World Journal of Pharmaceutical and Life Sciences
WJPLS
www.wjpls.org
SJIF Impact Factor: 6.129

REVIEW ON DIOSCOREA SPIECIES MENTIONED IN BHAVPRAKASH NIGHANTU,WITH SPECIAL REFERENCE TO ALUKA –A SANDHIGDH DRAVYA

Vd. Vipula D. Gavad*[1] and Vd. Rekha R. Khade[2]

[1]M.D. Scholar Dept. of Dravyaaguna Vigyan Y.M.T. Ayurvrdic Medical College and HospitalKharghar Navi Mumbai.
[2]Associate Professor, Dept. of Dept. of Dravyaaguna Vigyan Y.M.T. Ayurvrdic Medical Collage and Hospital Kharghar Navi Mumbai.

***Corresponding Author: Vd. Vipula D. Gavad**
M.D. Scholar Dept. of Dravyaaguna Vigyan Y.M.T. Ayurvrdic Medical College and Hospital Kharghar Navi Mumbai.

Article Received on 09/08/2021 **Article Revised on 30/08/2021** **Article Accepted on 20/09/2021**

ABSTRACT

A number of wild crop remain unexplored in this world & among them some have excellent medicinal and nutritional property. The Food & medicinal habits of these communities are not fully explored even today. Aluka mentioned in Bhavprakash Nighantu, Latin name given as Dioscorea species from Dioscoreaceae family. Dioscorea is one such tuber, having maximum use among the local of tribal area. However less documentation & no specific report are available on the food & medicinal values of the species available in this part of world. The present study was focused on the Ethnobotany and nutritional values of these species.

KEYWORDS: Aluka, Dioscorea species, Dioscoreaceae.

INTRODUCTION

India is a harbor of biodiversity in general & phytodiversity in particular. The plant diversity is distributed from western Ghats to Eastern Ghats, along with the North-Eastern region and from the greater Himalayas to the plain of Ganga.

Dioscorea species mentioned in Bhavapraksh Nighantu, given as Aluka have gunas like sheeta guru ruksha and also medicinal used in raktpitta, kaphavatakar, balya and angivardhak vrushya. Plants are utilized as therapeutics agents and as food supplements since time immemorial in both organized(Ayurved, Unani)& unorganized (folk, tribal, native)form.

Aluka was not so admired in classical text as main ingredient in compare to others medicinal plants but as well as it is reported from the times of Charaka.

Dioscorea species, popularly known as Yam worldwide is a prime staple medicinal food substitute for majority of rural & local people of the state of India of 13 species are known to be bitter in taste & unpalatable when taken raw. The most common Dioscorea species are D.bulbifera L. (Pita aalu), D.pentaphylla L. (Panja Sanga), D. hispida Dennst. (Banya aalu), D. alata L. (Khamba aalu), D. oppositifolia L. (Paani aalu), D. pubera Blume (Kukai Sanga)etc. Ten species are known to be bitter in taste or unpalatable when taken raw. The rural andlocal people who use them as food supplements make them edible by different traditional practices.

While investigating traditional food systems and palatability of Dioscorea species available in SBR, it was observed that tubers are mostly soaked overnight in water or left overnight in stream and subjected to successive boiling to remove the bitterness. Dioscorea species with nutritive and antioxidant content not only enrich the diet of the local rural and local people but also make them ethno medicinally important. Tubers of different species of Dioscorea areused for curing various diseases and ailments in different formulations. Most of the tubers of Dioscorea examined in the present study are used for birth control and skin infections. Tubers and vegetative parts of these species are used either in single or in multiple formulations.

A harmonious blend of indigenous knowledge is therefore essential to document and promote proper utilization of such resources available in the state. In this context, the present study found some unique and unreported ethnobotanical claims of Dioscorea species available in SBR. Knowledge of local practitioners and millions of aboriginals from generation to generation flows into the mainstream, which has emerged as a traditional therapeutic system. However, the modern scientific mind cannot accept such local knowledge unless it is experimentally substantiated. Keeping all the properties of Dioscorea species available in SBR and

utilized by the local community of SBR, an attempt has been made here to document the ethnobotanical and ethnopharmacological values of Dioscorea species used by the local communities of SBR, Odisha, India which would be helpful for researchers for utilization of this plant species in pharmaceutical applications and drug discovery.

