RESEARCH ACTIVITIES ON JATROPHA CURCAS: AGRONOMIC TECHNIQUES, BREEDING AND TOXICITY

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The activities, founded by the JTF Srl, includes some research activities developed in Italy and some practical activities done in open field in Senegal and Madagascar. Contacting autor: enrico.palchetti@unifi.it

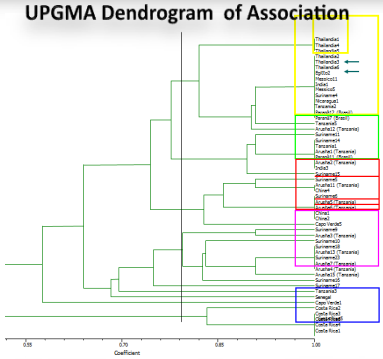
ACTIVITIES PERFORMED IN ITALY

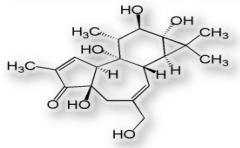
a) Germplasm collection of worldwide accessions: over 22 provenience of Jatropha curcas are actually cultivated in collection in the DIPSA greenhouses, a total number of 700 individuals are present.

b) Molecular characterization of the collection: using an enriched genomic library together with the Tubulin-Based- Polimorphism method the germplasm collection was characterized. A low level of variability was found among the accessions . Only the Costa Rica accession appears to be strongly different.

c) Physical/chemical characterization of the oils extracted: the jatropha curcas oil has been comparated with other vegetable oils (including moringa oleifera) for the technical parameters: cinematic viscosity, density, acid value, sulfur content, iodine number, water content. It fits the chemical and technical requirements for bio-diesel or for Pure Oil use.

UPGMA Dendrogram of Association





Phorbol-ester detected in JC

d) Chemical investigations of the toxics compounds: the chemical compounds named Phorbol-esters, presents in the whole jatropha plant, have been analyzed and partially tested for their toxicity. Five different phorbol-ester have been recognized in Jatropha, together with other anti-nutritional molecules. Actually their suspected toxicity is not confirmed.

e) Investigation of salt and drought tolerance: a screening for salt and drought tolerance among 12 accessions have been performed using a hydroponical system. The results confirm that Jatropha curcas is strongly tolerant to salt and drought.

f) Investigation of the capacity of adsorption of lead: a similar screening for lead (Pb) adsorption capacity is actually ongoing, from the earlier results Jatropha curcas appears to be a high phyto-remediant plant regarding lead.

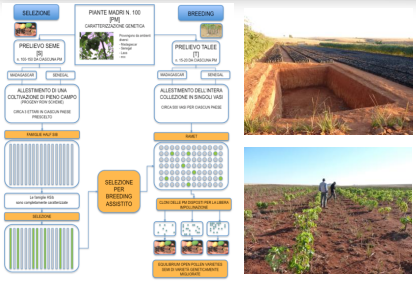
ACCESSION PARANÀ BRASILE - SALT TOLERANT

2 mS cm^{-1} 6 mS cm^{-1} 12 mS cm^{-1}

ACTIVITIES IN REPUBLIC OF SENEGAL

g) Province of Tambacounda, Republic of Senegal, realization of a nursery for 3.5 millions plantlets and a plantation of 700 hectares in year 2010: together with the practical activities of cultivation some researches on seed's germination and nursery management have been performed. The experimentation was focused on: direct seeding or phytocell use, influence of seed pre-treatment and temperature on germination rate, influence of plantlets' age on success in transplantation rate, trials on different methods of transplant. The target achieved is represented by the realization of a pilot plantation of 700 Ha that represent the first step for a targeted plantation of 5.000 Ha in the next years .

ACTIVITIES IN REPUBLIC OF MADAGASCAR



Breeding scheme

h) Horombe plateaux, Republic of Madagascar, creation of a 3 million plantlets nursery and 400 hectares of open field plantation in 2011: while the Tozzi Green's team was installing a nursery and a 400 Ha plantation in intercropping with Vetiver, the DIPSA researchers started with the first step of a 6 years breeding project focused on the creation of new varieties of Jatropha curcas. For this purpose a wide local germplasm collection has been firstly created, this collection is actually under molecular and morphological characterization in the DIPSA laboratories while a 3 hectares field suitable for crossing pollination and breeding activity has been realised in Satrokala, on the central plateaux of Horombe in Madagascar.