

An aquatic wild plant as a keystone species in a traditional Philippine rice growing system: its agroecological implications

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ABSTRACT

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In the province of Ifugao, Northern Luzon, Philippines rice cultivation on irrigated terraces has been practiced since centuries ago. The traditional system is characterized by one harvest per year from permanently flooded fields. The macrophyte *Najas graminea* Del. is the most abundant submerged wild plant in this agroecosystem. It is argued that this plant can be seen as a keystone species, because of its crucial role in maintaining the organization and diversity of the aquatic community which also has impacts on the terrestrial community of the agroecosystem. This conclusion was drawn from two aspects studied: (1) The food web of the aquatic community depends on the presence of *N. graminea* since it provides Aufwuchs and detritus, on the surfaces of its leaves, to primary consumers such as crustaceans, the larvae of Ephemeroptera and Chironomidae, and Gastropoda which in turn serve as prey for a number of predators, mainly the larvae of Odonata, certain Coleoptera and *Diplonychus rusticus* (Fabricius). (2) The golden snail *Pomacea canaliculata* (Lamarck), a recent invader into Southeast Asian rice fields from tropical America and a serious pest of rice seedlings in modern production systems, caused no appreciable damage in the Ifugao rice terraces so far. The most probable explanation for that is the presence of a high biomass of wild aquatic plants mainly *N. graminea* and the floating fern *Azolla pinnata* R. Br. which serve as alternative food sources for *P. canaliculata* when the rice plants are most vulnerable to its attacks. Comparison of snail fauna in different fields before and seven years after the invasion of *P. canaliculata* showed that it had no clear negative impacts on the native species. Possible future impacts of the species on the agroecosystem are discussed.

Keywords: agroecosystem. aquatic fauna. food web. golden snail. Ifugao rice terraces. *Najas graminea*. *Pomacea canaliculata*.

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