Forest conversion to oil palm compresses food chain length in tropical streams

ABSTRACT

In Southeast Asia, biodiversity-rich forests are being extensively logged and con-verted to oil palm monocultures. Although the impacts of these changes on biodiversity arelargely well documented, we know addition to samples we collected in 201 little about howthese largescale impacts affect freshwater trophic ecology. We used stable isotope analyses(SIA) to determine the impacts of land-use changes on the relative contribution of allochtho-nous and autochthonous basal resources in 19 stream food webs. We also applied compound-specific SIA and bulk-SIA to determine the trophic position of fish apex predators and meso-predators (invertivores and omnivores). There was no difference in the contribution of auto-chthonous resources in either consumer group (70–82%) among streams with different land-use type. There was no change in trophic position for meso-predators, but trophic positiondecreased significantly for apex predators in oil palm plantation streams compared to foreststreams. This change in maximum food chain length was due to turnover in identity of the apexpredator among land-use types. Disruption of aquatic trophic ecology, through reduction infood chain length and shift in basal resources, may cause significant changes in biodiversity aswell as ecosystem functions and services. Understanding this change can help develop morefocused priorities for mediating the negative impacts of human activities on freshwater ecosys-tems