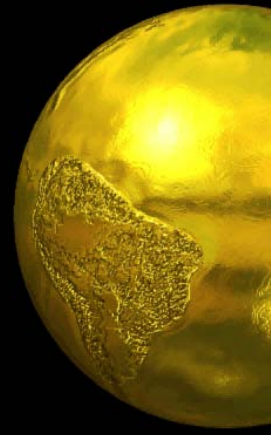
PRESENTATION OUTLINE



1. BACKGROUND
2. OBJECTIVE
3. METHODOLOGY
4. RESULTS OF ANALISYS
5. CONCLUSIONS

BACKGROUND

1. This research has never been done by previous researchers
2. The research area is affected by the tsunami (2006), so the seafloor sediment is mixed with other deposition of environment
3. The research of Ostracoda conducted off the coast south of Java island (Nusawere) which has never done, it is hoped results can be used as a comparison of distribution ostracoda before and after the tsunami occurred
4. Territorial Nusawere found many Ostracoda
5. Ostracoda affect the development of changes in the environment to deep sea, so need be studied how do the depth ostracoda located in Pangandaran.

OSTRACODA :

- Arthropodha
- Cambrium – Holocene
- Fesh water – Marine water
- Size <2 cm
- chitin- carbonate

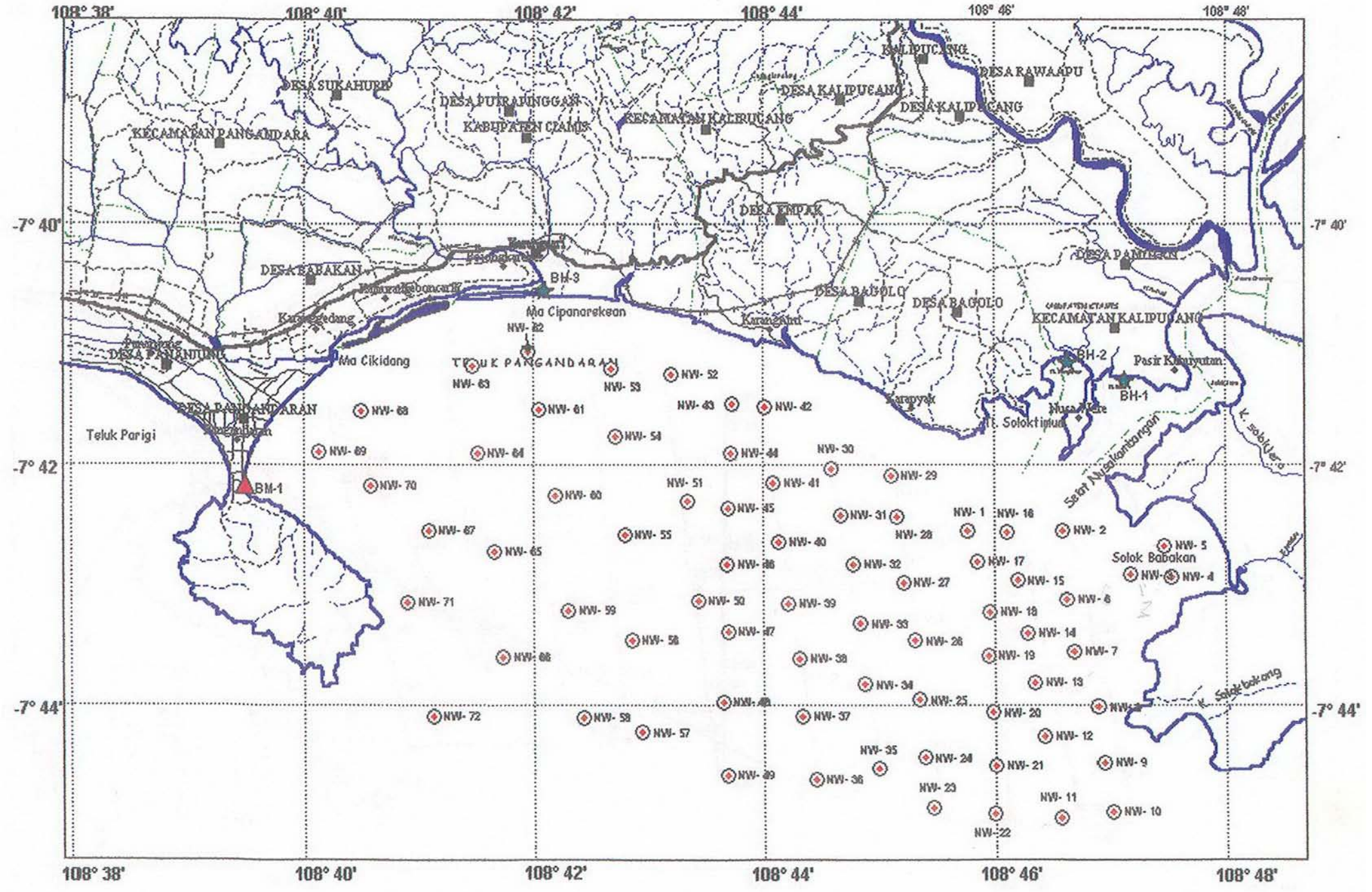
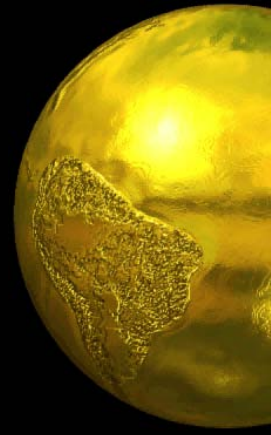


Figure 1. Study Area

OBJECTIVES :



- To determine the genus-species ostracoda
- To know the abundance and variety of the genus-species ostracoda
- To determine of age
- To determine of the bathymetric environment

METHODOLOGY

- Take samples from the seafloor Nusawere, Gulf of Pangandaran using Grab Sampling method and select 30 from 70 samples then analyse (Lab. Micropaleontology PPGL Bandung).
- Dry sample using oven/heater, then wash the mineral using sieve analysis
- The result of residue collected and dried (taken 100 gr) and determine using microscope of magnification binocular 75x to perceive its genus and species.

METHODOLOGY (Continuation)

- Analyze the sample to determine : genus, species and give the name ostracoda based on naming of researchers previously

- The results of analysis, then arranged into the table and graph (number of sample, specimen calculation, abundance and variety species, age interpretation and bathimetry)

