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ASSESSMENT OF PASSPORT DATA & REMOVAL OF DUPLICATES IN DIFFERENT ACCESSIONS *Jatropha curcas* SEEDS ASSEMBLED FROM DIFFERENT AGRO-CLIMATIC ZONES OF INDIA

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ABSTRACT

A Under the Micro-mission on Production and Demonstration of Quality Planting Material of *Jatropha* supported by the Department of Biotechnology (DBT), Government of India (GoI), effort on agronomic practices, assortment of elite trees, clonal propagation, tissue culture, etc. is being undertaken (ref:- DBT Annual Report, 2005-06). Under Present investigation for "Assessment of Passport data & removal of duplicates in different accessions of freshly harvested *Jatropha curcas* seeds assembled from fifteen states of India representing variable climatic conditions; The freshly harvested accessions/seeds were collected/ assembled from different 15 Indian states representing different agro climatic regions of India. All accessions received were verified for duplicates, and then registered with National Identity.

KEYWORDS: *Jatropha curcas*, Passport data, Duplicates, Agro climatic regions

The pantropic oil-bearing tree *Jatropha curcas L.* is receiving lot of consideration from policy makers and project developers, as it is well adapted to arid and semi-arid climates, and is also accredited to reclaim wasteland at the same time, produce bio-diesel and boost socio-economic development in degraded areas (Achten et al., 2007). Though this species can commendably endure a wide range of adverse climatic and edaphic conditions, fruit yield comes down substantially with reduced rainfall. Numerous research studies are being conducted on the planting material of *Jatropha,* agro-technologies, properties of the oil and the bio-diesel produced and the fuel competence in different types of engines.

Under the Micro-mission on Production and Demonstration of Quality Planting Material of Jatropha supported by the Department of Biotechnology (DBT), Government of India (GoI), effort on agronomic practices, assortment of elite trees, clonal propagation, tissue culture, etc. is being undertaken (ref:- DBT Annual Report, 2005-06). National Oil and Vegetable Oil Development (NOVOD) Board is also encouraging work on standardization of propagation, establishment of model plantations, detoxification of seed meal, development of pre-processing & processing equipment's, training, above and beyond tree improvement through agricultural and conventional universities, state forest departments and forest development corporations national institutions etc., Indian Railways, the single largest consumer of high speed diesel (HSD) and a few state road transport undertakings in the country are making efforts to alternate mix biodiesel with HSD (Singh, 2006). In India 12 species of Jatropha have been listed and J. curcas which is considered as a prolific fruit yielder, is an exotic from Portugal and Central America introduced by Portuguese settlers about 500 years ago. Though it has spread to many parts of India in a short span of time, the genetic base remained small except those changes in the phenology, biochemical and genetic constitution forced by site quality and associated factors.

MATERIALS AND METHODS

Under Present investigation for "Assessment of Passport data & removal of duplicates in different accessions of freshly harvested *Jatropha curcas* seeds assembled from fifteen states of India representing variable climatic

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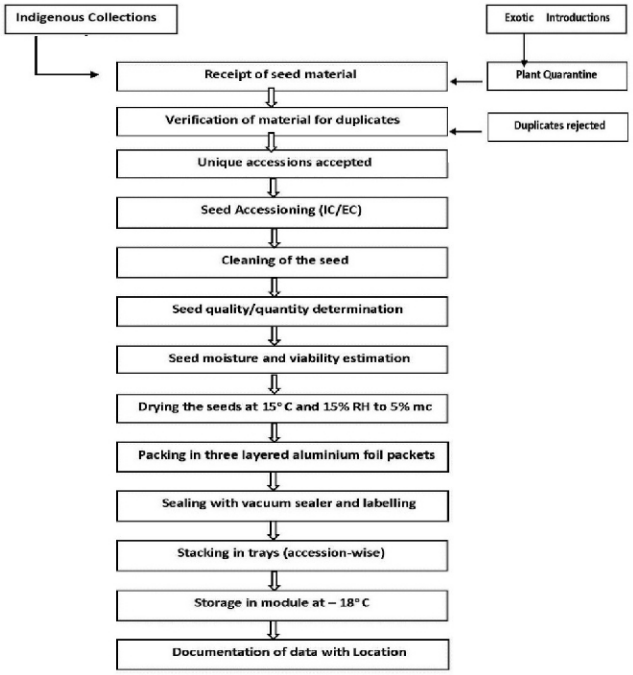
conditions; The freshly harvested accessions/seeds were collected/ assembled from different 15 Indian states representing different agro climatic regions of India. All accessions received were verified for duplicates {ISTA (1985), ISTA (1993), ISTA (1996), ISTA (1999), ISTA (2003)}, and then registered with National Identity as per protocol given in flow chart (Flowchart-1) below.



