



IPC12

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Community Ecology of Polychaeta (Annelida) in Soft Bottom Macrobenthos of Southern South China Sea

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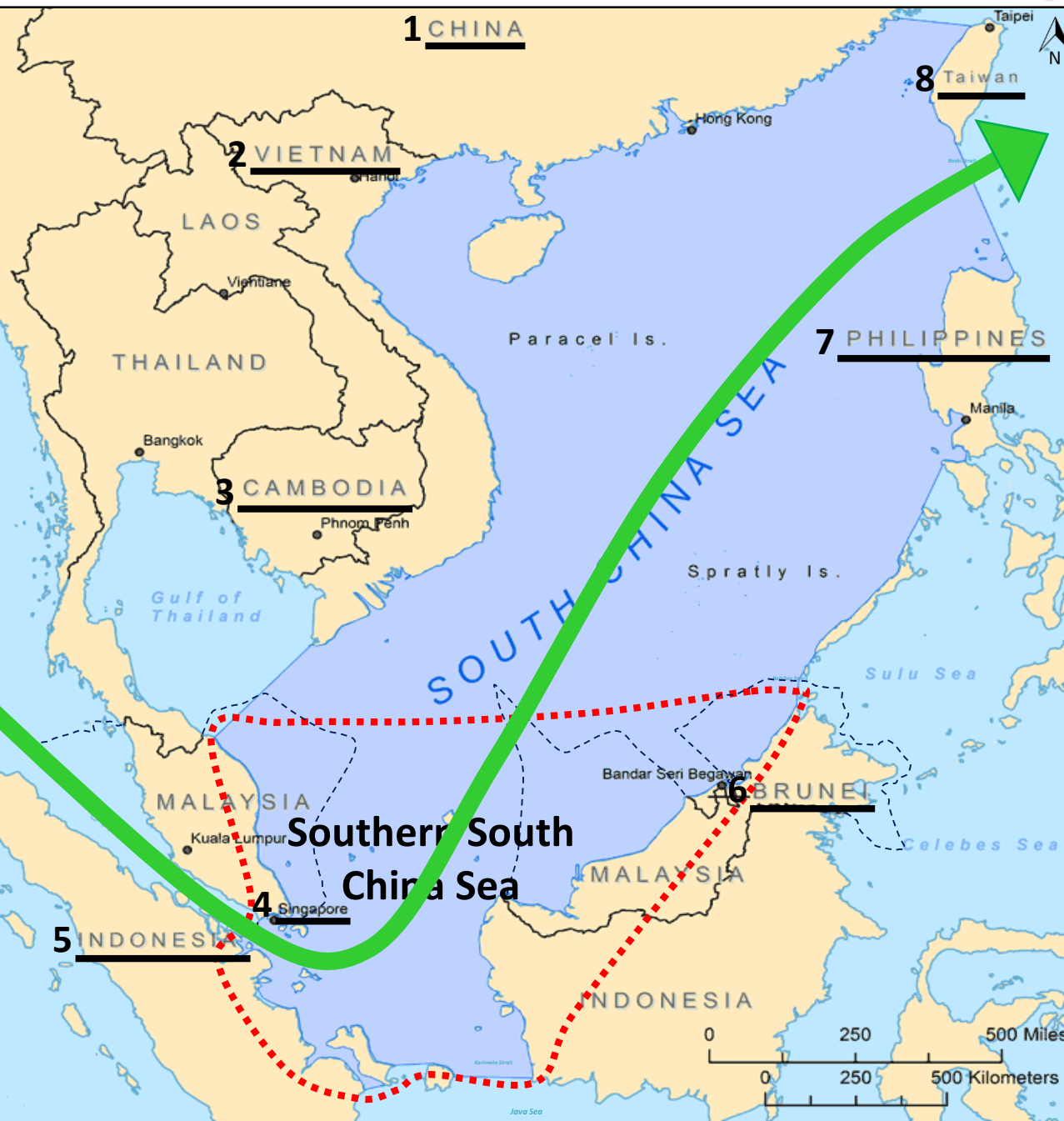
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Polychaete

- Presence in various **marine habitats** (Frid, 2011).
- Constitutes more to the total macrobenthic animals:-
 - **abundance**
 - **biomass**
 - **number of species**
 - **number of individuals**