REGIONAL GEOLOGY

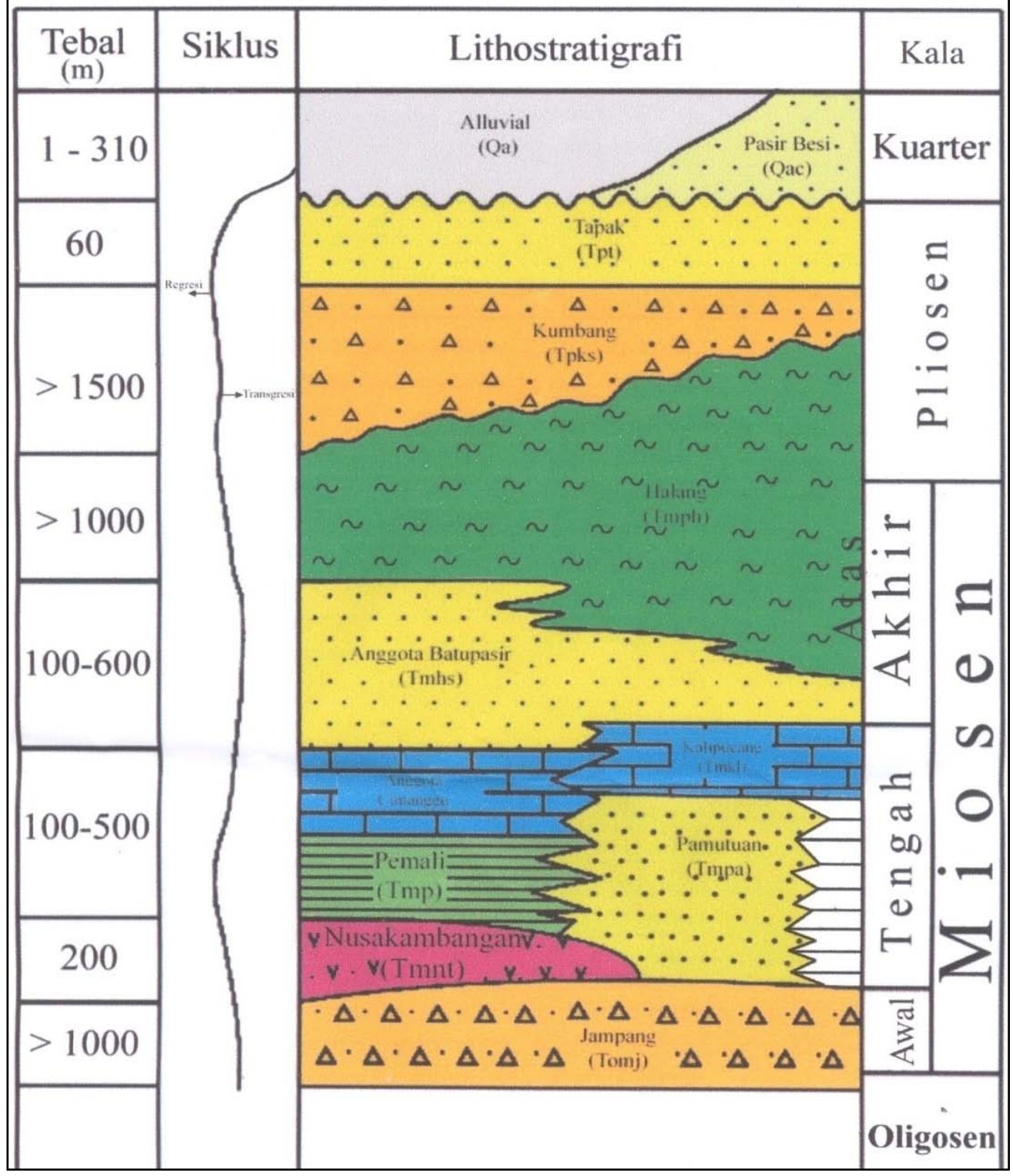
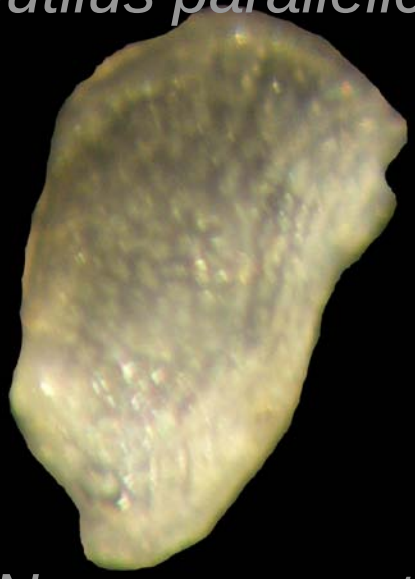


Figure 2. Regional Stratigrafi of Pangandaran (Simanjuntak and Surono, 1992)

ANALYSIS RESULTS

Cytherella sp

Mutilus parallelicostatus



Mutilus sp

Keijella

Neomonoceratina sp

Lanckacythere sp

ANALYSIS RESULTS

NO	Genus & Spesies	Nomor sampel	Jumlah Spesimen
A-1	*Cytherella* sp. 1	NW–63	3
A-2	*Keijella multisulcus* (Whatley & Zhao, 1988)	NW–63	3
A-3	*Lankacythere coralloides* (Brady, 1866)	NW–63	3
A-4	*Neomonoceratina* sp.	NW–63	3
A-5	*Bythocythere* sp.(Whatley & Zhao, 1987)	NW–63	3
A-6	*Stigmatocythere* sp.	NW–63	3
A-7	*Parakrithella* sp. 1 (Mandelstam, 1960)	NW–18	C
A-8	*Ruggieria indopacifica* (Whatley & Zhao, 1988)	NW–63,18, 8	1 + 1 + 1
A-9	*Mutilus parallelicostatus* (Skogsberg, 1928)	NW–63 + NW–08	2 + 1
A-10	*Neonesidea elegans* (Brady, 1869)	NW–63, 53, 10	1 + 1 + 1
A-11	*Mutilus* sp. (Skogsberg, 1928)	NW–63, 53, 54	1 + 1 + 1
A-12	*Cytheropteron miurense* (Hanai, 1957)	NW–63	1
A-13	*Leptocythere* sp. (Sars, 1992)	NW–63 + NW–53	1 + 2
A-14	*Mutilus splendideornatus australis*	NW–63	1
A-15	*Xestoleberis* sp. 1	NW–53	3
A-16	*Lankacythere* sp. (Sars, 1992)	NW–69 + NW–53	2 + 1
A-17	*Keijilla apta* (Guan, 1978)	NW–53 + NW–18	C + 2
A-18	*Copytus posteroculcus* (Wang, 1985)	NW–53 + NW–44	2 C + C
A-19	*Mutilus variornatus* (Sars, 1866)	NW–53	1
A-20	*Xestoleberis communis* (Muller, 1894)	NW–53	3
A-21	*Cytherolloidea excavata* (Mostafawi, 1992)	NW–63	C + 1
A-22	*Javanella kendengensis* (Kingma, 1948)	NW–53	1
A-23	Unidentified sp.1	NW–03	2
A-24	*Neomonoceratina macropora* (Kingma, 1948)	NW–03, 18, 68	1 + 1 + 1
A-25	*Callistocythere* sp. 1	NW–03	1

The abundance of genus and species

Table 1. Diversity index of genus and species ostracoda in Nusawere

No Sample	Total Specimen	Total Species	Diversity Index
NW- 03	62	15	2,70805
NW- 06	3	3	1,098612
NW- 07	25	5	1,609438
NW-08	103	12	2,484907
NW-09	15	3	1,098612
NW-10	9	6	1,791759
NW-18	141	22	3,091043
NW-20	3	3	1,098612
NW-21	9	2	0,6931472
NW-22	1	1	-
NW-27	2	2	-
NW-29	22	10	2,302585
NW-31	9	2	0,6931472
NW-33	4	4	1,386294
NW-34	3	2	-
NW-35	1	1	-
NW-36	12	1	-
NW-40	14	4	1,386294
NW-41	9	3	1,098612
NW-44	53	10	2,302585
NW-47	16	1	-
NW-48	3	2	-
NW-53	141	19	2,944439
NW-54	120	11	2,397895
NW-57	6	3	1,098612
NW-63	180	18	2,890372
NW-66	249	11	2,397895
NW-67	171	6	1,791759
NW-68	125	17	2,833213
NW-69	84	14	2,639057

