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Title: A preliminary benthic macroinvertebrate index of biotic integrity (B-IBI) for monitoring the Moiben River, Lake Victoria Basin, Kenya

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Abstract: A Benthic Index of Biotic Integrity (B-IBI) was developed for the Moiben River. The index assesses effects of human disturbance on the biotic condition of stream macroinvertebrate communities. Eight stations were selected to represent different land-use types including forestry, settlement, grassland and mixed farming, practiced at different intensities. A total of 22 metrics were correlated against habitat quality and water quality parameters to determine their interrelationships. Ten metrics were shown to be responsive to changes in water and habitat quality, so could be used to separate sites according to levels of degradation. These were taxa richness (of Ephemeroptera, Plecoptera, Trichoptera and intolerant taxa richness), assemblage composition (percentage Ephemeroptera + Plecoptera + Trichoptera [EPT] individuals, and percentage of individuals in dominant taxa), pollution tolerance (percentage of tolerant individuals) and three functional feeding group metrics (ratio of scraper: filterer individuals, percentage gatherer genera, and percentage predator individuals). We calculated B-IBIs by summing metrics for each site, after transforming them to a discrete 1, 3, 5 scale. Values for the final index correlated well with measures of human influence based on qualitative assessment of habitat quality (Pearson's $r^2 = 0.88$). This preliminary benthic macroinvertebrate B-IBI shows promise for developing biological standards, which would facilitate long-term monitoring of streams in the upper reaches of Lake Victoria Basin.

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