South China Sea and Malaysia EEZ

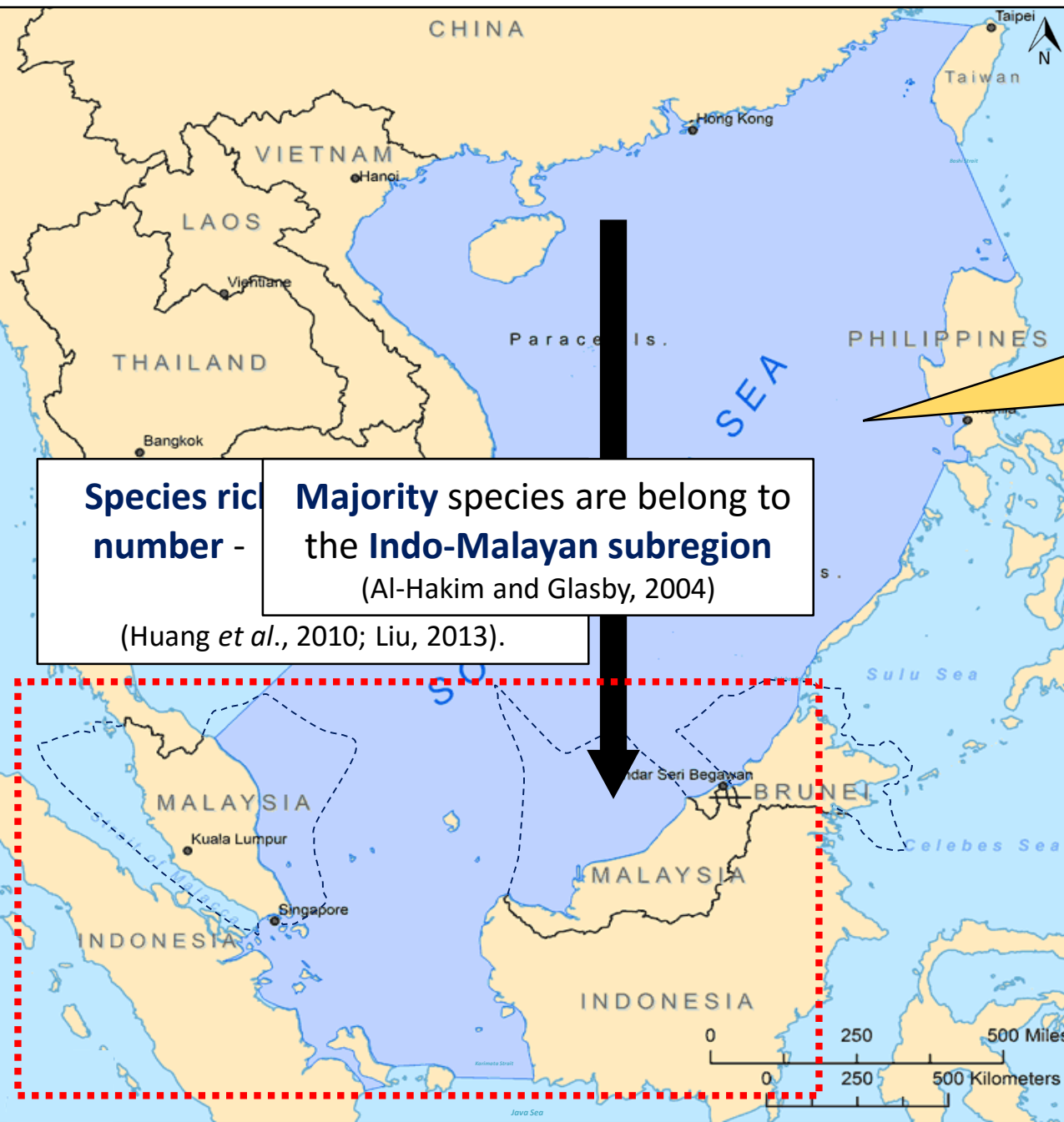


- **Semi-enclosed body of water.**
- **Large Marine Ecosystem (LME) - high biodiversity** (Liu, 2013).
- **Critical world trade routes** (Morton and Blackmore, 2001).

— — — Malaysia Exclusive Economic Zone (EEZ)

(Image modified from EIA, 2013)

Problem Statement and Justification



**Species rich
number -**

Majority species are belong to
the **Indo-Malayan subregion**
(Al-Hakim and Glasby, 2004)

(Huang *et al.*, 2010; Liu, 2013).

**661 species
54 families**

(Paxton and Chou, 2000)

Problem Statement and Justification



- Offshore polychaete study:

SEAFDEC Expedition (1997-2000)

- Previous studies:

- **estuary**

(Nakao *et al.*, 1989)

- **reef**

(Ibrahim *et al.*, 2006)

- **coastal**

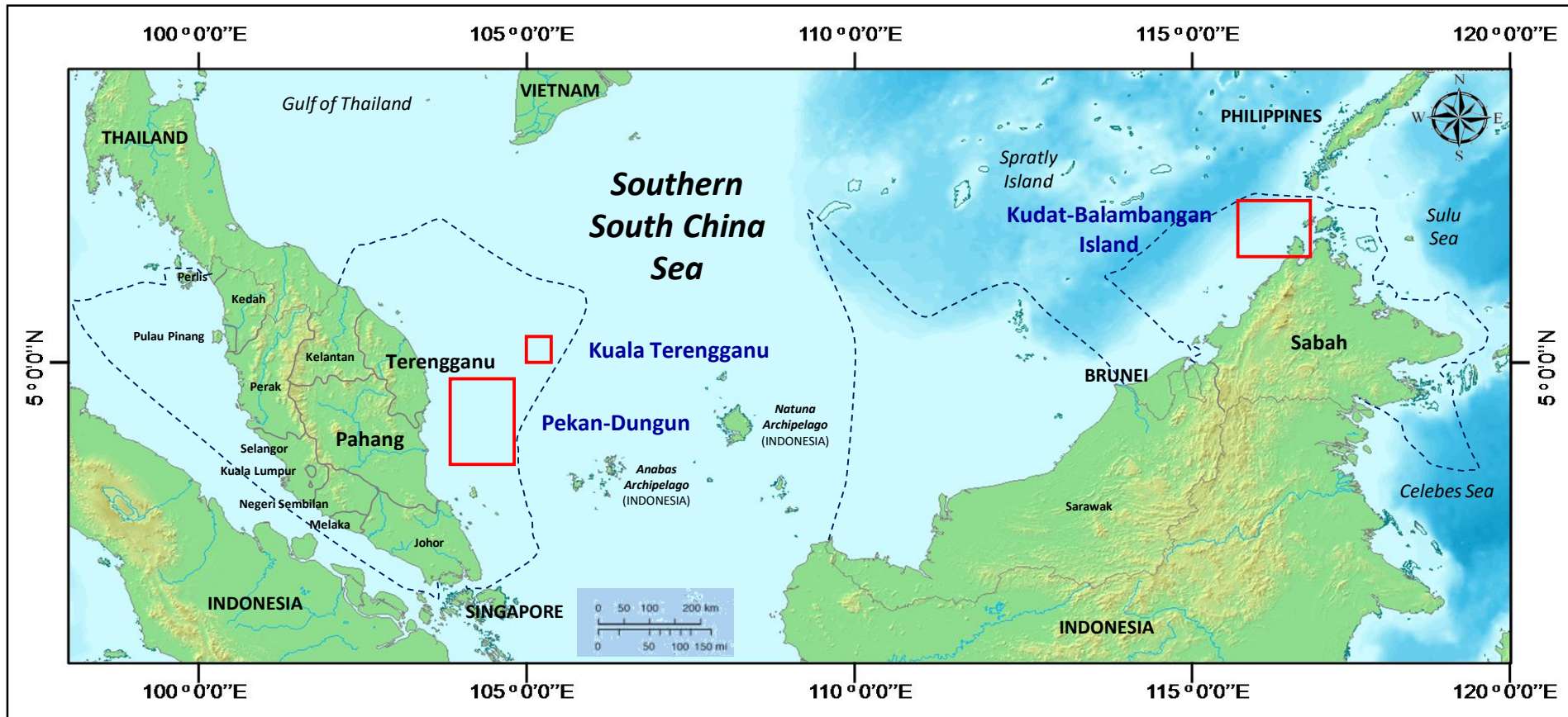
(Gholizadeh *et al.*, 2012)