ANALYSIS RESULTS

1. The abundance of genus and species ostracoda was found : 38 genus with 70 species

2. Diversity Index devided : 3 index

H’ = (0 - 1)	Over flow / Low
H’ = (>1 - 2)	Medium
H’ = (>2-3)	High

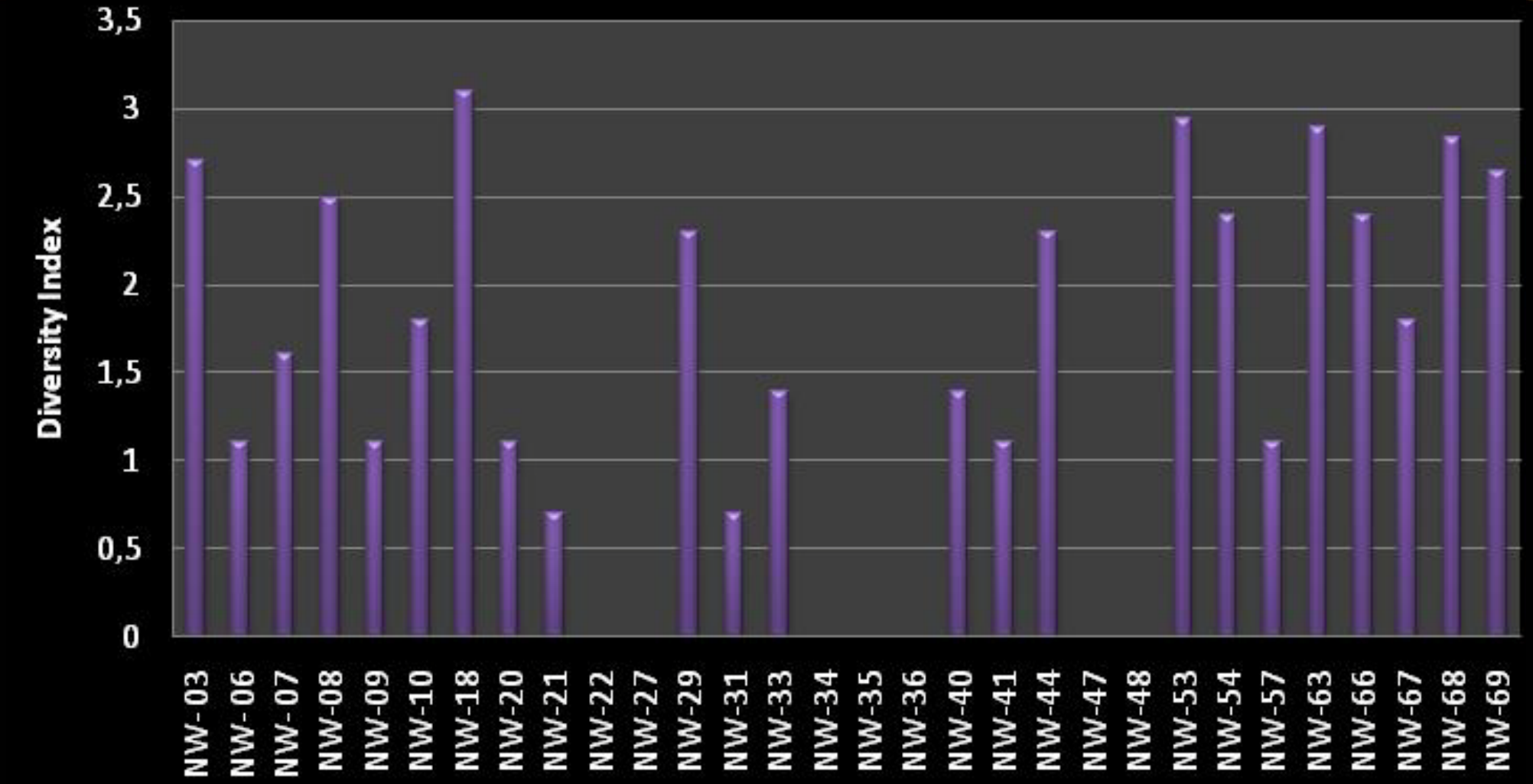
1. Diversity Index (H') 0-1 (Over flow) / low , is characterized :
   - The amount of variety level and specimen are very small
   - The locations are : NW-21, NW-22, NW-35, NW-36, NW-48
   - The location in central and southern part of bay of Pangandaran

2. Diversity Index (H') 1- 2 (Medium) :
   - The amount variety level and specimen about 1-2
   - There are 10 locations and divided 3 area (western, middle and Eastern bay of Pangandaran

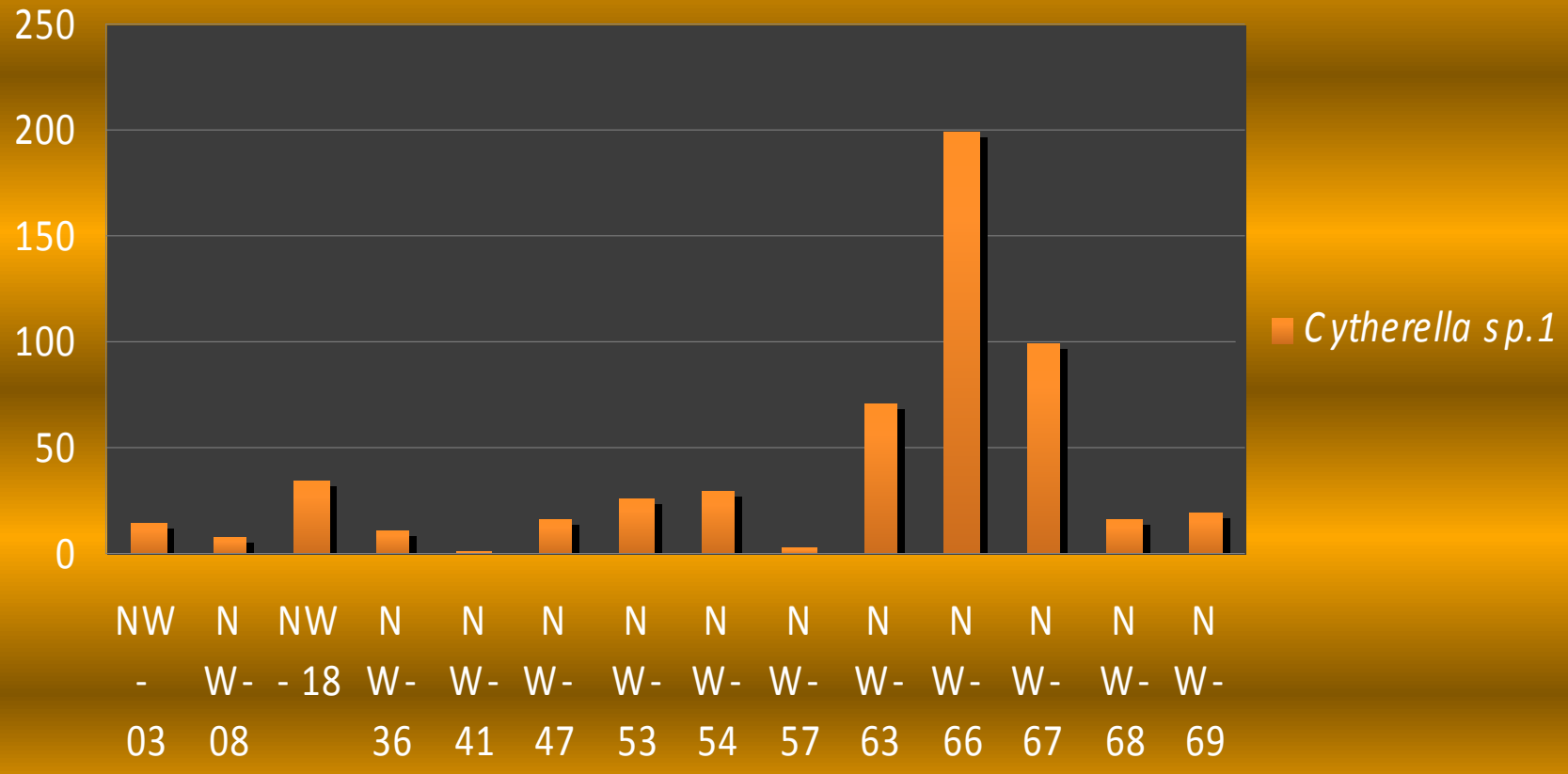
3. Diversity Index (H') > 2-3 (High)
   - The amount of variety level and specimen are very high.
   - There are 10 locations and divided 4 :
   North-west bay of Pangandaran, Soutwest, East and Northern bay of Pangandaran