Flowchart 1 : Protocol followed for removal of duplicates from accessions received & registration with National Identity.

RESULTS AND DISCUSSION

Table 1, illustrates the passport data of *Jatropha curcas* collected from fifteen different states of India, viz Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Tamil Nadu, Uttaranchal, Uttar Pradesh and West Bengal. All these seed collections were assembled from the wildly dispersed trees where Andhra Pradesh represents East Coast Plains & Hills Region-XI, West Coast Plains & Ghats Region-XII & Southern Plateau & Hills Region-X; Assam represents Eastern Himalayan Region-II; Bihar represents Middle Gangetic Plains Region-IV; Gujarat represents Gujarat Plains & Hill Region-XIII; Haryana represents Trans-gangetic Plains Region VI; Himachal Pradesh represents Western Himalayan Region- I ; Kerala represents West Coast Plains & Ghats Region- XII; Madhya Pradesh represents Eastern Plateau & Hills Region-VII, Central Plateau & Hills Region-VIII, Western Plateau & Hills Region-IX; Maharashtra represents Eastern Plateau & Hills Region-VII, Western Plateau & Hills Region-IX & West Coast Plains & Ghats Region-XII; Punjab represents Trans-gangetic Plains Region VI; Rajasthan represents Trans-gangetic Plains Region VI, Central Plateau & Hills Region- VIII, Western Plateau & Hills Region-IX. & Western Dry Region-XIV; Tamil Nadu represents Southern Plateau & Hills Region-X, East Coast Plains & Hills Region-XI & West Coast Plains & Ghats Region; Uttaranchal represents Western Himalayan Region I; Uttar Pradesh represents Middle Gangetic Plains Region IV, Upper Gangetic Plains Region - V Central Plateau & Hills Region-VIII; West Bengal represents Eastern Himalayan Region II, Lower and Middle Gangetic Plains Regions-III & IV & Eastern Plateau & Hills Region-VII.

Jatropha does well in warmer areas. During cold weather it drops off its leaves & can also withstand light frost to some extent. The older the tree the better it will withstand. Black frost will almost certainly kill young plants and severely damage older plants. This highly drought- resistant species is adapted to arid and semi-arid

conditions. The current distribution illustrates that introduction has been most successful in the drier regions of the tropics with annual rainfall of 300-1000mm. It occurs mainly at lower altitudes (0-500 m) in areas with average annual temperatures well above 20°C but can grow at higher altitudes and tolerates slight frost. It grows on well-drained soils with fine aeration and is well adapted to marginal soils with stumpy nutrients. It grows at various places as shrub, herb and tree. Such a diverse habitat can make the plant behave differently in different places. Consequently, under the present investigation different accessions assembled from diverse states (habitat- from different agro-climatic zone of India) with different seed sizes were used.

Different bio geographical zones- the Trans-Himalayan, the Himalyan, the Indian desert, the semi-arid zone(s), the Western Ghats, the Deccan Peninsula, the Gangetic Plain, North-East India, and the islands and coasts evidently testify that India has a rich and varied heritage of bio- diversity (Rodgers; Panwar and Mathur, 2000). India is prosperous at all levels of biodiversity and is one of the twelve mega diversity countries in the world. A high level of ecosystem diversity encompassing forests, wetlands, grasslands, deserts, coastal and marine ecosystems, each with a unique assemblage of species has been existing. India principally due to its wide range of climatic and topographical features (MoEF,2002), more than 47,000 species plants and over 89,000 species of animals over just 70% of the country's area has been testified through comprehensive surveys conducted hitherto in India (MoEF, 1999). India's biogeographical location at the junction of the Agrotropical, Indo-Malayan and Paleo-Arctic realms has contributed to the biological richness of the country. The endemism of Indian biodiversity is high about 33% of the country's recorded flora is endemic to the country and is concentrated mainly in the North-East, Western Ghats, North-West Himalaya and the Andaman and Nicobar islands. On the subject of 62% of the known amphibian species and 50% of the lizards are endemic to India, the majority occurring in Western Ghats (MoEF, 1999). It is evident that Amplified exploration, characterization and utilization genetic resources are vital to develop *Jatropha* crop to its full potential for the benefit of mankind.