Objectives

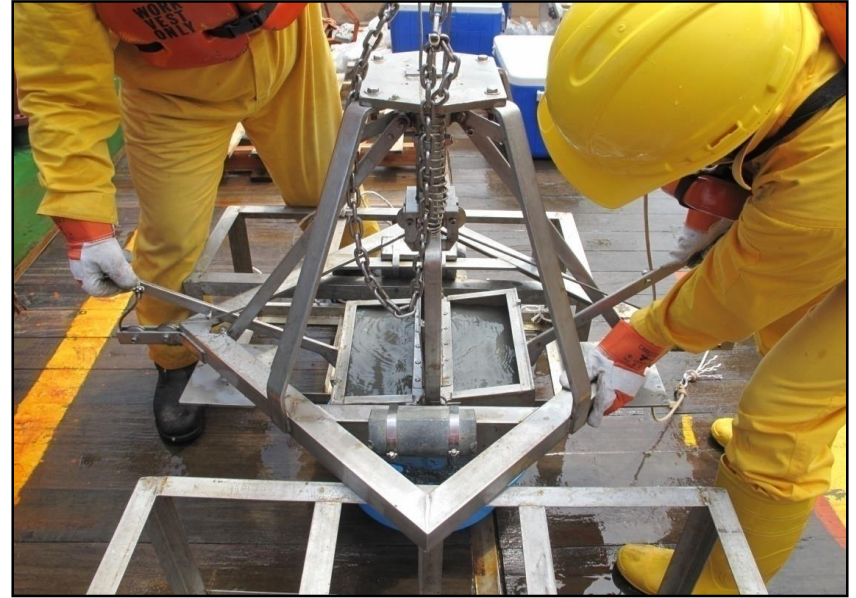
Determination of the **relationship** between **polychaetes community structures** with **sediment parameters** in southern South China Sea

