



A note on an edible fern of Nepal: *Blechnum orientale* L.

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Notes on Ethnobotany

Abstract

Background: The consumption of ferns as vegetables and pickles in Nepal is a noteworthy phenomenon. *Diplazium esculentum* stands out as one of the most commonly consumed ferns. Being rich in plant resources, eastern Nepal remains relatively unexplored compared to central Nepal. Therefore, the present study seeks to provide a brief account of the edible uses of *Blechnum orientale*, a fern species, from eastern Nepal.

Methods: Multiple field visits were conducted in Pathari Municipality and Kanepokhari Rural Municipality of Morang district. The habitats where *B. orientale* was collected by local vendors were examined, ethnobotanical uses, photographs, and market prices were recorded.

Results: From April to May, young fronds of *B. orientale* were collected from local community forests by Tamang, Limbu, and Magar tribes of an area. Young fronds were washed, boiled to soften them, and used to prepare vegetables. Pickles are also made by mixing boiled young fronds with potatoes, green chili, onions, salt, mustard oil, and flax seed powder. Local vendors sell the fronds in bundles along Mahendra Highway in the price of 50 to 100 Nrs per bundle.

Conclusion: The fern is a vital vegetable source for local communities during the monsoon season, providing sustenance and income generation opportunities. Sustainable collection and commercialization are recommended.

Keywords: Blechnaceae, Edible, Eastern Nepal, Morang.

Background

Nepal is one of the richest countries in the world in terms of biodiversity (Paudel *et al.* 2012). The country harbors 583 taxa of pteridophytes (Fraser-Jenkins *et al.* 2015; Fraser-Jenkins & Kandel 2019; Kandel & Fraser-Jenkins 2020). Majority of the taxonomic and ecological works on ferns are confined to central Nepal (Bhattarai *et al.* 2004). Whereas very few attempts are made in eastern Nepal though being climatically suitable for ferns (Fraser-Jenkins *et al.* 2015). Therefore, taxonomic and ecological data on ferns are lacking from eastern Nepal, making it a prime period to carry out further research.

A total of 24 species of edible ferns are reported to be consumed in Nepal in the form of vegetable and pickles (Ojha & Devkota 2021). Pteridaceae is the family with the highest number of edible and medicinal species in Nepal (Ojha, & Devkota 2021). *Diplazium esculentum* is one of the most common vegetables of fern and other species such as *Diplazium maximum*, *Ophioglossum petiolatum*, *Dryopteris cochleata*, etc. are also frequently used as vegetables in different regions of Nepal (Kandel 2021).

Family Blechnaceae represents only three genera Nepal viz., *Blechnum*, *Stenochalena*, and *Woodwardia*, comprising single species each. *Stenochalena palustris* (Burm. fil.) Bedd is consumed as vegetables in eastern Nepal and in other parts of the world (Kandel 2020). *Woodwardia unigemmata* (Makino) Nakai is used in the preparation of cake noodles and liquor in China (Liu *et al.* 2012), while its uses in Nepal is yet to be reported. *Blechnum orientale* L. is recently reported for its edible value in Nepal (Kandel 2021). We have attempted to further elaborate on the use value of *Blechnum orientale* from eastern Nepal.

Materials and Methods

Several field visits were conducted in Pathari Municipality and Kanepokhari Rural Municipality of Morang district of eastern Nepal during May–September 2021. The habitats where *B. orientale* was collected by local vendors were examined, ethnobotanical uses were documented, photographs were taken, and market prices were recorded. The plant was identified with the help of Fraser-Jenkins & Kandel (2019), and the voucher specimen was deposited at Tribhuvan University Regional Herbarium (TURH), Department of Botany, Degree Campus, Tribhuvan University, Biratnagar.

Results and Discussion

The people of the Pathari Municipality and Kanepokhari Rural Municipality of eastern Nepal belonging to tribes like Tamang, Limbu, and Magar collect young fronds from April to May and use them as vegetable and pickle. Young fronds are collected from the local community forests and washed properly to remove the scales. Then it is boiled in water for a few minutes to make it soft. Vegetable is prepared from boiled shoots. Pickles are also prepared from the boiled young fronds by mixing it with boiled potatoes, green chili, onions, salt, mustard oil, powder of fried flax seeds, etc. Local vendors also sell bundles of young fronds along Mahendra Highway (Figure 1).

Vernacular names: *dauthe niguro*, *rato niguro*.

Price: 50 to 100 Nepali Rupees per bundle (A bundle of about 1 Kg).

Ecology: It is a large terrestrial fern occurring densely in the shore of streams, and gully, and frequently on the forest floor and also on roadsides.

Distribution: Tropical Asia to the Pacific and Australia.

Taxonomy: A large fern 1–2 m tall, fronds lanceolate with young red fronds, unipinnate lamina with unlobed alternate slightly separate pinnae, contiguous at their widened bases the lower pinnae are abruptly reduced to small flaps and then knobs down the stipe; sori central double line extending along the pinna on a longitudinal vein; contiguous to the pinna midrib indusiate (Fraser-Jenkins, Kandel 2019).

Use in other countries: Young fronds of *Blechnum orientale* are used as vegetable in Malaysia, fried or stir-fried fronds and young red leaves are used as vegetable in China (Liu *et al.* 2012), cooked leaf eaten along with vegetable soup in Indonesia (Sujarwo *et al.* 2014), young fronds and rhizomes are consumed as a vegetable in India (Yumkham *et al.* 2017), Sri Lanka (Ranil & Bussman 2020) and Bangladesh (Sarker & Hossain 2009). Apart from edible uses, young fronds are also used against boils, urinary disorders, in cuts, and wounds in Assam, India (Sen & Ghos 2011), and is used to treat typhoid and bacterial infections in South India (Sathiyaraj *et al.* 2015).

Toxicity: Plant growing in polluted area has been reported to accumulate a significant amount of heavy metals like As, Hg, Pb, and Cd (Zhu *et al.* 2013; Yu *et al.* 2020).

Conclusion

B. orientale serves as a crucial vegetable source for local communities during the monsoon season, providing sustenance and nutrition. Additionally, the plant also serves as an income-generating opportunity for locals, who may sell it in local markets, contributing to their livelihoods. Sustainable collection and commercialization of the fern is recommended.



Figure 1. Photographs of *B. orientale*. (a) leaves (b) young fronds (c,d,e) bundles of *B. orientale* young fronds kept for sale in the local market, (f) fronds after removing scales, (g) fronds being cooked with other vegetables after boiling, (h) cooked vegetable ready to eat.

Declarations

List of abbreviations: Not applicable.

Ethics approval and consent to participate: Prior to the survey, we obtained oral informed consent from each participant, as per the ethical guidelines of the International Society of Ethnobiology.

Consent for publication: Not applicable.

Availability of data and materials: All the data are presented in the manuscript and are available with the corresponding authors.

Competing interests: The authors declare that they have no competing interests.

Author Contributions: RO conducted fieldwork and prepared the manuscript. HPD revised the manuscript.

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