

Phyto-Sociological Study of Seedless Fruits in *Diospyros* spp. in Southern Gujarat

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ABSTRACT

A *Diospyros* genus belongs to the Ebenaceae family of the plants. Present research paper entails about the first phyto-sociological study on parthenocarpic fruit character in *Diospyros* spp. from the agriculture land of the Dangs District in Gujarat State. This unique information of parthenocarpic or seedless character in this specific *Diospyros* spp. was obtained from tribal communities of the study area. Collected information was found to be important therefore, location and coordinates were marked on the field. Species physical were measured and total 8.1tC carbon sink estimated by the non-destructive method.

Keywords:

Carbon sink (tC), *Diospyros* spp., Parthenocarpic (Seedless), Phyto-Sociological.

Introduction:

Diospyros is a genus of more than 700 species of deciduous and evergreen trees and shrubs belongs to the Ebenaceae family of plants. *Diospyros* is a Greek word which means Divine Fruit. About 41 *Diospyros* species occur in India of more than 350 species identified; these are mostly trees and rarely shrubs, out of these *Diospyros melanoxydon*, *Diospyros peregrina*, *Diospyros sylvatica*, and *Diospyros tomentosa* species were found to be useful in Malaria [1].

In India, the leaves of *Diospyros* spp. (*Diospyros melanoxydon* Roxb, *Diospyros montana* etc.) are used in traditional cigarette making called as "Bidi". Under suitable climatic conditions mature tree produces fruits which exhibit compressed, oblong, and shiny seeds but, in this present study we have found the parthenocarpic characters in fruits of *Diospyros* spp. Okaro et al 2011 proposed, Vegetative parthenocarpy is widely botanically defined as fruit development in the absence of fertilization in plants i.e. plant produces seedless fruits. Species found in present study is medicinally very important and useful in Astringent and other digestive disorders [5]. We spotted this species from the Dangs district of Gujarat State. Species was marked on following location:

Species Location

In Gujarat, majority of the *Diospyros melanoxydon* Roxb species is reported in earlier research studies. Parthenocarpic *Diospyros* spp. marked on the coordinates of 20° 49' 51.3" North and 073° 40' 02.5" East (on the elevation of 1583ft. above the sea level) in the agriculture land of "Diwantimru" village of the Dangs District in Gujarat State (Map-1, 2). Identically, the name of the village itself denotes about the species locality in this area (Diwantimru- Diwan or Dwellers and Timru- *Diospyros* spp.). The total village land area is 5062.4ha out of which 4664.95ha comprises of forest land and remaining comprises of agriculture and revenue area. This species was observed in agriculture land of the village.

Field Survey on Species

Physical parameters Girth at Breast Height (GBH in cm) and total height (meter) of the tree was measured in summer season. During summer (May) season we found leaves on complete mature trunks. *Ficus rumphii* Blume, was also allied on partial side of trunks and Orchids were also observed on the main branches of tree. Tree girth was measured with the Tailor tap above the ground 1.32meter and tree height was