Study location



Depth (m)	No. of station
20 – 59	13
60 - 79	30

Field sampling



Results

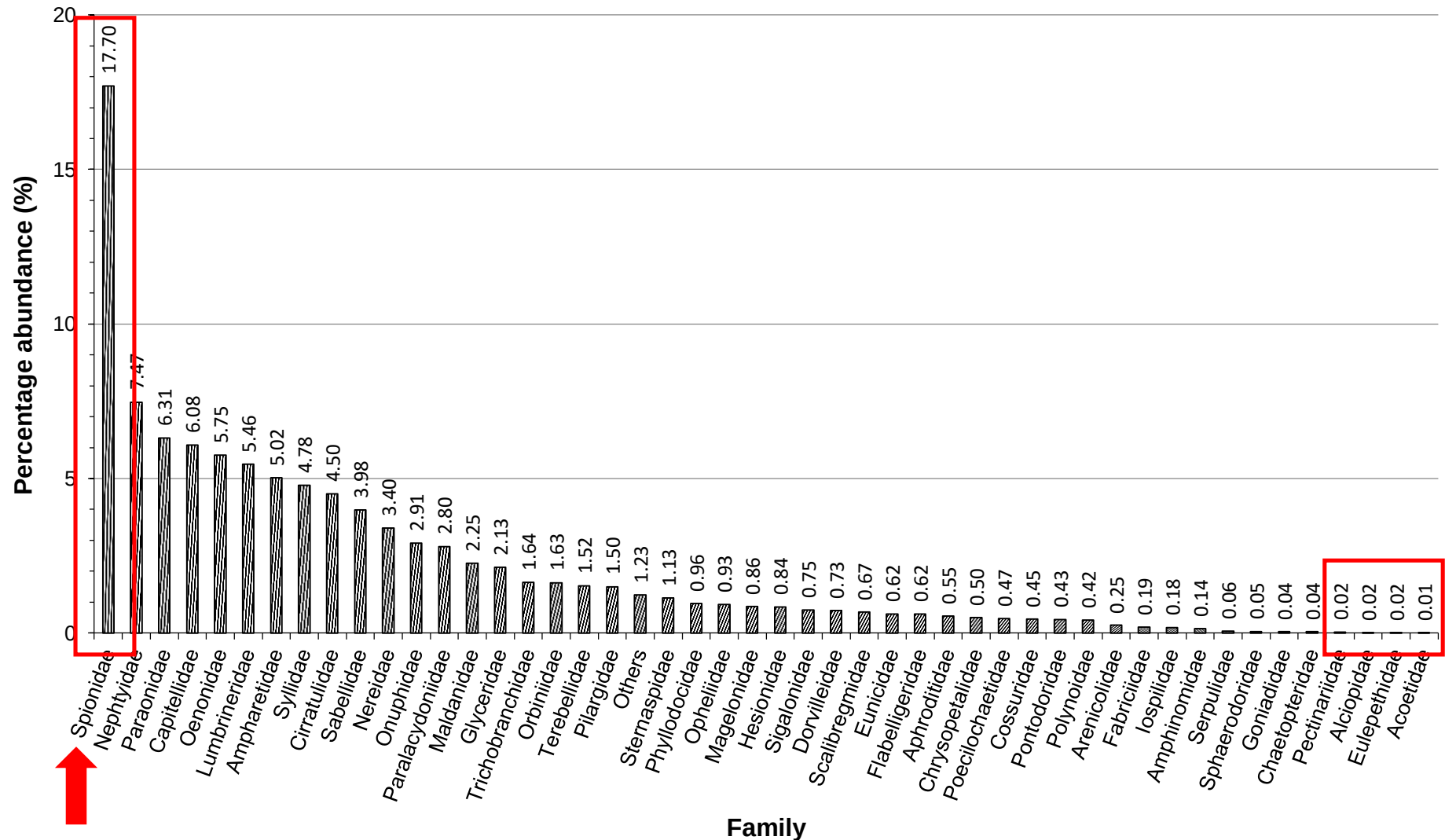
**12,477
individuals**



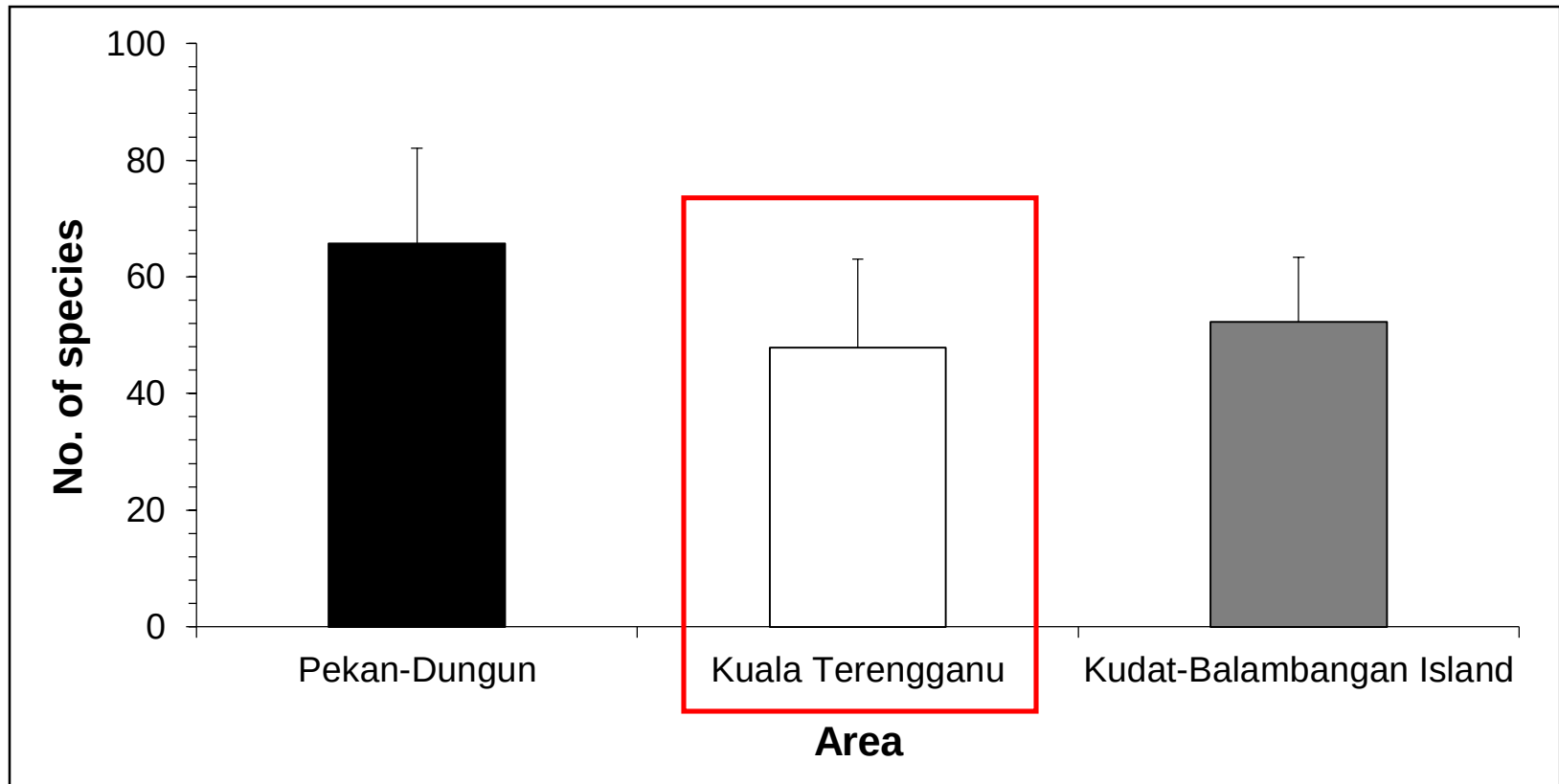
**47 families,
217 genera**



