

## Functional Feeding Group (FFG) of Aquatic Macroinvertebrate in Middle Reach of Kerian River Basin of North Malaysia Peninsula

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### Abstract

Investigations on the distribution and abundance of aquatic macroinvertebrates functional feeding group (FFG) in Bogak, Kerian and Serdang rivers of Kerian River Basin showed that there were 120 genera from 59 families of 13 orders of macroinvertebrates. Predator mainly Odonata, Hemiptera and Coleoptera was the most common group and found in high densities in Bogak River (modified river) and Kerian River (main river). The second dominant group in both rivers was collector-gatherer (Diptera and Ephemeroptera) followed by scraper (mollusks). A different pattern of FFG distribution was observed in Serdang River (tributary of Kerian River). The most abundant group was collector-gatherer, followed by predator and scraper. In general, predator abundance showed a significant positive correlation with their prey abundance (other feeding groups). Predator abundance especially in Bogak and Kerian rivers, was significantly influenced by parameters such PO43-, NO3-N and Zn. In Serdang River, collector-gatherer abundance was affected by water temperature, velocity, TSS, turbidity, Mn and Cu content in the sediments. However, all water parameters weakly influenced the abundance of FFGs in all locations. High abundance of collector-gatherer in Serdang River was related to enriched water contributed by anthropogenic waste from surrounding residential areas. In general, dominant FFG in each river reflected the influence of different environmental conditions and availability of food sources in the area.

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2. **Biotransference and biomagnification of selenium copper, cadmium, zinc, arsenic and lead in a temperate seagrass ecosystem from Lake Macquarie Estuary, NSW, Australia** Times Cited: 178  
By: Barwick, M; Maher, W  
MARINE ENVIRONMENTAL RESEARCH Volume: 56 Issue: 4 Pages: 471-502 Published: OCT 2003
3. **Sandy bottom macroinvertebrates in two moderately polluted stations of the River Treia (Central Italy): structural and functional organization** Times Cited: 5  
By: Bazzanti, M.  
ANNALES DE LIMNOLOGIE-INTERNATIONAL JOURNAL OF LIMNOLOGY Volume: 27 Issue: 3 Pages: 287-298 Published: JAN 1991
4. **THE INITIAL ASSESSMENT OF TRACE-METAL POLLUTION IN COASTAL SEDIMENTS** Times Cited: 124  
By: CHESTER, R; VOUSINOU, FG  
MARINE POLLUTION BULLETIN Volume: 12 Issue: 3 Pages: 84-91 Published: 1981
5. **Macroinvertebrates.** Times Cited: 5  
By: Cummins, K.W.  
Studies Ecol Volume: 2 Pages: 170-198 Published: 1975
6. **Ecology and distribution of aquatic insects.** Times Cited: 56  
By: Cummins, Kenneth W.; Merritt, Richard W.  
An introduction to the aquatic insects of North America. Third edition. Pages: 74-86 Published: 1996
7. **Ecology and distribution of aquatic insects** Times Cited: 26  
By: Cummins, KW; Merritt, RW; Berg, MB.  
An introduction to the aquatic insects of north America Pages: 105-122 Published: 2008  
Publisher: Kendall Hunt Publication, Dubuque
8. **FEEDING ECOLOGY OF STREAM INVERTEBRATES** Times Cited: 958  
By: CUMMINS, KW; KLUG, MJ  
ANNUAL REVIEW OF ECOLOGY AND SYSTEMATICS Volume: 10 Pages: 147-172 Published: 1979
9. **TROPHIC RELATIONS OF AQUATIC INSECTS** Times Cited: 741  
By: CUMMINS, KW  
ANNUAL REVIEW OF ENTOMOLOGY Volume: 18 Pages: 183-206 Published: 1973
10. Title: [not available] Times Cited: 2  
By: Fernando, C H; Cheng, L.  
A guide to Malayan water bugs (Hemiptera-Heteroptera) with keys to the genera Published: 1963  
Publisher: University of Singapore, Singapore
11. Title: [not available] Times Cited: 2  
By: Fonseka, T.  
The dragonflies of Sri Lanka Published: 2000  
Publisher: WHT Publication (Private) Limited, Colombo, Sri Lanka
12. **Assessment of constructed wetland biological integrity using aquatic macroinvertebrates.** Times Cited: 3  
By: Galbrand, C.; Lemieux, I. G.; Ghaly, A. E.; et al.  
Online Journal of Biological Sciences Volume: 7 Issue: 2 Pages: 52-65 Published: 2007
13. **EFFECTS OF RIPARIAN COMMUNITY STRUCTURE, SEDIMENT SIZE, AND WATER-QUALITY ON THE MACROINVERTEBRATE COMMUNITIES IN A SMALL, SUBURBAN STREAM** Times Cited: 21  
By: HACHMOLLER, B; MATTHEWS, RA; BRAKKE, DF  
NORTHWEST SCIENCE Volume: 65 Issue: 3 Pages: 125-132 Published: MAY 1991
14. **Chironomid communities in relation to physical habitat** Times Cited: 1  
By: Hawtin, E  
ADVANCES IN RIVER BOTTOM ECOLOGY Pages: 175-184 Published: 1998
15. **Macroinvertebrates: Composition, Life Histories and Production** Times Cited: 82  
By: Jacobsen, Dean; Cressa, Claudia; Mathooko, Jude M.; et al.  
TROPICAL STREAM ECOLOGY Book Series: Aquatic Ecology Series Pages: 65-105 Published: 2008
16. Title: [not available] Times Cited: 1,654  
By: Merritt, R. W.; Cummins, K. W.  
An Introduction to the Aquatic Insects of North America Published: 1996  
Publisher: Kendall Hunt Publishing Co, Debuque, IA

