

IDENTIFICATION OF SUITABLE *Colocasia* AS A POTENTIAL SOURCE OF HIGH IRON ENRICHED LEAFY VEGETABLES IN RAJSHAHI REGION OF BANGLADESH

M. A. Majid*, M. Z. Turin, M. A. Islam¹, N. Nobi and M. M. Rahman

Bangladesh Institute of Research and Training on Applied Nutrition (BIRTAN), Sirajganj

¹Department of Biochemistry and Molecular Biology, Rajshahi University

*Corresponding author's email: mamajidncc@gmail.com

ABSTRACT

Colocasia ssp of family: Araceae an annual herbaceous plant with a long history of usage in traditional medicine in several countries across the world, especially in the tropical and subtropical regions including Bangladesh. A field experiment was conducted in Bangladesh Institute of Research and Training on Applied Nutrition (BIRTAN) regional station to evaluate iron rich *Colocasia species* in Rajshahi region. A wide range of chemical compounds and minerals including Iron have been isolated from *Colocasia* species. There were twelve varieties collected from Rajshahi region (eight local varieties and four BARI releases varieties). Iron was extracted from leaf, leaf stem, corm and lat. The study noted that iron (Fe⁺⁺) was rich (average) in the leaf part and less in corm. Consideration of all parts (average value) the higher iron found in moulovi kachu (1.50 mg/100g) and nearest result were observed in BARI pani kachu-6 and Deshi lati kala kachu (1.34 mg/100g), respectively.

Key words: *Colocasia esculenta*, chemical constituents, ethno medical uses, pharmacological profile

Introduction

Colocasia, a perennial tropical plant native to Southeast Asia is primarily grown as a vegetable for its edible starchy corm but the versatility of the plant is reflected by the fact that not only the corm but its stem and leaves are also used frequently as seasonal vegetable. Leaves of *Colocasia* are considered as a rich source of β -carotene, ascorbic acid, folic acid, riboflavin, B vitamins, vitamin A and minerals such as iron, zinc, calcium, potassium, phosphorus, magnesium. *Colocasia* plants or plant based preparations are also used for the treatment of various ailments in their traditional system of medicine. The family Araceae de Juss. is represented by 3,645 species globally under 144 genera (Boyce and Croat, 2011). In Bangladesh, the family consists of 27 genera and 109 species of which 81 species are wild and 29 are cultivated (Ara, 2016). This would go a long way to improve the role of *Colocasia* in providing high nutrition quality enriched crops in Bangladesh. For any effective work to be done on *Colocasia*, it is important to know its characteristics (both qualitative and quantitative) in local germplasm found in Bangladesh. The characteristics of these germplasm will serve as the basis for selection of germplasm that are high yielding and nutritious in Bangladesh. This will help suitable *Colocasia* as a potential Source of high Iron enriched leafy vegetables.

Materials and Methods

The plant materials were collected from different local areas of Rajshahi region and Research Institute releases varieties (which are cultivated in the Rajshahi region) from Bangladesh Agricultural Research Institute (BARI). There were eight local varieties and four research institute releases varieties collected and evaluated in Bangladesh Institute of Research and Training on Applied Nutrition (BIRTAN) regional station Sirajganj to evaluate iron rich *Colocasia species* and variety in Rajshahi region. This study was conducted in the 2021-22 in a research field of the Bangladesh Institute of Research and Training of Applied Nutrition (BIRTAN) Regional Centre, Sirajganj. The experiment was carried out in the form of factorial in randomized complete block design (RCBD) by three replications. The edible parts of the vegetables were homogenized, sun dried and dried using a microwave-oven, blended in powder. Selected samples were analyzed with standard titration methods in Soil Resources Development Institute (SRDI).