Polychaete families & spatial distribution

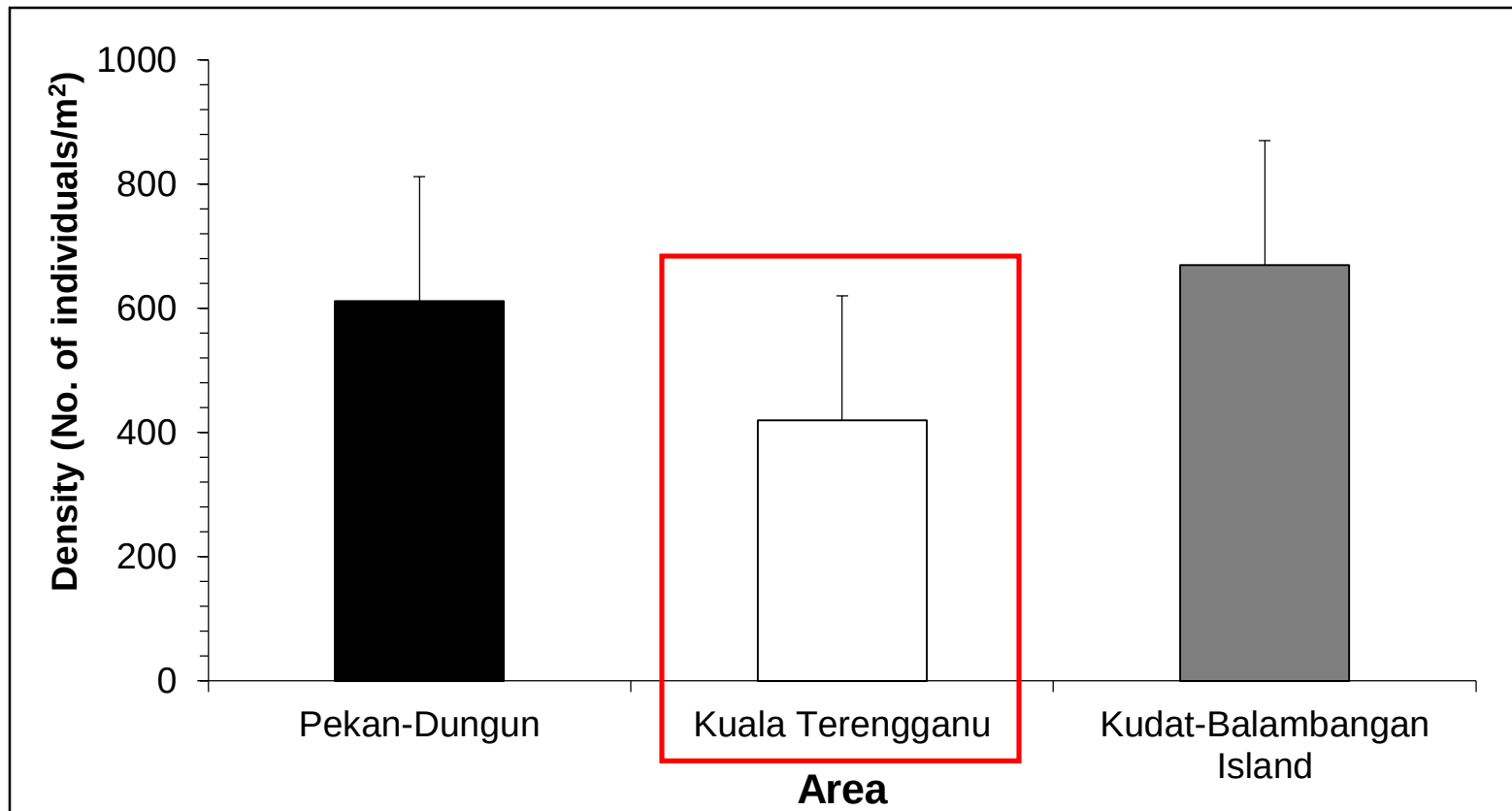


Polychaete species & spatial distribution



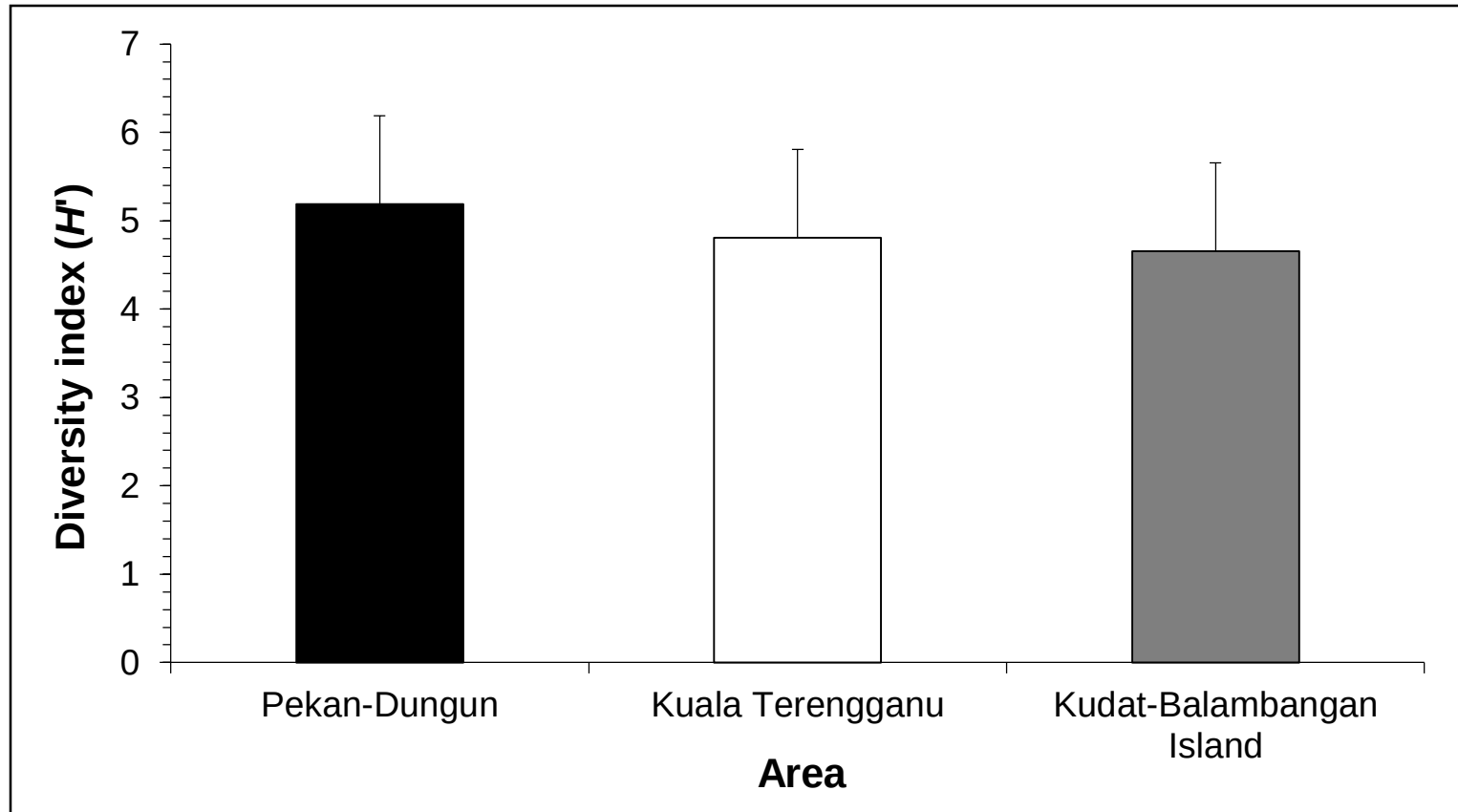
- **Number of species:** ($p < 0.05$) among areas
- **Lowest:** Kuala Terengganu

