عنوان مقاله:

Domestication of rice reshaped associated biodiversity of rice field ecosystem

محل انتشار:

نشریه تنوع جانوری, دوره 4, شماره 1 (سال: 1400)

تعداد صفحات اصل مقاله: 0

نویسندگان:

Ayan Mondal - *Department of Environmental Science, The University of Burdwan, ۷۱۳۱۰۴, West Bengal, India*

Nilanjan Das - *Department of Environmental Science, The University of Burdwan, ۷۱۳۱۰۴, West Bengal, India*

Sudipto Mandal - *Department of Environmental Science, The University of Burdwan, ۷۱۳۱۰۴, West Bengal, India*

خلاصه مقاله:

Domestication of rice (Oryza sativa L.) has a rich history with its diversification from wild progenitors based on genetic differences. For the benefit of human beings, natural environments have been modified in the name of agriculture. Concurrently, the biodiversity of natural or wild environments is greatly affected. Here, a comparison has been made between wild-type rice and domesticated rice fields. The study assessed the deviation of biodiversity on the whole. Species were categorized into larger groups, i.e. Arthropoda (Arth), Other Invertebrate (OInv), Vertebrate (Vert), Algae (Alg), Fungi (Fng), Pteridophyta (Ptrd), and Higher Plant (HPlan). Physico-chemical factors like water depth (WD), water pH (pH), temperature (T), total hardness (TH), dissolved organic carbon (DOC), turbidity (Turb), and dissolved oxygen (DO) were measured directly in the field. Statistical analysis such as Student's t-test, Kolmogorov-Smirnov test for equal distributions, tests for dominance, Simpson, Shannon, and Evenness indices were used to assess the biodiversity. Moreover, Principal Component Analysis (PCA) and Multivariate Analysis of Variance (MANOVA) were used for community comparison, SIMPER analysis was used to assess dissimilarity between taxa. The Artificial Neural Network model (ANN) was applied to assess the relative importance of factors governing the system. The study showed the assemblage of species in the wild along with domestication. The vertebrate species number was well correlated with all the other biotic groups indicating a bottom-up controlling pattern in the rice field ecosystem. ANN analysis showed that environmental factors WD played the most important role, followed by pH, T. DOC and DO as the next influencing factors distinguishing wild and domesticated rice field ecosystems. SIMPER analysis demonstrated that arthropods were a major contributor to dissimilarity. Our results together show that domestication of rice led to a decline in biodiversity.

کلمات کلیدی:

Diversity, crop, Oryza sativa, Oryza rufipogon, physico-chemical variables

لینک ثابت مقاله در پایگاه سیویلیکا:

https://civilica.com/doc/1483552