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Table 1: Passport data of different accessions of freshly harvested *Jatropha curcas* seeds assembled from fifteen states of India representing variable climatic conditions

S No.	*Jatropha curcas* seed Accession	Source district	Latitude & Longitude	Source State & related Agro climatic zone of INDIA
1	IC0573195	Hyderabad	17.20° N & 78°30' E	Andhra Pradesh; East Coast Plains & Hills Region
2	IC0329726	Khammam	17.24° N & 80.15° E	Andhra Pradesh; East Coast Plains & Hills Region
3	IC0569320	Kamrup	26.31°N & 91.59° E	Assam; Eastern Himalayas Region
4	IC0569321	Cachar	24.78°N & 92.85° E	Assam; Eastern Himalayas Region
5	IC0574417	West Champaran	27.15°N & 84.35° E	Bihar; Middle Gangetic Plains Region -
6	IC0574418	West Champaran	27.15°N & 84.35° E	Bihar; Middle Gangetic Plains Region
7	IC0573196	Bhavnagar	21.76°N & 72.15° E	Gujarat; Gujarat Plains & Hills Region
8	IC0573197	Bhavnagar	21.76°N & 72.15° E	Gujarat; Gujarat Plains & Hills Region
9	IC0565512	Hisar	29.14°N & 75.72° E	Haryana; Trans-Gangetic Plains Region
10	IC0565513	Hisar	29.14°N & 75.72° E	Haryana; Trans-Gangetic Plains Region
11	IC0561223	Hamirpur	31.68°N & 76.52° E	Himachal Pradesh; Western Himalayas Region
12	IC0561224	Hamirpur	31.68°N & 76.52° E	Himachal Pradesh; Western Himalayas Region
13	IC0210676	Thrissur	10.52°N & 76.21° E	Kerala; West Coast Plains
14	IC0564433	Kasargod	12.51°N & 74.98° E	Kerala; West Coast Plains
15	IC0589358	Satna	24.53°N & 80.89° E	Madhya Pradesh; Central Plateau and Hills Region
16	IC0558211	Amaravati	20.93°N & 77.77° E	Maharashtra; Western Plateau and Hills Region
17	IC0558212	Amaravati	20.93°N & 77.77° E	Maharashtra; Western Plateau and Hills Region
18	IC0560678	Patiala	30.33°N & 76.38° E	Punjab; Trans-Gangetic Plains Region
19	IC0561287	Patiala	30.33°N & 76.38° E	Punjab; Trans-Gangetic Plains Region
20	IC0566614	Rewari	22.12°N & 79.27° E	Rajasthan; Central Plateau and Hills Region
21	IC0566615	Udaipur	24.58°N & 73.71° E	Rajasthan; Central Plateau and Hills Region
22	IC0569121	Madurai	9.92°N & 78.11° E	Tamilnadu; Southern Plateau and Hills region
23	IC0569122	Madurai	9.92°N & 78.11° E	Tamilnadu; Southern Plateau and Hills region
24	IC0559372	Rae Barely	26.23°N & 81.24° E	Uttar Pradesh; Upper Gangetic Plains Region
25	IC0559373	Gorakhpur	26.76°N & 83.37° E	Uttar Pradesh; Eastern Himalayas Region
26	IC0371783	Dehradun	30.31°N & 78.03° E	Uttarakhand; Western Himalayas Region
27	IC0560615	Dehradun	30.31°N & 78.03° E	Uttarakhand; Western Himalayas Region
28	IC0556024	Jalpaiguri	26.54°N & 88.72° E	West Bengal; Eastern Himalayas Region
29	IC0556025	Jalpaiguri	26.54°N & 88.72° E	West Bengal; Eastern Himalayas Region

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