(Maximum index : 3,091, location NW-18)

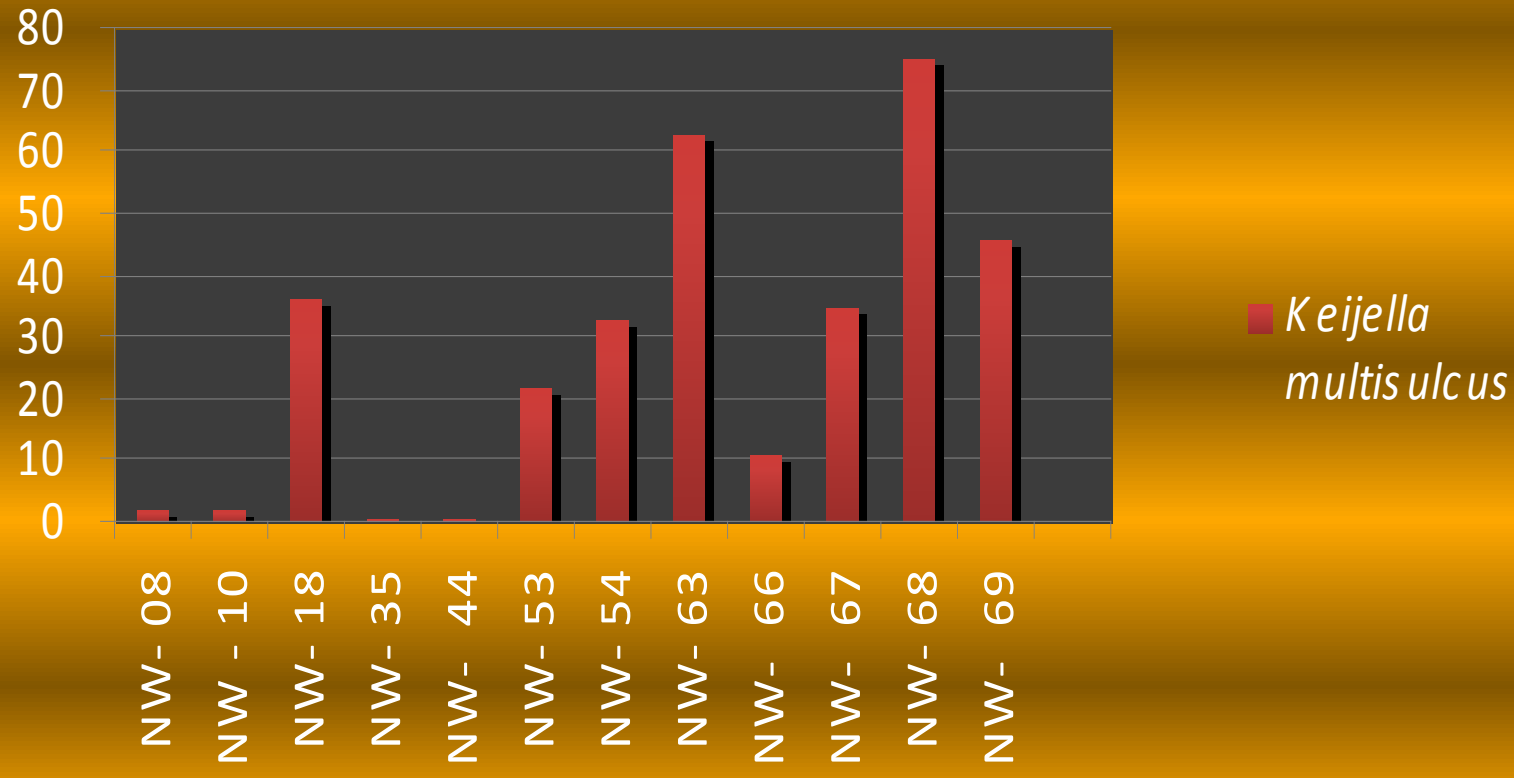
Graphic : Diversity Index - Sample location