Local Communities and Their Traditional Use of Dioscorea Species

The extensive and densely forested hilly tracts of SBR are the home of many local communities, such as Bathudi, Bhumija, Gonda, Ho, Kolha, Mahali, Munda, Pauri Bhuiyan, Santhal, and Saunti, including two primitive groups, Hill-Kharia and MankirdiaThere are around 61 villages inside the core and buffer zone and about 1200 villages in the transitional zone, having a total population of about 4,50,000, out of which the scheduled tribes constitute 73.44 % of the total population of Similipal.These poor local peoples practice primitive culture, traditions, and rituals, and have no or very few acquired skills. Their main occupation is food gathering, hunting, collection of forest products, and traditional farming or agriculture. In the present study, the Ho, 2 Bathudi, Mankirdia, Kolho, Munda, and Santhal were selected for detailed study on their traditional knowledge on Dioscorea species.

The "Ho" is a Kolarian ethnic group belonging to the same stock of Munda and Kol.

They mainly cultivate rice, maize, and millets along with seasonal vegetables. They also collect different types of wild plants from the forest and store them (Ota et al., 2013). They usually collect tubers and rhizome, including starchy tubers of Dioscorea species. They use tubers as food and medicine (Tables 1, 2). They are inhibiting from collecting D. pubera Blume (Figures 2.3, 2.5) during rainy seasons. Mankirdia is a primitive tribe that constitutes aseminomadic section of the Birhor tribe (Ota, 2007; Dash, 2011). They are primarily a hunting and food gathering community (Ota and Mohanty, 2008). The present study observed that they wander from Similipal to Hazaribagh National Park (Jharkhand) and return after a year to Similipal again (Source: Token Mankirdia, interviewed near the Kalikaparsad gate, transitional zone of SBR). During their movement in forest, they collect various types of medicinal plants to cure common diseases. They collect tuber of D. bulbifera L. (Figure 2.2) and D. pentaphylla L. (Figure 2.1) for curing skin infections, and abdominal pain, and for birth control (Kumar et al., 2012; Misra et al., 2013). They also collect tubers during early winter and store them for consuming in the summer and rainy seasons. The Hill-Kharia, locally known as "Pahari Kharia" is a highland local group (Ota et al., 2008). They are expert in collection of honey, resin, and arrowroot. They are primarily a forager community in the SBR. They do major seasonal collection along with agricultural labor in the agricultural season (Ota and Sahoo, 2013). During the rainy season, most of the Hill-Kharia face rice scarcity, and they principally depend on other food stuffs, like maize, edible roots, and tubers of Dioscorea species and corns. The Santhals, one of the common local communities of India,mainly inhabit in the districts of Mayurbhanj, Keonjhar, and Balasore in the state of Odisha, India. They collect minor forest products like tubers, roots, fruits, green leaves, honey, mahua flowers, etc., that sustain them for 3–4 months in a year (Ota and Patnaik, 2014). Bathudi is also a very common local community in SBR. They are simple and shy in nature.

They are excellent at agriculture and gathering forest products and medicinal plants. A detailed study on Dioscorea species is presented below.

Sr No.	Botanical name	Plant parts	Ethno-botanical/Pharmacological values
1.	Dioscorea alata L.	Tuber	• Tuber powder is used to cure piles. • Tuber Tubers are eaten raw twice a day until weakness is reduced. • Tuber Juice of tuber is used to kill stomach worm.
2.	Dioscorea belophylia (Prain) Voigt ex Haines	Tuber	• Tuber juice with hot water is given to treat fever, malaria, headache and dysentery.
3.	Dioscorea bulbifera L.	Tuber Leaves Tuber	• Raw tuber is eaten to enhance appetite. • Tuber is good for intestinal colic, relieving dysmenorthoea, reducing acidity, against rheumatoid arthritis, to relieve intense inflammation in the acute phase, in spasmodic asthma, for menopausal problems, for labor pain and the prevention of early miscarriage, for hernia, relieving the pain of childbirth. • Paste is used against skin infections. • Bubbils are used to reduce throat pain. • Boiled tubers are taken orally to reduce body heat. • Used against boils and dysentery. • Tuber powder mix with butter is given to check diarrhea. • Used as refrigerant to reduce body heat during summer. • Used to treat skin infection.