Abundance of polychaetes



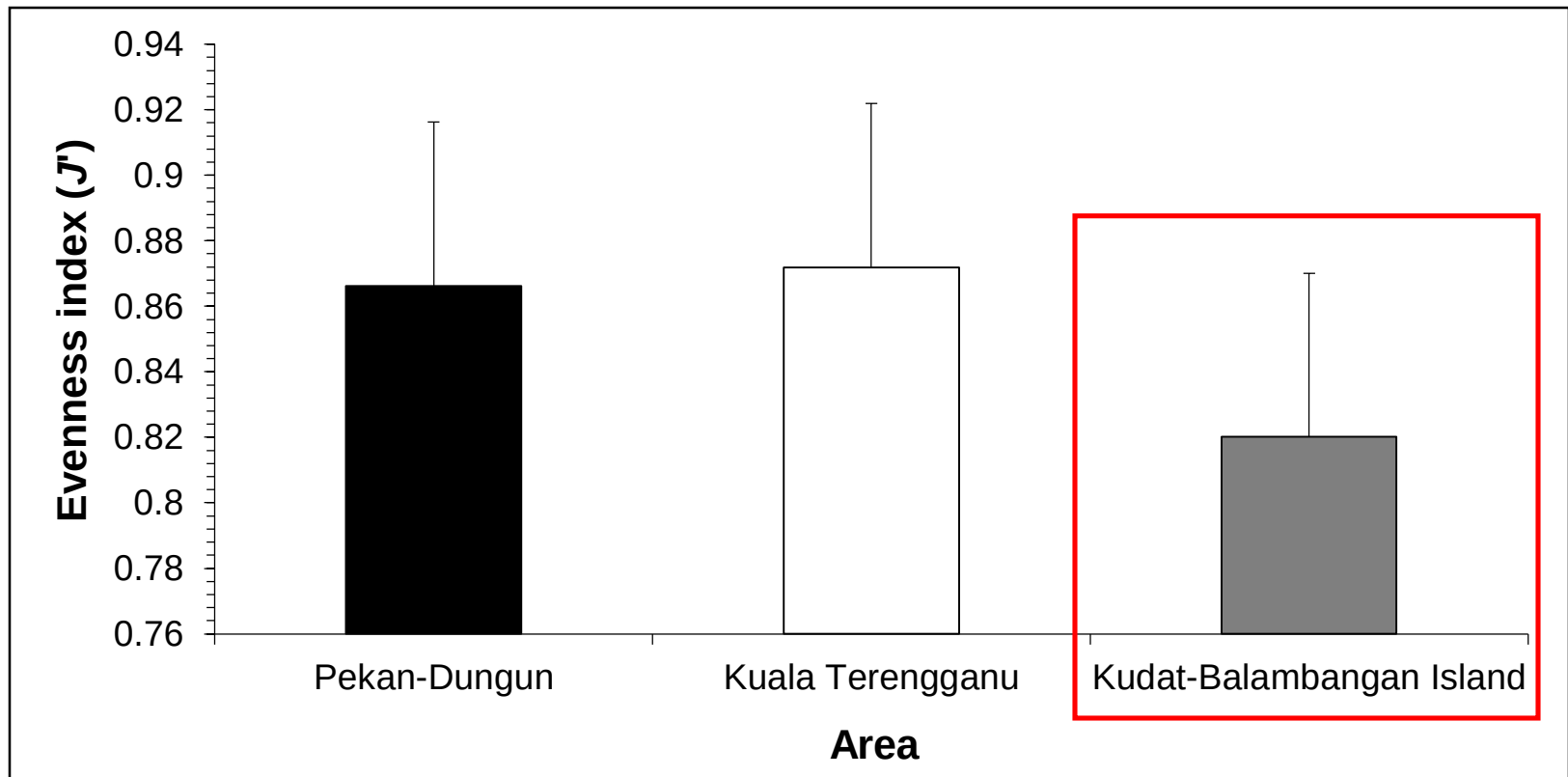
- **Total density:** ($p < 0.05$) among areas
- **Lowest:** Kuala Terengganu (420 ± 167 individuals/m²)