Results and Discussion

Twelve available varieties in Rajshahi region (eight local varieties and four BARI releases varieties) were investigated to carry out this present study. Iron was extracted from leaf, leaf stem, corm and lati (Chowdhury *et al.*, 2019). Among the four parts of *Colocasia*, iron (Fe^{++}) was rich (average) in the leaf part, which was decreased in leaf stem, lati/sucker/stolon and corm, respectively (Fig. 1). It was highlighted that among the local varieties Fankachu (*Colocasia gigantea*) contained more iron in leaf part (1.93 mg/g) and nearest contents detected from Deshikachu (black) (*Colocasia esculenta*) and Moulovi kachu (*Colocasia fallax*), respectively (Fig. 2). The observation of this study closely support by Ara (2007) and Hooker (1893). Among the BARI releases varieties BARI panikachu-4 leaf contained the highest iron (2.40 mg/100g) and nearest result was observed in leaf of BARI panikachu-1 (2.30 mg/100g). Consideration all cases the higher iron found in moulovi kachu (1.50 mg/100g) and nearest result was observed in BARI pani kachu-6 and Deshi lati kala kachu (1.34 mg/100g), respectively (Figs. 3-5).

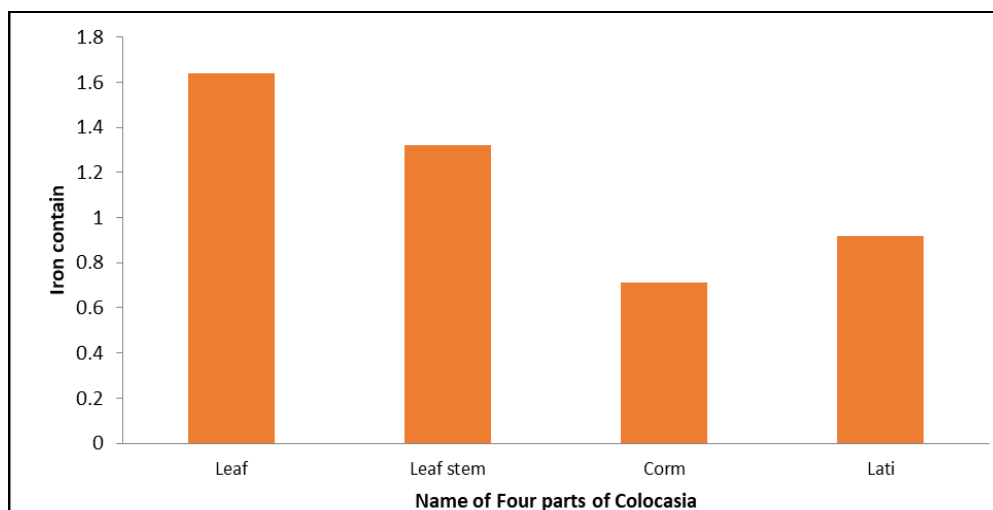


Fig. 1. Average iron contained (mg/100gm) among parts of twelve *Colocasia* varieties