		Stem Tuber	• Used to treat bronchial cough and used as antiseptic. • Useful for acidity and ulcers. • Tender shoots and twigs are crushed and rubbed on wet hair to remove Dandruff. • Root paste mixed with cow milk is taken orally for the treatment of cough and Teron asthma. • Used to treat typhoid with Curcuma aromatica • Tubers are used in ulcer, piles, syphilis, and dysentery, and powder used to kill hair lice. • About 10 gm of powder is given once a day for 5-6 days after menses as contraceptive. • Tubers are boiled after processing and given for abdominal pains. The tubers are dried and pea sized pieces are cut and given in early morning with water for 3 days to cure piles. • The roasted and mashed tubers are eaten with salt to cure cough.
4.	Dioscorea dumetorum (Kunth) Pax	Tuber	• Tuber juice is used to make arrow poison. Used against jaundice.
5.	Dioscorea esculenta (Lour) Burkill	Tuber	• Tubers are used for treatment of chest pain, nervous disorders, and swellings. • Tuber paste is used to relieve pain and to treat boils, dysentery and swellings.
6.	Dioscorea hamiltonii Hook.f.	Tuber	• For treatment of stomach ache. • Eaten for poor appetite. • Crushed tubers are given as body refrigerant during summer seasons and good for treating diarthea. • Piles
7.	Dioscorea hintfiora Benth	Tuber	• Used to treat gonorrhea.
8.	Dioscorea hispida Dennst.	Tuber Tendrils	• Water of soaked tuber is used as medicine for eyes. • Used as fish poison. • Sap of tuber is pasted around the affected parts and covered with cloths for about one night to treat peeling of skin of feet. • Tuber is used to treat vomiting, indigestion, possesses narcotic properties and fresh tuber taken as purgative. • Tubers are roasted and pounded and its paste is applied on wounds and injuries. • Antidote against arrow poison. • De - worming
9.	Dioscorea kamoonensis Kunth	Tuber	• Tubers are used in the treatment of arthritis and rheumatism.
10.	Dioscorea oppositifolia L.	Tuber Leaf Tuber	• Tuber is boiled with D. unifforus and is given to women once a day for nearly a month after delivery to revive their strength. • Oral administration of tuber powder mixed with honey is used for increasing sperm. • Leaf paste is used as antiseptic for ulcers. • Powered root mixed with cow urine is applied on scorpion bite. • Tuber Leaves are mixed with leaves of clematis and 2-8 drops of juice put in the nose of affected person to get relief after sneezing in fits and epilepsy.
11.	Dioscorea pentaphylia L.	Tuber	• 'Tubers are applied on swelling of joints and used as tonic to improve body immunity. • Used for stomach pain. • Crushed mass of tuber is given to cattle when they become sick by eating green leaves of maize. • Tuber is used as tonic and also used to cure stomach troubles and rheumatic swellings. • Inflorescence is used as vegetables for body weakness. Tubers are useful to allay pain and swelling.
12.	Dioscorea pubera Blume	Bubbils Tubers	• Bulbils are cooked and taken to cure colic pain. • Weakness
13.	Dioscorea wallichi: Hook.f.	Tuber	• Roasted and eaten for flatulence. • Used in stomach pain.
14.	Dioscorea spinosa Burm	Tuber	• Tubers are edible in the district Mayurbhanj of Ocisha, India.


1
2
3
4
5
6
7
8
9

Ethnobotanical Values of Dioscorea sp.

Dioscorea have sound ethnobotanical values throughout the Tropics. There are numerous reports available on local claims on Dioscorea species worldwide. The boiled tubers of D. membranacea Pierre ex Prain & Burkill are used to treat asthma and fever (Maneenoon et al., 2008). The mucilage from the tubers of D. piscatorum Prain & Burkill is used to poison fish is used by the native people of Malaysia as a piscicide (Burkill, 1951, 1960). D. prazeri Prain & Burkill is used as soap and shampoo to kill lice in India (Maneenoon et al., 2008).

Dioscorea is used in curing gastritis among Yoruba local groups of Cuba (Kadiri et al., 2014). Tubers of D. hamiltonii Hook.f. are used as body refrigerant during summer and are also usedto treat diarrhea (Dutta, 2015). D. bulbifera L. is used against tuberculosis and raw tuber of D. pentaphylla L. against diphtheria in cattle (Sharma and Bastakoti, 2009). Tubers of D. oppositifolia L. (Figure 2.7) are used in the treatment of swellings, scorpion stings, and snakebites (Dutta, 2015). Juice of D. wallichii Hook.f. is used in the treatment of Jaundice. D. hispida Dennst. (Figure 2.6) is used as an antidote to arrow poison (Sinha and Lakra, 2005; Edison et al., 2006; Mishra S. et al., 2008; Swarnkar and Katewa, 2008; Sahu et al., 2010). Details of ethnobotanical values of different species of Dioscorea are listed in Table 1. Besides the traditional therapeutic values, many researchers reported other pharmacological/ common uses of different Dioscorea species.

Food Values of Dioscorea sp.