Polychaete diversity



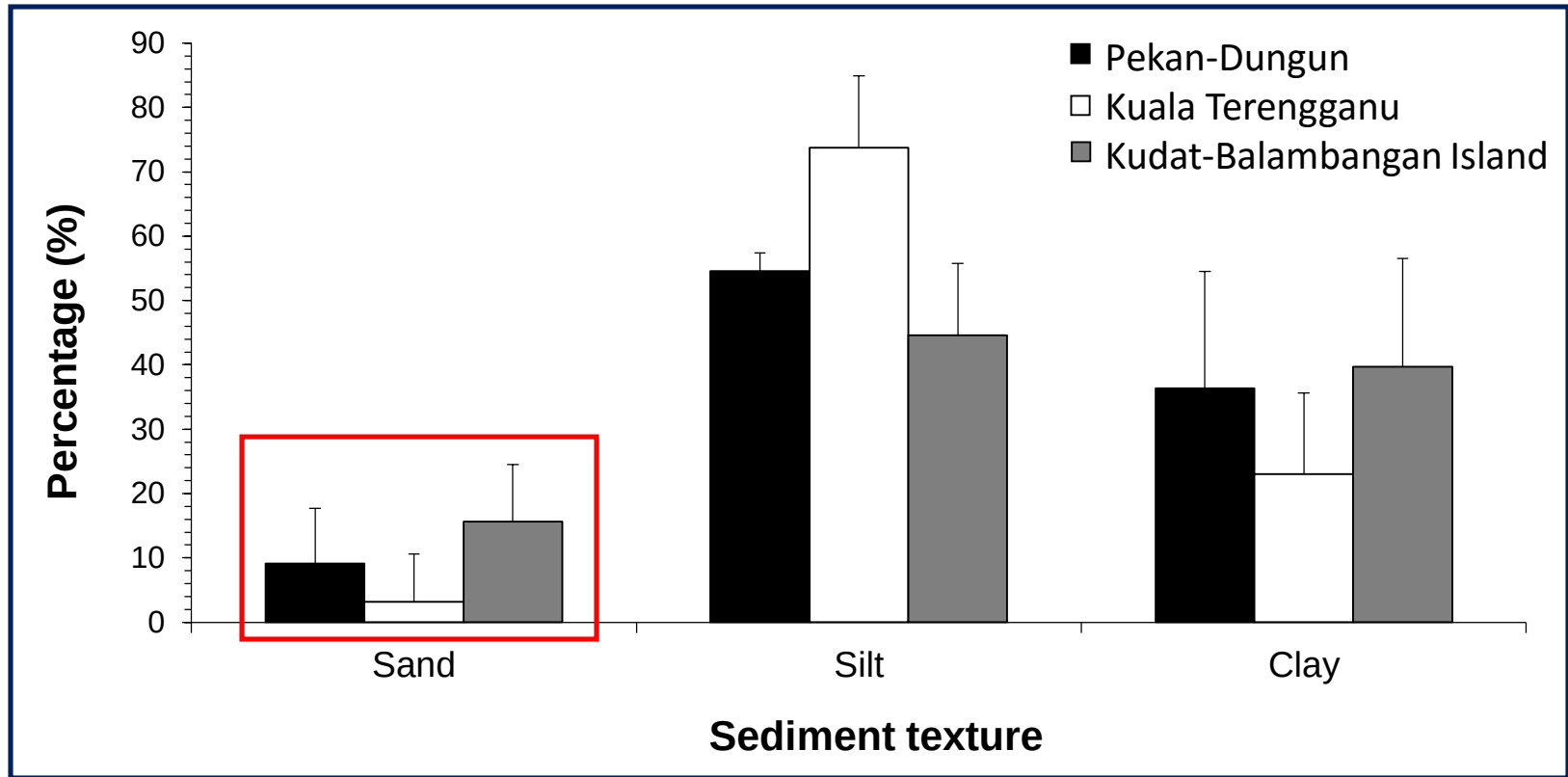
- **Diversity:** ($p < 0.05$) among areas (3.88 to 5.65)