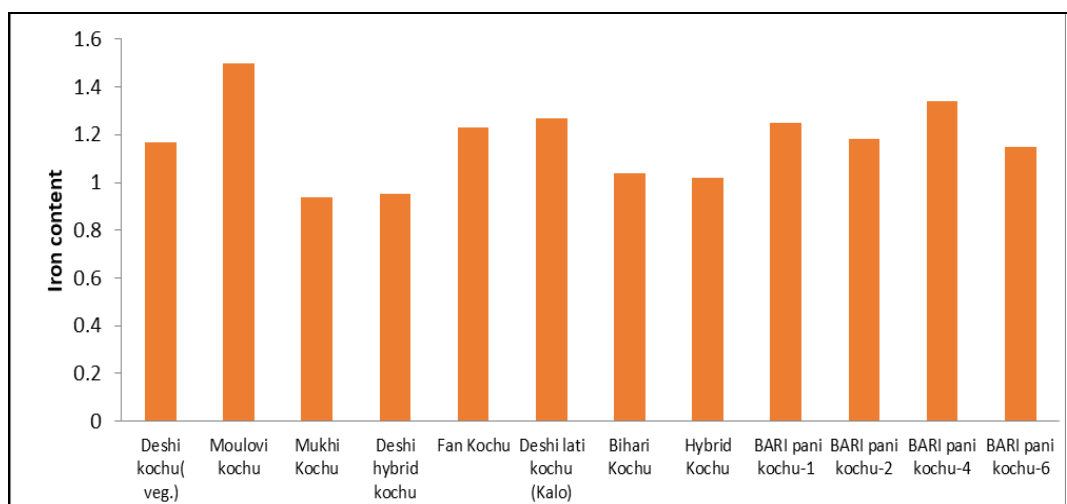


Fig. 2. Average iron contained (mg/100gm) among twelve varieties of *Colocasia*

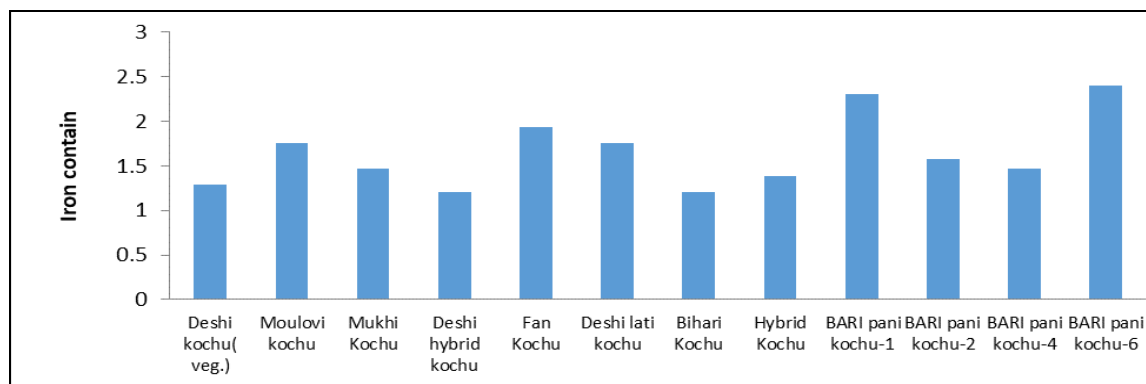


Fig. 3. Average iron contained (mg/100gm) in leaves of *Colocasia*

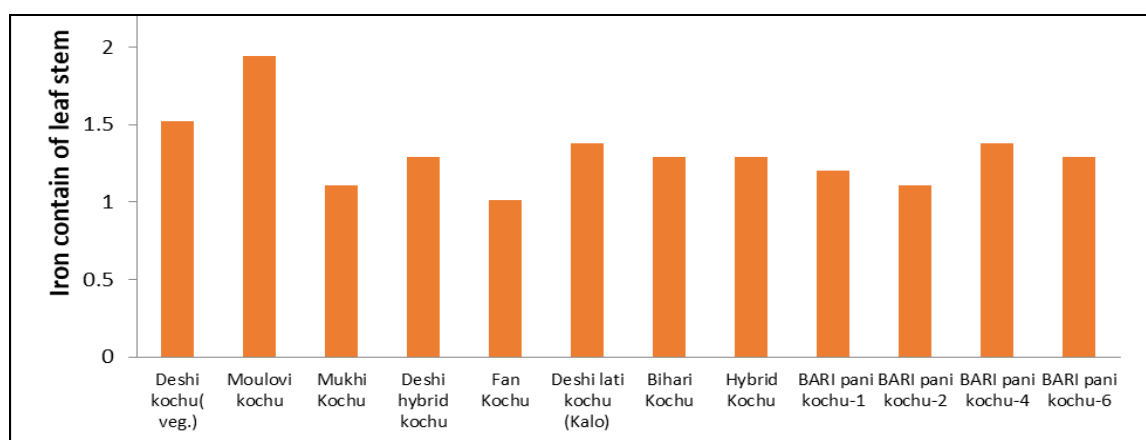


Fig. 4. Average iron contained (mg/100gm) in stems of *Colocasia*

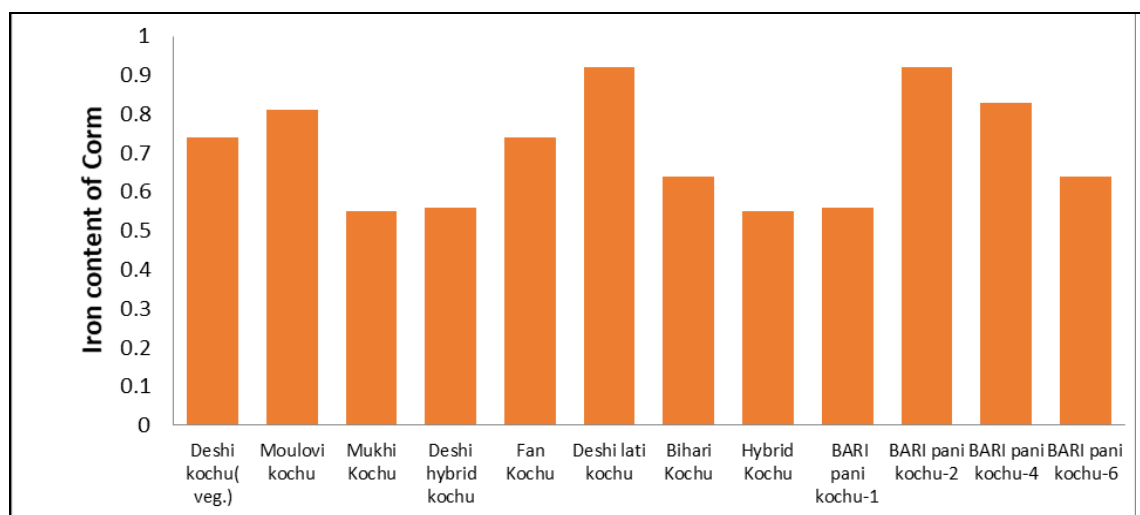


Fig. 5. Average iron contained (mg/100gm) in corms of *Colocasia*

Conclusion

The study concluded that among the four parts cultivated *Colocasia*, iron (Fe^{++}) was rich in the leaf part (1.64 mg/100g) and decreasing iron contain (average) detected in leaf stem (1.32 mg/100g), lati/stolon (0.92 mg/100g) and corm (0.71 mg/100g), respectively. Consideration of all parts (average value) the higher iron found in moulovi kachu (1.50 mg/100g) and nearest result were observed in BARI pani kachu-6 and Deshi lati kala kachu (1.34 mg/100g), respectively.

References