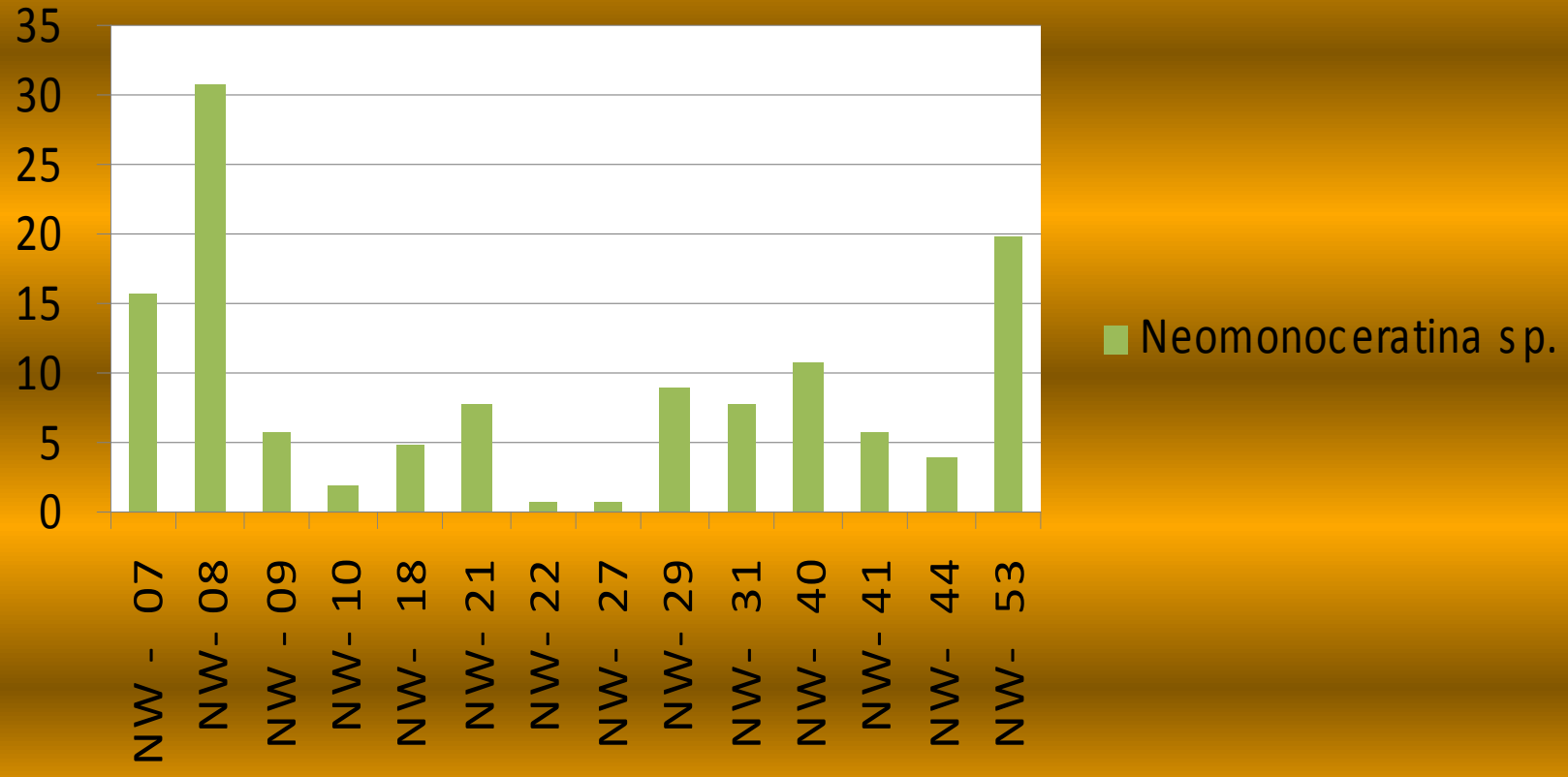
Cytherella sp.1



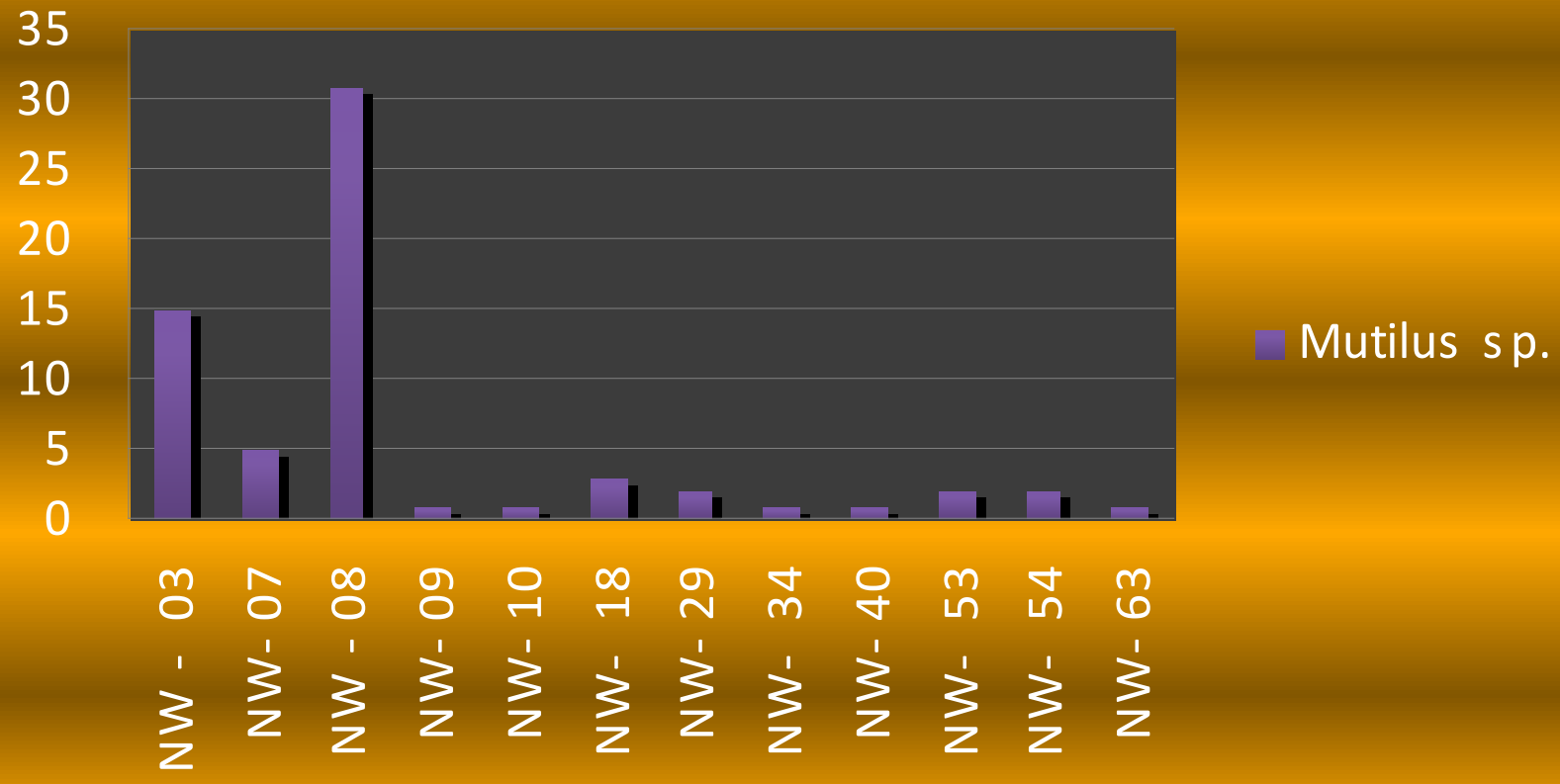
Keijella multisulcus



Neomonoceratina sp.



Mutilus sp.