In developing countries like India, people do not get enough food to meet their daily requirement, and most often the diet is deficient in one or more micronutrients (FAO, 1994). National food grain production was merely 50.82 million tons during 1950–1951, but has risen to 264.38 million tons in 2012–2013 (FAO, 1994). Edible roots and tubers not only enrich the diet due to the presence of starch and energy supplemented metabolites in them, but also possess medicinal properties due to the presence of diverse secondary metabolites. The tuber crop under study here, Dioscorea, is superior to many others as an important medico-food used by about 300 million people throughout the world (Arnau et al., 2010). In fact, they are one of the principal sources of energy food for many people in the Tropics (Nayaboga et al., 2014). As per source of dietary nutrients, Dioscorea species rank as the world's fourth most important root and tuber crops after potatoes, cassava, and sweet potatoes (Lev and Shriver, 1998). Many of the tubers of Dioscorea are bitter in taste, and local people use traditional skills to remove bitterness. Aboriginals also use their tubers as snacks, and in roasted, powdered, and other forms (Kumar et al., 2012; Misra et al., 2013). The same processes are also followed in various parts of India, including the Himalayan regions and North-Eastern part of India (Sheikh et al., 2013), Orissa (Sinha and Lakra, 2005; Kumar and Satpathy, 2011; Kumar et al., 2012; Misra et al., 2013), Tamil Nadu (Rajyalakshmi and Geervani, 1994; Shajeela et al., 2011), and among Palliyar and Kanikkar tribes (Shanthakumari et al., 2008; Arinathan et al., 2009) living in South-Eastern slopes of WesternGhats (Padmaja et al., 2001). They are also used by the local of Kumaon and Garhwal hills of India (Pramila et al., 1991). The nutrient content of the Yam has been compared with several other crops (Table 3; Wanasundera and Ravindran, 1994).

Bioactive Compounds Present in *Dioscorea* sp:-

Compounds	Uses	Species
Diosgenin	Synthesis of steroidal drugs	*Dioscorea deltoidei Wall.ex Griseb*
Sapogenin	Anti-infammatory effect	*Dioscorea spp.*
Saponin	Skin Infections	*Dioscorea spp.*
Cyanidin	Exhibit trypsin inhibitors	*Dioscorea spp.*
Flavonoids	Skin Infections	*Dioscorea belophylla (Prain) Voigt ex Haines*
Allantoin	Detoxification of ammonia	*Dioscorea spp.*
Diosconine	Birth Control	*Dioscorea bubifera* L.
Chenolic compounds	Skin Infections	*Dioscorea pentaphylla* L.

CONCLUSION

As these Dioscorea species mentioned above have so many medical uses and other pharmacological activity, it is need to be validated and detailed investigations on the composition and pharmacological significance of the medicinal plants under this genus along with the standardization of the formulations used should be undertaken extensively.

The most important identified compound from Dioscorea species is diosgenin, it is presently used in the synthesis of steroidal drugs, however other potential uses of this compounds and related compounds as estrogenic, anti-inflammatory and anticancer potentialneed to be studied extensively. Similarly, authentication of all the secondary metabolites (alkaloids, saponin, flavonoids, tannins and phenols) from this genus should be performed carefully by advanced analytical techniques to validate its quality and for conforming its biological potentials. Further studies are also required to address various issues regarding the composition of the extracts used, explicability of the preclinical experiments and

lack of conversion of the preclinical results to clinical effectiveness. Attempt should also be made to conduct serious human trails and to determine the mechanism of action, bioavailability, pharmacokinetics and the physiological pathways for various types of bioactive compounds for their potential applications in drug discovery and for curing various life threatening diseases. Studies should also be carried out to utilize the bioactive compounds present in these tubers for formulation of new drugs to fight against pathogenic multidrug resistant microorganisms and antimicrobial resistance.

REFERENCES

1. Chunekar krushnachandra bhavaprakash Nighantu, Varanasi, Chaukhamba Bharati Prakashan Varanasi; Shakavarg, 2015; 681.
2. Abasi, N. A., Thompson, E. D., and Onyenweaku, C. E. Measuring efficiency of yam (Dioscorea spp.) production among resource poor farmers in rural Nigeria. J. Agric. Food Sci., 2013; 1: 42–47.
3. Google Scholar, Abhyankar, R. K., and Upadhyay, R. Ethno medicinal studies of tubers of Hoshangabad, M.P. bulletin of environment. Pharmacol. Life Sci., 2011; 1: 57–59.
4. Google Scholar, Aderiye, B. I., Ogundana, S. K., Adesanya, S. A., and Roberts, M. F. Antifungal properties of Yam (Dioscorea alata) peel extract. Folia Microbiol, 1996; 41: 407–412. doi: 10.1007/BF02815690
5. PubMed Abstract | CrossRef Full Text | Google Scholar, Adetoun, A., and Ikotun, T. Antifungal activity of dihydrodioscorine extracted from a wild variety of Dioscorea bulbifera L. J. Basic Microbiol, 1989; 29: 265–267. doi:10.1002/jobm.3620290504
6. https://doi.org/10.3389/fphar.2017.00052