- Ara, H. 2007. Araceae In: Siddiqui, K. U., Islam, M. A., Ahmed, Z. U., Begum, Z. N. T., Hassan, M. A., Khondker, M., Rahman, M. M., Kabir, S. M. H., Ahmad, M., Ahmed, A. T. A., Rahman, A. K. A. and Haque, E.U. (eds.). *Encyclopedia of Flora and Fauna of Bangladesh*, Vol. 11, Asiatic Society of Bangladesh, Dhaka, pp. 19-98.
- Ara, H. 2016. Taxonomic studies in the family Araceae from Bangladesh. Ph. D. Thesis (unpublished), Department of Botany, University of Dhaka, Bangladesh, pp. 1–524.
- Boyce and Croat, 2011. Studies on the *Alocasia* Schott (Araceae-Colocasieae) of Borneo: I. Two new species from Sarawak, Malaysian Borneo. *Gardens' Bull. Singapore*, 58(2): 141-154.
- Chawdhury, K. *et al.*, 2019. Antidiabetic activity of ethanol extract of *Colocasia esculentaleaves* in alloxan induced diabetic rats. *Int. J. Pharma. Tech. Res.*, 2 (2), 1246- 1249.
- Hooker, J. D. 1893. Aroideae. *Flora of British India* 6. Indian reprint 1973. Bishen Singh Mahendra Pal Singh, Dehra Dun, India, pp. 490-556.