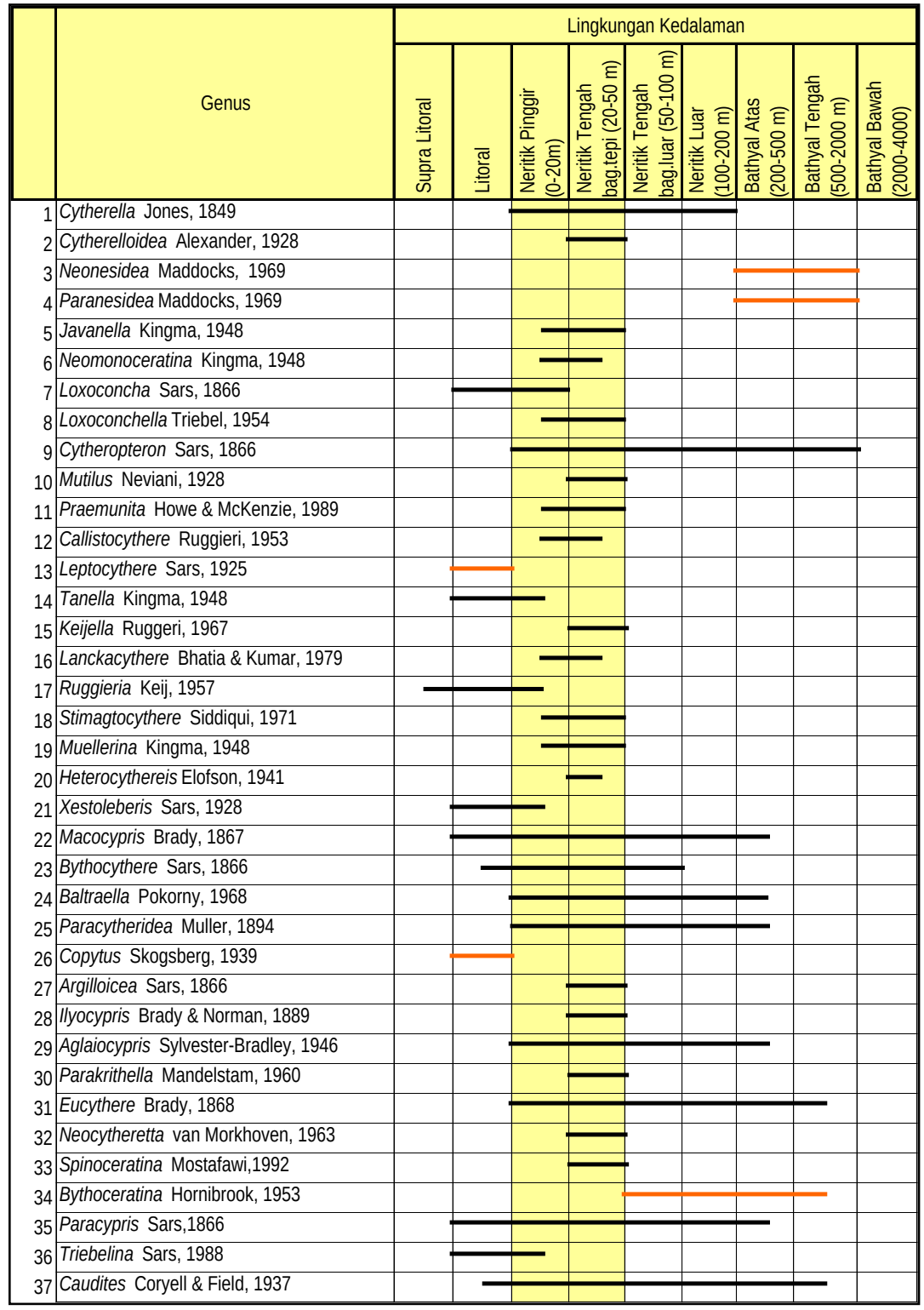

35
30
25
20
15
10
5
0
NW - 03
NW- 07
NW - 08
NW- 09
NW- 10
NW- 18
NW- 29
NW- 34
NW- 40
NW- 53
NW- 54
NW- 63
Mutilus sp.

Bathymetry Environment

The abundance and distribution of species is not flattens.

Very dominant Ostracoda is type ostracoda sea.

The result of the research showen that of bathymetry shallow marine (Inner to middle neritic / 0-50 m).


Genus
Lingkungan Kedalaman
Supra Litoral
Litoral
Neritik Pinggir (0-20m)
Neritik Tengah bag.tepi (20-50 m)
Neritik Tengah bag.luar (50-100 m)
Neritik Luar (100-200 m)
Bathyal Atas (200-500 m)
Bathyal Tengah (500-2000 m)
Bathyal Bawah (2000-4000)
1 Cytherella Jones, 1849
2 Cytherelloidea Alexander, 1928
3 Neonesidea Maddocks, 1969
4 Paranesidea Maddocks, 1969
5 Javanella Kingma, 1948
6 Neomonoceratina Kingma, 1948
7 Loxoconcha Sars, 1866
8 Loxoconchella Triebel, 1954
9 Cytheropteron Sars, 1866
10 Mutilus Neviani, 1928
11 Praemunita Howe & McKenzie, 1989
12 Callistocythere Ruggieri, 1953
13 Leptocythere Sars, 1925
14 Tanella Kingma, 1948
15 Keijella Ruggeri, 1967
16 Lanckacythere Bhatia & Kumar, 1979
17 Ruggieria Keij, 1957
18 Stimagtocythere Siddiqui, 1971
19 Muellerina Kingma, 1948
20 Heterocythereis Elofson, 1941
21 Xestoleberis Sars, 1928
22 Macocypris Brady, 1867
23 Bythocythere Sars, 1866
24 Baltraella Pokorny, 1968
25 Paracytheridea Muller, 1894
26 Copytus Skogsberg, 1939
27 Argilloicea Sars, 1866
28 Ilyocypris Brady & Norman, 1889
29 Aglaiocypris Sylvester-Bradley, 1946
30 Parakrithella Mandelstam, 1960
31 Eucythere Brady, 1868
32 Neocytheretta van Morkhoven, 1963
33 Spinoceratina Mostafawi,1992
34 Bythoceratina Hornibrook, 1953
35 Paracypris Sars,1866
36 Triebelina Sars, 1988
37 Caudites Coryell & Field, 1937

Age determination

- Determination of age ostracoda can be determined based on genus
- Abundance and distribution of the genus ostracoda dominated by suborder *Podoopina* (Ordovician - Recent)
- The range ages is Recent (Holocene).

Table 2. Table of the age range based on genus ostracoda according to some references

No	Genus Ostracoda	Age
1	*Stimagtocythere* Siddiqui, 1971	Holocene
2	*Muellerina* Kingma, 1948	Holocene
3	*Heterocythereis* Elofson, 1941	Pliocene to Holocene
4	*Xestoleberis* Sars, 1928	Upper Cretaceous - Holocene
5	*Macocypris* Brady, 1867	Lower Cretaceous - Holocene
6	*Bythocythere* Sars, 1866	Oligocene - Holocene
7	*Baltraella* Pokorny, 196	Holocene
8	*Paracytheridea* Muller, 1894	Holocene
9	*Copytus* Skogsberg, 1939	Holocene
10	*Argilloicea* Sars, 1866	Upper Cretaceous - Holocene
11	*Ilyocypris* Brady & Norman, 1889	Upper Yura - Holocene
12	*Aglaiocypris* Sylvester-Bradley, 1946	Pleistocene - Holocene
13	*Parakrithella* Mandelstam, 1960	Upper Cretaceous - Holocene
14	*Eucythere* Brady, 1868	Lower Cretaceous - Holocene
15	*Neocytheretta* Van Morkhoven, 1963	Miocene - Holocene
16	*Spinoceratina* Mostafawi, 1992	Holocene
17	*Bythoceratina* Hornibrook, 1953	Kapur Atas - Holocene
18	*Paracypris* Sars, 1866	Cambrium - Holocene
19	*Paracypris* Sars, 1866	Cambrium - Holocene
20	*Triebelina* Sars, 1988	Paleocene - Holocene

CONCLUSION

1. From 30 samples that analized indicated that distribution genus and species ostracoda ,there are 38 genus with 70 species, and only 58 species identified, 8 species using term sp., and 4 species (Unidentified).

2. The abundance of genus and species are:
   - *Cytherella* sp.
   - *Neomonoceratina* sp.
   - *Keijella multisulcus*
   - *Mutilus* sp.

CONCLUSION

3. Diversity Index (H') devided : 3 classes
   - H' = 0-1 (*Over flow*) at 5 locations
   - H'= >1- 2 (*Medium*) at 10 locations
   - H'= > 2-3 (*High*) at 11 locations

   Diversity maximum (H' max = 3,091) at NW-18.

4. Bathymetric environment have the same with the South China sea, dominated sea ostracoda, having shallow marine, bathymetry (Inner to middle Neritic / 0-50 m).

5. Determination of age based on genus ostracoda, that is Recent / Holocene

ACKNOWLEDGEMENTS

1. Pertamina Cirebon

2. Lab. PPGL Bandung.

3. LPPM UPN “Veteran” Yogyakarta

4. Ir. Kresna PPGL Bandung

Chiterella sp ***Multisulcus sp***

LAMPIRAN A

KOLEKSI OSTRACODA

Tabel Plate A. Koleksi Ostracoda di Perairan Nusawere Teluk Pangandaran Kabupaten Ciamis Jawa Barat.

