Abstract

Macroinvertebrate shredders may have been overlooked in tropical streams due to the geographical bias of early studies, methodological limitations, and the complex influences of local-scale factors. While shredders seem to be scarce in most oceanic island streams, we here test if they are abundant in a continental island. Gut content analyses of benthic macroinvertebrates were used to identify shredding taxa in streams located in different types of forest in Gorgona Island (Tropical Eastern Pacific). General dietary overlap (GO) was quantified and relative biomass, relative frequency and the leaf litter percentage in the guts were used to establish the relative importance of each taxon in the shredding guild. Various indices were used to identify the spatial arrangement (i.e. contagious or random) of each taxon and shredding guild among streams. We identified 31 shredding taxa that were divided into specialist-shredders (14 taxa), generalist-shredders (10), and collector-shredders (7). There was a complete GO (0.75, p <0.001) for the guild. Cockroaches (Epilampra) were the most represented shredders due to the greatest contribution to guild total biomass and to the highest content of leaf litter in their guts. These organisms were more important than shrimps and crabs in terms of abundance and biomass in leaf pack samples. Potimirin shrimps ranked second and Stenochironomus midges ranked third. Among aquatic insects, other secondarily important species were Leptohyphes (Ephemeroptera), Macrelmis, Anchytarsus and Tetraglosa (Coleoptera). Ten taxa exhibited contagious spatial pattern and twenty-one exhibited a random distribution. Resource distribution (i.e., leaf packs) between streams was random too. The guild was contagiously distributed, but this result could be highly influenced by the taxa with contagious distribution. Mean abundance, richness and mean biomass of shredders were not significantly correlated with any of the environmental variables measured. Three factors seemly explain the high richness and abundance of shredders in Gorgona Island: (1) its continental origin, (2) its current proximity to the continent (35 km), and (3) the high diversity and availability of leaf litter and woody debris inputs to the streams. Although crabs, shrimps, aquatic insects and semiaquatic-cockroaches coexisted in Gorgona Island, the latter were the most important leaf litter shredders in terms of biomass.

Keywords

Shredders, leaf litter, dietary overlap, spatial arrangement.