17. Title: [not available] Times Cited: 166  
By: Morse, J. C.; Yang, L; Tian, L.  
Aquatic Insects of China Useful for Monitoring Water Quality Published: 1994  
Publisher: Hohai University Press, Nanjing, China.
18. **Freshwater biomonitoring with macroinvertebrates in East Asia** Times Cited: 71  
By: Morse, John C.; Bae, Yeon J.; Munkhjargal, Gotov; et al.  
FRONTIERS IN ECOLOGY AND THE ENVIRONMENT Volume: 5 Issue: 1 Pages: 33-42 Published: FEB 2007
19. **BIOLOGY OF FRESH-WATER CHIRONOMIDAE** Times Cited: 349  
By: PINDER, LCV  
ANNUAL REVIEW OF ENTOMOLOGY Volume: 31 Pages: 1-23 Published: 1986
20. **Macroinvertebrate functional feeding group methods in ecological assessment** Times Cited: 62  
By: Rawer-Jost, C; Bohmer, J; Blank, J; et al.  
HYDROBIOLOGIA Volume: 422 Pages: 225-232 Published: APR 2000
21. **Use of aquatic insects in biomonitoring** Times Cited: 23  
By: Rosenberg, D.M; King, R.S.; Resh, V.H.  
An introduction to the aquatic insects of North America Pages: 123-137 Published: 2008  
Publisher: Kendall/Hunt, Dubuque
22. **RIVER CONTINUUM CONCEPT** Times Cited: 5,302  
By: VANNOTE, RL; MINSHALL, GW; CUMMINS, KW; et al.  
CANADIAN JOURNAL OF FISHERIES AND AQUATIC SCIENCES Volume: 37 Issue: 1 Pages: 130-137 Published: 1980
23. **The role of macroinvertebrates in stream ecosystem function** Times Cited: 504  
By: Wallace, JB; Webster, JR  
ANNUAL REVIEW OF ENTOMOLOGY Volume: 41 Pages: 115-139 Published: 1996
24. **Riparian Wetlands of Tropical Streams** Times Cited: 15  
By: Wantzen, Karl M.; Yule, Catherine M.; Tockner, Klement; et al.  
TROPICAL STREAM ECOLOGY Book Series: Aquatic Ecology-San Diego Pages: 199-217 Published: 2008
25. **Influence of organic matter on invertebrate colonization of sand substrata in a northern Michigan stream** Times Cited: 10  
By: Yamamuro, Asako M.; Lamberti, Gary A.  
JOURNAL OF THE NORTH AMERICAN BENTHOLOGICAL SOCIETY Volume: 26 Issue: 2 Pages: 244-252 Published: JUN 2007
26. **A Malaysian tidal barrage incorporating a fishery component: Perspectives** Times Cited: 2  
By: Yap, S.W.  
P 2 AS RES FISH WORK Pages: 76-103 Published: 1990
27. **Freshwater environments** Times Cited: 3  
By: Yule, CM.  
Freshwater invertebrates of the Malaysian region Pages: 1-12 Published: 2004  
Publisher: Academy of Sciences Malaysia, Kuala Lumpur

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