NO	Genus & Spesies	Nomor sampel	Jumlah Spesimen	Referensi
A-01	***Cytherella* sp.** (Jones, 1849)	NW–63	3	Yassini & Jones (1995), gb. 19.
A-02	***Keijella multisulcus*** (Whatley & Zhao, 1988)	NW–63	3	Whatley & Zhao (1988), h. 13, pl. 7, gb. 24-28.
A-03	***Lankacythere coralloides*** (Brady, 1866)	NW–63	3	Whatley & Zhao (1988), h. 9, pl. 6, gb. 20, 21.
A-04	***Neomonoceratina* sp.**	NW–63	3	
A-05	***Bythocythere* sp.** (Whatley & Zhao, 1987)	NW–63	3	Whatley & Zhao (1987), h. 341, pl. 2, gb. 28.
A-06	***Stigmatocythere* sp.**	NW–63	3	
A-07	***Parakrithella* sp. 1** (Mandelstam, 1960)	NW–18	C	Dewi (1997), h. 63, gb. 37, 38.
A-08	***Ruggieria indopacifica*** (Whatley & Zhao, 1988)	NW–63 + NW–18 + NW–8	1 + 1 + 1	Dewi (1997), h. 71, gb. 176-177.
A-09	***Mutilus parallelicostatus*** (Skogsberg, 1928)	NW–63 + NW–08	2 + 1	Schroder & Hartmann (1978), tabel IX, gb. 3.
A-10	***Neonesidea elegans*** (Brady, 1869)	NW–63 + NW–53 + NW–10	1 + 1 + 1	Whatley & Zhao (1987), h. 22, pl. 1, gb. 1-7.
A-11	***Mutilus* sp.** (Skogsberg, 1928)	NW–63 + NW– 53 + NW–54	1 + 1 + 1	Whatley & Zhao (1988), h. 6, pl. 6, gb. 7.
A-12	***Cytheropteron miurense*** (Hanai, 1957)	NW–63	1	Zhou *et al* (2000), h. 262, pl. 2, gb. 21, 22.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A-31
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A-32

A-13	***Leptocythere* sp.** (Sars, 1992)	NW–63 + NW–53	1 + 2	Zhao *et al* (1985), h. 362, pl. 30.
A-14	***Mutilus splendideornatus australis*** (Schroder & Hartmann, 1978)	NW–63	1	Schroder & Hartmann (1978), tabel VIII, gb. 9.
A-15	***Xestoleberis* sp. 1** (Sars, 1866)	NW–53	3	Yassini & Jones (1995), h. 386, gb. 701-702.
A-16	***Lankacythere* sp.** (Sars, 1992)	NW–69 + NW–53	2 + 1	Dewi (1997), h. 71, gb. 180, 182.
A-17	***Keijella apta*** (Guan, 1978)	NW–53 + NW–18	C + 2	Whatley & Zhao (1988), h. 12, pl. 7, gb. 10-12.
A-18	***Copytus posteroculcus*** (Wang, 1985)	NW–53 + NW–44	2 C + C	Whatley & Zhao (1988),h. 365, pl. 4, gb. 6-8.
A-19	***Mutilus variornatus*** (Sars, 1866)	NW–53	1	Schroder & Hartmann (1978), tabel VIII, gb. 1.
A-20	***Xestoleberis communis*** (Muller, 1894)	NW–53	3	Yassini (1979), h. 412, pl. 2, gb 3-5.
A-21	***Cytherolloidea excavata*** (Mostafawi, 1992)	NW–63	C + 1	Mostafawi (1992), h. 136, tabel 1, gb. 9-11.
A-22	***Javanella kendengensis*** (Kingma, 1948)	NW–53	1	Yassini *et al* (1993), h. 386, pl. 2, gb. 33-35.
A-23	**Unidentified sp.1**	NW–03	2	
A-24	***Neomonoceratina macropora*** (Kingma, 1948)	NW–03 + NW–18 + NW–68	1 + 1 + 1	Whatley & Zhao (1987), h. 340, pl. 2, gb. 22.
A-25	***Callistocythere* sp. 1** (Ruggieri, 1953)	NW–03	1	Dewi (1997), h. 67, gb. 136-137.
A-26	***Callistocythere* sp. 2** (Ruggieri, 1953)	NW–03	1	Witte (1993), h. 30, pl. 3, gb. 19-22.
A-27	***Xestoleberis pararotunda*** (Sars, 1866)	NW–48	1	Zhou (1995), h. 9, pl. 6, gb. 11.


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A-45
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A-47
0.03 mm
0.05 mm
A-48

A-28	***Mutilus* cf *splendideornatus australiensis*** (Schroder & Hartmann, 1978)	NW–48 + NW–18	2 + 1	Schroder & Hartmann (1978), tabel 4, gb. 9.
A-29	***Baltraella hanaii*** (Keij, 1979)	NW–18	3	Dewi (1997), h. 62, gb. 80, 82.
A-30	**Unidentified sp. 2**	NW–18	3	
A-31	***Neomonoceratina koeningswaldi*** (Kingma, 1948)	NW–66	3 C	Schroder & Hartmann (1978), tabel III, gb. 5.
A-32	***Macrocypris decora*** (Brady, 1866)	NW–66	2	Dewi (1997), h. 57, gb. 28.
A-33	***Xestoleberis broomensis*** (Sars, 1866)	NW–66	2 C + 1	Whatley & Maybury (1983), tabel XII, gb. 8.
A-34	***Loxoconcha australis*** (Brady, 1880)	NW–66	1	Yassini & Jones (1995), h. 340, gb. 310-314.
A-35	***Paracytheridea tschoppi*** (Van Den Bold, 1946)	NW–66 + NW–08	2 + 1	Witte (1993), h. 66, pl. 8, gb. 18, 19.
A-36	***Leptocythere* sp. 1**	NW–53 + NW–18 + NW–66	1 + 1 + 1	
A-37	***Argilloicea parameridionalis*** (Sars, 1866)	NW–53	1	Whatley *et al* (1998), pl. 1, gb. 1-5.
A-38	***Caudites scopulicolus*** (Hartmann, 1981)	NW–53	1	Yassini & Jones (1995), h. 364, gb. 460.
A-39	***Loxoconcha* sp.** (Sars, 1866)	NW–44 + NW–68	1 + 2	Yassini & Jones (1995), h. 343, gb. 334.
A-40	***Praemunita mowbrayi*** (Yassini & Mikulandra, 1989)	NW–44	1	Yassini & Jones (1995), h. 337, gb. 289, 293.
A-41	***Mutilus* sp.**	NW–53	1	


