Date Palm Hybridization and Metaxenial Effects on Biochemical Attributes and Hybrid Development

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Abstract:

Date palm (2n=36) is dioecious monocotyledonous belonging to Arecaceae family. As pollen grains caused the great diversity and variations in size, quality and ripening time so 9 different pollen sources were selected to study the differential behaviour of pollen parents on fruit characteristics of female cultivars i.e Hillawi. Fruit was harvested at Khalal stage from controlled pollinated treatments and biochemical analysis was carried out to study the metaxenial effect of different pollen.while the seeds obtained from these fruits were planted in the nursery for confirmation of hybrids. Biochemical characters, total sugars, DPPH, ascorbic acid, total phenolic contents, total soluble solids, total proteins, sucrose, glucose, fructose, and enzymatic activities (peroxidase, catalaze, superoxidase ans protease) were highly variables. Among 9 pollen sources M8 (Sq.no. 32) was superior because it was positively associated with most of the variables. M7 (collected from Uni campus) retained highest capability for ascorbic acid and reduced ripening time. The morphological and biochemical dendrogram generated from Wards method can distinguished these combinations into 3 clusters for cultivar Hillawi. Our results showed that biochemical traits (using XLSTAT software) were very appropriate for studying the metaxenail effect that can be used for further breeding targets as economically very important regarding yield and quality. For hybrid identification 12 Simple Sequence Repeats were used to identify the true hybrid of date palm developed from the seeds, resulted from the controlled pollination from their respective parents. Main objective of this study was to identify the true hybrids respective to their parents to carry out the further breeding programmes. Out of 12, only 6 SSR primers clearly produced the SSR amplification with the size ranging from 125 to 500 bp. Total 6 primers identified the true to type as well as ambiguous hybrids. Primer mpdCIR-10 identified the maximum no of true hybrids 13 (81.25%) out of 16 while 3 ambiguous hybrids (18.75%).

Recent Publications :

1. Hussain Z., M. Zubair, W.Nouman, I. Ashraf, **Maryam**, R. Qureshi, M.F.Nawaz. and K.A. Ansari. 2018. Phytoremedial potential of *Azadirachta indica* A. Juss. for lead contamination under saline conditions. Pak. J. Weed Sci. Res., 24(2): 165-175
2. **Maryam.**, Jaskani, M.J, S. Ahmad, F.S. Awan and I.A. Khan. 2016. Development of molecular method for sex identification in date palm (*Phoenix dactylifera* L.) plantlets using novel sex-linked microsatellite markers. 3 Biotech 6:22
3. Ahmad, I., M. Nafees, I. Ashraf, **Maryam**, J.M. Al-Khayri, M.M. Yousaf, B. Ahmad and R. Qureshi. 2016. Fruit morphological attributes to assess genetic diversity in jujube (Ziziphus mauritiana L.) germplasm of Bahawalpur. Pure and Applied Biology. 5(4): 921-926
4. **Maryam.**, M.J. Jaskani, B. Fatima, M. S. Haider, S.A.Naqvi, M. Nafees, R. Ahmad and I.A.Kkhan. 2015. Evaluation of pollen viability in date palm cultivars under different storage temperatures. *Pak. J. Bot*., 47(1): 377-381.
5. **Maryam**., M.J. Jaskani, S.Ahmad and F.S. Awan. 2015. Metaxenial effects on morphological attributes in date palm cvs. Hillawi and Khadrawy. Pak. J. Agri. Sci., 52(2), 387-393

Biography:

Dr. Maryam has her expertise in date palm metaxenic studies as well as date palm biotechnology. She has identified the best superior date palm male plants for qualitative and sustainable production. She has also identified the date palm gender at early developmental stage.