

# Interaction between medico-food *Euryale ferox* Salisb., and *Porphyrio poliocephalus* (Latham, 1801)

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## Abstract

*Wetlands are the hub of flora, fauna, avifauna, amphibians, insects, molluscs etc. The interactions among taxa in wetlands need to be understood. Therefore, relations between Euryale ferox (Prickly water lily) and Porphyrio poliocephalu (Grey-headed swamphen) were studied in the month of March 2023 at Anshupa Lake, India, and it was found that E. ferox provides food to Grey-Headed Swamphen and other waterbirds, including local communities. Local communities use E. ferox as a medicinal agent too. The chapter highlights the importance of aquatic medico-food for the conservation of water birds, providing medico-food for local people, and balancing wetland ecosystems.*

*Keywords: Aquatic, effective restoration, food web, nut plant, waterbirds*

## 1. Introduction

Wetlands are known to have one of the richest biodiversity areas, with a very close relationship among aquatic, semi-aquatic flora, water birds, fish, molluscs, etc., as well as directly or indirectly supporting many people by providing goods and ecological services to them (Pattanaik and Reddy 2007; Mahanti and Kumar 2016; Mahanti and Kumar 2017). To understand the relationship for sustainable development and ecological balance, need to study the wetlands and their bio wealth. *Euryale ferox* Salisb. is an aquatic herb of the lily family (Nymphaeaceae), found to be grown on most wetland waterbodies. It is covered with pointed prickly spines, and the nut is generally known as the "Fox nut," from which Makhana is popped out (Vidyanath et al. 2018). This prickly aquatic herb is very popular because of its high nutritional values. It is cultivated in many places as a cash crop. Apart from its nutritious food value, it has medicinal and ecological importance (Verma et al. 2010). It is an important flora in the wetland ecosystem, as many waterbirds feed on the nuts of *E. ferox*. Keeping the importance of relationship among different taxa and availability of *E. ferox* in Anshupa Lake, Odisha, India, an attempt has been made to observe the relationship between waterbirds and *E. ferox* in the month of March 2023. It is the largest freshwater lake, and its adjoining wetland are situated near the bank of the Mahanadi River in the Banki block of Cuttack district under Athagarh Forest Division, Odisha, India (Mohanty 2015). It not only supports rich diversity of flora and fauna but also offers a wide range of important resources and ecological functions such as food, water, flood moderation, water purification, erosion control, climate regulation, long-term carbon and water storage, wetland products, etc. (Xu et al. 2020; Mitsch et al. 2015; Mateos et al. 2015). In this ecosystem, birds play a major role as a part of the food web. Some birds get their food mainly from plants. Among them, Grey-headed swamphen from the family Rallidae is a large purple-bluish rail with a red bill, a frontal shield, and the white patch under the stumpy tail flashing as the bird flicks its tail with each step (Pranty and Callaghan 2021).

Grey-headed swamphen depends on aquatic flora for food. Therefore, the chapter is designed to bring attention on the importance of plant-animal relation for environment and life on the earth.

## **2. Methodology**

The team members of Ambika Prasad Research Foundation have surveyed the area of Ansupa Lake and its adjoining wetlands using binoculars (**Vanguard Mariner and Vanguard Orros 1042**) and 2-3 high-resolution dual-pixel cameras (**Canon EOS R5 and Nikon Z50**). The survey was carried out for about a week, usually in the late afternoon between 3-6 PM in the month of March 2023. The interaction of avifauna like grey-headed (purple) swamphens and aquatic plants, i.e., *E. ferox* is observed and from local people, food, and medicinal values of *E. ferox* are gathered (**Kumar et al. 2017**).

## **3. Observation**

Some peculiar observations were recorded during the survey. The team observed many aquatic floras. It was noticed that *E. ferox* is one of the most important aquatic plant among them. Grey-headed (purple) swamphens and other water birds were observed feeding on these plants. We noticed that *E. ferox*, which is an aquatic herb of the lily family and has nuts, was the major food for the Grey-headed swamphen. Feeding of these nuts is usually observed in the early evening. This interaction of the aquatic plants and avifauna (*E. ferox* and Grey-headed purple samphans) in this case is highlighted with the photograph in Plate 1. Other such interactions were also observed in the survey. Water birds like little cormorant, white-breasted waterhen, pond heron, etc. were found to be feeding on either aquatic flora or small insects, fish, amphibians, etc. The interactions with local people revealed that the nuts are edible and used to treat food poisoning.

