

Palatable varieties of *Dioscorea pentaphylla* L. of Sikkim Himalaya

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Abstract

The Sikkim Himalaya bestowed with rich biodiversity where in recent study the two palatable varieties of *Dioscorea* were studied. The taxonomic characters of these plants included along with the information of certain essential constituents.

Thus, the paper described the taxonomic characters comparing the specimen from the different herbaria. Further, the new findings of nutritional variations in *Dioscorea pentaphylla* var *suli* Prain and Burkill and *Dioscorea pentaphylla* L. var *kussok* Prain and Burkill provided to support varietal existence.

Keywords: Dioscorea pentaphylla L. var kussok, Dioscorea pentaphylla var suli, Sikkim Himalaya, varieties.

INTRODUCTION

The genus, *Dioscorea*, represents herbaceous climber plants having tubers which are regarded as the food sources (Burkill, 1960; Purseglove, 1972; Van Staden and Fowlds, 1992) as well as medicines (Mander, 1998) across the regions of Africa, America and Asia (Terui and Okagami, 1993; Diederichs *et al.*, 2002). Several medicinal uses for treating are hysteria, convulsions and epilepsy (Watt and Breyer-Brandwijk, 1962; Watt and Pujol, 1990) and for treating sores, facilitating childbirth (Kelmanson *et al.*, 2000; Diederichs *et al.*, 2002).

Further, the species of this genus are used as the principle sources of diosgenin and steroid production (Van Staden and Fowlds, 1992), contraceptives and antiinflammatory agents (Kulkarni *et al.*, 2007).

In the hills of Sikkim Himlaya, the two varieties, *Dioscorea pentaphylla* L. var *kussok* Prain and Burkill and *Dioscorea pentaphylla* L. var *suli* Prain and Burkill are available but the identification as well as the descriptions of these varieties are briefly discussed in earlier publication, which requires additional information for their proper identifications. Thus, the descriptions of the two varieties included in this paper and attempted to include the novel nutritional information of two varieties of *Dioscorea pentaphylla* L.

MATERIAL AND METHOD

Dioscorea pentaphylla L. var *kussok* Prain and Burkill and *Dioscorea pentaphylla* L. var *suli* Prain and Burkill collected from Linko, North Sikkim, c. 1583 m. The herbarium of the plants were made and deposited in Sikkim State Forest Herbarium (SSFH), Gangtok for the future references.

The herbarium specimens were pressed, mounted and labeled following the standard protocol of herbarium preparation (Ranjan, 2018).

Taxonomy

Dioscorea pentaphylla L. var *suli* Prain and Burkill In: J. Proc. Asiat. Soc. Bengal 10(1): 23 (1914). Lectotype: K00098195.

Habit and Habitat: On the open sunny areas, climber, annual, terrestrial; Distribution: INDIA: Sikkim, West Bengal; BHUTAN.

Specimen examined: INDIA: Sikkim: North Sikkim, Upper Dzongu, Linko, c. 1545 m, GPS 27° 32′ 53″ N, 88° 29′ 20″ E, Acc. no SSFH SK004948; Royal Botanical Garden, H0014/91 3641, Kew, Herbarium of the Late East India Company No 5532. Collection place: Darjeeling.

Dioscorea pentaphylla L. var *kussok* Prain and Burkill In: J. Proc. Asiat. Soc. Bengal 10(1): 23 (1914).

Habit and Habitat: On the open sunny areas, climber, annual, terrestrial; Distribution: INDIA, BHUTAN, SINGAPORE.

Specimen examined: **INDIA**: North Sikkim, Upper Dzongu, Linko, c. 1583 m, GPS 27° 33′ 54″ N, 88° 25′ 18″ E, Acc. no SSFH SK004951; Coll. G.H Cave, Collection Place Mungpu, Darjeeling, Royal Botanic Garden H0014/91 369 Kew, K001142525; Coll. Gamble, K001142520.

RESULTS AND DISCUSSION

The brief latin description of varieties of *Dioscorea pentaphylla* L. found and in recent time, the lectotypication was made (Hoque *et al.*, 2018). *Dioscorea pentaphylla* L. var *suli* Prian and Burkill was described as "Prescedenti sunilis differ foliis glabrescentibus" and *Dioscorea pentaphylla* L. var *kussok* Prain and Burkill described as "Prescedentibus similis at folia tenuissima, at folia tenuissima fere glabra". But this paper included the additional descriptions of the two varieties for more taxonomic usages.

Description:

Dioscorea pentaphylla L. var suli Prian and Burkill.

Climber plant. Bulb 10-30 cm in diameter. Leaves palmate, 3-7 leaflets, ovate, 7.5-11.5 cm length, 3.5-6.6 cm breadth, petiole 9-12.5 cm. Stem bears thorns having ca.3 mm in length in an interval of 1-2 cm. Rhizome 15-25 cm diameter, 15-25 cm length. Only terminal part of yam is hairy, ca. 1 cm length. **Fl.**: August-September. **Fr.**: January -February.

FI.: August-September. **FT.:** January – Febru

Status: Common in the natural habitat.

Note: Yam used as food supplement and has no fibrous structure within.

Dioscorea pentaphylla L. var kussok Prain and Burkill

Climber plant. Bulb 10-30 cm in diameter. Leaves palmate, 3-5 leaflets, ovate, 11-14.6 cm length, 3.5-6.6 cm breadth, petiole 9.6- 14.2 cm length, 0.3 cm diameter. Leaf rough in texture. Stem 0.4-0.5 cm diameter, stem bears thorns having 2mm in length in an interval of 3.8-5.5 cm. Rhizome 20-30 cm diameter, 20-30 cm length, completely hairy c. 1 cm covering whole yam, white colour inside.

Fl.: August- September-October Fr.: Dec-January-February.

Status: Common in the natural habitat.

Note: Yam uses as food supplement that has fibrous tissues with less edible portion. The variety epithet 'kussok' derived from the Lepcha language who called this plant as 'Kussok'.

Nutrients availability in Dioscorea pentaphylla L.

The leaf part of *Dioscorea pentaphylla varieties* analyzed and estimated the contents of ammonia, calcium, magnesium, nitrate, phosphate, potassium and sulfate (Table 1).

| Table 1: Nutritional constituents of leaf in Dioscorea pentaphylla | | | |
|--|-------------|-------------------------------|------------------------------|
| Sr | Particulars | Leaf (ppm) | Leaf (ppm) |
| No | | <i>D. pentaphylla</i> L.var. | <i>D. pentaphylla</i> L. var |
| | | <i>suli</i> Prain and Burkill | <i>kussok</i> Prain and |
| | | | Burkill |
| 01 | Ammonia | 9.5 | 9.9 |
| 02 | Calcium | 37 | 46 |
| 03 | Magnesium | 124 | 101 |
| 04 | Nitrate | 23.2 | 3.6 |
| 05 | Phosphate | 7.7 | 7.1 |
| 06 | Potassium | 2.6 | 2.2 |
| 07 | Sulfate | 27.0 | 32 |

The data represented in the Table 1 indicated that the certain constituents in the leaves of two varieties of *Dioscorea pentaphylla* differ, which are significant information. This result supports the existence of varieties of *Dioscorea pentaphylla* in the Sikkim Himalaya (Burkill, 1960).

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