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0,04 mm
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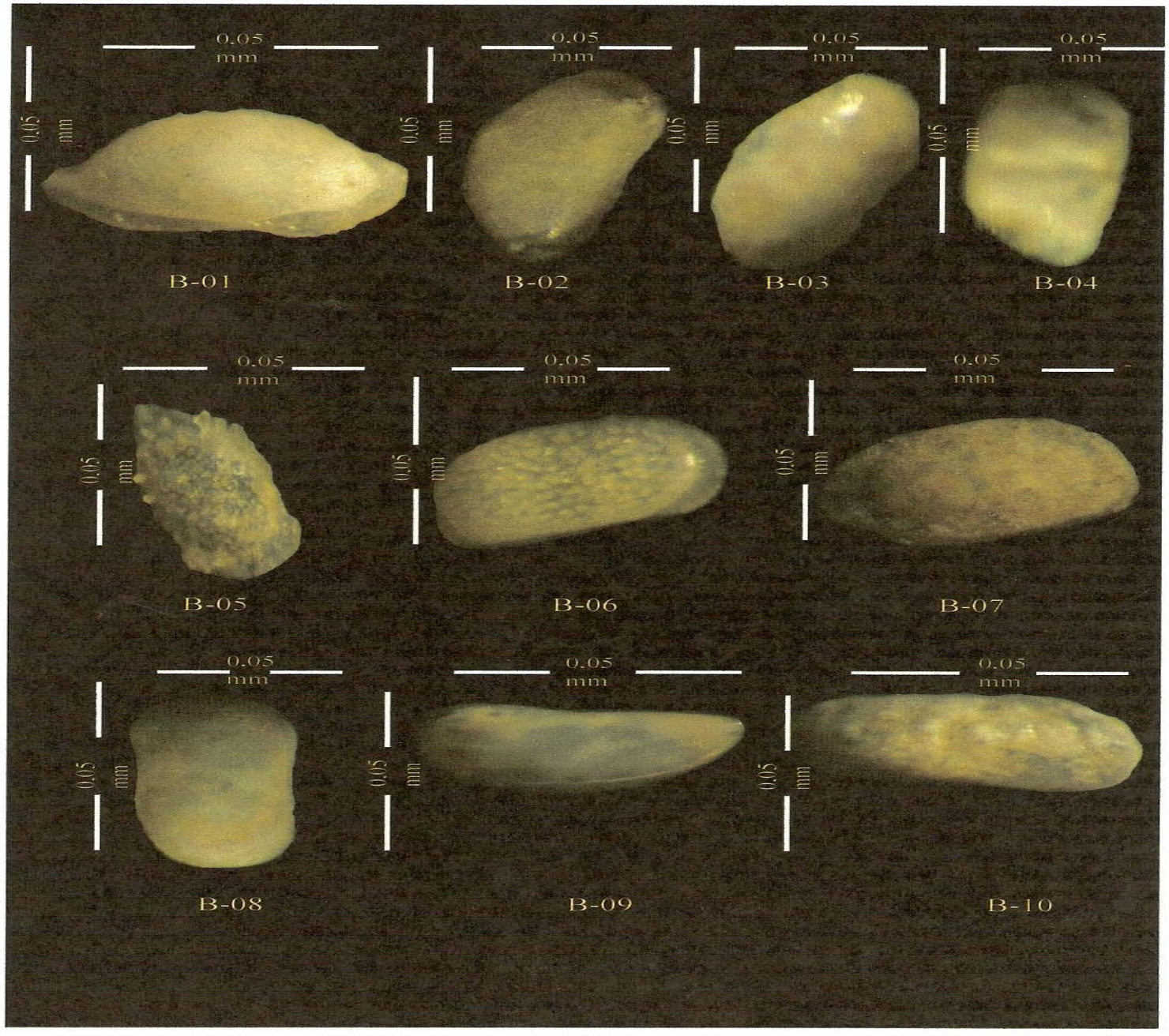
0,03 mm
A-59
0,02 mm
0,03 mm
A-60

A-42	***Neomonoceratina ikoroduensis*** (Omatsola, 1970)	NW–03	1	Witte (1993), h. 24, pl. 3, gb. 5-12.
A-43	***Muellerina* sp.** (Kingma, 1948)	NW–03	3	Whatley *et al* (1997), h. 69, pl. 11, gb. 5-6.
A-44	***Loxoconcha lacunensis*** (Omatsola, 1970)	NW–18 + NW–03	2 + 1	Witte (1993), h. 59, pl. 8, gb. 5-8.
A-45	***Heterocythereis albomaculata*** (Baird, 1838)	NW–03	1	Yassini (1979), h. 400, pl. 5, gb. 10.
A-46	***Loxoconchella pulchra*** (McKenzie, 1967)	NW–03	1	Yassini & Jones (1995), h. 343, gb. 306, 308.
A-47	***Ilyocypris* sp. cf. *Ilocypris gibba*** (Ramdohr, 1808)	NW–18	2	Whatley *et al* (1997), h. 18, pl. 1, gb. 9-10.
A-48	***Cytherella* sp. 1**	NW–18 + NW–53	1 + 2	
A-49	***Cytherelloidea leroyi*** (Keij, 1964)	NW–69	3	Dewi (1997), h. 55, gb. 15.
A-50	***Loxoconcha pulchara*** (McKenzie, 1985)	NW–68	3	(McKenzie, 1985); McKenzie & Pickett, gb. B.
A-51	***Loxoconcha paiki*** (whatley & Zhao 1987)	NW–68	3 C	Mostafawi (1950), tabel 5, gb. 105.
A-52	***Loxoconcha malayensis*** (Zhao & Whatley, 1989)	NW–68	3	Zhao & Whatley (1989), h. 174, pl. 2, gb. 1.
A-53	***Aglaiocypris gambiensis*** (Sylvester Bradleyi, 1946)	NW–68	3	Witte (1993), h. 77, pl. 11, gb. 1-6.
A-54	***Tanella gracilis*** (Kingma, 1948)	NW–68	1	Yassini & Jones (1995), h. 334, gb. 239-240.
A-55	***Loxoconcha broomensis*** (Sars, 1866)	NW–57	1	Schroder & Hartmann (1978), Tabel X, gb. 1.
A-56	***Caudites exmouthensis*** (Sars, 1866)	NW–18	1	Whatley & Zhao (1988), h. 7, pl. 6, gb. 8, 9.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A-57	***Paranesidea illawarraiana* sp.nov** (Maddocks, 1969)	NW–57	1	Yassini & Jones (1995), h. 305, gb. 40
A-58	***Eucythere* sp.** (Zhao, 1988)	NW–41 + NW–18	1 + 2	Yassini & Jones (1995), h. 335, gb. 251.
A-59	***Neomonoceratina mediterranea ruggieri*** (Kingma, 1948)	NW–18 + NW–66	1 + 2	McKenzie & Pickett (1985), h. 236, gb. z.
A-60	***Triebelina* sp. B** (Sars, 1988)	NW–63	1	Mostafawi (1985), h. 15, tabel. 1, gb. 1.

Tabel Plate B. Koleksi Ostracoda di Perairan Nusawere Teluk Pangandaran Kabupaten Ciamis Jawa Barat.

NO	Genus & Spesies	Nomor	Jumlah Spesies	Referensi
B-01	***Neonesidea* sp. 1** (Maddocks, 1969)	NW–33	1	Whatley & Zhao (1987), h. 335, pl. 1, gb. 22.
B-02	***Neonesidea* sp. 2**	NW–69	1	
B-03	***Triebelina* sp.**	NW–68	1	
B-04	***Bythoceratina* sp. 1** (Hornibrook, 1953)	NW–18	2	Whatley & Zhao (1987), h. 343, pl. 3, gb. 16.
B-05	***Spinoceratina spinosa*** (Zhao & Whatley, 1988)	NW–69	1	Dewi (1997), h. 60, gb. 60, 61.
B-06	***Neocytheretta spongiosa*** (Brady, 1870)	NW–69	1	Dewi (1997), h. 73, gb. 201-203.
B-07	**Unidentified sp.3**	NW–69	1	
B-08	***Cytherella* cf. *c. ponderosa*** (Jones, 1849)	NW–07	1	Witte (1993), h. 19, pl. 1, gb. 16-21.