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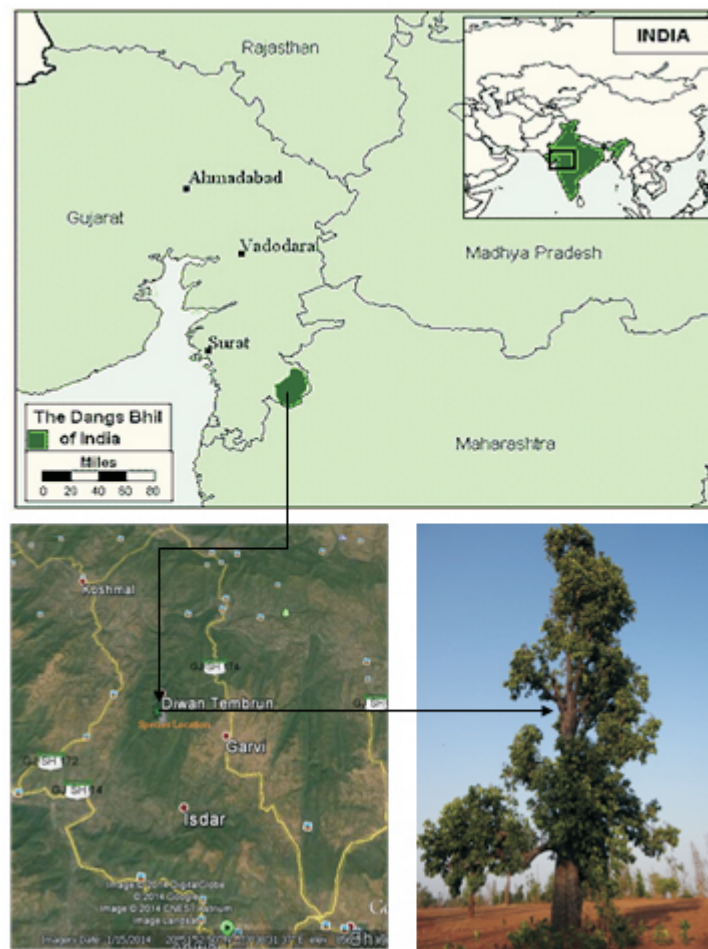
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assumed using 2meter long *Dendrocalamus strictus* culm. Joined trunks of this species were observed on the ground as shown in photograph-1. The nearing forest area is rich in the presence of *Diospyros melanoxylon* Roxb which generally occurs in the maximum girth of 190cm [3] but we have recorded larger trunks in our study. Trunk-1 GBH was 298cm and Trunk-2 GBH was 154cm recorded in respect to 24 meter height. Carbon sink of the species was estimated by non-destructive method [4]. The confirmation of its parthenocarpic characters of this species was based on Phyto-Sociological survey in the village. Total 166 households were reported from village head. 10% households from total households were randomly selected for survey. A reluctant responding household were skipped and instead of that next household was surveyed. For species verification, following few questions were asked to the tribal communities and later the information were computed.

- 1.Does any more parthenocarpic fruits producing individuals of this species are available in your village?
- 2.How much quantity of fruits are produced every Year or gap in the Years?
- 3.Which characters have you been observed in this species?
- 4.Are all the fruits of this plants are seedless?
- 5.How long you know about this species parthenocarpic character?



Map-1: http://kcm.co.kr/bethany/p_maps1/606.gif

Map-2: www.wikimapia.org
Species Photograph-1: By Author.

Results and Information Limitation

Total 18 households (HH's) were surveyed under this study. Three tribal communities Konkani, Warli and Bhil were recorded from the village. 11 HH's of Konkani communities, 5 HH's of Warli and 2HH's of Bhil communities were surveyed. From surveyed households about >90% households confirmed that plant produces seedless fruits and fruits size appears quite larger than actual fruits. From data collection we found that, plant produces minimum 95±2kg fruits per year and maximum 135±5kg fruits per year. From our community survey, we also come to know that this

is the only trunk of this *Diospyros* spp. in the whole village area which produces parthenocarpic fruits than other tree individuals of this species. It is suggested in available literatures in fruits of *Diospyros kaki* L., *Diospyros blancoi* A.DC. are parthenocarpic [2]. From the physical parameters and available non-destructive equations we estimate the total carbon sink of the species. 8.1tC carbon weight estimated from the non-destructive method (Table-1).

Mean GBH of both trunks (cm)	Height (meter)	Diameter (cm)	Bio-volume (W)	Total Green weight (Kg)	Total Dry weight (Kg)	Total Carbon weight (Kg)	tC
226	24	71.97452	18649.19	22379.03	16224.80	8112.40	8.1

Conclusion, Queries and Recommendation:

Presently, very scanty information is available about this recorded *Diospyros* spp. during our field survey. There is only single parthenocarpic *Diospyros* spp. (two trunks but separated below 1.37meter) was found in our study area. The reason of Seedlessness characters in this species is still unclear, whether it is the impact of climate on particular species or gene mutation in particular species. If it's mutation than, Does mutation affects the fruit productivity of the species? Therefore, from our phyto-sociological study it can be concluded Species with such unique features requires conservation and protection from relevant departmental authorities and further studies at genetic level are also required for particular species.

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