Polychaete evenness

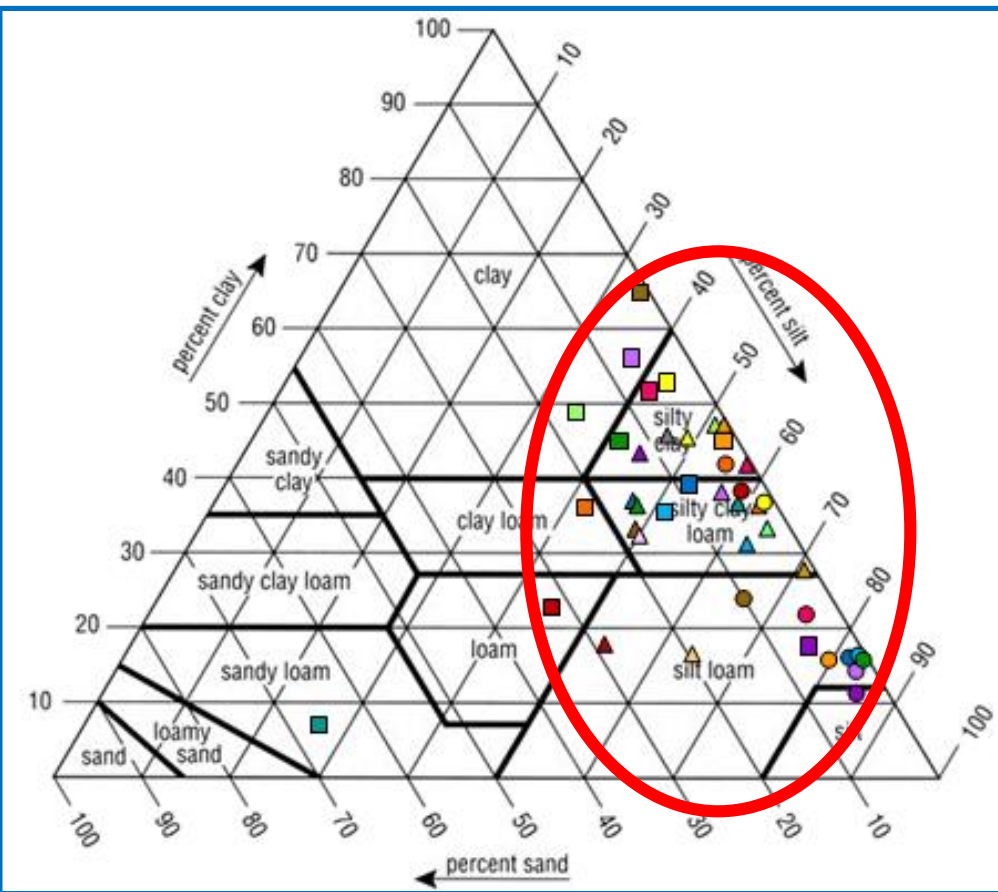


- **Evenness:** ($p > 0.05$) among areas
- **Lowest:** Kudat-Balambangan Island

Sediment characteristics



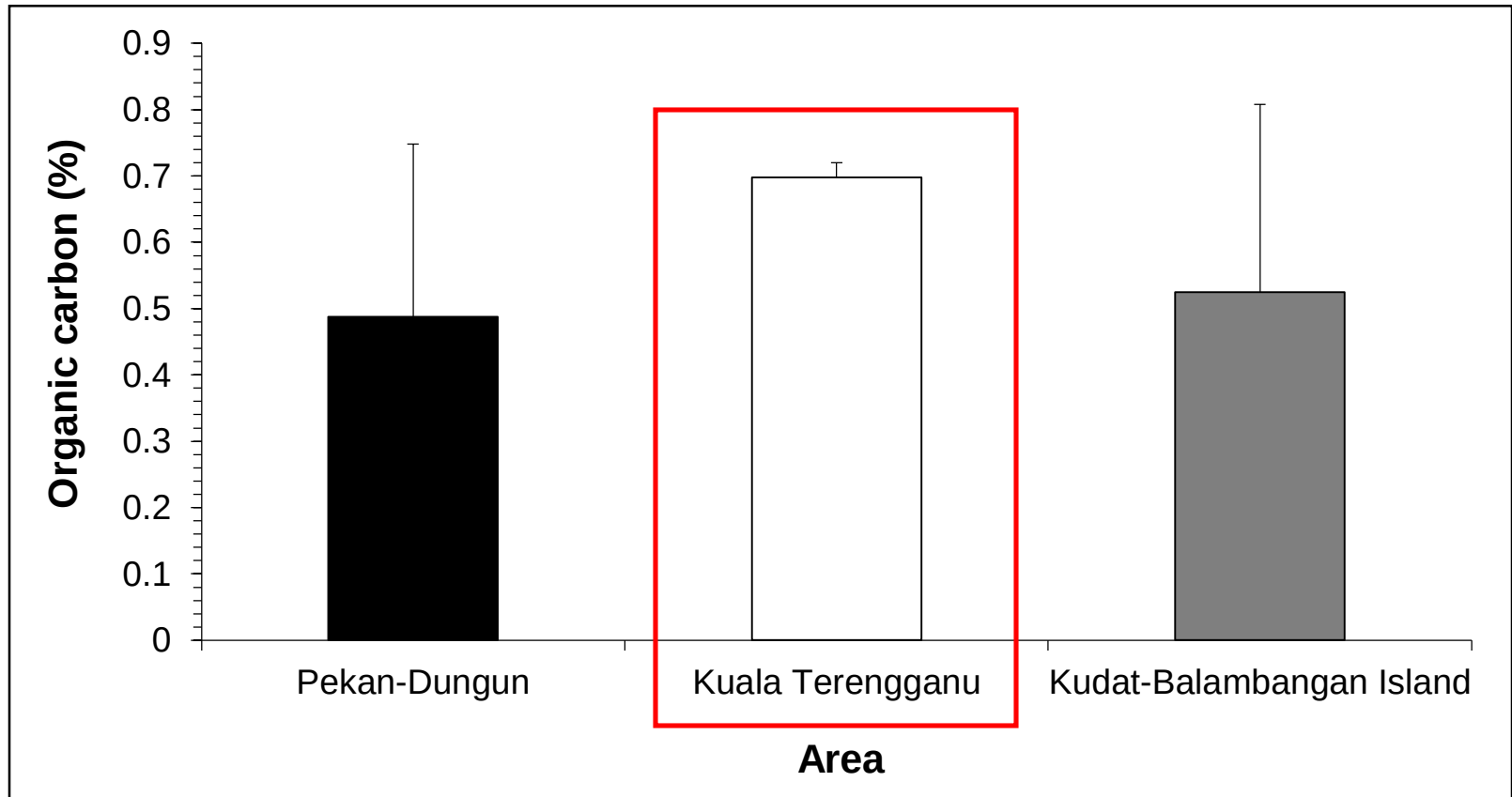
- Sediment types (%): **sand**, **silt** and **clay**
- **Sand** < **silt** & **clay** ($p < 0.05$)



Sediment texture	No. of stations
Silty-clay	11
Silty-clay-loam	14
Silt-loam	10
Silt	1
Clay	3
Clay-loam	1
Loam	1
Sandy-loam	1

- Offshore sediments → **compounded** and **complicated**.
- **Compounded** → **mixture of various sediments** (silty-clay, silty-clay-loam, silt-loam and sandy-loam).
- **Complicated** → **patchy distribution**.

Sediment organic carbon (OC)



- Highest: Kuala Terengganu ($p < 0.05$)

Variation in abundance in sediment

Abundance in each group (individuals/m²)

Group of sediment

Pekan-
Dungun

Kuala
Terengganu

Kudat-
Balambangan
Island

Mean

Silty-clay

523

308

534

1364.5

Silty-clay-loam

654

569

382

1604.8

Silt-loam

616

397

676

1688.9

Silt

-

398

-

398

Clay

-

-

861

861.3

Clay-loam

-

-

528

528

Loam

-

-

574

574

Sandy-loam

-

-

638

638

Discussions

No.	Location	Density (No. of ind/m ²)	References
1	Offshore Malaysia	567	Present study
2	North and South Vietnamese water	31.5	Trong <i>et al.</i> , 2000
3	East Coast Peninsular Malaysia & Gulf of Thailand	107	Piamthipmanus, 1999
4	East Coast of Peninsular Malaysia & Gulf of Thailand	106	Yasin and Razak, 1999
5	Brunei, Malaysia (Sabah and Sarawak)	113	Piamthipmanus, 1998

Discussions

- **High** species diversity and evenness.
- Kuala Terengganu lowest in species number and abundance:
 - **small area.**
 - **far** from mainland.
- **Sediment type** is the **main factor** on **diversity and distribution** of polychaetes.



Conclusion

- Southern South China Sea - **high polychaete diversity** .
- Polychaete in southern South China Sea mainly found in **silty-clay, silty-clay-loam and silt-loam**.
- Significant **baseline information** – sustainable marine management ecosystem of southern South China Sea.
- Potential **bio-indicator** for mineral resources.



Acknowledgements

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Terima kasih, thank you, diolch, merci,
syukran!



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Scholarship



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