Keystone species - sea stars

Literature, Russian Literature

Keystone species Biotic factors coexist in ecosystems in which they interact through competition for available resources or through predation. These two forms of interaction determine composition of ecosystem through the natural rule of survival for the fittest. Each species, in a food chain, has its effects on composition of a habitat.

A keystone species is a species in an ecosystem, whose influence in the ecosystem are greater than would be expected based on its population size. The disproportionate effect is more significant than expected for a given population size. Such a species therefore play important roles in shaping an ecosystem’s composition and energy flow. It may increase population of a species or limit it through direct competition for resources or through predation.

The sea stars are considered a keystone species in the rocky intertidal habitat because it determines the habitat’s composition. One of its significant effects is its control over the population of mussel. It dictates the population of mussels within the intertidal region that it inhabits. Even though it can predate many other invertebrates in the middle intertidal, its preference of mussels determines the prey’s population in the habitat. This has secondary effects on populations of other species in the middle intertidal. In the absence of sea stars, mussels grow and colonize the middle intertidal. This leads to extinction of other species such as barnacles and large algae in the locality. This means that sea stars control population of different biotic factors and allows for establishment and sustainability of different species in the middle intertidal, a factor that identifies its supreme influence.

Sustainable biodiversity is important to an ecosystem. Sea stars affect biodiversity in rocky intertidal by ensuring a fair environment for survival of all factors in the ecosystem. Sea stars achieve this by controlling population of mussels that is a threat to other species in the habitat. By preferring the prey and by overwhelming it in the middle intertidal, sea stars allows for existence of other organisms that mussels would otherwise disadvantage and eliminate from the habitat.

Removal of sea stars threatens biodiversity of the rocky intertidal habitat through facilitating dominance of mussels over other species. It allows mussels into the lower zones and this leads to extinction of other species in the region. Sea stars control population of mussels and their removal leads to extensive dominance of mussel that then disadvantages other species and leads to the extinction of the other species. An experiment that controlled existence of sea stars explains this. In the experiment, existence of sea stars controlled population of mussels and ensured biodiversity while their absence lead to high mussels' population and extinction of other species.

Ecosystems consist of biotic factors that interact with other biotic factors and with abiotic factors for survival. Some organisms, keystone species, however have greater significance in the environments that is expected. Sea stars are a keystone species in the rocky intertidal and its existence controls the population of mussels in the middle intertidal to ensure sustainability of other organisms. Absence of sea stars in the rocky intertidal however allows for massive growth of mussels and this leads to extinction of other species in the middle intertidal.