## 4. Discussion

The interaction within the wetland system needs to be studied to find the causes of degradation in the wetlands in many ways. The major cause due to anthropogenic activities or the flushing down of pollutants, including fertilisers, pesticides, drains with various chemicals from factories, and dumping of waste in wetlands, could pose a major threat to the growth of important aquatic plants like *E. ferox* or other such aquatic plants with ecological importance. This could alter the chemical composition and pH of the lake, leading to eutrophication and the overgrowth of invasive species. This condition could lead to habitat destruction for the water birds, thereby creating an imbalance in the food web. Some researchers have also reported the plant-animal interactions (Kumar and Mohanty 2016; Kerry et al. 2018; Das et al. 2019; Tanty et al. 2019; Rout et al. 2019; Jyethi 2020; Anuradha et al. 2023) and water birds of Anshupa lake and adjoining areas (Kumar et al. 2018; Jyethi et al. 2021).

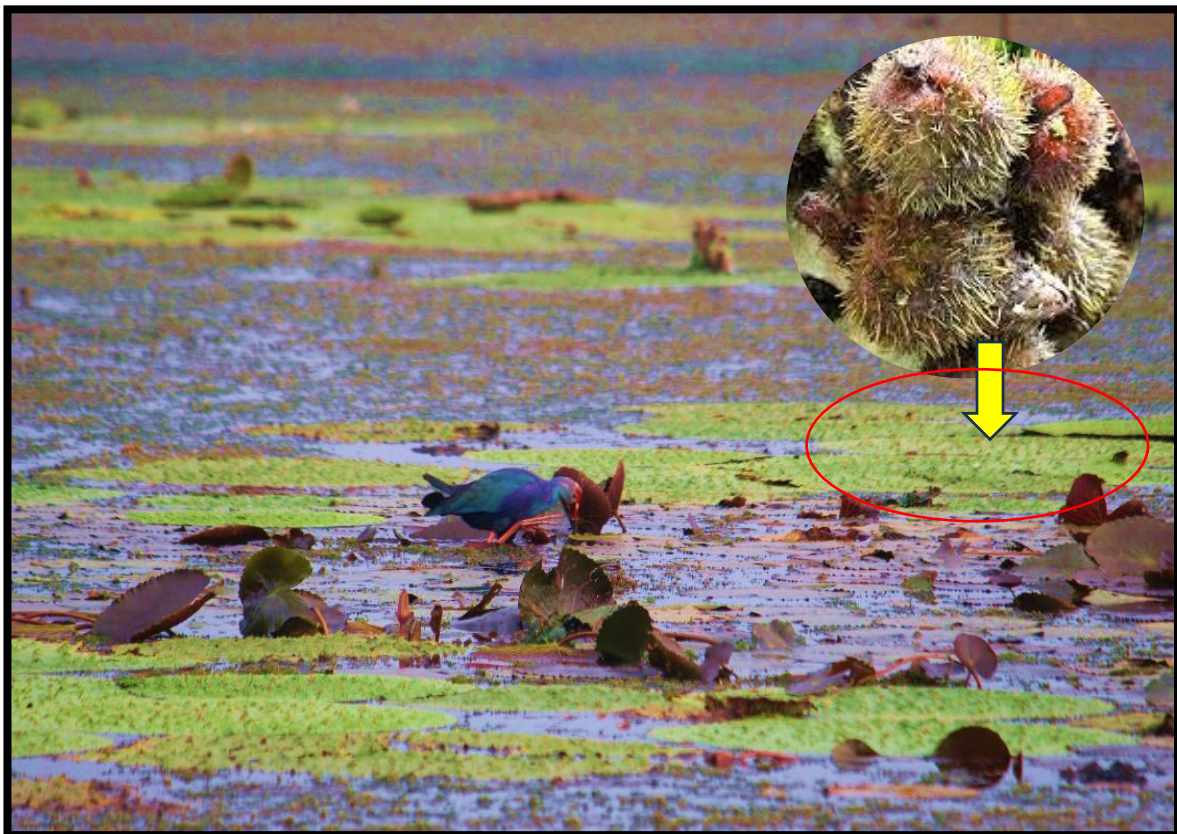
## 5. Conclusion

The interaction between avifauna and aquatic flora forms a key part of the food web of the wetland at Ansupa Lake, Odisha, India. Wetland ecosystems are important in many ways; however, the food provided by wetlands for many avifaunal species makes them the best habitat for water birds. Here, a grey-headed purple swamphen feeding on *E. ferox* is an important example on interaction. If such study will be carried out in wetlands globally, a good strategy can be made with the aquatic food plants for protecting the water birds and restoring the wetlands. All the threats discussed in this chapter that could hamper the interaction of aquatic flora and avifauna in wetland ecosystems could result not only in the destruction of wetland resources but also deteriorate the natural environment for the survival of waterbirds, especially the grey-headed purple swamphen and other wetland-associated faunal species. The chapter also highlights the food and medicinal values for local people. Therefore, urgent conservation

measures are required and should be implemented to reduce pollutants and protect the wetland ecosystem for a better environment better tomorrow.

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*Plate 1: Grey Headed (Purple) Swamphen searching for nuts of Eurayle ferox*

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